HYMANS ROBERTSON

Worcestershire County Council Pension Fund

Review of Investment Strategy

February 2019

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For and on behalf of Hymans Robertson LLP

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Executive Summary

This reports sets out the analysis and conclusions of a high level review of the Worcestershire County Council Pension Fund. It covers a broad range of investment issues. The key findings from the review are as follows:

- The Fund looks to be in a strong place in its ability to deliver the required return against the current funding plan. Equities are clearly the main driver of return but also a significant contributor to risk. While the structured equity solution will help manage this risk if held on a rolling basis, we believe this also has the potential to impact on expected returns.
- We believe there is an opportunity to marginally improve the expected return on Fund assets while reducing volatility by reducing the exposure to equities and allocating to alternative and income focussed assets such as multi-asset credit and private debt.
- We are supportive of committing additional monies to private debt and multi-asset credit but would consider the timing of implementation for multi-asset credit carefully. We also support the current programme to build up the allocation to property and infrastructure as diversifying, income focussed assets.
- De-risking into more liability focussed assets like gilts may be a more effective way of reducing risk than structured equity. However, we would not recommend doing this at present given the current outlook unless it was considered as part of a wider de-risking framework that also considered funding affordability.
- The future of the structured equity solution should consider the Fund's long term objectives and impact on funding. We are not in favour of a long term rolling allocation to structured equity given the potential impact on returns. If considering whether to extend the existing solution into 2020, the Committee would need to address:
    - whether pricing gives the required trade off in terms of downside protection and loss of upside; and
    - how important the risk reduction provided by a structured equity arrangement is to the funding approach and what impact it will have on funding of future service costs.
- We would not recommend the Fund look to de-risk into lower risk assets like gilts at present, but should instead focus on diversification of risk and revisit the potential for setting funding level triggers or a risk management framework as part of the upcoming valuation.
- Regarding currency risk, for the equity allocation our preference is not to try and predict the future direction of currency markets, or to implement currency hedging on a tactical basis. We do not see it as a strategic requirement for the Fund to hedge out its foreign currency exposure.
- The Fund is likely to continue to be cashflow negative and these demands may increase in the coming years. We believe work should be undertaken to understand the likely cashflow demands of the illiquid asset commitments like infrastructure, debt and property. We also propose the Committee look to establish a high level liquidity waterfall framework for accessing cash should it be required to fund any future investments or to pay member benefits.
- The split between active and passive management will depend on the Committee's belief in the ability of active management to add value. However, we believe there is merit in moving the corporate bond allocation to a passive approach.
- The Committee could also consider whether the split between market cap and multi-factor remains appropriate and whether the allocation to market cap could be reduced in favour of multi-factor. The

Committee will also need to engage with the Central pool to understand what equity style options will be offered within the pool.

- Interest rate and inflation risk can have a significant impact on the funding position and is an important risk consideration. Our preference would be for the Fund to focus on generating long term real returns and only consider hedging if looking at managing employer specific risks or if there was an improvement in the pricing or outlook for index-linked gilts.
- The options for mapping existing allocations across to LGPS Central should be carefully considered and a consistent framework applied to help review options and ensure good engagement with the pool. Immediate options for mapping existing allocations into LGPS Central should be considered for passive UK Equities and active Emerging market equities.
- Further strategic considerations are required for mapping the remainder of the equity allocation including passive equities ex UK, active Asian equity and factor based equities and also corporate bonds if a passive alternative is not preferred. In our view the available equity options do not meet the strategic objectives of the Fund and therefore further engagement with the Pool is needed.
- The Fund should look to engage with the Pool regarding solutions still in development or where no equivalent options are available for existing Fund allocations such as property, infrastructure, private debt and multi-asset credit.
- We are supportive of the Committee's development of a core set of investment beliefs as a framework for decision making. We believe that any recommendations from this report are tested against these beliefs to ensure there is a robust process for testing investment decisions that can stand up to scrutiny and can be clearly explained to external parties or new members of Committee.

We look forward to discussing this report with Committee.

Prepared by:-

David Walker, Partner

Emma Garrett, Associate Investment Consultant

28 January 2019

For and on behalf of Hymans Robertson LLP

1 Introduction

Addressee

This report is addressed to the Pensions Committee ('the Committee') and officers of the Worcestershire County Council Pension Fund ("WCCPF"). This report sets out the conclusions of the independent high level review of the Fund's investment strategy and also makes recommendations on the asset allocation and mandate structure for the Fund's investment arrangements.

The report should not be disclosed to any third party except as required by law or regulatory obligation or with our prior written consent. Where this is permitted, the report may only be released or otherwise disclosed in a complete form which fully discloses our advice and the basis on which it is given.

Background

The Worcestershire County Council Pension Fund ("WCCPF") has appointed Hymans Robertson to provide an independent high level review of its investment strategy to serve as an interim review in advance of the 2019 actuarial valuation to assess the suitability of the current investment strategy and asset allocation set in 2016.

This review takes into account any scope to improve the risk return profile of the Fund's investments, optimising diversification benefit where possible, whilst being mindful of contribution rates, income generation and the dynamic structured equity arrangement in place.

In order to test the impact of different variations in the strategy we have carried out a mix of quantitative and qualitative analysis within this report. This high level review takes into consideration the following aspects of the Fund's investment strategy.

Overview of current strategy

The Fund's current investment strategy had an overall best estimate average expected return of c.3.7% per annum in excess of CPI inflation at the 2016 valuation date. The Fund employs a mixture of active and passive investments and an equity protection strategy across its passive equity portfolio which is due to expire in July 2019. The Fund has also recently increased its allocation to alternative growth assets which are in the process of being funded.

Testing variations in strategy

Assess the current strategic asset allocation by undertaking quantitative structure modelling on both the current allocation and a range of agreed alternative investment strategies to test their risk and return profiles.

Structured Equity

Review the current structured equity arrangement in place and quantify the protection provided together with any associated risks.

Assess the impact on the Fund's return and volatility should the existing equity protection strategy be rolled forward and outline alternative ways of generating long term return whilst also providing equity risk protection.

Investment strategy and funding affordability

Outline the current contribution rates and assess the sensitivity of funding assumptions to changes in the expected return and how this might impact on the affordability of contributions. Consider what a long term steady state investment strategy looks like for the Fund now it is close to 100% funded.

Currency hedging

Provide a brief summary of the key benefits, risks and implementation considerations of currency hedging more generally including the ways in which currency hedging could be implemented in the Fund.

Income and net cashflow requirements

Assess the likely cashflow requirements of the Fund in the short to medium term, considering potential income that could be sourced from existing mandates and potential income from new asset classes.

Active versus passive management

Review the current active / passive split of the Fund's assets together with any factor tilts. Provide advice on the appropriateness of the split given the underlying mandates and investment management fees paid.

Interest rate and inflation hedging

Our review will assess if this allocation continues to play a role as a protection asset given the current approach to funding and the focus on delivering long-term real returns. We will consider efficient ways of delivering a low-risk liquid protection solution, particularly if the Fund wishes to manage these risks at underlying employer level.

Investment pooling – Mapping to LGPS Central Ltd

Review the funds currently on offer within the pool and consider how the Fund's existing assets could map across to the pooled fund offering. Take future pooling activity into account when providing any advice as part of the strategy review.

Investment beliefs

We aim to highlight key considerations throughout each aspect of the strategy review in order to ensure that all investment decisions are conscious and accurately reflect Committee beliefs.

2 Overview of Current Strategy

Current investment and funding position

The WCCPF was valued at £2.82bn as at end August 2018 and was 99% funded. The primary objective of the Fund's investment strategy is to ensure that sufficient assets are available to meet liabilities as they fall due and to maximise the expected return at an acceptable level of risk.

The Committee, taking into account the Fund's liability structure, has set its strategic investment asset allocation to meet this objective as detailed in Table 1 below. The Fund's current investment strategy had an overall best estimate average expected return, as calculated by the Fund Actuary at the time of the last actuarial valuation, of c.3.7% per annum in excess of CPI at the 2016 valuation date.

The Fund has recently increased its allocation to alternative growth assets, property and infrastructure, to improve diversification and reduce volatility of returns. These mandates are currently in the process of being funded and as at the end of September 2018, there remained c.£240m of undrawn commitments within the Fund's property and infrastructure portfolio.

The Fund maintains a high exposure to growth assets, with the allocation to equity making up c.75% of the Fund's overall strategic asset allocation. To manage the market risk associated with this high growth strategy the Fund employs an equity protection arrangement which is due to expire in July 2019. The fund also holds some synthetic equity exposure across a proportion of the passive UK Equities held.

The Fund is currently marginally cashflow negative due to a number of main employers within the pension fund prepaying their 3 year contributions in April 2017. This, together with the likelihood that employers will seek to reduce or extend deficit repayments at the 2019 valuation requires the Fund to increase the level of income generated from its assets whilst minimising the impact on returns as much as possible.

Table 1: Current investment strategy

Asset allocation	Target %
UK equity	23.5
Global equity	41.5
EM equity	10.0
Total Growth	75.0
Property	4.0
Real estate debt	2.0
Infrastructure	9.0
Total Alternatives	15.0
Private debt	2.0
Corporate bonds	8.0
Total Fixed income	10.0
Total	100%

High level risk and return analysis

In order to test both the current and alternative investment strategies, we have carried out a mix of quantitative and qualitative analysis within this report.

The quantitative analysis is supported by our proprietary structure model. Further details of this modelling including the assumptions, are provided in Appendix 1 of this report. However, in summary, the modelling undertaken calculates expected returns and risk under various combinations of asset class returns and economic variables for a variety of predetermined asset allocations.

The modelling allows us to look at the expected return against liabilities and associated volatility of a variety of different investment strategies. It also allows us to show how each mandate contributes to the total risk within the portfolio. The charts below set out the analysis of the current investment strategy in terms of both the expected returns and the risk exposures within the portfolio.

Chart 1: Expected return composition relative to cash (with and without structured equity arrangement)

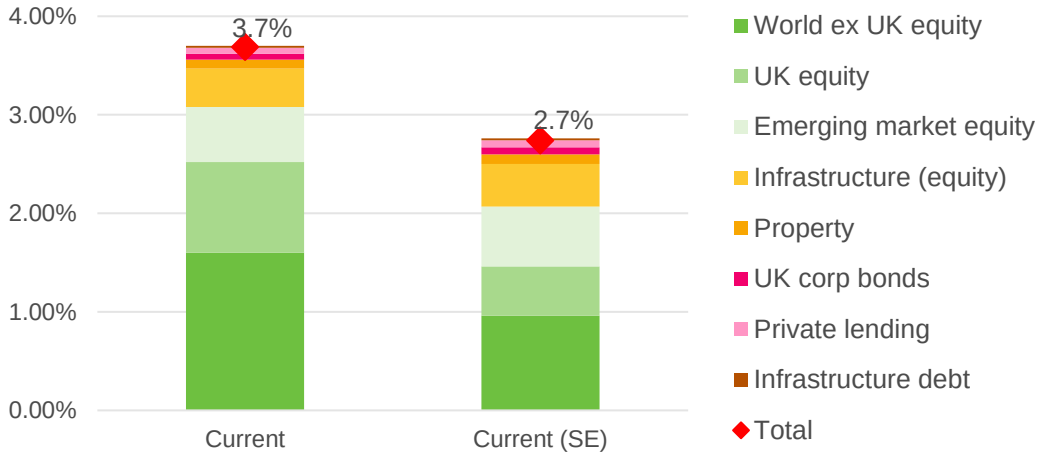


Chart 2: Expected returns relative to CPI (with and without structured equity arrangement)

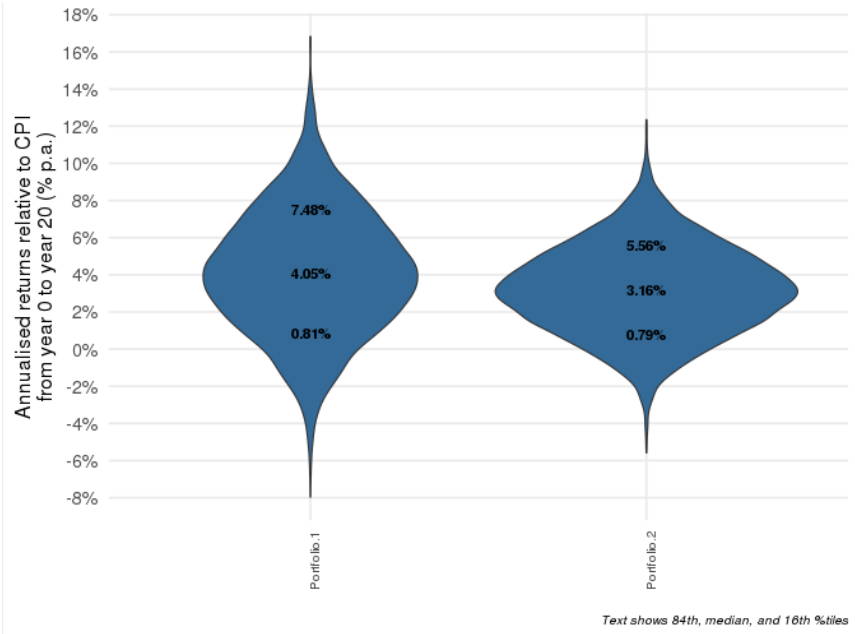
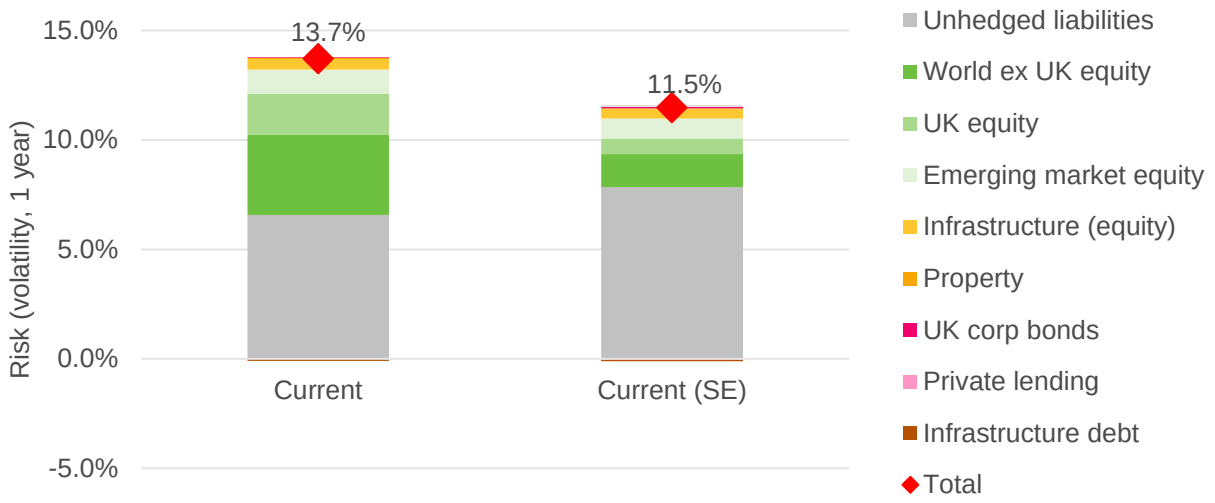


Chart 3: Risk contribution (with and without structured equity arrangement)



The above charts show expected returns and volatility of the current investment strategy with and without the structured equity arrangement ('SE'). Key points to note from the analysis above are:

- Chart 1 shows that the key drivers of expected returns are the Fund's allocation to equities (the green sections of the bars), with the Fund's allocation to alternative assets also modestly contributing.
- The median expected total return under the current investment strategy relative to cash is 3.7% with an annual volatility of 13.7%, with a rolling structured equity arrangement reducing both figures to 2.7% and 11.5% respectively.
- Chart 2 shows expected returns relative to CPI inflation. The Fund's expected return assumptions and valuation discount rate is derived relative to CPI. Both expected returns exceed the underlying valuation assumption of CPI+ 2.15% p.a. and CPI +2.75% p.a. for past and future service respectively.
- Chart 3 shows the Fund's allocation to equities as a large contributor to the overall Fund's risk allocation accounting for 6.7% of the 13.7% volatility measure. The equity component of the overall risk halves to 3.1% with the structured equity overlay.
- Whilst the yield risk of the un-hedged liabilities is large (the grey section of the chart) we view this more as a short term mark to market risk than a real risk as it combines both moves in interest rates and inflation which the current valuation approach is less sensitive to.

An important point in the above analysis is that we have allowed for the Fund's structured equity arrangement by modelling the arrangement as a portfolio of cash and equities, with the proportion split set by the Delta figures produced by River and Mercantile for the arrangement. A Delta figure provides a measure of the expected return of the arrangement relative to actual equity market movements.

Academic studies have shown that over the long term a rolling structured equity arrangement, such as a put-collar spread, tends to produce dampened equity returns similar to a portfolio of cash and equities. We discuss the structured equity solution in more detail in Section 4 of this report.

Summary

The Fund looks to be in a strong place, being able to deliver the required return against the current funding plan. Equities are clearly the main driver of return but also a significant contributor to risk. While the structured equity solution will help manage this risk if held on a rolling basis we believe this also has the potential to impact on expected returns.

3 Testing variations in strategy

Strategy modelling

This section of the report sets out the results of the quantitative modelling showing the impact on risk and expected return under a variety of different strategic asset allocations detailed in Table 2 below. Each of the five strategies has been modelled with and without the current structured equity arrangement (SE) in place.

Table 2: Strategies modelled

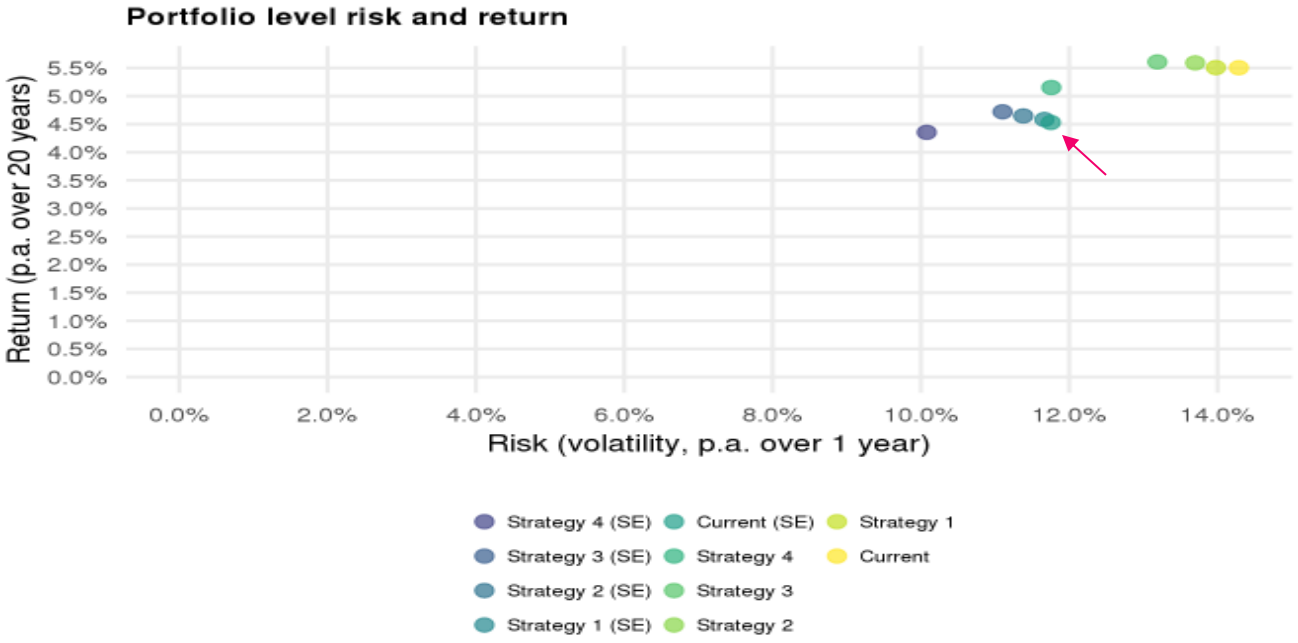
		Current	Strategy 1	Strategy 2	Strategy 3	Strategy 4
	UK equity	23.5	21	21	19	16
	Global equity	41.5	40	40	38	32
	EM equity	10	9	9	8	7
Total Growth		**75**	**70**	**70**	**65**	**55**
	Property	4	6.5	4	4	4
	Real estate debt	2	2	2	2	2
	Infrastructure	9	11.5	9	9	9
Total Alternative		**15**	**20**	**15**	**15**	**15**
	Multi asset credit	-	-	8	10	10
	Private debt	2	2	2	5	5
	Corporate Bonds	8	8	5	5	5
	Gilts	-	-	-	-	5
	IL Gilts	-	-	-	-	5
Total Fixed Income		**10**	**10**	**15**	**20**	**30**
Total		**100**	**100**	**100**	**100**	**100**

The alternative strategies were chosen to explore the impact of increasing the Fund's allocation to alternative income generating credit assets as these assets will help to diversify equity risk, generate income and provide more stability to the Fund's return stream.

Strategy 4 includes a weighting to Gilts and Index Linked gilts with the aim of demonstrating the impact of a lower risk investment strategy should the Fund decide to implement a de-risking framework and is discussed in more detail in section 5 of this report.

Analysis results

Chart 4: Risk vs return of alternative strategies



The Fund's current strategy including the impact of a rolling structured equity arrangement is highlighted by the pink arrow. This analysis shows:

- It is possible to marginally improve the expected return of the Fund's assets whilst simultaneously reducing volatility of returns by diversifying the Fund's growth allocation. This has been achieved in the modelling by either including higher allocations to multi asset credit and private debt or increasing allocations to property and infrastructure. Further investment in property and infrastructure have less impact on risk given the Fund already has allocations to these assets but would be positive from an income perspective.
- The impact of a rolling structured equity arrangement is expected to reduce both the volatility and expected returns of the Fund's assets.
- The Fund could afford to de-risk to strategy 4 and still have a higher expected return and reduced volatility than the current investment strategy with the structured equity overlay.
- The increased allocation to alternatives or fixed income under strategies 1, 2, 3 and 4, will improve the income generated from the Fund's assets to help meet the cashflow deficit without materially foregoing return.

Qualitative views on investment strategy options

The above analysis set out our views on strategy options purely from a quantitative perspective. This takes into account our long term modelling assumptions on different asset classes which are calibrated to current market conditions. We believe it is prudent to overlay this with our more qualitative market views on asset classes from our investment research team which takes into account, fundamentals, valuations and technical factors which may drive the short to medium term outlook for each asset class.

Summary of current asset class views

Asset class	Current view	Comment
Equities	Neutral	Our overall assessment is 'Neutral' following the move down in equity valuations, which have taken global equities slightly below historical averages. Equity fundamentals look sound, although earnings momentum is fading, and visibility has deteriorated. There remains a significant disparity in regional equity valuations. UK and Emerging Markets are below historical averages, whilst US equity valuations remain at a premium, albeit less so after recent market moves. Technical factors are mixed. Whilst investor sentiment has been impacted by recent volatility, we view this as a healthy adjustment from the elevated levels of a year ago. The unwinding of central bank liquidity and the continued global trade disputes are two factors that continue to weigh on the equity outlook.
Property	Cautious	Low property yields now look stretched relative to UK and Global equities, leading to a downgrade in our overall view. Sector divergence remains stark and prospects for the retail sector continues to deteriorate. Long lease property view is neutral to cautious.
Real estate debt	Neutral - attractive	Our rating for speculative-grade commercial real estate (CRE) lending reflects even stronger lender protections and lower competition for investment, as banks and insurers avoid this area of the credit market.
Infrastructure	Neutral - attractive	We maintain our view that technical drivers are strong and could underpin further revaluation. We continue to favour implementations where managers focus on deals with a degree of complexity or areas where they have a competitive edge.
Multi asset credit	Neutral - cautious	We have moved our overall assessment of liquid speculative-grade credit upwards to Neutral – Cautious. This reflects the move in valuations closer to long term medians. However we are cautious on the increased risk to market sentiment from trade disputes and the outlook for global growth in 2019.
Private debt	Neutral	Our direct corporate lending rating reflects the better protection for lenders and a still-attractive yield premium over traded corporate markets.
Corporate bonds	Cautious	Global corporate spreads have moved above long-term median levels, improving our assessment of valuations. Yields relative to sterling corporates remain in-line with historic norms. A more positive relative valuation assessment is tempered by a less positive outlook for risk-free returns.
UK Gilts	Cautious - negative	Falling gilt yields over the quarter have edged down our overall assessment of conventional gilts to be in line with that on index-linked gilts. While hedging demand and economic uncertainty keep downwards pressure on yields, they remain far below our, and the Bank of England's, assessment of a long-term neutral level.

These ratings are intended to give a guide to our views on the prospects for markets over a period of around three years; although they are updated quarterly, they are not intended as tactical calls. The ratings reflect our expectations of absolute returns and assume no constraints on investment discretion. In practice, they need to be interpreted in the context of the strategic framework within which individual schemes are managed. The ratings ignore purchase costs, for property, in particular, they are therefore most relevant for current holders.

Key points from views in relation to strategic advice

From the comments above we can take the following in relation to the Fund's investment strategy:

- While the modelling supported an allocation to alternative credit markets from a strategic perspective we are slightly cautious on timing given pricing in some credit markets including asset backed securities (ABS) and high yield;
- The outlook is more supportive of an increased allocation to private debt which was also supported by the quantitative analysis;
- In the modelling we have not aimed to differentiate the opportunity within different equity markets but we note there are potential valuation differences across global markets;
- The outlook supports the Fund's current aim to build the allocation to infrastructure and potentially increase the target allocation; and
- While under strategy 4 we illustrated the risk reduction impact from investing in additional funds in UK gilts the outlook from a return perspective is currently fairly negative.

Conclusions

Based on the quantitative and qualitative analysis set out in this section of the report, our views on the Fund's strategy are as follows:

- There is an opportunity to marginally improve the expected return of Fund assets while reducing volatility by reducing the exposure to equities and allocating to alternative and income focussed assets such as multi-asset credit and private debt or property and infrastructure;
- We are supportive of committing additional monies to private debt and multi-asset credit but would consider the timing of implementation for multi-asset credit carefully;
- We support the current programme to build up the allocation to infrastructure as a diversifying income focussed asset and potentially increase the current target to alternatives; and
- De-risking into more liability focussed assets like gilts may be a more effective way of reducing risk than structured equity, however, we would not recommend doing this at present given the current outlook unless considered as part of a wider de-risking framework that also considered funding affordability.

4 Structured equity

Background to structured equity

Structured equity allows investors to restructure their equity return profile to their specific needs using equity derivatives, in particular options. By way of a reminder, options carry the right, but not the obligation, to buy or sell a stock or an index at a specified date in the future at a specified price. The most common solution considered is referred to as a 'put spread collar'. The key objective of this strategy is to keep investing in equities, but to buy some downside protection and pay for the premium by giving away some of the upside if equity markets rise more than expected (which is equivalent to de-risking if equity markets rise).

The payoff diagram of an example put spread collar (PSC) at expiry is shown in the chart on the right.

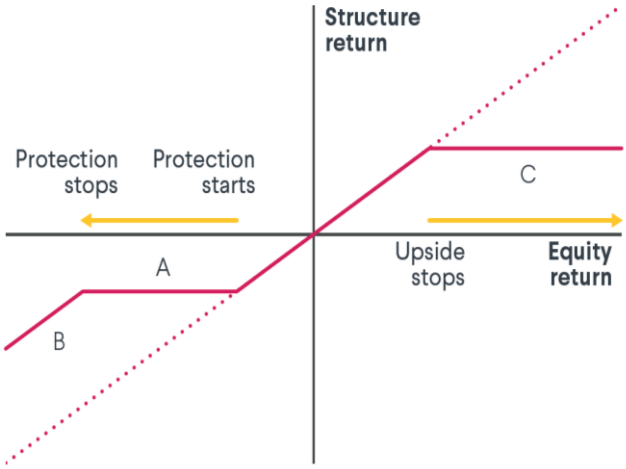
The PSC has three components:

A - Buy a put option, to protect equity return below a certain level by paying a premium.

B - Sell a put option, to remove the protection below a level lower than the floor to cheapen the premium.

C - Sell a call option, to give away equity return above a certain level to further cheapen the premium.

As is often the case, the level of upside given away by the call option can be chosen such that the premium from the overall structure is nil.



However, it would be equally valid to consider a PSC with a non-zero premium, particularly if there is a desire to retain more upside over the term of the option or if there was some asymmetry in pricing.

WCCPF structured equity solution

WCCPF put a structured equity solution in place on a phased basis in February and March 2018 which is managed and implemented by River and Mercantile. The solution put in place was a PSC broadly in line with the illustrative diagram above. However, the implementation solution was split into 4 sections (Equity Derivative Overlay Strategy (EDOS) 1 to 4) and implemented in 3 tranches. This allowed River and Mercantile some freedom in execution of the trades against a range of constraints. The constraints included the capped upside on the return and the capital protection achieved on the downside. The contract terms were mostly 18-19 months and therefore will be scheduled to expire in June and July this year.

Of the 4 sections 1-3 focussed on different equity regions, namely US equities, European equities and UK equities and were implemented as overlays to existing allocations while section 4 was implemented as a replacement to an existing UK portfolio to allow the manager to manage collateral and margin requirements on the derivative exposures.

The levels of upside and downside caps and protections achieved were as follows:

Table 3: Summary of structured equity solutions

Section	EDOS1	EDOS2	EDOS3	EDOS4
Equity market	US (S&P 500)	Europe (ESTOXX50)	UK (FTSE100)	UK (FTSE100)
Notional value	~£300m	~£200m	£408m	£240m
Capped return (%p.a.)	6.0	5.0	5.0	5.0
Protection target	100	97	97	97
Capital protection	25.6 - 27.1	14.8 - 15.6	16.4 - 17.6	20.4 – 21.2

The Sections were all implemented at zero premium but there were underlying trading costs incurred and fees charged by River and Mercantile for the implementation and management of the solution. In Appendix 2 we have set out the expected payoff profile for each Section of the structured equity solution at expiry.

As shown in the table above we can see that:

- The solution was successful in providing a sizeable level of capital protection from downward movements in equity markets;
- Allowing for dividends the outright protection target levels were kept close to 100; and
- The capped returns at 5% p.a. and 6% p.a. meant the Fund still has exposure to sufficient potential equity market upside to exceed the actuarial valuation assumptions.

Assessing impact of current solution

The assessment of whether the existing structured equity solution has been effective can we viewed in two ways. One is the actual impact on Fund's returns, or financial impact at the end of the period. This will be very much driven by realised markets returns and could result in the following views:

- If markets rose in excess of the capped return then the Fund may still be happy to have benefitted from some upside but regret having given some of this away;
- If markets stayed within the range between the level protection kicks in and the capped return then there would be no immediate benefit and a negative impact from transaction and running costs; or
- If markets fall below the level the protection starts then the Fund would benefit from the solution and be in a stronger position relative to being fully exposed to the market.

This approach does not take into account the overall risk benefit that has been gained from having the solution in place. Similar to any normal insurance policy, if we have to claim against the policy then it can be very valuable, if not then the premium can seem wasted, but how much value and reassurance is there from having the risk managed and insured? A key question for the Committee, is to understand how much value is gained in having the equity protection in place. We set out below a number of questions that the Committee might want to consider.

What should WCCPF be asking themselves regarding structured equity?

Is structured equity a part of a decision to reduce your Fund's risk for the longer-term?

Over the long-term, vanilla equity protection portfolios are expected to generate returns similar to a portfolio of equity and cash, i.e. dampened return and dampened volatility. Could you achieve similar long-term strategic benefits by selling equities and investing the proceeds elsewhere? Could the structured equity solution be designed to replicate expected returns from alternatives e.g. if we assume equities have a risk premium of c.3-4% p.a., with volatility of c.18%, designing an equity protection portfolio with a risk premium of (say) c.2-3% with lower volatility might act as a reasonable proxy for some alternative investments (even as an interim holding period while alternatives are being funded or if the alternatives are considered expensive).

Is this a part of a decision to reduce your Fund's risk for the short or medium-term?

There are a number of governance related aspects to consider such as, why make this decision now, on what grounds will this decision be unwound, are there plans to roll the hedge, how will success be measured? If the decision to implement the solution is linked to the upcoming valuation, how does it fit with the Fund Actuary's approach to setting contributions and managing contribution volatility? Do you already have some protections "baked in" e.g. contribution stabilisation or long-term modelling of contributions meaning that the funding level on and around the valuation date is not a critical point in terms of the Fund's long-term future success? If so, does the proposed solution really add much to the Fund's risk management arrangements?

Our understanding is that the Fund Actuary is supportive of strategies such as equity protection to manage risk around valuation points and to help set funding contributions. However, it is not clear to us how short term market movements would automatically feed through into contributions rates. While asset movements would impact on funding levels through the stated asset value, most LGPS funding approaches take a longer term view in setting contribution rates that looks beyond this.

Before considering extending the existing solution we believe it would therefore be sensible to get a clear view from the Fund Actuary on how sensitive contributions rates would be to short term market movements and therefore how important it is to close down risk around the actuarial valuation date. This might vary at fund level versus underlying employer level depend on the funding approach adopted.

What is the impact on return?

The PSC chart illustrates that the return profile of the PSC (the solid pink line) is quite different from that of holding equities alone (the dotted pink line), and in practice, this profile can be tailored to meet a pension fund's specific needs. The actual return achieved on the option strategy may be higher or lower than the market return for any given equity market outcome. However, options are not a free lunch. Even if an option strategy is sold as 'nil premium', it will typically cause a slight drag on the average expected return reflecting the price of the options (i.e. nil premium does not equal nil cost as there are transaction costs charged by the banks and the median expected return is not the same as the mean expected return). In addition to the price at time of being implemented, it is also important to consider how the value of an option strategy may change in response to changes in market conditions, such as an increase in equity volatility.

As demonstrated by the analysis set out in sections 2 and 3 of this report we believe that, if viewed as an ongoing strategy, equity protection can reduce expected returns. Part of this reason is the reduction in the range of expected returns, particularly from curtailing the upside which can reduce mean expected returns resulting in a return profile closer to a mix of equity and cash.

From a funding perspective one of the most volatile, and most significant parts of the funding equation, is the cost of future service benefits. This is not driven by existing asset volatility but the assumed return on assets. It is therefore important that the insurance of a structure equity solution, while helping manage deficit volatility, does not negatively impact on future service costs by reducing expected returns.

What about the governance?

There are governance aspects to be considered. Questions to consider include, how does this fit with the Fund's cashflow needs (e.g. an equity market rally is likely to need cash collateral to be posted by the Fund), what are the fees that will be paid, what monitoring arrangements are needed and what training is needed for our elected members? None of these should be barriers to continued implementation of structured equity but are important considerations.

Extending beyond summer 2019

We understand there have been discussions regarding the extension of the structure equity beyond 2019 to potentially coincide with the onset of the next funding plan coming into force. In order to assess the benefits of extending the structured equity solution we recommend the Committee address a number of points as outlined above:

- Current pricing – does the trade off in terms of downside protection and loss of upside give the Fund the desired level of insurance given the current market environment?
- Is this a long term strategy or are there other options for managing risk; extending the structured equity solution may be appropriate if there is a lead in time for funding other asset solutions; and
- How important is the risk reduction from structured equity to the funding approach and what impact will it have on funding of future service costs?

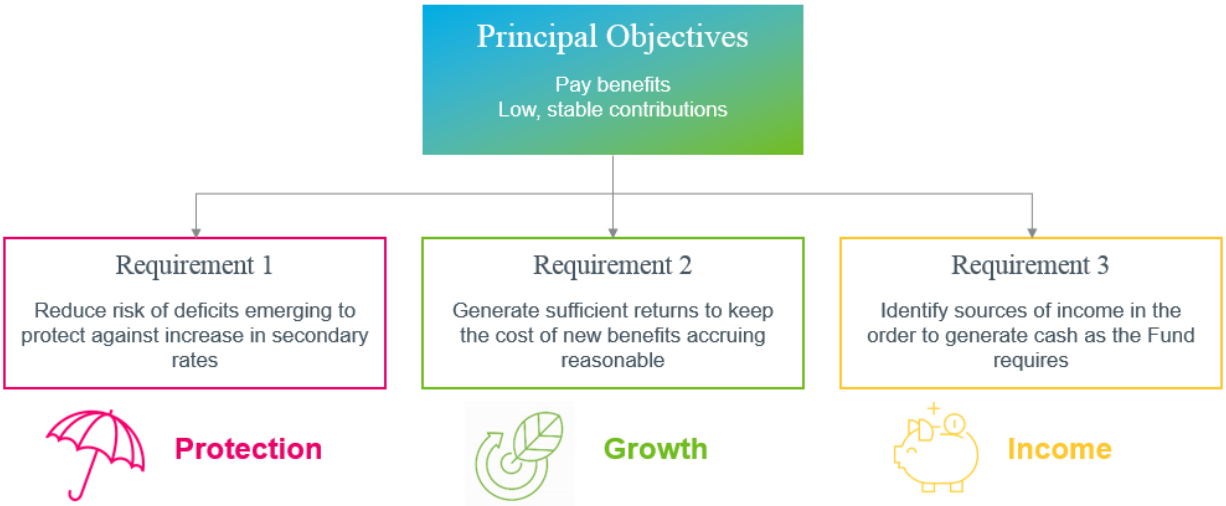
We believe a focus on objectives is key when setting strategy and therefore the use of structured equity should be considered with these objectives in mind.

5 Investment strategy and funding affordability

As outlined earlier in this report, over the last valuation cycle the Fund has seen improvements in funding level to the extent that the funding level stood at 99% in August 2018. While this will likely have fallen back a little as a result of the recent period of market volatility the strong position leads to questions on whether any action should be taken as a result of improvements in funding. Many funds in the LGPS are having discussions about de-risking, but the question is what are you de-risking towards? We believe risk should be considered in conjunction with objectives as both investment and funding strategies should be aligned with the aim of achieving agreed objectives.

Understanding your objectives

The overarching objective of the Fund is to be able to provide pensions for current and future generations. However, LGPS funds are also tasked with the objective of keeping contributions affordable and stable. This is not an easy task and it can require us to balance sometimes conflicting requirements as set out in the diagram below.



We believe the aim should be to find a balance between investment risk and return that best meets your needs and is aligned to your objectives. This will include what the Committee deem to be an affordable long term contribution rate to target, which will then inform what investment risk is required to make this rate affordable and sustainable.

Current investment and funding strategy

The assumptions underlying the current funding basis assumes that the Fund will be able to generate returns of CPI +2.15% p.a. to meet past service obligations and CPI +2.75% p.a. to meet future service costs. At the last actuarial valuation, a strategy was agreed which set an employer contribution rate of 15.3% of pay which, in combination with the investment returns, would be sufficient to recover the current deficit and meet future service costs.

As set out in sections 2 and 3 of this report we believe that the investment strategy is expected the generate returns which should exceed the actuarial funding assumptions by a prudent margin. With improvements in funding there is now the question as to whether investment risk can be reduced, noting that the assumptions also include a level of prudence in setting the discount rates relative to the best estimate expected returns.

Before answering the question on investment risk we first need to answer the question on objectives. Does the Committee view the 15.3% contribution rate as its long term affordable rate or not? If targeting a lower

contribution rate then this means the level of investment risk may have to be maintained (requirement 2 in the diagram).

As the valuation process for 2019 commences it's important the Committee engages with the Fund Actuary to set objectives to ensure both the funding and investment strategies are aligned.

Risk management frameworks

In section 3 we modelled one strategy (strategy 4) which illustrated the impact of a 10% switch out of equity into a mix of fixed and index-linked gilts. This switch reduced the expected return on Fund assets by circa 0.5% from the current position but also resulted in a sizeable reduction in risk/volatility. This illustrates the need to balance requirements 1 and 2 in the diagram above.

We believe the Fund should only de-risk into lower risk assets like gilts when it is aligned to the long term objectives and that it is also affordable from a funding perspective, and won't negatively impact on contribution rates. To determine when the level of risk should be changed (which could include re-risking as well as de-risking) a risk management framework could be put in place that sets trigger points that would drive changes to the investment strategy.

Risk management frameworks can be set by testing strategies against agreed success and risk metrics. It is possible to test a range of strategies on the current position but also for various stress tests looking at changes in asset values or funding levels. This helps identify points at which the level of risk should be changed to either improve chances of success or to maintain chances of success but reducing the risks of adverse outcomes (e.g. having a less than 10% chance of funding levels falling back below 90% over the next valuation cycle).

We have not carried out this analysis as part of this review which has mainly focussed on the efficiency of the existing strategy that is in place. However, we do believe there is merit in Committee considering a risk management framework as part of the actuarial valuation process.

Can the Fund de-risk now?

Based on the analysis in section 3 we believe that strategy 4 would still generate sufficient return to meet the funding requirements given the current level of prudence. However, the Fund actuary would need to confirm this would not have an impact on current funding costs. In the qualitative part of section 3 we also commented on the market outlook for lower risk assets like gilts which we do not think is particularly appealing.

We would not therefore recommend the Fund look to de-risk now but instead focus on diversification of risk and revisit the potential for setting triggers or a risk management framework as part of the upcoming valuation.

6 Currency hedging

Currency exposure

The Fund is exposed to currency movements through its investments in overseas equities and investments in property and infrastructure. Any currency risk associated with the corporate bond holdings is 100% hedged back to GBP by JP Morgan.

Table 4: Outline of currency exposures

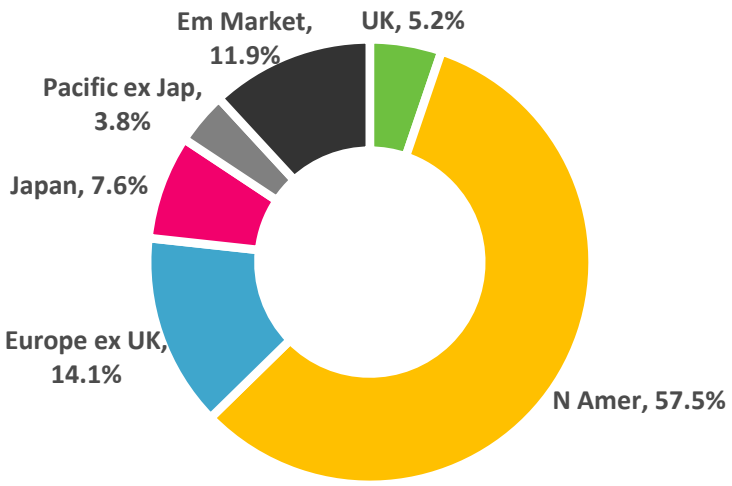
Mandate	Strategic target	Currency Exposure?
Actively managed Equities – Far East and Emerging	20%	Yes, currently unmanaged
Passively managed Equities – Market Cap	40%	Yes, currently unmanaged
Passively managed Equities – Alternative Indices	15%	Yes, currently unmanaged
Actively managed Alternative – Property and Infrastructure	10%	Some, majority hedged back to GBP
Actively managed Bonds – corporate and direct lending	15%	Some, majority of investments are in UK or hedged to GBP

The majority of currency risk faced by the Fund is through its exposure to global equities, the Fund currently does not hedge any of its overseas currency exposure across the equity mandates. The table below provides details of the Fund's broad regional split for its equity holdings (split by index regional weights as at 31 December 2018).

Table 5: Overseas equity currency exposure

Mandate	Target	UK	North America	Europe	Japan	Asia Pacific ex Japan	Emerging Markets
Actively managed Equities							
FTSE Developed Asia Pacific	**10%**				52.3%	35.0%	12.7%
FTSE All World Emerging Market	**10%**						100%
Passively Managed Equities - Market Cap							
FTSE All Share	**23.5%**	100%					
FTSE All World North American	**9%**		100%				
FTSE Developed Europe Ex. UK	**7.5%**			100%			
Passively managed Equities - Alternative Indices							
FTSE RAFI Developed 1000	**6%**	9.5%	53.7%		10.4%	5.6%	20.8%
MSCI World Minimum Volatility	**4.5%**		72.8%	7.0%	15.3%	5.3%	
MSCI World Quality Total Return	**4.5%**	9.0%	82.0%	6.10%	3.4%		
Total	**75%**	**24.5%**	**19.2%**	**8.1%**	**6.7%**	**4.1%**	**12.5%**
% of equity allocation		**32.6%**	**25.6%**	**10.8%**	**8.9%**	**5.4%**	**16.7%**

Chart 5: MSCI World Developed All Countries as at 31 December 2018



The Fund maintains a diverse equity portfolio across a range of regions but has a bias towards UK Equity exposure versus global market cap weights, with the US dollar accounting for the majority of the primary currency risk.

Currency hedging

Putting in place a passive foreign currency hedge is designed to reduce the extent to which the value of the overseas investments fluctuate from one year to the next – i.e. reduce short/medium term volatility.

There is little evidence that currency hedging adds to returns over time; indeed, over the very long term, sterling has historically been a relatively weak currency and exposure to overseas currencies has had a positive impact for UK based investors. The outlook for the UK, both economically and politically, has changed significantly over the last year and there is no reason why sterling should necessarily revert to its previous levels.

Currency hedging is typically considered to reduce the overall risk of a portfolio, through removing the additional risk of currency fluctuations and leaving the residual risk of the underlying asset.

When investing in fixed income and credit assets we recommend always hedging returns back to sterling for UK investors. The rationale for investing in credit assets tends to be, in the most part, to generate a return from an income stream. Credit spreads do not typically compensate for the risk of currency movements eroding the income stream which could wipe out returns.

However, when considering if to hedge currency exposure within equities the rationale is less clear cut. Most of a global equity portfolio's volatility to a sterling investor relates to the volatility of the stock itself (as opposed to its currency exposure).

Historically currency hedging would have reduced volatility of equity returns. For example rolling 10 year equity volatility figures from the MSCI AC World index were 13.9% for GBP hedged returns vs 15.4% for unhedged returns since 1970.

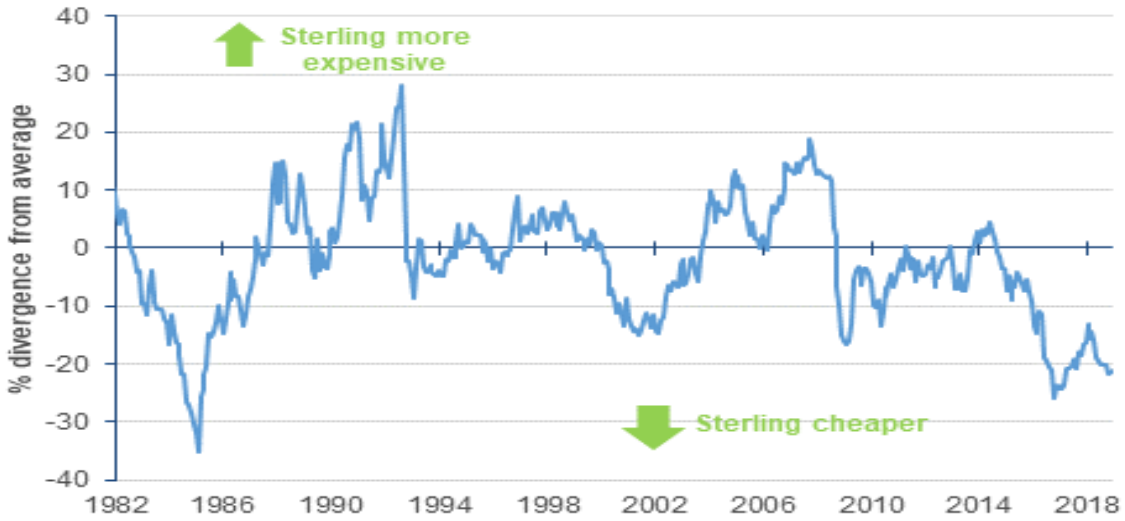
However, over the last 10 years currency hedging has not had the intended effect of reducing equity return volatility due to there being a significant correlation at times between equity market moves and currency moves. In fact over the last 10 years hedging has actually increased equity return volatility.

Following sterling's plunge since 2016, this may seem an appropriate time to increase hedging ratios to protect the windfall gains from currency exposure. A tactical assessment would typically involve (at least) three elements.

I. Valuation

Although it is most relevant over the long term, valuation would be included. Often this will involve a comparison with the exchange rate against a level consistent with Purchasing Power Parity, based on the idea that exchange rates adjust over the long term to reflect relative inflation. Chart 5 compares the sterling- US dollar with its average CPI-inflation adjusted exchange rate since 1980 and suggests that sterling currently looks cheap.

Chart 6: $/£ CPI adjusted



II. Fundamental

The chart also shows by how far and for how long exchange rates can diverge from PPP measures. Just because sterling looks cheap does not mean it is destined to strengthen quickly. Fundamental factors can have more influence over the medium term, e.g. the relative outlook for growth, divergence in monetary and fiscal policies, current account balances and capital flows. This may be particularly important in current circumstances, when structural changes to the UK economy following Brexit may diminish the importance of historic valuation as a guide to the future.

III. Technical

Technical factors can dominate in the short term. Momentum is often a powerful force on the foreign exchanges and cost of carry (i.e. interest rate differentials) can drive significant speculative flows from one currency to another.

There is simply no one-size-fits-all answer to managing currency risk. The Committee should instead aim to construct an appropriate solution consistent with its investment objectives and beliefs. The Committee may therefore consider any of the following:

- Retaining the currency exposure as part of the ongoing exposure to global markets.
- Hedging a proportion to balance the risk of currency exposure being either a positive or negative.
- Making a more tactical assessment of the desired exposure subject to governance process being in place the make this type of decision effectively and to reassess the position over time.

Implementation options

There are a number of ways in which the Fund could implement a currency hedge. These include:

- Investing in currency hedged funds. Passive managers will usually offer a hedged option for a small additional basis point fee (typically between 2-3 basis points (0.02-0.03% p.a.);
- Request the manager to hedge within their mandate. This is not something active managers will traditionally offer; or
- Implement a hedge through a segregated derivative overlay with a third party. This would require some collateral to be posted with the overlay provider. This could have more material operational implications in terms of managing any collateral and associated cash calls backing the hedging overlay.

Should the Committee be minded to hedge some of the overseas equity exposure, the most straightforward option would be to switch global passive exposure into a hedged share class. This might have limited impact given the regional structure of the Fund's equity mandates and that hedging can often be limited to developed markets and may omit Asian or Emerging countries.

To hedge a greater proportion of the exposure an overlay would be required. As the currency allocation is bespoke to the Fund, if the Committee would like to implement a currency hedging overlay it may need to be managed within the fund even following LGPS pooling. This could provide operational issues given the need to manage margin and collateral requirements.

The Fund also has a significant exposure to emerging market equities, it is very expensive to hedge this exposure and often the derivative instruments to do so may not exist or be traded liquidly. In addition, a key driver of emerging market equity returns is the exposure to the growth of a developing market currency, therefore we would not recommend trying to hedge this exposure.

Arguments for hedging	Arguments against hedging
• FX may be regarded as an uncompensated source of risk(Assuming no long term downward trend in Sterling) • Notable proportion of an overseas portfolio's volatility can be attributed to FX risk • FX markets volatile in recent years • We can insure against this risk by hedging • FX risk can provide some diversification – 100% FX hedge not optimal	• Relationship between equity return and FX • Volatility impact over the long term • FX hedging is not perfect • Derivative counterparty risk • Derivative regulation • Management and trading costs • Collateral and settlement (indirect costs) • Implementation and monitoring complexity

Our view

On balance, our preference is not to try and predict the future direction of currency markets, or to implement currency hedging on a tactical basis. In our view, LGPS funds like Worcestershire can withstand short term volatility in the value of their investments as long as they are not required to sell assets on a regular basis to meet benefits.

Therefore, we do not see it as a strategic requirement for the Fund to hedge out its foreign currency exposure. However, the approach to managing currency risk should reflect the investment beliefs of the Committee and some of the considerations set out above.

7 Income and net cashflow requirements

Cashflow position

The Fund is currently marginally cashflow negative due to a number of main employers within the pension fund prepaying their 3 year contributions in April 2017. This, together with the likelihood that employers will seek to reduce or extend deficit repayments at the 2019 valuation requires the Fund to increase the level of income generated from its assets whilst minimising the impact on returns as much as possible.

It is likely that the requirement for the Fund to generate more income to meet future liabilities and the pressure to reduce contributions will continue to grow as the Fund matures. The Fund also has c.£240m of undrawn commitments within the property and infrastructure portfolio and is currently disinvesting from equities as and when required to meet capital calls.

The Fund currently has no strategic allocation to cash and chooses to keep the amount of cash held within the Fund very low so as to maximise investment return. However this does introduce liquidity risk. It is therefore necessary to consider the most efficient way by which income can be sourced from the Fund's existing assets to mitigate this liquidity risk and prevent the Fund form being a forced seller of assets at potentially inopportune times.

Existing assets

To bridge any future cashflow deficit the Fund could look to take any income naturally generated by the Fund's existing assets that is currently re-invested.

Equities

The majority of the Fund's assets are invested in equities which produce regular income in the way of dividends. One way of accessing this income would be to switch the passive equities held into an income distributing share class, or to ask the active managers to distribute any available dividend income on an ongoing basis. However the amount of income produced is likely to be lumpy and the compounding effect of re-investing divided income is a key driver in equity growth which the Fund would have to forgo.

We believe it would be more efficient to take income from asset classes with an income focus and long term contractual like returns such as property, infrastructure, and alternative credit.

Property and Infrastructure

The Fund has recently made a commitment (15% of total assets) to a mixture of Property, Infrastructure and Real Estate Debt mandates offering absolute returns of c6-12% p.a., these are currently in their drawdown phase.

It may take up to 3 years for the full capital commitment to be drawn down and invested before this level of income is generated. However this new commitment could be expected to generate an additional c.£37m of income p.a. for the Fund. The nature of these types of illiquid, closed ended investments means that work could be carried out to model the expected cashflow pattern over time to ensure the Fund achieves the strategic allocation being targeted but also is able to use the income rather than it being fully reinvested.

New income generating assets

The strategy modelling in section 3 supports the Fund's ability to increase its allocation to some alternative credit assets such as multi-asset credit and private debt. These assets are attractive for the level of income they provide but also the predictability and stability of returns.

Private debt

We believe the current trend for pension funds to provide more direct finance to businesses at the expense of banks will continue and that the rewards will be earned by those pension funds which are prepared to withstand a degree of illiquidity. At a time when yields on traded bonds have fallen to very low levels, there is still a material premium to be earned (of 1% - 2% p.a.) for less liquid forms of debt, reflecting the fact that the vast majority of investors cannot commit capital to these markets and are restricted to investing in bond market securities.

A number of funds now exist where specialist managers make a series of direct loans to businesses using capital committed primarily by pension funds. The credit quality tends to be reasonably strong and the loans generate a strong income stream from the outset. Potential returns in the region of 5% p.a. above LIBOR appear attractive against our current expectations from equities which are in the region of 6% p.a. Therefore, the Fund would not be giving up much in terms of expected returns by switching assets from equities into an investment where returns will be delivered in the form of a high and regular income stream.

We believe private debt is capable of providing strong growth but with reduced mark-to-market volatility and more transparency, and we prefer the visibility of return through contractual income offered by private debt opportunities.

Private debt funds are closed ended, and therefore the Fund could look to invest further in these opportunities ahead of asset pooling and retain the new investments outside of the pool. Alternatively, it would be possible to wait for suitable debt vehicles to be made available within the Central Pool.

Multi-asset Credit

Mulit-asset credit strategies will invest in higher yielding bonds offering higher prospective returns in exchange for increased credit risk. However, they tend to be quite short dated or LIBOR linked - and therefore carry very limited interest rate risk. A portfolio might comprise investments in areas such as high yield bonds, emerging market debt, loans, asset-backed securities, etc.

Whilst we are attracted in principle to the yields on offer in multi asset credit, the extra yield available for the increased credit risk has been squeezed quite tightly in markets in recent months and, from a market timing perspective, we would ideally defer investment for the moment.

Re-balancing and liquidity waterfall

Even with regular income being generated from the Fund's assets the Fund may need to access capital at short notice to meet outgo. The Fund is currently disinvesting from equities to meet any additional outgo not met by the current level of contributions and income.

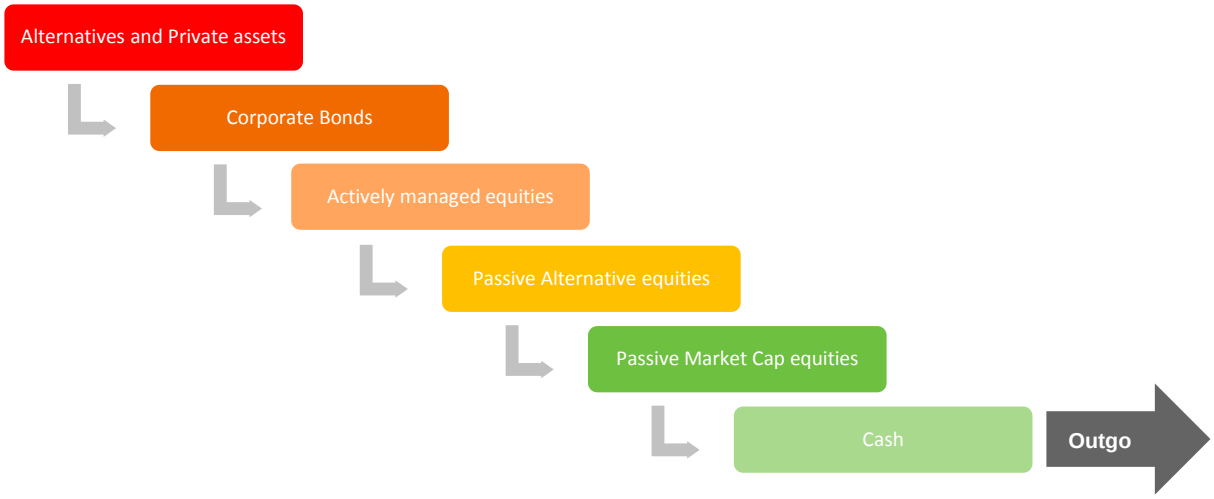
To limit liquidity risk and prevent the Fund from being a forced seller of assets we propose the Committee establish a formal re-balancing policy and liquidity waterfall framework.

The Committee currently monitors the Fund's investment strategy relative to the agreed strategic benchmark against the ranges in the table below. If ranges are breached, then appropriate action is taken by the Chief Financial Officer.

Table 6: Rebalancing ranges

Asset Type	Strategic Target (%)	Range (%)
Equities	75	70 – 85
Bonds	10	5 – 15
Infrastructure and Property	15	5 - 15

We propose the committee look to establish a high level liquidity waterfall for accessing cash should it be required to fund any future investments or to pay member benefits. An illustration of this is shown below.



1. Should access to funds be required instantly this should be sourced from the Funds most liquid asset, ideally cash. The Committee may wish to consider maintaining a small cash buffer.
2. If cash is unavailable funds should then be sourced from the next most liquid asset, passive market cap equities.
3. To prevent these liquid assets being depleted, they should then be replaced by the less liquid investments, over a short period.

To establish this waterfall process a more detailed re-balancing process would need to be put in place. Maintaining the strategic asset allocation will ensure the Fund is taking the right level of investment risk and that there remains sufficiently liquid assets to meet Fund outgo.

The parameters around such a waterfall structure should be determined by the Committee, taking into account the Fund's specific objectives and circumstances.

8 Active versus passive management

As discussed throughout this paper and in section 11, having a well-defined set of investment beliefs offers a number of advantages to the Committee including clarity on the rationale for each mandate held within the Fund and consistency around decision making. Beliefs can apply to high level strategy and risk appetite but also to the approach to investing in different asset classes and how these are accessed. For example, the belief that passive management has a role to play in a Fund's asset allocation, bringing liquidity, transparency and reducing fee levels.

In this section we review the Fund's investment approaches, first considering the split between active and passive management before going on to consider equity style biases. Throughout, we have looked to pull out what we believe the current arrangements indicate the Committee's beliefs are.

The table below sets out the Fund's current mandates and whether these are managed on an active or passive basis.

Table 7: Fund investment summary

Mandate	Target allocation	Active/Passive
Far East Developed	10%	Active
Emerging Markets	10%	Active
Global equities	55%	Passive
Market cap	*40%*	
RAFI	*6%*	
Low Volatility	*4.5%*	
Quality	*4.5%*	
Total Equities	75%	20% / 55%
Fixed Interest	10%	Active
Alternatives	15%	Active

Active vs passive

Equities

Around 45% of the Fund's mandates are managed on an active basis at total fund level and around 25% of the target equity allocation is actively managed. Active management is employed only in the emerging markets and far east regions, indicating the Committee believes markets in these regions are less efficient relative to other global regions.

Overall, the long term track record of active equity managers has been generally disappointing. The statistics for the LGPS sector supplied by WM show that active UK managers had added value of only 0.3% p.a. before fees relative to their benchmark over the 10 years to March 2016 (the WM performance information is no longer available). Active overseas equity managers had actually lost 0.7% p.a. over the same period. Relative performance will vary over time – similar statistics from 5 years ago show a 10 year track record of no added

value from UK equity managers but 1.2% p.a. outperformance from overseas managers. However, the average active manager has not added value over time. This is borne out by regular industry surveys, including the recent FCA review on the asset management industry. The key requirement therefore is the ability to identify in advance an above-average manager.

We believe there is a role for an allocation to passive equities as part of an overall equity allocation which is reflected in our own equity beliefs (included in Appendix 3). This is due to the low risk, low fee benefits. Active management should only be considered where the Committee believes it can add value. Where active management is employed, we have a preference for high-conviction mandates investing on a global basis to exploit the widest opportunity set to add value. For a number of other asset classes, active investment is currently the only viable investment option, for example, property, private equity and private debt.

The Fund has recently experienced a mixed time with its active equity managers: Nomura's far east mandate is down 1.5% relative to benchmark over 12 months but 0.9% p.a. ahead over 3 years and 0.1% since inception. This is below their performance target of 1.5% ahead of the benchmark.

In emerging markets, the Fund has had a mixed experience, with the JPM mandate down -3.8% over 12 months but the Schroders mandate ahead +2.5%. Both mandates are ahead of the benchmark since inception (by 0.3% p.a. and 2.4% p.a. respectively). Only Schroders appear to have achieved their performance target of 2% ahead of the benchmark. The Committee may wish to review the Nomura and JPM mandates given poor longer term performance or look to revisit the fees currently being paid, set out in the table below. Alternative options may also be available through LGPS Central.

Table 8: Active equity management fees

Mandate	Management fee
Nomura far east	0.50% p.a. on first £25m 0.40% p.a. on next £50m 0.35% p.a. thereafter
JPM emerging markets	0.65% p.a. on first £50m 0.60% p.a. on next £30m 0.55% p.a. thereafter
Schroders emerging markets	0.95% p.a. on first £50m 0.75% p.a. on next £50m 0.65% p.a. thereafter

Other assets

We believe that the Fund's corporate bonds could be passively managed. Passively managing these assets would generate some economies, including reducing the governance burden associated with the mandates and reducing the investment management fees. Our preference for passive management over active is based on the belief that active managers in assets such as corporate bonds do not add enough value in terms of returns in excess of the benchmark. Our view extends to the management of gilts and index linked gilts, to which new allocations are considered under strategy 4.

We acknowledge that corporate bonds and gilts represent a relatively small allocation within the current and alternative structures considered. However, if the Central Pool is to offer a passive investment grade credit fund, we would favour transferring the current allocation into a passive approach. The modelling carried out makes no allowance for active management and so a switch from active to passive management would not have an adverse impact on the expected returns shown earlier.

As mentioned above, new allocations to multi asset credit or private debt will need to be implemented via an active approach, due to the nature of these asset classes and lack of investible index to track.

Our view

The overall split between active and passive management for those assets where both approaches are possible will depend on the Committee's beliefs in the ability of active management to add value. As per the above, we propose considering moving the corporate bond allocation to a passive approach.

Style exposure

Just over half of the Fund's equities are managed on a passive market capitalisation weighted index tracking basis. A capitalisation-weighted index applies weights according to the total market value of the constituent companies' outstanding shares. There are several positive attributes to a market cap index tracking approach:

- Management fees are low, generally at 0.10% p.a or less;
- The overwhelming majority of managers use market cap indices as benchmarks resulting in high levels of liquidity and correspondingly lower transaction costs for market cap index tracking funds;
- Market cap index funds generally require less rebalancing due to index construction - the indices are, to a large degree, self-rebalancing. The index stock weights move in tandem with the market prices, negating the need for buying and selling shares; and
- Index tracking managers do need to deal with events such as rights issues, new entrants to and departures from the index and taxation issues; however, this is a relatively simple and predictable task, and is often where tracking managers can add marginal value.

The major criticism for price led index construction is that it has a pro-cyclical nature. As a stock's price increases relative to other index constituents, so does its weight in the index and vice versa. If companies' share prices accurately reflect their underlying financial performance then market cap weighted indices are behaving efficiently. However, stock prices are very erratic, driven by short term news and investors' behavioural drivers. There is much evidence to suggest that, even over extended periods, the relationship between share price and underlying fundamental value breaks down.

We believe that passively managed market-cap weighted equity investment has an anchor role to play in most pension schemes' equity allocations, reducing average fee levels. However, market-cap weighted indices do have their drawbacks. The passive acceptance of market prices implicit in market cap weightings means that opportunities to exploit the many opportunities when markets overshoot or undershoot fundamental value is missed. We believe (as set out in our equity beliefs) there is evidence to suggest that an appropriately constructed portfolio of factor tilts can provide a more efficient way of investing, net of fees and costs, than a market cap index.

For example:

- Exposure to "valuation factors" can improve risk adjusted returns over time. Even if outweighed by technical factors in the short-term, diversified exposure to valuation based factor tilts can add excess return per unit of risk over a reasonable timeframe;

- Exposure to the “low volatility factor” can reduce absolute equity volatility and improve risk-adjusted returns. Strategies can be implemented which manage downside risk while achieving market returns over time;

A factor-based approach is based on using specific characteristics (‘factors’) to construct benchmarks with the aim of generating a more attractive risk and return profile. Four common factors are described below. The Fund already has exposure to a number of these alternative passive equity approaches through a multi-factor mandate managed by L&G.

- **Value** - The value factor targets companies whose share price is deemed to be lower than the fundamentals of the company would suggest. The argument for the existence of a value premium is that investors on average overestimate how long stocks can sustain high growth and therefore under-price those stocks seen as low-growth.

- **Low volatility** – Some studies suggest that stocks with lower risk, due for example to the stability of the company, earn higher risk-adjusted returns. The behavioural argument is that investors’ desire to share in the possibility of high returns from high-risk stocks lead them to be overpriced on average.

- **Smaller stocks –** Smaller companies tend to be ignored by many investors. It is argued that this lack of attention, as well as their lower liquidity, creates a premium for smaller stocks.

- **Quality** – What constitutes ‘quality’ is less well defined than other factors, but, as a rule, high-quality companies are typically either highly profitable or are conservatively managed. The general argument for the existence of a quality premium is that investors tend to underestimate the ability of some companies to produce stable growth over the long term.

Our view

We like the Fund’s allocations to factor tilted equity strategies. There is an ongoing debate about the existence, size and sustainability of these various risk premiums and therefore investment beliefs are often key in determining which approaches are favoured. The decision to allocate c75% of the overall equity allocation to passive market cap along with a multi factor mandate is evidence that the Committee believes a factor-based approach has potential to enhance the expected returns from a market cap approach and deliver a less volatile return series. The decision to allocate between different equity styles indicates caution over risk concentration with a particular style.

The Committee could consider whether the split between market cap and multi-factor remains appropriate and whether the allocation to market cap could be reduced in favour of multi-factor. In the previous section of the report we did not assume any significant variations in how equity market returns are modelled depending on the management style or the regional allocation.

The Committee will need to engage with the Central pool to understand what equity style options will be offered within the pool.

9 Interest rate and inflation hedging

The Fund's liabilities are linked to inflation and, depending on the valuation approach, changes in interest rates. One approach to meeting liabilities is therefore to buy assets which match the expected liability payments or have the same sensitivity to changes in interest rates and inflation. The downside of this approach is that the matching assets, such as index-linked gilts, are expensive. The Fund Actuary previously provided a funding illustration showing that if the Fund solely invested in matching assets, or a minimum risk portfolio, this would result in a funding level in the region of 50%.

In the structure modelling analysis in sections 2 and 3 we showed that yield risk, the potential funding impact from movements in interest rates and inflation, was almost half of the overall risk. However, as commented in that section much of this risk is 'mark to market' focussed rather than a real risk. Inflation is a real risk in that it directly impacts the value of member benefits but again there are two parts to this, one is realised inflation year-on-year while the other is pricing of future inflation (reflected in gilt pricing) which can be impacted by factors such as supply and demand. It is year-on-year inflation that impacts benefits while inflation pricing will have an impact through actuarial valuations.

Should the Fund seek to hedge interest rate and inflation risk

The question on hedging for LGPS funds again comes back to objectives and the diagram in section 5. Hedging out risks can help with requirement 1 (reducing the chance of deficit increasing) as it can help to reduce the volatility of the funding level. However, if hedging is funded from other assets this might impact on assumed returns and also impact the deficit. It also has the potential to impact on requirement 2 (affordability of future benefits) as expected returns on matching hedging assets are lower than equities. There are other ways of hedging the risks through derivative solutions or by introducing leverage but we would again return to objectives.

To achieve the primary objective of paying member benefits and keeping them affordable, the Fund needs to generate long term real returns. The focus to date has been to invest primarily in equities which are expected to generate returns in excess of inflation, albeit they can be volatile in the short term. The focus has therefore been to try and maintain returns but smooth out the risk profile through diversification of risks.

We believe that this approach of targeting long term real returns, and diversifying the risks within the fund, remains appropriate. If it is affordable to do so then the Fund could seek to invest in matching assets as outlined in sections 3 and 5, subject to this being affordable from a funding and contribution rate perspective.

Where we do think hedging strategies are particularly relevant, is when seeking to manage specific employer risks. At present the Fund has a single investment strategy for all employers. We are now seeing a number of funds in the LGPS focus more on specific employers and the different objectives and risks they have. For example this can include employers working toward cessation or pools of well funded closed employers where either they are not required to take the same level of risk or they are looking to manage short term risk closely as they work towards a crystallisation event like cessation. This is something the Committee may wish to revisit in future.

Managing inflation risk

One challenge to managing inflation risk for LGPS funds is that the benefits are now linked to CPI. At present there are very few assets with CPI linkage providing a direct link to CPI returns but also the pricing of CPI itself. The standard approach has therefore been to value and match inflation risk through RPI linked assets with a suitable adjustment for the difference in CPI and RPI. This means that until CPI linked assets are available there will always be an element of basis risk.

Another concern that has recently arisen is the potential treatment of RPI. The House of Lords recently published their report into the use of RPI which concluded that the Statistics Authority should try to fix the issue with clothes prices being included in the calculation of RPI and resume regular methodological improvements. They also reported that the government should agree to a single measure of inflation within five years to be used wherever possible. The House of Lords report increases the possibility that the RPI methodology could be changed in a way that is detrimental to holders of RPI-linked bonds and swaps, most likely to remove the upward bias of 0.30% p.a. caused by the 2010 change to clothing price collection.

The gilt and swap markets are taking that possibility seriously, with the level of inflation implied by those markets falling by c. 0.10% following the publication of the report. There remains significant uncertainty as to what happens next and when, any changes are not likely to be soon, but the report increases the momentum towards issuance of CPI or CPIH linked gilts.

We would therefore be cautious of putting inflation hedging in place ahead of the potential availability of CPI-linked government bonds and the potential impact on existing RPI linked assets or hedging instruments.

Current gilt pricing

The charts below show the distribution of gilt yields over the last 5 years and also the yield position at 18 January 2019. We have shown real yields and the market implied level of RPI based on the difference in gilt and index-linked gilt yields.

Chart 7: Real gilt yields

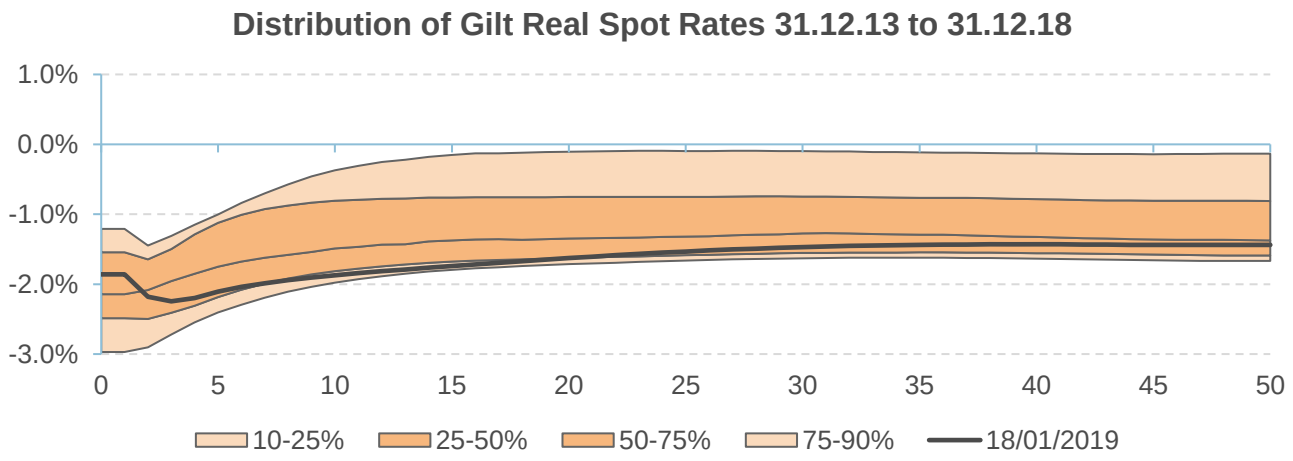
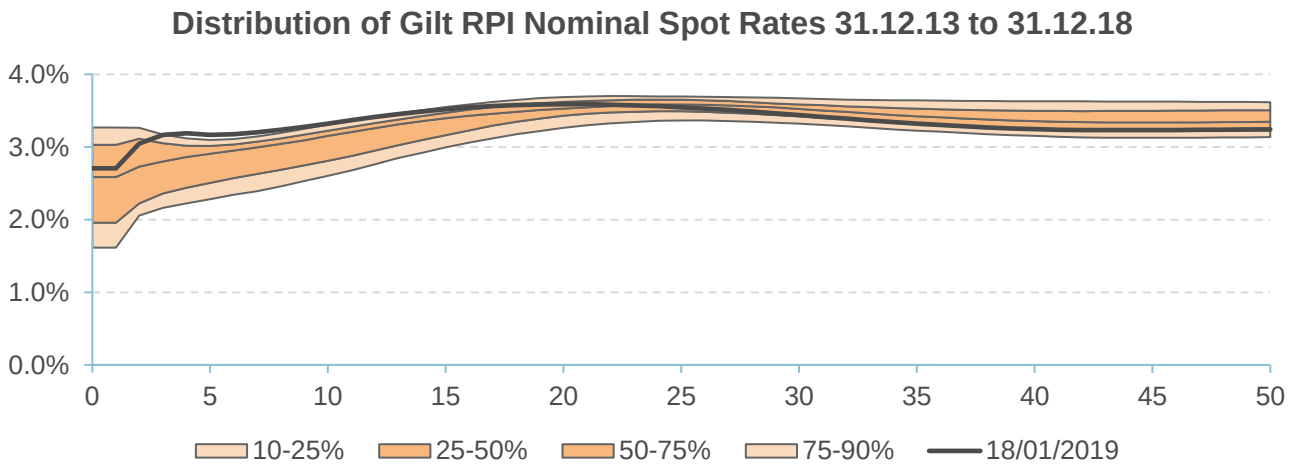


Chart 8: market implied inflation – RPI



The charts above show that real yields remain at extremely low levels due to a combination of the expectation of a continued low interest rate environment and the value investors place on inflation protection. Inflation protection is priced relatively attractively compared to where it has been in the last 5 years up to 20-25 years out but is still expensive longer term but as set out above there are some technical factors also impacting the potential attractiveness of inflation hedging given uncertainty over the future of RPI and RPI linked instruments.

Summary

Interest rate and inflation risk can have a significant impact on the funding position and is an important risk consideration. However, this risk is partly a mark to market risk and should be considered in that context. Our preference would be for the Fund to focus on generating long term real returns and only consider hedging if looking at managing employer specific risks, or revisiting if there was an improvement in the pricing or outlook for index-linked gilts.

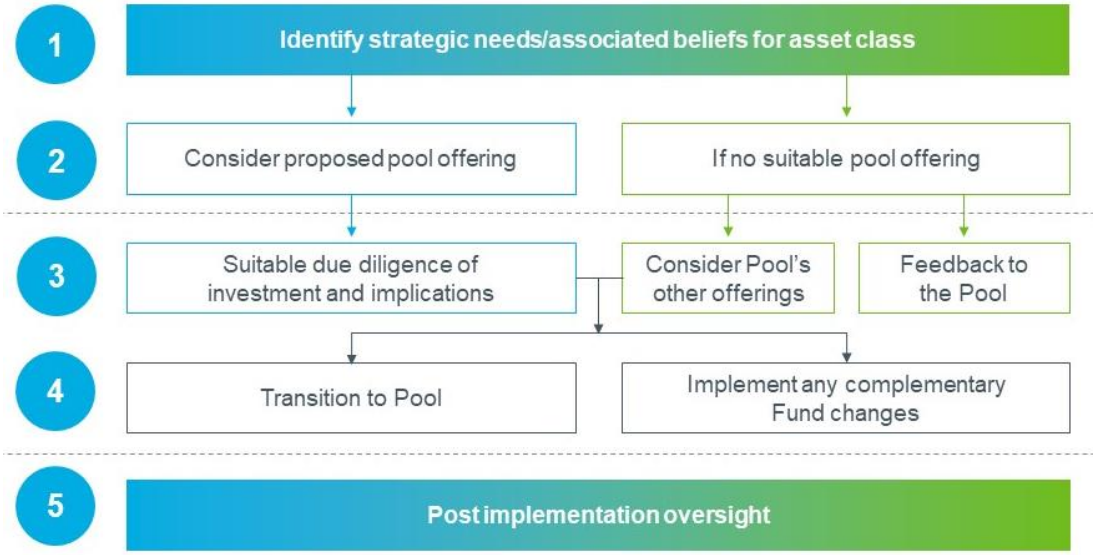
10 Investment Pooling – Mapping to LGPS Central Ltd

As demonstrated by the new guidance on pooling which is currently under consultation the focus on investment pooling and the pace of transition is if anything likely to increase over the next couple of years. When reviewing the strategic asset allocation it is therefore important that the ability to map the existing strategy across to the LGPS Central investment options is considered and any issues are identified to help with engagement and to prioritise the development of any new solutions that the Fund requires.

Process of mapping to the Pool

Our approach to mapping is built around the framework below.

Decision-making process



Stage 1: The Fund's investment strategy is the key driver of future returns (evidence shows investment strategy can contribute up to 90% of a scheme's total return). The mapping process is the "bridge" between the Committee's strategy (driven by objectives and beliefs) and the actual assets held (which will be managed by the Pool) and therefore Stage 1 is a fundamental part of the Fund's move into the Pool.

Given the importance of Stage 1, we recommend strongly that the Fund feeds into the Central Pool when considering its sub-fund range e.g. the nature/design of these sub-funds, to ensure the Fund's investment beliefs can be reflected in the investment strategy.

Stages 2 and 3:
When considering the Pool's existing sub-funds, we focus on the following questions:

- Does the sub-fund range allow the Fund to replicate the existing exposure? If it does (and the fund wishes to retain this exposure) we then move to the due diligence stage.
- Does the sub-fund range create opportunities not previously available? Examples tend to be smaller funds that have previously used DGFs which, due to the efficiencies from pooling, could now access alternatives more efficiently. Given the Fund's scale, this may be less of a factor.
- What gaps continue to exist in the sub-fund range that prevent the Fund's strategy from being implemented in full? Is the Pool planning to fill these gaps? If so, when?

- If options are viewed as suboptimal from a strategic perspective agree how best to engage the Pool to address this?

Once there is comfort with Stages 1-3, focus should move on to Stages 4 and 5, the transition process and ensuring there is suitable oversight of the Pool's approach to managing the Fund's assets. These are extremely important aspects of pooling.

The pooling process is likely to take time and the mapping aspect is a fundamental part of this process.

Initial thoughts on mapping of strategic allocation

In the table below we set out our initial thoughts on the potential to map existing asset across the LGPS Central and potential opportunities to access new investment solutions. Please note these are initial high level views and further consideration and due diligence would be required before any transition of assets.

Asset allocation	Mapping potential to LGPS Central
Active equity	The Pool will shortly be launching an active emerging market equity solution. This should be reviewed against the existing strategic objectives for the Schroder and JP Morgan mandates and the framework above with a view to switching existing assets into the Pool. The bespoke nature of the Nomura Asian equity mandate means that the Pool is not likely to offer an equivalent in the near term.
Passive equity	The Fund is currently benefiting from collectively negotiated fee terms with LGIM. The Pool currently offers a passive UK equity solution and passive Global solution in an ACS structure. There is an opportunity to review the UK allocation based on transition costs, running costs and RI options. The global solution is not a direct fit for existing allocations so would require greater strategic discussions on suitability.
Factor based equity	The Fund employs a mix of factor based approaches combining value, low volatility and quality biases and a rebalancing premium. The Pool offers a factor based solution focussed on diivdend growth. Given this is not a direct mapping strategic discussions on suitability would be required.
Structured equity	The Fund benefits from pool negotiated terms. We understand the Fund has received advice from the Pool on structured equity but the bespoke nature of the mandate means this would need to be maintained outside the Pool for now.
Property	The Fund has quite a bespoke portolio comprising open and closed ended core and specialist funds. We understand the Pool is still considering how to incorporate legacy assets and design a solution to meet client needs. In the short term the Fund should continue to develop the existing allocation while engaging with the Pool to help design an apprioriate solution.
Infrastructure	Similar to property the Fund has a mix of closed ended solutions investing across a range of infrastructure regions and segments. No clear mapping is available to the Pool yet. There is opportunity to wait for closed ended funds to mature and consider new commitment needs. The potential LGPS Central solution is currerntly in the design stage and is focussed on a CPI +3% return target
Private debt	The Fund has only a small allocation to private debt at the moment. The Pool is still in the design stage but we understand there is client demand so this is a good opportunity to engage with the Pool if seeking to commit further capital to this asset class.

Asset allocation	Mapping potential to LGPS Central
Multi-asset credit	No existing Fund allocation. Pool solution being designed and aiming for launch later this year. Opportunity to engage with Pool to shape strategic focus of solution.
Corporate bonds	The Pool corporate bond fund will be launched shortly with an active +0.80% target and 50% UK 50% Overseas benchmark. Potential strategic fit but some change required from existing allocation so suitability would need to be reviewed.

In addition to the comments above we would note that the new draft guidance on pooling currently under consultation may impact the views on pooling options and the timeframes for both moving assets and investing in new opportunities. For example, for retained assets outside the Pool there will be a need to compare options and justify why they are being kept as a retained asset. This may be straightforward where no equivalent is available such as property but harder in cases like UK or Emerging market equity.

Summary

In respect of the move toward investment pooling our initial views, based on the current strategy and options offered by LGPS Central, are as follows:

- The Committee should apply a consistent framework in assessing pooling options as set out in this section of the report.. This will assist in supporting any residual retained assets and the justifications required for reporting in the Investment Strategy Statement.
- We believe there are immediate options to consider mapping existing allocations into LGPS Central for passive UK Equities and active Emerging market equities.
- Further strategic considerations are required for allocations such as the remainder of the equity allocation including passive equities ex UK, active Asian equity and factor based equities and also corporate bonds if a passive alternative is not preferred. In our view the available equity options do not meet the strategic objectives of the Fund and therefore greater engagement with the Pool is needed.
- The Fund should look to engage with the Pool regarding solutions still in development or where no equivalent options are available for existing Fund allocations. This would include property, infrastructure, private debt and multi-asset credit.

11 Investment beliefs

Why beliefs are important

Beliefs are, by definition, unique to each pension committee or trustee body. They reflect the way in which committees (explicitly or implicitly) translate a fund's objectives into its actual investment arrangements. For example, you can have two funds, with broadly similar characteristics and objectives, but very different investment arrangements e.g. the extent of their use of diversification, active and passive management, regional equity exposures, approach to environmental, social and governance matters etc. all because the committees' beliefs are very different.

Having a well-defined set of investment beliefs offers a number of advantages, including:

Clarity of why each mandate is held and the role it performs in the Fund's arrangements – this clarity is of benefit to committees and the underlying members. It also offers a basis for framing external communication on investment strategy which is of particular relevance where decisions are subject to public scrutiny.

Prioritisation - having identified which investment decisions are most important, advice can be sought and meetings scheduled around these key priorities.

Long-term thinking - having a set of stated beliefs, committees are better able to avoid being unduly influenced by short-term market noise and "fads".

Consistency, both of advice and decision-making – meaning all decisions are reached using the same consistent framework.

Continuity of understanding in decision-making – having a decision making framework based on a set of beliefs allows decisions to be contextualised which is particularly valuable if there is regular turnover of committee members, i.e. the committee may not "own" the decision on a certain element of the investment strategy, but as they own the framework, they can better understand why the decision was taken.

There is no right answer when it comes to setting beliefs, with each scheme's beliefs being unique, depending on their specific circumstances and their Committee's views. A scheme's beliefs should be revisited on a regular basis to ensure they remain appropriate. It is also important that these beliefs are reflected in the underlying portfolio of assets and in the scheme's ways of working.

The Fund has already developed a set of investment beliefs which we have included in appendix X. We believe it is important that these are tested and applied as part of any investment decision process.

Testing strategy against beliefs

In this report we have covered a number of areas and potential amendments to investment strategy. Each of these should be tested against the investment beliefs to ensure they are consistent with the Committee's thinking about investment decision making. The areas for consideration include:

We discuss potential reductions in the equity allocation with a view to increasing the level of diversification

We discuss the use of structured equity which has a bearing on views to equity investing, risk management and the timeframe of setting an testing objectives

We discuss the use of active and passive management. Do the current beliefs accurately reflect the way the Fund currently invests and is there any impact from the recommendations in this paper

We discuss risk management options in areas including currency risk and interest rate and inflation risk.

We discuss meeting cashflow requirements and policies for realising cash when required

We also discuss the process of mapping assets into the pool and how best to engage with the pool, how does the pool governance and the engagement of the Fund with the pool compare to the Fund's beliefs on organisational beliefs

Summary

We are supportive of the Committee's development of a core set of investment beliefs as a framework for decision making. We believe that any investment decision should be tested against these beliefs including the conclusions and recommendations from this paper to ensure there is a robust process for testing potential changes in strategy that can stand up to scrutiny and can be clearly explained to external parties or new members of Committee.

Appendix 1 – Structure model reliances and limitations

Modelling

The modelling used calculates the estimated market risk and return characteristics of different portfolios against liabilities that are proxied by a combination of cash, fixed and index linked gilts under typical market conditions. It does not use liability cash flows and cannot accommodate accrual or contributions. Risk and return are described only at a summary level and the model cannot be used to drill down into how certain risks might manifest. This model cannot be used to explore long term funding risks and recovery plans.

The model is not in any way intended to be predictive of portfolio returns. Returns are presented as the median of 5,000 projected simulations of returns over the specified period. The risks are the specified-year volatilities (standard deviations) of the deficit divided by the value of the liability proxy at outset. The risk measure is therefore a balance sheet (mark to market or model) type measure and provides no indication of liquidity, cash flow matching, collateral adequacy or the other risks.

The attribution of risk is by considering the marginal impact on the overall volatility of the addition of a small allocation of the asset class (fund or mandate). The attributions therefore depend on the volatility of the asset class on its own, its correlation with other asset classes in the portfolio and the size of the allocations (before the notional marginal addition).

Unless otherwise stated, the structure model does not consider the asymmetric risks associated with any of the following types of investments/strategies:

•Financial options, such as interest rate swaptions and equity options.

•Non-rebalanced strategies - all investment strategies tested in the model are assumed to be rebalanced to the allocations input into the model.

•Impact of contributions on long term risk.

•Management actions taken by Committees (mechanistic, strategic or otherwise) around hedging, derisking, benefit changes, portfolio management and so on.

Economic Scenario Service

The distributions of outcomes depend significantly on the Economic Scenario Service (ESS), our (proprietary) stochastic asset model. This type of model is known as an economic scenario generator and uses probability distributions to project a range of possible outcomes for the future behaviour of asset returns and economic variables. Some of the parameters of the model are dependent on the current state of financial markets and are updated each month (for example, the current level of equity market volatility) while other more subjective parameters do not change with different calibrations of the model.

Key subjective assumptions are the average excess equity return over the risk free asset, the volatility of equity returns and the level and volatility of yields, credit spreads, inflation and expected (breakeven) inflation, which affect the projected liability and bond returns. The output of the model is also affected by other more subtle effects, such as the correlations between economic and financial variables.

Our expectation (i.e. the average outcome) is that long term real interest rates will gradually rise from their current low levels. Higher long-term yields in the future will mean a lower value placed on liabilities and therefore our median projection will show, all other things being equal, an improvement in the current funding position (because of the mismatch between assets and liabilities). The mean reversion in yields also affects expected bond returns. The impact of the yield reversion assumption is illustrated in the standard results charts that we produce using the model output.

While the model allows for the possibility of scenarios that would be extreme by historical standards, including very significant downturns in equity markets, large systemic and structural dislocations are not captured by the model. Such events are unknowable in effect, magnitude and nature, meaning that the most extreme possibilities are not necessarily captured within the distributions of results.

Given the context of this modelling, we have not undertaken any sensitivity analysis to assess how different the results might be with alternative calibrations of the economic scenario generator.

The returns presented here are time weighted returns over the specified period and are unaffected by the timing of any contributions received or pensions paid over that period. Such returns are, in general, a poor estimator of money weighted returns, which are sensitive to the timing of cashflows.

The probability that a specific asset return will be exceeded will not usually equate to the probability that some funding plan based on this return will be sufficient to meet all the pension payments. Complex interactions between the assets, yields and cashflow timings can mean that the two probabilities are materially different, especially for more mature schemes.

The following figures have been calculated using 5,000 simulations of the Hymans Robertson Economic Scenario Service, calibrated using market data as at 31 December 2018. All returns are shown net of fees. Percentiles refer to percentiles of the 5,000 simulations and are the annualised total returns over 5, 10 and 20 years, except for the yields which refer to the (simulated) yields in force at that time horizon.

		Annualised total returns									
		Cash	Index Linked Gilts (medium)	Fixed Interest Gilts (medium)	UK Equity	Overseas Equity	Property	CorpMedium A	Inflation	17 year real yield	17 year yield
5 years	16th %'ile	-0.2%	-2.1%	-2.6%	-4.2%	-4.0%	-3.3%	-2.2%	1.6%	-2.3%	1.0%
	50th %'ile	0.9%	0.7%	0.5%	4.2%	4.3%	2.6%	1.3%	3.1%	-1.4%	2.3%
	84th %'ile	2.2%	3.5%	3.6%	13.2%	13.0%	9.0%	4.5%	4.7%	-0.5%	3.9%
10 years	16th %'ile	0.0%	-1.4%	-0.9%	-1.2%	-1.1%	-1.3%	-0.4%	1.8%	-1.8%	1.4%
	50th %'ile	1.5%	0.4%	0.6%	4.9%	5.0%	3.4%	1.4%	3.2%	-0.6%	3.0%
	84th %'ile	3.2%	2.3%	2.0%	11.3%	11.1%	8.0%	3.0%	4.8%	0.6%	5.0%
20 years	16th %'ile	0.9%	-0.7%	0.5%	1.4%	1.5%	0.8%	1.1%	2.0%	-0.7%	2.2%
	50th %'ile	2.6%	0.7%	1.4%	5.9%	6.0%	4.5%	2.3%	3.2%	0.8%	4.0%
	84th %'ile	4.6%	2.4%	2.3%	10.6%	10.6%	8.3%	3.5%	4.7%	2.3%	6.3%
	Volatility (Disp) (1 yr)	1%	7%	10%	19%	19%	14%	10%	1%		

The current calibration of the model indicates that a period of outward yield movement is expected. For example, over the next 20 years our model expects the 17 year maturity annualised real (nominal) interest rate to rise from -1.8% (1.8%) to 0.8% (4.0%)

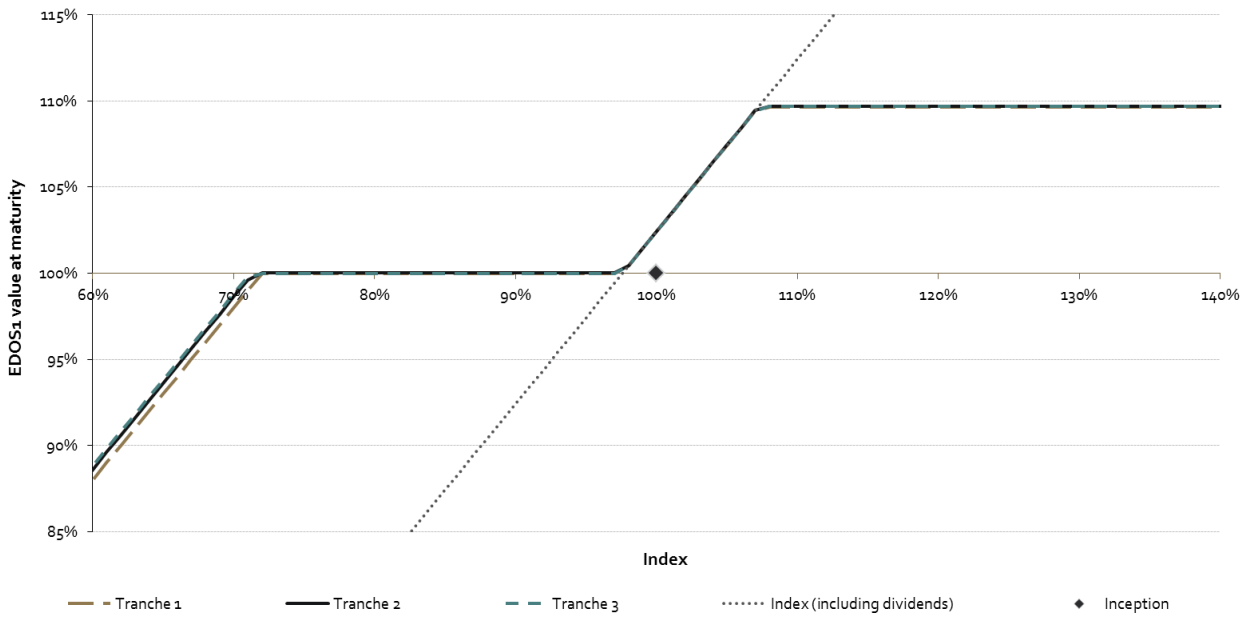
Modelling liabilities

We model scheme liabilities approximately by assuming that real and fixed liabilities can be represented by long dated inflation linked and fixed interest gilts respectively. It is possible that the proxy liabilities mis-state the true sensitivity of the scheme liabilities to changes in interest rates and inflation.

Appendix 2 – Structured equity pay-off profiles

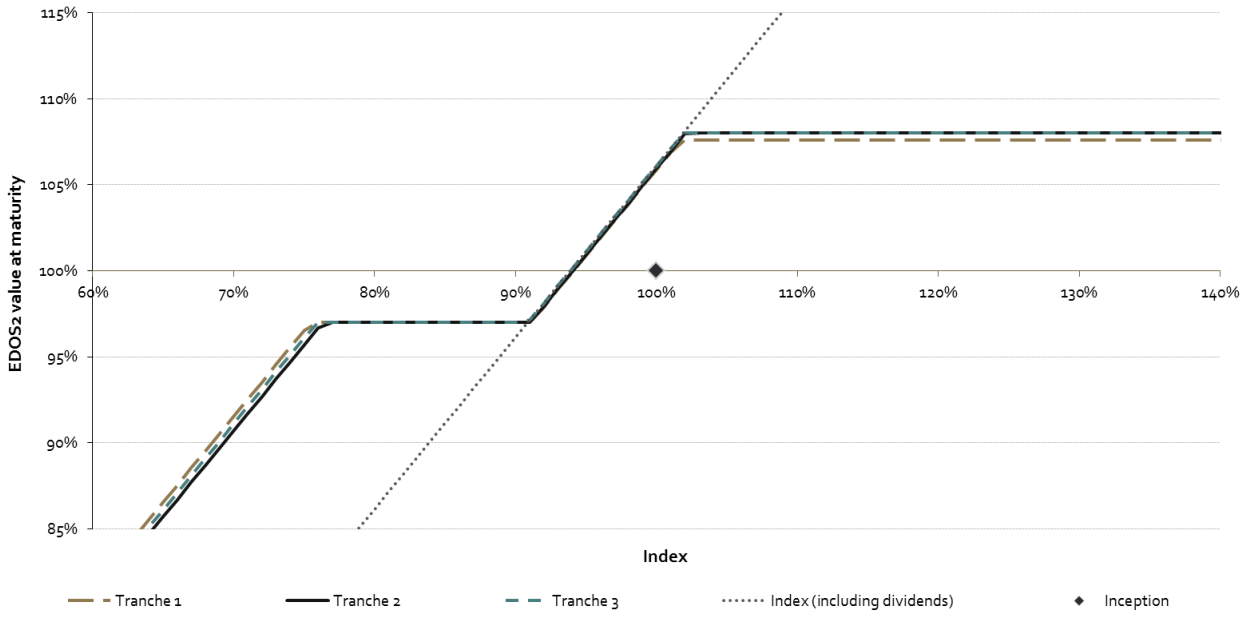
The following charts set out the pay-off profiles of the Sections of the structured equity solutions at expiry. We would note that the payoff profile will look different if liquidated before expiry.

EDOS1



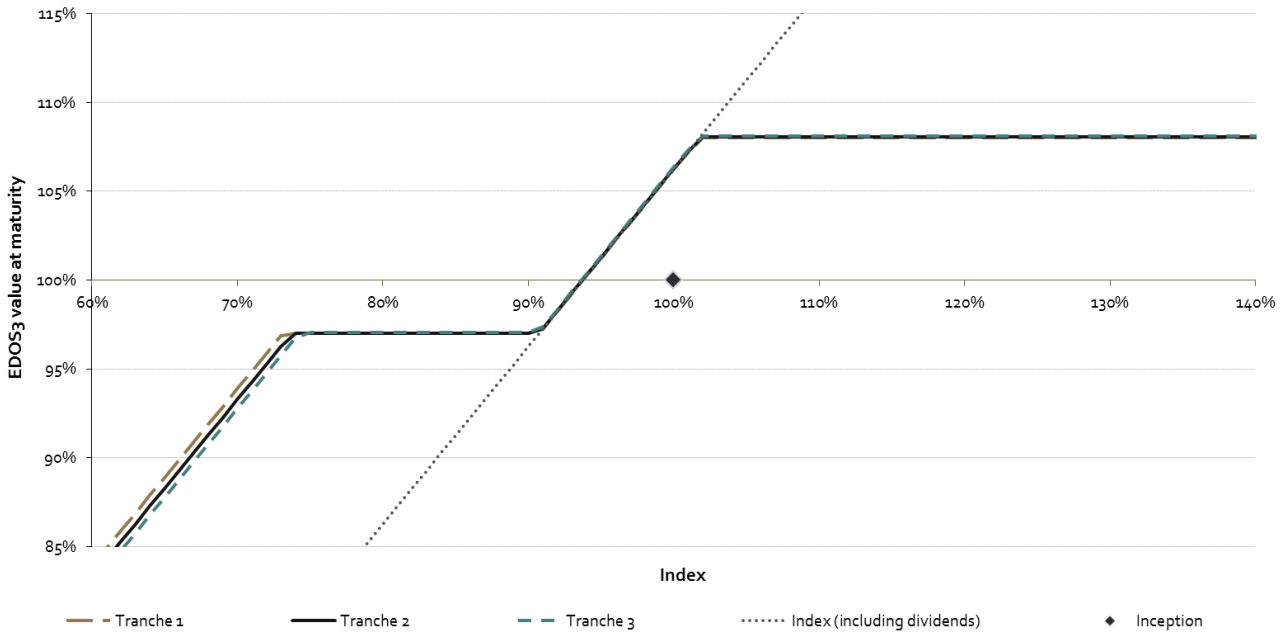
Source: River and Mercantile Derivatives

EDOS2



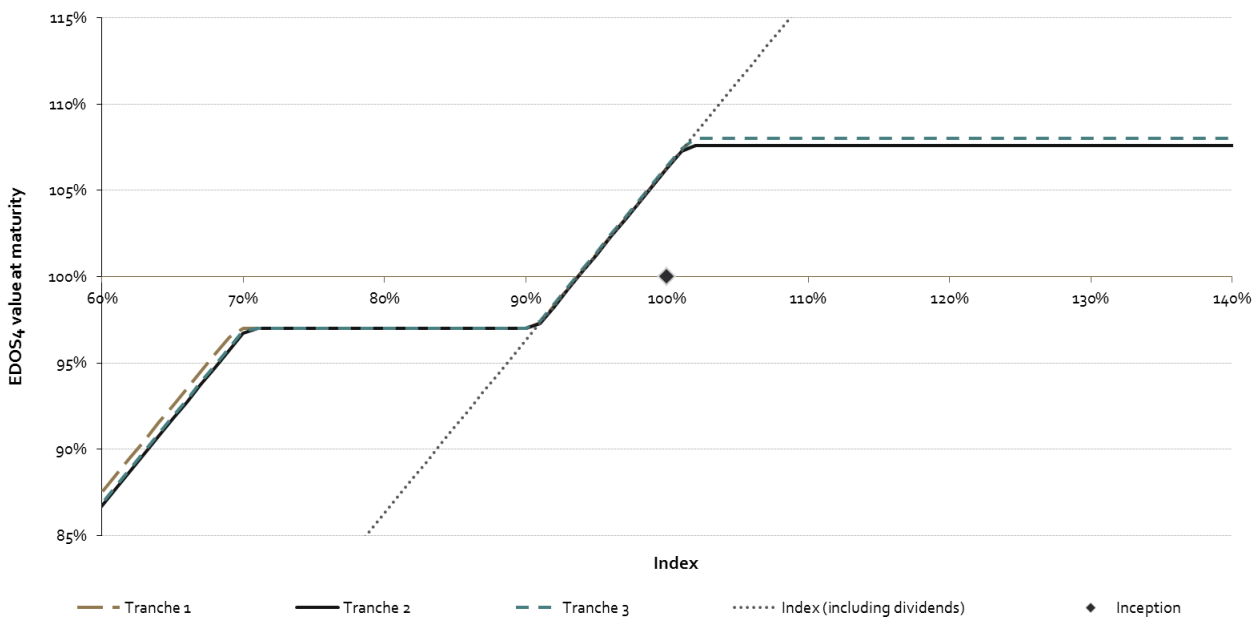
Source: River and Mercantile Derivatives

EDOS3



Source: River and Mercantile Derivatives

EDOS4



Source: River and Mercantile Derivatives

Appendix 3 - Equity beliefs

Investment Beliefs: Listed Equity

1. Passively managed market cap based investment has a balancing role to play in most pension schemes' equity allocations, bringing liquidity, transparency and reducing average fee levels;
2. Market cap weighted indices have their drawbacks; adding carefully selected systematic, factor tilted equity strategies can improve risk-adjusted returns, benefiting from disciplined rebalancing (the "rebalancing premium");
    - Exposure to "valuation factors" can improve risk adjusted returns over time. Even if outweighed by technical factors in the short-term, diversified exposure to valuation based factor tilts can add excess return per unit of risk over a reasonable timeframe;
    - Exposure to the "low volatility factor" can reduce absolute equity volatility and improve risk-adjusted returns. Strategies can be implemented which manage downside risk while achieving market returns over time;
    - Exposure to the "small size factor" can improve risk-adjusted returns. A diversified tilt towards medium and smaller sized businesses is generally rewarded over time;
    - Carefully selected exposure to actively managed growth strategies can improve the balance of overall equity exposure and improve risk adjusted returns;
3. Exposure to emerging markets provides diversification and the opportunity for higher returns due to the higher risk premium typically earned for investing in these markets;
4. With sufficient research and governance, active equity management can be incorporated to add value relative to market cap weighted indices; overall active equity exposure should be focused predominantly on stock-specific risk;
5. Currency exposure associated with investing in equities can add volatility. Whilst it can be desirable to retain exposure to some currencies, hedging a proportion of non-domestic currency exposure can reduce the volatility of equity investing;

Appendix 4 - WCCPF – Investment beliefs

Statement of Investment Beliefs from ISS

The Fund's investment beliefs outline key aspects of how it sets and manages the Fund's exposures to investment risk. They are as follows:

Financial Market Beliefs

- There exists a relationship between the level of investment risk taken and the rate of expected investment return. As taking calculated risks does not guarantee returns, investment losses or below expected returns are possible outcomes.
- Markets are dynamic and are not always efficient, and therefore offer opportunities for skilled active managers.
- In making investments in illiquid assets, a return premium should be sought.
- Diversification is a key technique available to institutional investors for improving risk-adjusted returns.
- The fund believes that investing for the long term can add value to the fund as it allows the fund manager to focus on long term value and use short term volatility to establish favourable investments.
- Where an asset class/strategy is not expected to help in delivering the risk adjusted investment return required it should not be held.

Investment Strategy/Process Beliefs

Clear investment objectives are essential. Return and risk should be considered relative to the Fund's liabilities, funding position and contribution strategy.

Risk should be viewed both qualitatively and quantitatively. Particular focus should be given to the risk of loss and also to the nature and likelihood of extreme events so that the Fund is not a forced seller of assets.

- Strategic asset allocation is a key determinant of risk and return, and thus is typically more important than manager or stock selection.
- Equities are expected to generate superior long-term returns relative to Government bonds.
- Alternative asset class investments are designed to further diversify the portfolio and improve its risk-return characteristics.
- Active management can add value over time but it is not guaranteed and can be hard to access. Where generating 'alpha' is particularly difficult, passive management is preferred.
- Operational, counterparty, conflicts of interest and reputational risk need assessment and management, in addition to investment risk.
- Concentrated portfolios (smaller numbers of holdings or less external managers) allow for greater investment focus, lower investment costs and enable more focused engagement with Responsible investment.
- Managing fees and costs matter especially in low-return environments. Fee arrangements with our fund managers – as well as the remuneration policies of investee companies – should be aligned with the Fund's long-term interests.

Organisational Beliefs

- Effective governance and decision-making structures that promote decisiveness, efficiency and accountability are effective and add value to the Fund.
- When outperformance of a desired benchmark is not possible the fund will use index funds, financial instruments or proxies (Investments that share similar characteristics) to gain exposure to the asset class in the most cost effective way.
- Investment costs are necessary to generate outperformance in asset classes where outperformance is achievable. Investment costs are a certain cost that should be fully transparent and managed by the operator in the best interests of the pension Fund.

Responsible Investment Beliefs

- Effective management of financially material ESG risks should support the Fund's requirement to protect returns over the long term.
- Investee companies with robust governance structures should be better positioned to handle the effects of shocks and stresses of future events.
- There are some investment opportunities arising from environmental and social challenges which can be captured so long as they are aligned with the Fund's investment objectives and strategy.
- Responsible Investment should be integrated into the Investment process.
- The Fund will manage Responsible Investment factors through engagement rather than exclusions.