Aon Hewitt
Retirement & Investment

London Borough of Harrow Pension Fund ('the Pension Fund')

Date: 28 June 2017
Prepared for: Pension Fund Committee ('the Committee')
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Investment Strategy Recommendation

Introduction

The purpose of this report is to provide a recommendation for the Committee in respect of the Fund's investment strategy.

On 6 June 2017, the Committee held an Investment Strategy workshop, where Aon Hewitt provided our initial analysis on the Fund's current investment strategy and tabled some suggested alternative investment strategies for the Committee to consider.

Based on the discussions that occurred at the workshop, we have incorporated feedback and provide a recommendation to be considered at the 28 June 2017 Committee meeting.

As part of this recommendation we also consider some more specific issues with certain of the Fund's assets classes.

Analysis Background

For the investment strategy review, Aon Hewitt undertook an Asset Liability Study, providing a tool to analyse the Fund's current investment strategy and alternative options. The modelling undertaken utilised liability data provided by Hyman's Robertson as used in the 31 March 2016 Actuarial Valuation, as well as Aon Hewitt capital market assumptions as at 31 March 2017.

When analysing the current investment strategy and other suggested alternatives, we have looked at a number of different metrics to compare the outcomes, including risk, expected return and expected funding in 10 years.

In our modelling we have considered 2 types of risk:

- Absolute risk – the risk that the value of the Fund's assets decreases. This is measured through the absolute volatility of the assets.
- Relative risk – the risk associated with the volatility of the value of the Fund's assets relative to the value of its liabilities. This reflects the fact that the assets and liabilities do not necessarily react to market conditions in the same way.

We also show return expectations in both absolute and relative terms.

When considering relative risk, we have also looked at a short-term measure known as the Value at Risk ("VaR"). This indicates the amount that the Fund's surplus/deficit stands to deteriorate by in a 1 in 20 event.

When we refer to stochastic projections in this report we are referring to having run the investment strategy through our asset liability model, which includes 5,000 different economic scenarios.

The results of the 31 March 2016 Actuarial Valuation indicated that the Fund was c. 74% funded, with assets of c.£661m and liabilities of c.£889m. As at 31 March 2017, the Fund's assets were valued at c.£807m, with an estimated funding level of c.78%, based on Aon Hewitt calculations.

The discount rate used in our analysis is long-dated gilts + 1.6% p.a., consistent with that in the Fund's Actuarial Valuation.

Details of further assumptions used can be found in Appendices 1 and 2.

Current Investment Strategy

The Fund's current investment strategy is outlined in the table below, including the central strategic allocation and ranges. We also show the Fund's actual asset allocation as at 31 March 2017.

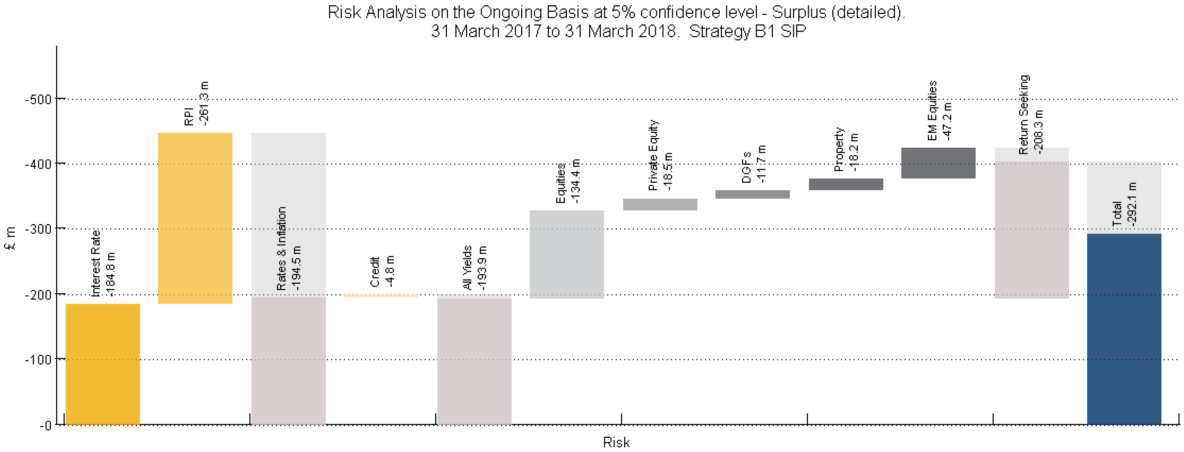
Asset Class	31 March 2017 Allocation (%)	Strategic Allocation (%)	Strategic Range (%)
Global Equities*	54.2	51.7	58.0 – 68.0
Emerging Market Equities	11.7	10.3	
Private Equity	2.4	5.0	4.0 – 6.0
Diversified Growth Funds	7.2	10.0	8.0 – 12.0
Property	8.0	10.0	8.0 – 12.0
Index-Linked Gilts	2.5	2.6	11.0 – 15.0
UK Corporate Bonds	10.0	10.4	
Cash & NCA	4.0	0.0	N/A

*includes a 50% currency hedge of overseas equity market exposure within developed markets

The 10 year risk and return statistics for the Fund's current investment strategy, as shown below, indicate that the Fund currently has a high level of absolute (14.1%) and relative (17.4%) volatility, which is driven by the high allocation to equities within the portfolio.

Current Strategy	Key Statistics
10 year volatility (absolute)	14.1%
10 year volatility (relative)	17.4%
10 year return (absolute)	6.9%
10 year return (relative)	4.2%
Return/Risk (absolute)	0.49
Return/Risk (relative)	0.24

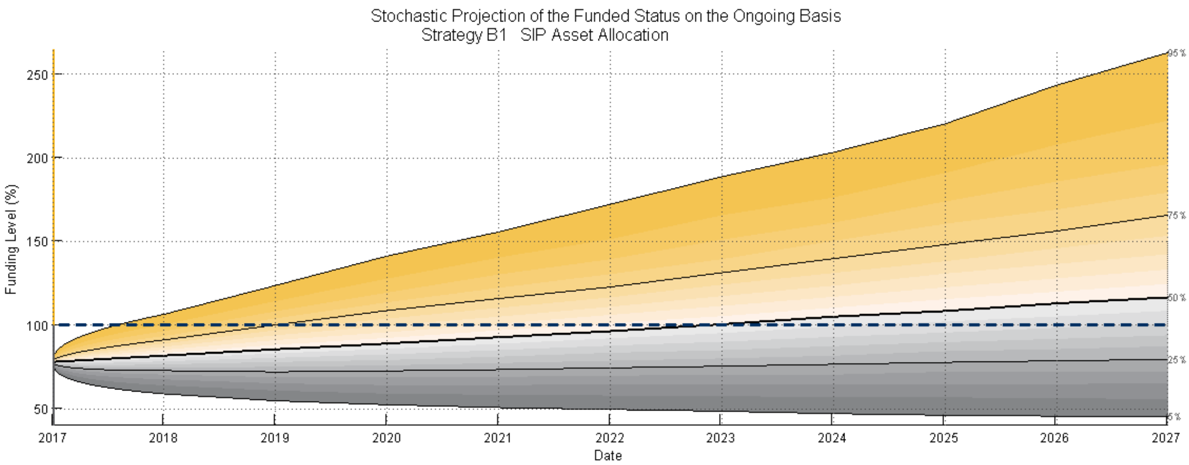
Looking at the current investment strategy in terms of more short-term risk, the following chart provides a breakdown of the Fund's one year VaR, as at 31 March 2017:



This analysis shows that the Fund has a one year VaR of c. £292m, which is equivalent to almost one third of the Fund's overall liabilities.

Breaking the VaR down into its constituent parts shows that the majority of the risk is being taken within the Fund's equity portfolio, as mentioned earlier, but also that inflation is a key risk to the Fund. The inflation risk arises as a result of the Fund's inflation linked liabilities and the relatively small allocation to inflation linked assets, such as Index-Linked Gilts, that the Fund has.

Turning to analysis of the Fund's funding level, the chart below shows the stochastic projection of the Fund's funding level over time, showing the range of potential future outcomes for the Fund's funding level based on the current investment strategy.



This analysis shows a median funding level in 10 years of 117%, with a wide range of outcomes for the funding level when projected forward. The wide range of potential outcomes is representative of the level of risk associated with the current investment strategy, given the high allocation to growth assets, in particular equities.

The rest of this report focusses on a potential alternative investment strategy and also looks to address some specific considerations in relation to certain on the Fund's assets.

Alternative Investment Strategies

At the Investment Strategy workshop on 6 June 2017, Aon Hewitt presented a number of different possible investment strategies for the Committee to consider in order to reduce the level of risk in the portfolio. These can be broadly categorised as follows:

- Reducing the allocation to Equities and investing the proceeds into other of the Fund's current growth assets (Diversified Growth Funds and Property)
- Reducing the allocation to Equities and investing the proceeds into other of the Fund current growth assets (Diversified Growth Funds and Property) and Infrastructure
- Reducing the allocation to equities and investing the proceeds into matching assets such as Index-Linked Gilts (i.e. de-risking)

Details of all of the allocations modelled are included in Appendix 3.

Reducing the Equity allocation and investing the proceeds into other of the Fund's current growth assets maintains an expected return well above the discount rate, with lower risk than the current investment strategy.

Adding Infrastructure into the mix of asset classes for the proceeds of an Equity reduction provides a very marginal increase in returns, with a small increase in the median funding level in 10 years. We discuss the merits of investing in Infrastructure later in this report.

De-risking the Fund's investment strategy by reducing the allocation to Equities in favour of Index-Linked Gilts has the impact of reducing both the absolute and relative levels of risk and expected returns. As a consequence, the expected time to full funding increases.

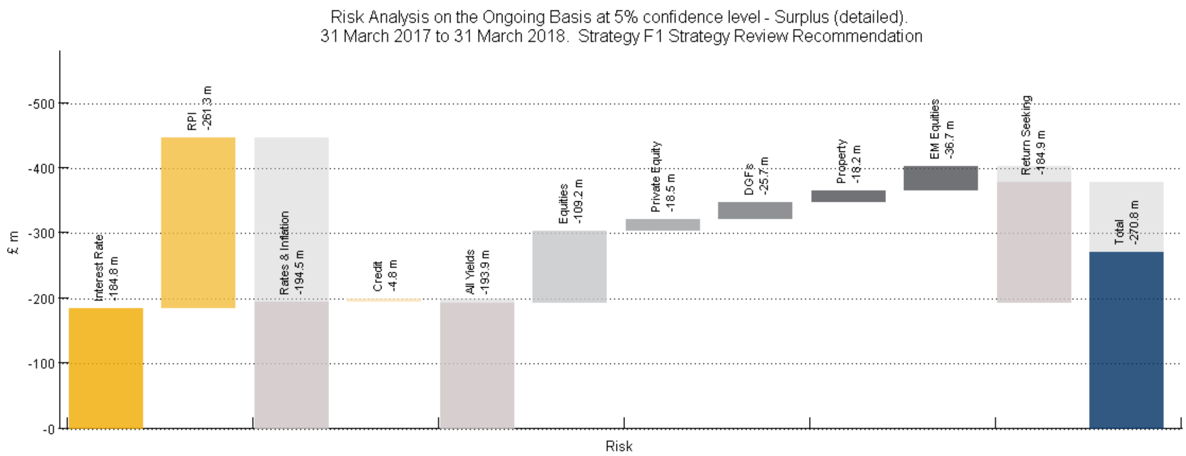
The discussions at the Investment Strategy workshop centred around the strategies of reducing the allocation to Equities, with the proceeds being invested into growth assets to reduce risk by providing more diversification, rather than reducing risk by investing in matching assets.

Incorporating feedback from the discussions, we have proposed the asset allocation in the following table for the Fund's revised investment strategy. This represents a short-term strategy, with the proceeds from the reduction in the allocation to Equities being invested into Diversified Growth Funds. The Fund's medium-term strategy sees some of the short-term allocation to Diversified Growth Funds, and a reduction in the allocation to Private Equity, being used to fund an increase in the allocation to Property and also to introduce an allocation to Infrastructure, as opportunities arise. This is discussed in more detail later in the report.

Asset Class	Allocation (%)	Desired Movement in Medium-Term
Global Equities*	42.0	
Emerging Market Equities	8.0	
Private Equity	5.0	Reduce as current funds wind down
Diversified Growth Funds	22.0	Decrease as proceeds required to fund Property and Infrastructure opportunities
Property	10.0	Increase as opportunities arise
Infrastructure	0.0	Increase as opportunities arise
Index-Linked Gilts	2.6	
UK Corporate Bonds	10.4	

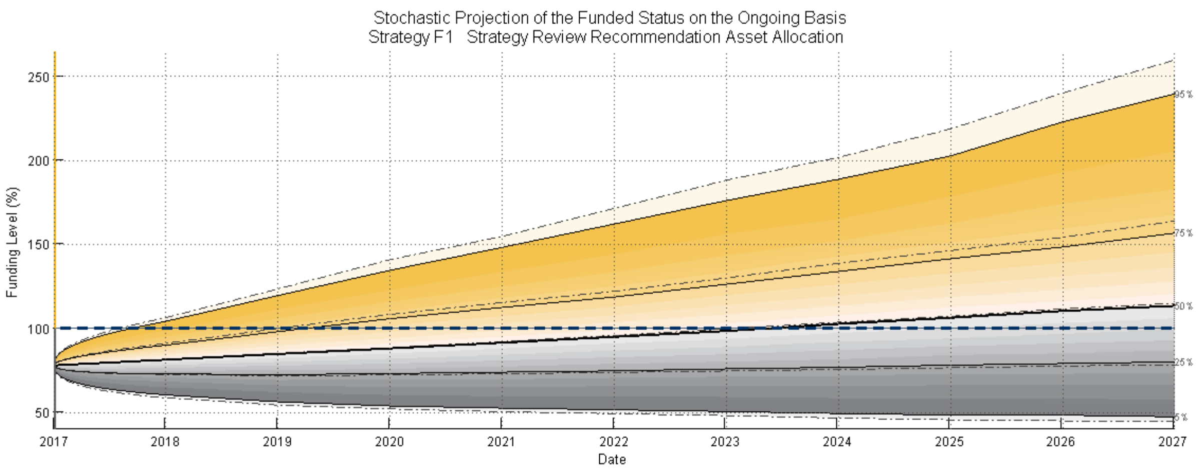
*includes a 50% currency hedge of overseas equity market exposure within developed markets

The VaR breakdown analysis of this strategy is shown in the following chart:



The overall VaR for this revised investment strategy is £271m, which represents a reduction of £21.3m from the current investment strategy. The reduction in VaR is driven by the reduced allocation to Equities and the diversification benefits that investing the proceeds into Diversified Growth Funds provide.

The stochastic funding level projection chart for this investment strategy is shown below, overlaid on top of the same chart for the current investment strategy.



The funding level projection chart shows a median funding level of 113% in 10 years time, with a narrower range of potential funding level outcomes.

This strategy shows a fall in the expected returns compared to the current strategy, from 6.9% p.a. to 6.5%p.a. on an absolute basis and from 4.2% p.a. to 4.0% p.a. on a relative basis. However, this is coupled with a reduction in the risk associated with the strategy, with the annualised absolute volatility reducing from 14.1% to 12.7% and the annualised relative volatility falling from 17.4% to 16.1%.

We believe that this investment strategy is appropriate for the Fund in the short term. Even though the expected returns of the revised strategy remain above the Fund's discount rate, before any change in strategy is agreed the Fund's Actuary should be consulted to check that it does not invalidate any of the assumptions used in the Actuarial Valuation.

The rest of this report discusses some specific issues in relation to some of the asset classes that the Fund invests in.

London Collective Investment Vehicle (" CIV")

The Fund is soon to have its first assets in the London CIV, with the Global Equity allocation with Longview scheduled to be transferred in July 2017. The Fund's Passive Equity assets held with StateStreet are permitted to remain outside of the CIV, but still deemed to be 'pooled' in the desired way. The allocations to these two managers make up c.42% of the Fund's current investment strategy.

Neither of the Fund's other two Equity managers (GMO or Oldfield) are currently on the CIV nor, to our knowledge, are scheduled to join the CIV. Similarly, neither of the Fund's two current Diversified Growth Managers, Insight or Standard Life, are currently on the CIV.

With this in mind, we ask the Committee to acknowledge that the time will arrive in the future whereby a decision has to be made on whether to transfer the investments held in these asset classes to the alternatives available on the CIV. Another potential option would be to hold the assets passively outside of the CIV.

Other asset classes are to become available through the CIV in the future, although this will take time. For any new allocations that the Committee is considering making for the Fund, the CIV should be considered if the asset class is available.

Accordingly, we recommend that the Committee engage with the London CIV on their future plans, both for the on-boarding of new managers and future asset classes that are to be added.

Illiquid Assets

The Fund currently has a strategic allocation to both Private Equity and Property, whilst LGPS funds are also being encouraged to consider allocations to another illiquid asset class, Infrastructure.

We briefly discuss each of these below.

Private Equity

The Fund has a strategic allocation of 5.0% to Private Equity, invested in three funds with Pantheon. As at 31 March 2017 the allocation was closer to c.2.5% in total across the three funds.

The Private Equity portfolio is now in the stage where distributions are regularly being paid out.

Given there is typically a high correlation between Private Equity and listed Equity, the fact that the Fund has not committed to the asset class for some time meaning it has vintage year gaps, plus the considerations of investing in other illiquid asset classes such as Infrastructure, we recommend that no further allocation is made to Private Equity and the allocation be allowed to wind down as distributions come back to the Fund.

Property

A separate review of the Property asset class has been undertaken by Aon Hewitt, with the results included in the report *Property Allocation Options.*

In this report we recommend that the Fund consider investing any further allocation to the Property asset class in growth focussed strategies such as Private Rented Sector, Value-Add and Opportunistic Property funds.

Given the high transaction costs involved and the fact that we believe UK pension schemes should have a sizeable allocation to Core UK Commercial Property , we do not recommend that the Fund disinvest from its current allocation in the Aviva UK Real Estate Fund of Funds.

At this stage we recommend that the Committee undertake training on the Alternative Property allocation options mentioned.

Infrastructure

The Fund currently has no strategic allocation to Infrastructure. We believe that this is an asset class that the Committee should consider investing in for two reasons:

1) To provide further diversification within the Fund's growth assets and provide an element of exposure to inflation linked assets;
2) The directive from central government is for LGPS Funds to invest into Infrastructure, with there being reference to this in the Local Government Pension Scheme: Investment Reform Criteria issued by the Department for Communities and Local Government in November 2015.

For the avoidance of any doubt, where we refer to Infrastructure throughout this report we are referring to investing in Infrastructure Equity rather than Infrastructure Debt.

In the first instance we recommend that the Committee undertake training on Infrastructure Equity as an asset class.

Cash & NCA

At their 7 March 2017 meeting, the Committee agreed to reduce the allocation to Oldfield Global Equity to its strategic allocation and the sum realised be held in Cash.

We note that this amount was retained as Cash to make it easier for the Committee to move the money into another fund such as Property, should it take such a view at its June 2017 meeting.

We understand that there is currently c. £20m of Cash available to invest into the Fund's invested assets.

Whilst training is undertaken on both Property and Infrastructure, we recommend that the amount be invested into the Fund's Diversified Growth Funds rather than being held as Cash

Recommendations

On the basis of the analysis conducted, and the feedback for the Investment Strategy workshop, the recommendations from Aon Hewitt in relation to the Fund's investment strategy are as follows:

1) Reduce the allocation to Equities by adopting the investment strategy outlined below in the short term. The allocations to the Equities funds and Diversified Growth Funds should be pro-rated and the currency hedging within the Equity allocation should remain at 50%

Asset Class	Allocation (%)	Desired Movement in Medium-Term
Global Equities*	42.0	
Emerging Market Equities	8.0	
Private Equity	5.0	Reduce as current funds wind down
Diversified Growth Funds	22.0	Decrease as proceeds required to fund Property and Infrastructure opportunities
Property	10.0	Increase as opportunities arise
Infrastructure	0.0	Increase as opportunities arise
Index-Linked Gilts	2.6	
UK Corporate Bonds	10.4	

*includes a 50% currency hedge of overseas equity market exposure within developed markets

Before any change is implemented, the Fund's Actuary should be consulted.

2) Allow the allocation to Private Equity to wind down, with no additional strategic allocation being made to the asset class.

3) Over the longer term use the proceeds from Private Equity and the increased allocation in Diversified Growth Funds to allocate further to growth-oriented Property opportunities and also to Infrastructure.

4) In the first instance, the Committee should receive training on both growth-oriented Property opportunities and Infrastructure.

5) In relation to the current level of Cash available to invest, whilst the training on Property is undertaken, we recommend that the amount be invested in the Fund's Diversified Growth Funds on a pro-rated basis.

We look forward to discussing this report with the Committee at their meeting on 28 June 2017.

Appendix 1 - Asset Returns, Volatilities & Correlations

The table below shows the 10 year expected returns, volatilities and correlations for the asset classes modelled as part of the investment strategy review.

Additional assumptions used when modelling specific asset classes are:

- Corporate bonds have been modelled as passive over 15 year AA non-gilts
- Index-linked gilts have been modelled as passive over 5 year ILGs
- Overseas equities have been modelled as 50% overseas GBP currency hedge. This is excluding the emerging market equity allocation, which is GBP currency unhedged.
- Infrastructure modelled as USD Infrastructure Total Return Hedged. This is Infrastructure equity.

DGFs modelled as 50% GARS style, 50% Capital Preservation style DGFs

	10y Return (%p.a.)	10y Risk (%p.a.)	Correlation							
	Median (GeoM)	Annual Volatility	Private Equity	Index Linked Gilts	UK Corporate Bonds	DGFs	Property	Infrastructure	Global Equities	EM Equities
Private Equity	8.2	27.5	1.00							
Index Linked Gilts	0.5	10.2	-0.05	1.00						
UK Corporate Bonds	1.5	9.9	0.00	0.48	1.00					
DGFs	5.2	9.0	0.60	0.10	0.40	1.00				
Property	5.5	12.6	0.31	-0.04	0.01	0.28	1.00			
Infrastructure	5.1	14.6	0.31	-0.01	0.02	0.27	0.21	1.00		
Global Equities	7.0	17.7	0.73	-0.08	0.00	0.72	0.41	0.39	1.00	
EM Equities	8.9	31.8	0.61	-0.07	0.02	0.67	0.35	0.30	0.82	1.00

Appendix 2 – Starting Position as at 31 March 2017 & Other Assumptions

Starting Position

The starting position for the analysis of the Fund is outlined below:

As at 31 March 2017:

- *Assets = 806.6m*
- *Liabilities* = 1,033.9m*
- *Funding level = c. 78%*

**Estimated value of the liabilities based on Aon Hewitt roll forward calculations*

Other Assumptions

- We have carried out the modelling on the technical provisions but assuming that the discount rate is based on an appropriate point on the yield curve. The basis uses best estimate inflation volatilities.
- All strategies assume that the future service accrual contributions for all employers in the Fund are spread over the years (i.e. no allowance has been made for pre-payment of accrual contributions). We have therefore used an accrual contribution rate of 20.2% in respect of Employer contributions for the entire projection period. Additionally, we have assumed the DRC payments continue to the end of the projection period, at the rate payable over 2019/20, as this was the last year for which the DRCs were provided. The DRCs provided totalled £12m, however the deficit as at the valuation date was £248m.

Appendix 3 – Asset Allocations & Key Statistics

The tables below show the asset allocations and the key statistics for the Fund's current investment strategy and the alternative strategies discussed in his report

	Current investment strategy	Reducing the equity allocation and investing proceeds into other of current growth assets		Reducing the equity allocation and investing proceeds into other of current growth assets and infrastructure			Reducing the equity allocation and investing the proceeds into matching assets (i.e. de-risking)		Recommend-ation
	B1	50% Eq C1	40% Eq C2	50% Eq D1	40% Eq D2	40% Eq D3	50% Eq E1	40% Eq E2	50% Eq F1
Global Equities (50% Developed OS GBP Hedge)	51.7%	42.0%	34.0%	42.0%	34.0%	34.0%	42.0%	34.0%	42.0%
Emerging Market Equities	10.3%	8.0%	6.0%	8.0%	6.0%	6.0%	8.0%	6.0%	8.0%
Private Equity	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%
DGFs	10.0%	16.0%	21.0%	12.0%	12.0%	22.0%	10.0%	10.0%	22.0%
Property	10.0%	16.0%	21.0%	12.0%	22.0%	12.0%	10.0%	10.0%	10.0%
Infrastructure				8.0%	8.0%	8.0%			
Index Linked Gilts	2.6%	2.6%	2.6%	2.6%	2.6%	2.6%	14.6%	24.6%	2.6%
UK Corporate Bonds	10.4%	10.4%	10.4%	10.4%	10.4%	10.4%	10.4%	10.4%	10.4%

-%	Decreased allocation
+%	Increased allocation

	Current investment strategy	Reducing the equity allocation and investing proceeds into other of current growth assets		Reducing the equity allocation and investing proceeds into other of current growth assets and infrastructure			Reducing the equity allocation and investing the proceeds into matching assets (i.e. de-risking)		Recommend-ation
	B1	50% Eq C1	40% Eq C2	50% Eq D1	40% Eq D2	40% Eq D3	50% Eq E1	40% Eq E2	50% Eq F1
Returns Relative to Liabilities (annualised)									
10 year median relative return	4.2%	4.0%	3.8%	4.0%	3.8%	3.8%	3.5%	2.8%	4.0%
10 year median relative volatility	17.4%	16.1%	15.1%	16.1%	15.1%	15.1%	14.7%	12.5%	16.1%
Efficiency	0.24	0.25	0.25	0.25	0.25	0.25	0.24	0.23	0.25
Absolute Returns (annualised)									
10 year median absolute return	6.9%	6.6%	6.3%	6.6%	6.4%	6.3%	6.1%	5.4%	6.5%
10 year median absolute volatility	14.1%	12.6%	11.5%	12.6%	11.4%	11.4%	11.9%	10.2%	12.7%
Efficiency	0.49	0.52	0.55	0.53	0.56	0.56	0.51	0.53	0.51
Short Term Risk									
Value at Risk (VaR) over 1 year (£m)	292.1	273.4	259.0	278.9	262.1	258.4	253.9	220.7	270.8
Expected Funding in 10 years									
Median funding level in 10 years	117%	114%	112%	115%	112%	112%	108%	102%	113%
Probability of being fully funded in 10 years	60%	60%	59%	60%	59%	59%	56%	51%	59%
Years until median fully funded	5.9	6.3	6.7	6.3	6.5	6.7	7.3	9.3	6.4

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