

Appendix A

Annual review of asset strategy and structure

Addressee

This paper is addressed to the Local Pension Committee (“LPC”) of Leicestershire County Council Pension Fund (“the Fund”). The purpose of this paper is to provide the 2019 annual assessment of the Fund’s investment strategy.

The note has not been prepared for use for any other purpose. This report complies with Technical Actuarial Standard 100: Principles for Technical Actuarial Work.

Executive Summary

Our paper considers both the strategic asset allocation and its implementation, taking into account the range of funds to be offered by LGPS Central. As per previous strategy reviews, our recommendations continue the direction of travel towards an investment strategy with greater focus on predictable and sustainable income based returns. In brief:

- Our strategic proposal is to increase the strategic allocation to credit from 10% to 12.5%, funded from the Targeted Return allocation;
- Our implementation proposals will reduce the number of externally held mandates by nine, making use of LGPS Central funds for circa two-thirds of the Fund’s assets, and increasing further as illiquid assets wind down and are subsequently replaced with LGPS Central fund offerings.

Equity

Following a review of the LGPS Central Pool Global Active Equity sub-fund, the LPC agreed to move the Fund’s global active equity holdings with Kempen and KBI to the LGPS Central Pool Global Active Equity sub-fund. We understand the transition of both mandates is due to take place in February.

The Fund currently uses LGIM for all passive equity management. Of the assets invested in LGIM funds, approximately 75% is invested in traditional market-cap based passive funds. The remaining allocation is invested in RAFI Fundamental index products. We are comfortable with the Fund’s passive exposure, but understand that LGPS Central will explore the development of a factor-based fund, potentially including some element of carbon-based investing. We suggest the ISC is delegated to consider whether this would be an appropriate replacement for some of the passive management when further details are available.

We anticipate the Fund making use of the LGPS Central Emerging Markets active equity sub-fund in place of Delaware, subject to suitable due diligence by the Officers and ISC.

The Fund’s private equity exposure with Adams Street is through closed-ended funds and will need to be held separately from the LGPS Central. In terms of ongoing investments required to maintain the Fund’s exposure we would expect these to be via the LGPS Central offering rather than any new commitments to Adams Street.

The Fund has agreed to make an initial commitment of £10m to the LGPS Central private equity 2018 fund. We believe that a 2019 vintage will be available from mid-2019. We propose that the LPC delegate to the Officers to review whether any commitments to private equity are required in 2019 in order to maintain the target weight, and that the ISC are delegated to agree whether to commit assets to the LGPS Central 2019 programme if a further commitment is necessary.

Currently the Fund operates a currency hedging programme in respect of 50% of the equity exposure and the Fund’s other US Dollar holdings. We propose that the ISC review the structure of the Fund’s currency hedging and how best to implement the hedge post pooling.

Index-linked gilts

We propose terminating the relationship with Kames and replicate the ILG exposure using either LGPS Central offering (if they can manage the assets internally) or using LGIM passive funds. We propose that the decision on whether to use the LGPS Central offering or LGIM, and the timing of any switch, is delegated to the ISC.

Infrastructure

LGPS Central will launch its infrastructure fund shortly and the LPC should consider scope to use this as the ongoing vehicle for future commitments. We propose this is delegated to the ISC, although there is no imperative to make any initial commitment to the fund given the current Fund allocations and commitments.

Timberland

We are not aware of LGPS Central having any plans to include timberland in its range of offerings, and therefore we expect the existing holding to continue to be held outwith the Pool, but to wind down over time. A decision will be required as to where to reinvest distributions and reallocate the strategic weight over time. We suggest the ISC determines each year whether distributions from the timberland holdings are redeployed into infrastructure or property on the basis of relative attractiveness.

Property

We remain comfortable with the 10% long-term strategic target. The initial proposals from LGPS Central include the intention to launch an open-ended directly invested property fund. However, the timing of this is very uncertain and for now the Fund will need to retain the allocation through its current investments. If LGPS Central do launch a direct property portfolio (managed internally or delegated), we suggest the ISC are delegated responsibility to review its suitability as a long-term alternative vehicle.

Targeted return

Following the review of Ruffer and the Targeted Return portfolio discussed in the October meeting, the ISC agreed a more balanced mix within the Targeted Return portfolio, bringing the strategic allocation to Ruffer and Pictet in line with one another.

In due course LGPS Central will provide a Targeted Return sub-fund. Once launched, subject to due diligence that this provides a similar solution to what the Fund is targeting, we would envisage the Fund adopting the Central Pool solution rather than retaining the current mandates outside of the Pool. For the purposes of removing the Targeted Return mandates at the time of adopting the Central Pool solution, this would include removing the Millennium currency overlay.

We propose reducing the strategic allocation to Targeted Return to 9% in order to fund an increased allocation to higher yielding liquid credit markets, which we believe now offer a more predictable and attractive return.

Credit

We believe it makes sense for the Fund to hold a meaningful strategic allocation to diversified higher yielding credit, given the predictability of returns. Through the Partners mandate the Fund has a reasonable allocation to private lending. However, we recommend the LPC increases the target strategic allocation to Credit by 2.5%, specifically targeting a higher allocation to liquid credit markets. This would be funded by the reduction in the Targeted Return allocation.

LGPS Central is due to launch investment grade and multi-asset credit sub-funds in 2019. In principle, we propose Fund use the Central Pool multi-asset credit sub-fund, subject to due diligence. The investment in the Central Pool multi-asset credit sub-fund would include assets from the existing JPMorgan credit mandate.

It is not clear at this stage whether this will include illiquid lending. The Fund should continue to hold the existing Partners Group exposure to private lending but look to LGPS Central to provide a vehicle for future allocations.

Equally, it is not clear whether the Central Pool multi-asset credit fund will include Emerging Market Debt. If not, then the Fund should continue to hold the existing Ashmore Fund, but look to LGPS Central to provide a replacement vehicle.

Opportunity pool

It is our understanding that there is no particular expectation of developing a formal Opportunity Pool type solution with the Central Pool. This means the Fund's opportunity assets will remain outwith the Central Pool. We understand the required resources and governance for making and maintaining commitments to new opportunities is limited. Therefore we propose that for now the Fund simply maintain its existing investments rather than making any new allocation.

We look forward to discussing this report with the LPC.

Prepared by:-

Andy Green, Partner
Emma McCallum, Associate Investment Consultant

For and on behalf of Hymans Robertson LLP, January 2019.

Reliances and limitations

The actuarial profession introduced Technical Actuarial Standard (TAS) 100 with effect from 1 July 2017. As part of our internal compliance regime, Hymans Robertson has chosen to apply the principles of TAS100 in the delivery of investment advice. TAS100 applies to work where actuarial principles and/or techniques are central to the work and which involves the exercise of judgement.

In this report we have provided our estimate of expected asset class returns and used this to estimate the return on the Fund as a whole based upon the current and proposed strategic asset allocation. The Fund's asset allocation at September 2018 has been sourced from the November LPC meeting pack and managers. The funding level information and discount rates have been taken from the Actuary's funding update as at 30 September 2018.

The expected returns are based upon 20 year median returns derived from our proprietary economic scenario generator (ESS) asset model. As with all modelling, the results are dependent on the model itself, the calibration of the model and the various approximations and estimations used. These processes involve an element of subjectivity. This model 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 to reflect metrics that can be measured in markets, such as yields, while other more subjective parameters do not change with different calibrations of the model. The expected returns we have shown are relative to expected CPI. We have assumed a 1% difference between expected RPI and CPI, consistent with the assumption made in the actuarial valuation basis.

Risk warning

Please note the value of investments, and income from them, may fall as well as rise. This includes equities, government or corporate bonds, and property, whether held directly or in a pooled or collective investment vehicle. Further, investments in developing or emerging markets may be more volatile and less marketable than in mature markets. Exchange rates may also affect the value of an investment. As a result, an investor may not get back the amount originally invested. Past performance is not necessarily a guide to future performance.

1 Fund asset allocation

Current strategic asset allocation

The strategic asset allocation and implementation of the Fund is structured to accommodate the need for long-term return requirements (primarily equities and alternatives) and a degree of inflation-linked returns, given the nature of the liabilities.

Details of the current strategic target allocation are shown in the table below:

Equities (44-48%)			Real Income Assets (26.5%)			Alternative (25.5-29.5%)			
	Manager	Target %	Inflation Linked (16.5%)				Manager	Target %	
Listed				Manager	Target %	Targeted	Ruffer	4.0 ¹	
Regional inc UK and EM	LGIM	30.0	Index-linked	Kames	7.5		Aspect	3.5	
Global	Kempen	4.0	Infrastructure	IFM	6.0		Pictet	4.0 ¹	
	Kleinwort Benson	4.0		KKR			Overlay	Millennium	-
				JPMorgan					
Emerging Markets	Delaware	4.0	Timberland	Stafford	3.0	Other investments			
			Property (10%)			EM Debt	Ashmore	2.5	
Private				Manager	Target %	Global Credit	JPM Partners	7.5	
	Adams Street	4.0	Fund of Funds	La Salle	10.0	Other opp. pool	M&G DOF CRC Infracapital SLC PE 2ndaries	4.0-8.0	
			Smaller lots, active value	Kames					
			Direct	Colliers					

1. Reflects decision made by ISC in November 2018. Due to be implemented in next few weeks.

The actual allocation as at 30 September 2018 is compared with the current target allocation below.

	Current Target	Actual
Equities incl. private equity	44-48%	51.0%
Inflation-linked	16.5%	14.8%
Property	10.0%	9.2%
Target return	11.5%	12.1%
Global Credit + EMD	10.0%	8.4%
Opportunity pool	4-8%	3.2%
Cash	-	1.4%
Total	100%	100%

At the end of September 2018, the Fund was overweight to equities and notably underweight to the opportunity pool. The Fund also holds 1.4% in cash. We note that market movements over the period from end September 2018 to date will have altered the actual allocation. In particular we estimate, based upon market movements that by 31 December 2018 the equity allocation would be close to the top end of the 44-48% target range and all assets much closer to target.

2 Strategy

Required rate of return on assets

The results of the 31 March 2016 actuarial valuation showed an improvement in the funding level since 2013 from 72% to 76%. Since March 2016 to end September 2018 the funding level has improved by almost 6%.

	31 March 2016 (£m)	30 September 2018 (£m)
Liabilities	4,153	5,197
Assets	3,164	4,264
Shortfall	(989)	(933)
Funding level	76.2%	82.0%

Over the period since the 2016 valuation gilt yields have fallen by c.0.5% p.a. and real yields have fallen 0.7% p.a. The effect of lower nominal and real discount rates has been to increase the monetary value of the liabilities since March 2016 and the value of the liabilities are now 25% higher than at March 2016. At the same time returns on assets over the 30 months to 30 September 2018 have been very positive and assets are 35% higher.

As a result, although the monetary size of the deficit has also decreased as the Fund's assets have grown at a slightly faster pace than the value placed on the liabilities, the deficit has fallen by a much smaller margin than the change in the percentage funding level and is still over £900m.

Since September 2018 to the end of the year, equity markets have fallen by over 10% and gilt yields are lower. Although the Fund is a long-term investor and should not be driven by short-term market movements, this will have eroded some of the funding improvement.

The discount rate used to calculate the value of the 2016 liabilities in the above table reflects an asset outperformance over gilts of 1.8% p.a. or an implied long-term real return over CPI of 1.9% p.a, assuming CPI is 1% below RPI on average. This means that if the Fund's assets were equal to the value of the liabilities and contributions were sufficient to meet the cost of benefits accruing, then the Fund would only need to earn a return of CPI + 1.9% since 2016.

As note in previous reviews, to the extent that contributions are less than the level required to meet future service costs and restore funding, the Fund will need to earn a higher return on the assets than the discount rate. How much more depends not only upon the level of contributions being paid, the timescale to restoring full funding, and progress in funding from one actuarial valuation to the next. This will therefore be assessed as part of the 2019 actuarial valuation.

Since March 2016 gilt yields have fallen. Hence, the absolute return implied by a discount rate of gilts + 1.8% is lower. Given implied inflation has actually risen over the same period, the discount rate of gilts + 1.8% is currently broadly equivalent to only CPI + 1.2% rather than CPI + 1.9%. All else being equal, that would mean a lower required return, relative to CPI. However, as illustrated below, the lower yields available on assets also mean lower expected future returns.

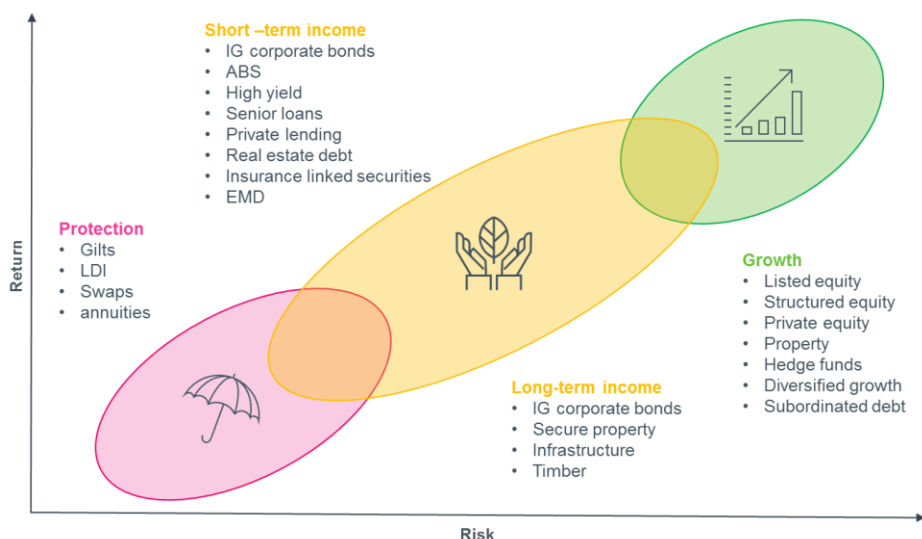
Strategic forecast return

Last year our estimate of the long-term expected return on assets was CPI + 3.6%. This represented a fall from CPI + 3.9% over the period since 2016. As at end December 2018, the expected return has continued to fall marginally relative to inflation and is CPI + 3.4% p.a. We note that the fall since March 2016 is not materially different, as is therefore offset by the reduction in the real yield implied by the discount rate.

In the following table we set out the expected return and contribution from each component of the current strategy to the overall expected return of CPI + 3.4%, based upon market conditions as at 31 December 2018. We note that these are based upon our subjective views of future returns.

	Benchmark weight (%)	Long-term Real Return vs CPI (% p.a.)	Contribution to Strategic Return (% p.a.)
Equities (44-48%)			
Listed equity	40.0-44.0	3.85	1.65
Private equity	4.0	5.85	0.25
Real (26.5%)			
Inflation-linked bonds	7.5	-0.50	-0.05
Infrastructure	6.0	3.35	0.2
Timberland	3.0	3.35	0.1
Property	10.0	2.15	0.2
Alternatives/Diversifiers (25.5-29.5%)			
Targeted return	11.5	3.40	0.4
Currency overlay (notional)	(c.10.0)	1.00	0.1
Emerging market debt	2.5	3.25	0.1
Global credit (inc private debt)	7.5	3.75	0.3
Opportunity pool	4.0-8.0	3.85	0.2
Total	100.0	3.40	3.40

As highlighted in previous strategy reviews, the Fund's investment strategy should reflect a combination of return sources that balance the need to generate return with the benefit of diversified returns. Strategically we favour a balance between growth assets (where the return is dependent upon corporate or economic growth, but will be less predictable) and income assets (where there is less surprise on upside or downside, but the return is more predictable). Long-term income assets often also provide a degree of inflation protection, and are included in the Fund's Real Asset allocation.



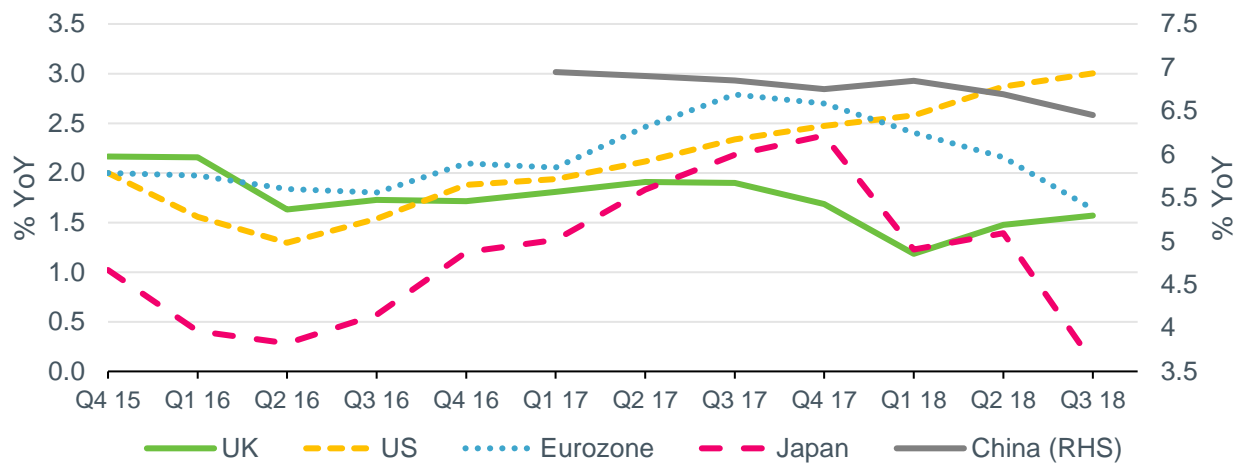
Ideally we would continue to allocate more assets to a variety of higher yielding credit type assets, and we discuss this in Section 7.

3 Market commentary

Overview

The economic outlook has moderated in recent months and while global growth is still reasonable, consensus forecasts suggest a modest slowdown in 2019. US growth remains robust but is expected to peak in the first half of 2019 - waning fiscal stimulus, tightening policy and uncertainty around China-US trade tariffs (despite a temporary truce being reached) will contribute to slowing growth in 2019. Eurozone GDP growth forecasts have been revised lower following lacklustre figures in Q3 and as uncertainty on trade and political tensions grow. In addition, fears of a slowdown in Chinese growth have materialised in recent weeks as GDP growth in Q3 missed expectations and China's manufacturing sector contracted for the first time in 19 months in December. Despite UK growth reaching its fastest quarterly pace in almost 2-years in Q3, elevated Brexit uncertainty leaves UK growth at modest levels.

Chart: GDP growth, % change on a year earlier



Manufacturing data, as measured by manufacturing purchasing managers' indices, are consistent with a moderation in growth. Gauges have fallen in the US, Eurozone and China. UK manufacturing survey data recorded its most positive reading since June, though this likely reflects purchases made in advance of Brexit.

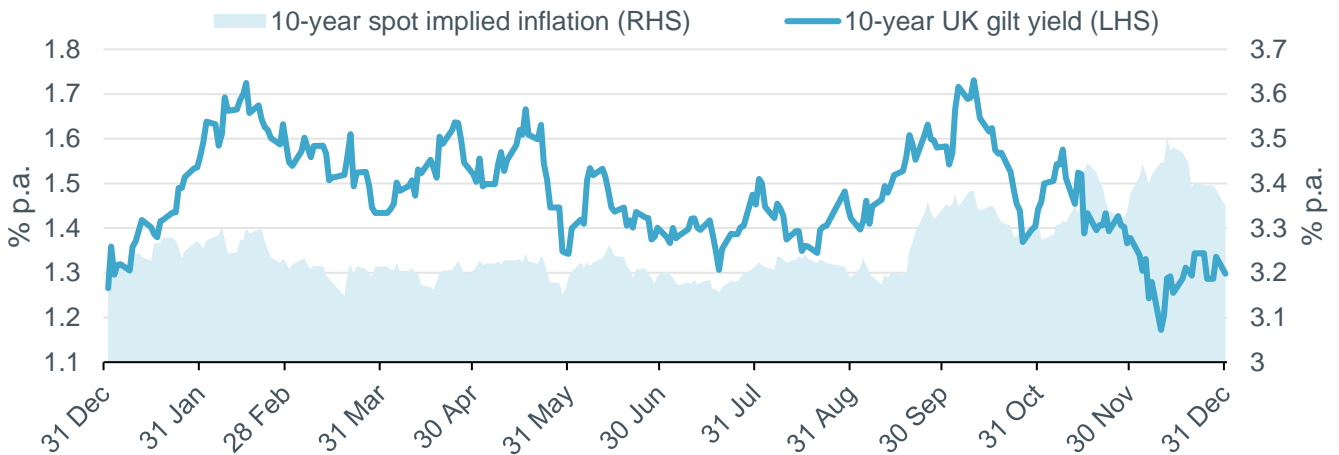
In general, headline inflation is forecast to fall in most regions in 2019. The gyrations in oil prices would be expected to impact headline figures, but core inflation measures have remained relatively stable. UK inflation has continued to fall as 2016 exchange rate effects continue to fade, though Brexit and its impact on Sterling could impact inflation either way.

In light of heavy stock market falls and fears of slowing global growth, rhetoric from the Fed has become a little less hawkish, raising rates for the fourth time this year at the December meeting but paring back forecasts for the pace of future rises. As expected, the ECB announced it will end QE purchases in December, though rates will likely remain negative territory until at least late 2019 against a backdrop of softer realised growth and inflation.

Government bonds

After drifting higher over the course of 2018 to mid-October in-line with US yields, conventional gilts fell in lock-step over Q4 as US yields dropped in response to concerns around growth and less hawkish sentiment from the Fed. Index-linked gilt yields neared record lows in December and implied inflation (as measured by the difference between conventional and index-linked gilt yields) reached its highest level since Q1 2017. Whether this reflected fears around Brexit outcome or driven by specific hedging demand and market liquidity is unclear, although the retreat from these troughs/peaks suggests it may be more the latter.

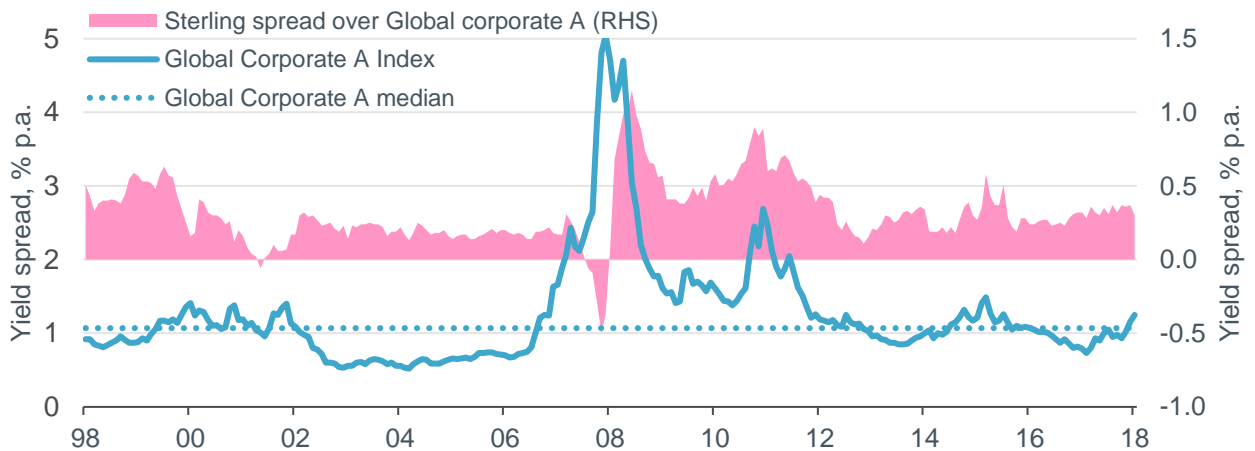
Chart: 10-year UK conventional gilt yield and 10-year spot implied inflation



Credit

Global credit markets sold-off in the final quarter of 2018, returning yield spreads above long-term median levels in investment-grade markets. Despite improving valuations, we retain a degree of caution given the very low level of underlying gilt yields, which will limit absolute returns. Yield spreads between Sterling and equivalent Global credit indices are in-line with historic norms, suggesting there is little significant regional opportunity other than the usual benefits of diversification.

Chart: Sterling and Global A-rated corporate credit yield spreads



Falling leverage and measures of debt affordability near all-time highs in the high yield bond market suggests the possibility of a material pick-up in defaults in the near-term looks remote. Large increases in credit yield spreads in Q4 have, in general, returned valuations in speculative-grade credit markets to more neutral levels.

Equities

Global equity markets took a sharp turn lower at the start of Q4 as 10-year US treasury yields climbed to 3.2%. Declines resumed in December as tighter monetary policy and concerns over the sustainability of the pace of global growth came to the fore.

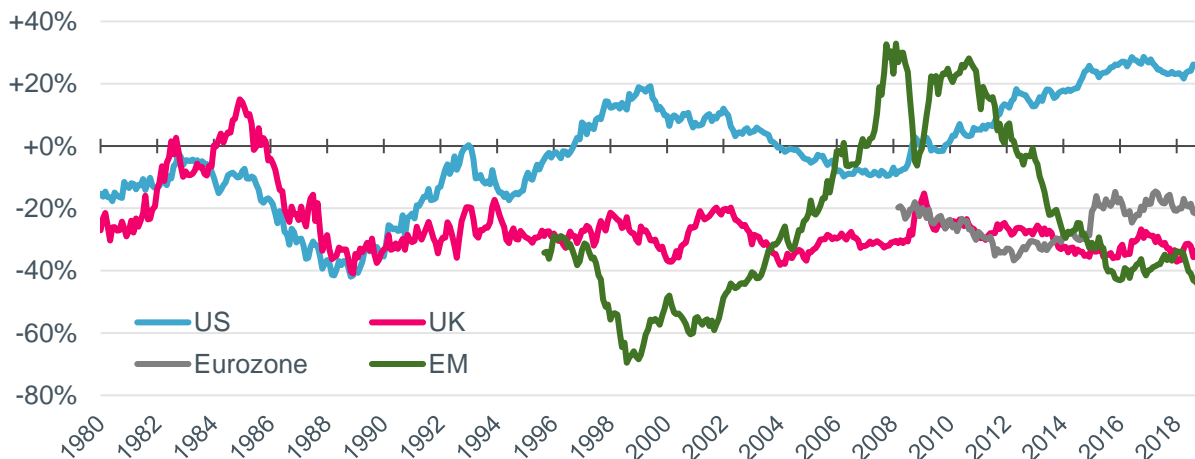
The fundamental backdrop remains supportive for equity markets, however, earnings momentum is expected to fade with US fiscal stimulus waning as the Fed continues to normalise rates and wage inflation continues to rise.

The recent price falls in equity markets, combined with earnings growth that has outpaced global indices since early 2017, have returned global equity valuations back below long-term averages. Our move to an overall neutral view on equities masks significant disparity in regional equity valuations. UK and Emerging markets are below historical averages while US equity valuations remain at a premium, albeit less so after the recent market moves.

Table: MSCI index valuations as at 31 Dec 2018 (long-term averages shown in brackets)

	P/E trailing		P/E Shiller	
World	16.1	<i>(17.7)</i>	20.4	<i>(21.3)</i>
US	18.4	<i>(18.0)</i>	25.3	<i>(20.1)</i>
EM	12.0	<i>(14.5)</i>	12.3	<i>(15.7)</i>
UK	13.2	<i>(14.2)</i>	14.0	<i>(15.0)</i>

Chart: Regional equity cyclically-adjusted price-to-earnings ratios versus World



Property

The UK property market continued to slow in Q4 with aggregate capital values falling in November for the first time since September 2016, driven by falling retail capital values sector and slowing growth in the industrial and office sectors. Rental growth is now flat, with positive growth from industrials and offices no longer outweighing the increasingly negative rental growth from the structurally challenged retail sector. Despite a deteriorating fundamental backdrop, low property yields remain near historic lows and now look stretched relative to UK and Global equities. This leads to a downgrade in our overall view on property to Cautious.

Summary of current views

In the table below we set out our central views of the core capital markets (as at 31 December 2018):

Growth assets	Income focused assets				Protection assets	
Equities	Sterling investment grade debt	Sub-investment grade debt	UK property	Infrastructure	Conventional gilts	Index-linked gilts
Neutral	Neutral-Cautious	Neutral-Cautious for public Neutral for private lending	Cautious Neutral-Cautious for secure income property	Neutral to Attractive	Cautious	Cautious to Negative

Overall range of ratings: Positive, Attractive, Neutral, Cautious, Negative

Brexit

When the UK invoked Article 50 of the Treaty of Lisbon on 29 March 2017, a two-year time period was set to negotiate the form of the UK's departure from the European Union. The UK is due to leave the EU on 29 March 2019, and the transition period is expected to take place over the next 21 months to December 2020.

The type of Brexit that will be faced by the British people is still hugely uncertain. While initially broadly categorised into three main categories: 'soft', 'hard', and 'no-deal' Brexit, the option of no Brexit is also now a realistic contender, increased in likelihood following the rejection of Mrs May's proposal.

A soft Brexit scenario is generally deemed to be the most 'business-friendly' of the Brexit options, as this scenario is likely to reflect a continuation of the existing agreements with the EU. A 'no Brexit' option would be considered business friendly, but has other potential repercussions. A no-deal Brexit is still seen as the most extreme case.

Until December most forecasts were still based on the central assumption that there will be a Withdrawal Agreement about as soft or even softer than the Chequers proposal. Reflecting this, the Consensus Forecast for UK GDP growth in 2019 is 1.5% (i.e. higher than this year) and UK CPI inflation is expected to be a little above 2%. Conversely a no-deal outcome is generally taken to mean that UK will trade under World Trade Organisation ("WTO") arrangements and is viewed as disruptive: UK growth forecasts for 2019 would be expected to be cut below 1% and some envisage a recession or near-recessionary environment. A spike in UK inflation would be expected, driven by currency weakness. The view that a no-deal Brexit will cause short-term economic disruption is relatively uncontroversial. It is also the consensus view that a no-deal Brexit will be bad for UK growth over the long term, but we note that views on this are far from uniform. One other plausible Brexit-related event that may arise is the end of the current government and its replacement by Labour; generally viewed as a negative outcome for the City.

We considered the impact of the initial three potential Brexit outcome scenarios (before no Brexit came back as a plausible possibility). Our focus is on the relative impact rather than the absolute projection of funding levels. In practice, we cannot predict which of these outcomes is the more likely (although as noted, at present the market appeared to be placing more emphasis on a "soft Brexit" outcome), nor what will actually happen to capital markets should one of these outcomes occur. However, the analysis hopefully provides a useful flavour of the range of outcomes that may arise, and the implications for funding.

In selecting the scenarios we did not attempt to introduce a view on the underlying details of any deal, but worked with the following framework:

- a “**soft Brexit**” is one that markets generally support, and that is considered broadly supportive of the UK’s current competitive position. The scenario outcome is one with an uplift to UK GDP growth, modest strengthening of sterling and the expectation of modestly faster future rate rises;
- a “**hard Brexit**” is one that markets consider will have features that weaken the UK’s competitive position, at least initially. The relative outcome of this scenario is a mirror of a soft Brexit – lowering of growth expectations, weaker currency and slower rise in interest rates than currently anticipated. We have added a modest increase to implied inflation and sterling credit spreads and a markdown in UK property values, akin to the experience of 2016;
- the “**no-deal**” assumes immediate disruptive elements to trade and ongoing uncertainty over the UK’s competitive position. We anticipate a much bigger adjustment to sterling and prolonged lower interest rates associated with more marked slowdown in growth. A combination of higher expected inflation and higher inflation risk premium push real yields materially lower. The adjustment to UK property is more severe, but UK equities are kept in positive territory due to the high level of overseas earnings.

Some adjustments will evolve after the immediate impact, say over the first two or three years. We have tried to factor these into our immediate impact assumptions.

Long-term outcomes are much more uncertain, and we make no attempt here to suggest which outcome will be better or worse for the UK economy in the long-term. Longer-term outcomes will also depend upon many other factors, and as such we do not consider there is material benefit in looking at longer-term time horizons as part of this analysis.

A summary of the assumed economic indicators and returns is set out below.

	Current Consensus	Soft Brexit		Hard Brexit		No deal	
	3 years (p.a.)	Immediate	3 years (p.a.)	Immediate	3 years (p.a.)	Immediate	3 years (p.a.)
3 year UK GDP	1.5%		2.0%		1.0%		0.0%
3 year RPI inflation	3.2%		3.0%		3.2%		3.7%
Change relative to current consensus							
£ to global basket		+5%		-7.5%		-15%	
UK equity		0%		0%		+5%	
Unhedged Global equity		-4.5%		+7%		+14%	
Base rates		-		-0.5%		-0.5%	
Gilt yields		+0.25%		-0.25%		-0.5%	
ILG yields		+0.25%		-0.5%		-1.0%	
UK IG corporate yld spreads		-		+0.25%		+0.5%	
UK property		-		-10%		-15%	

The returns defined in the table were used to estimate the change in funding for each scenario. All other assets were assumed to be unaffected by the Brexit outcome. The results for the Fund are illustrated below:

	Soft Brexit	Hard Brexit	No deal
% change in funding	+3.7%	-3.8%	-6.4%
£m change in deficit	£240m lower	£270m higher	£500m higher

From an investment strategy perspective, the key risks to the Fund's funding position in a hard or no deal scenario are from:

- a fall in nominal gilt yields;
- a rise in inflation expectations; and
- a fall in property values and potential fall in liquidity.

Whilst currency also represents a significant source of uncertainty regarding potential Brexit outcomes, the Fund's position is likely to act as a natural hedge against these risks as the impact of a Hard or No-deal Brexit is expected to be favourable, given one half of the overseas equity exposure is unhedged. However, to the extent that sterling is already weak, the extent of a further fall may be more muted than assumed above.

If the outcome is a Soft Brexit, then we might expect an improvement in funding level (of c3.7%), due to a rise in nominal gilt yields and extent to which yields remain unhedged. A no Brexit outcome would likely lead to an even more improved outcome. However, in the event of a Hard Brexit or No-Deal outcome then the funding level is likely to suffer due to an expected fall in nominal gilt yields and rise in inflation expectations.

Whether it is appropriate to take any pre-emptive action would require some greater expectation of one outcome over another, or consideration in conjunction with the impact on the broader finances of LCC and participating sponsors. It is impossible to attach too much weight to any one outcome and the purpose of this analysis is more to understand potential funding variability rather than to drive any action. If the LPC wanted to narrow the range of potential impact on the Fund it would require more hedging of real interest rates. However, we highlight this could lead to less positive outcomes in the event of a soft Brexit or no Brexit, i.e. there is no one single best hedge.

4 Governance and mapping with LGPS Central Pool

Throughout the remainder of this review we set out our comments on strategic allocation to each asset class, and in doing so also comment on how we envisage the Fund uses the sub-funds offered by LGPS Central or retains assets outside the Pool.

In terms of its approach to governance of the Fund under the new pooling arrangements, the LPC has two broad options:

- Greater outsourced governance: maximising use of LGPS Central and passive funds, with an objective to operate as few direct manager relationships outside of the Pool as possible. At times this may mean reducing or removing exposure to assets that the Fund would otherwise invest in, particularly where the Pool does not offer sub-funds in some assets;
- Higher governance model: under this approach the LPC would consider all asset options and be happy to retain or invest in strategies not directly available through the Pool. There is a higher level of governance associated with this approach as it will require the Fund to hold a higher proportion of assets and mandates outwith the Pool. In time there may be greater statutory rules that restrict the extent to which the Fund can adopt this option.

Recognising the changes to internal capacity and resource, we assume that the LPC and the Fund's Officers will have an appetite to use the Pool as much as possible, subject to suitable funds being offered.

Whichever approach the LPC adopt, we believe implementation for each asset strategy falls into one of 5 categories, as listed below.

- 1 Core assets (typically most liquid e.g. equities)
- 2 Strategies with existing mandates to be held separately, but run off over time
- 3 Strategies with existing mandates to be run off, but maintaining ongoing exposure using the Pool
- 4 Strategies not offered by the Pool, where the allocation is maintained externally
- 5 New asset classes offered by the Pool

We have used this categorisation when considering the potential mapping of the Fund's existing investment strategy to that offered (or due to be offered) from LGPS Central, and in summary section outline which we believe should be appropriate for each asset/mandate.

We also note the Ministry of Housing, Communities and Local Government's consultant on Draft Statutory guidance on asset pooling. This sets out the expectation that the transition of listed assets to pools should take place 'over a relatively short period' and that new investments will be made through pools with 2020 set as the target timescale. Exceptions to this include investments in local initiatives or products tailored to liabilities. Funds may continue to hold existing assets, in exceptional circumstances, including assets that need to be held to maturity or where the penalty for early exit would be costly. They will need to provide rationale for holding asset outside the pool and planned end date amongst other things. This is likely to limit the number of strategies that can be maintained under option 4 above, and, if unchanged by consultation, could remove some of the options we have outlined in this paper in respect of strategies not offered by LGPS Central.

5 Equities

The Fund's benchmark equity allocation is largely invested in listed equity markets (40-44%) with a further 4% invested in private equity.

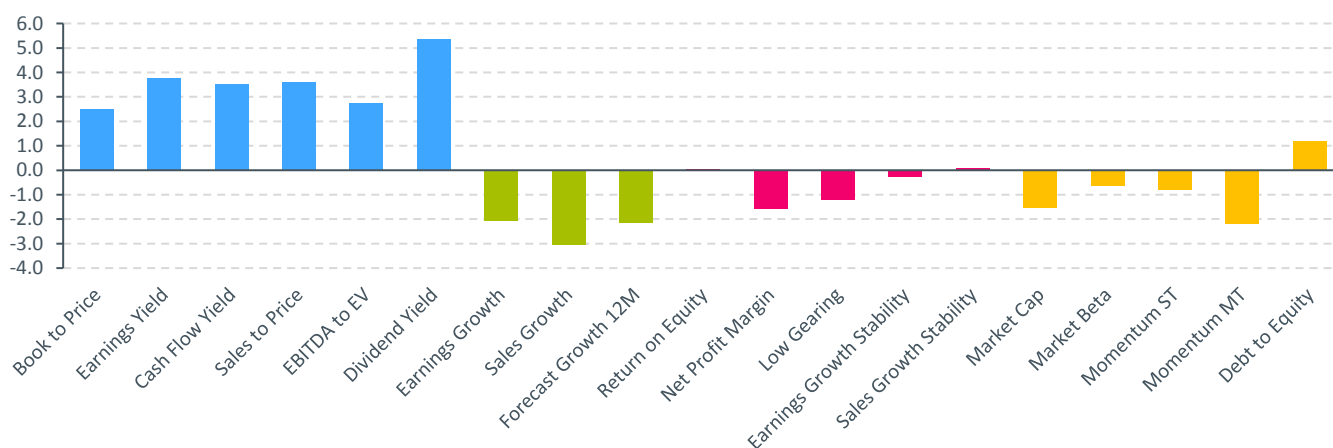
	Manager	Target %
Listed equity		
Regional (passive)	LGIM passive	30.0
	<i>Passive market-cap</i>	21.5
	<i>RAFI</i>	8.5
Global (active)	Currently Kempen/KBI	8.0
Emerging markets (active)	Delaware	4.0
Private equity		
	Adams Street	4.0

Global Active Equity

Following a review of the LGPS Central Pool Global Active Equity sub-fund, we proposed moving the Fund's global active equity holdings with Kempen and KBI to the LGPS Central Pool Global Active Equity sub-fund (comprising of Schroders Global Core Equity, Harris Associates Global Equity and Union Investments Global Equity Concentrated). Details of our review are included in our September 2018 paper.

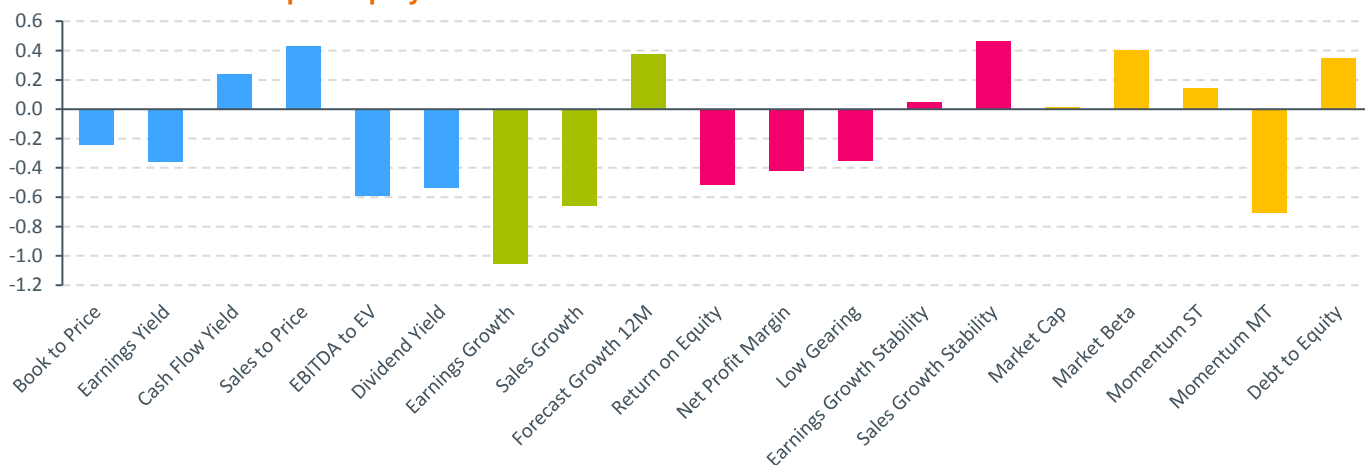
Key to the recommendation is the ability to capture a more balanced overall investment style for the Fund's active equity allocation. This is illustrated in the equity style skylines below, which compare the investment style exposures of the Fund's *current* equity portfolio and the *proposed* portfolio blend, relative to MSCI ACWI. Source: Style Analytics. Importantly, in line with our recommendation in previous years, the extent of the value bias (represented by the blue bars) is removed as a result.

Skyline: The Fund's current overall equity style blend



Allocations based on the current mix of global equity funds: LGIM regional passive funds, RAFI Developed Europe ex UK, RAFI Developed North America, KBI Developed Equity and Kempen Global Dividend.

Skyline: Proposed portfolio with LGPS Central Active Global Equity replacing Kempen Global Dividend and KBI Global Developed Equity



Allocations based on the proposed new mix of global equity funds: LGIM regional passive funds, RAFI Developed Europe ex UK, RAFI Developed North America, and LGPS Central Global Equity Active (in place of Kempen and KBI).

In our September paper we recommended splitting the timing of switching Kempen and KBI to the LGPS Central active global equity sub-fund reflecting the material underperformance of value and dividend-based equity strategies in the year up to September 2018. With value stocks having materially outperformed growth stocks over the fourth quarter (see below) this difference has been neutralised to some extent. We understand the transition of both mandates is due to take place in February.

	Year to 30 September 2018	Q4 2018
MSCI Global value	4.3%	-8.5%
MSCI Global growth	12.0%	-12.6%

Regional equity exposure

The derivation and background to the regional equity allocation was covered in the 2015/16 reviews, and is set out below. Including the active emerging markets exposure, the principle is to maintain a broadly diversified regional allocation across geographical blocks, with Emerging markets included alongside Asia. By adopting a fixed regional allocation for the passive and single market exposures, it avoids over-allocating to markets that have outperformed and maintains a diversified portfolio. We are comfortable that this approach remains appropriate for the Fund.

Mandate	Percentage of regional	Wider Regional
UK	20	35
Europe	15	
US	35	35
Asia ex Japan	7.5	15
Japan	7.5	
Emerging Markets (passive + active)	15	15
Total	100	100

Passive equity and RAFI and alternative factor based approaches to investing

The Fund currently uses LGIM for all passive equity management. The benchmark allocation to passive regional equity indices is based upon the regional allocation set out above, but excluding the active Emerging Market equity exposure.

Mandate	Percentage of passive
L&G UK equity (market cap)	10
L&G UK equity (capped weights)	12
L&G Europe ex UK (market cap)	8.4
L&G Europe ex UK RAFI	8.4
L&G N America (market cap)	19.4
L&G N America RAFI	19.4
L&G Asia Pacific (market cap)	8.25
L&G Japan (market cap)	8.25
L&G Emerging Markets	5.9
Total	100

Of the assets invested in LGIM funds, approximately 75% is invested in traditional market-cap based passive funds. The remaining allocation is to fundamental indexation strategies invested in RAFI Fundamental index products.

The market-cap allocation comprises of all developed markets and an allocation to emerging markets. Half of the passive exposure to the US and Europe (ex UK) is achieved using RAFI funds. Just over half of the UK exposure adopts a cap weighted index with no stock representing more than 3.5% of the index. We remain comfortable with the use of UK capped weights as an efficient way to limit exposure to any one company.

As a reminder, 'fundamental indexation' is an alternative method of passive investment, where indices are constructed based on a number of desirable stock fundamentals (e.g. balance sheet, profitability or valuation metrics), rather than by the market capitalisation of the constituents. Although not designed as a value based index, the nature of the metrics used within the index composition does tend to lead to a value bias.

Over recent years, following the introduction of RAFI indices, a range of alternative indexation approaches have been developed, often described as 'factor-based investing' or 'smart beta'. Factor-based investing is a systematic, rules-based approach where securities are selected based on factors associated with higher returns. These factors have been identified by academic research as being significant drivers of return across equity markets. As such, factor-based investing aims to allocate to stocks that possess these factors, which if the theory holds, should deliver strong risk-adjusted returns over the long-term. Indeed, the structure of the LGPS Central Global Equity Active sub-fund draws upon these principles by adopting one value manager, one growth manager and one style rotation manager.

As with the fixed regional allocation approach, another benefit of factor based investing is the discipline of rebalancing assets between sub-strategies, i.e. switching assets from stocks, sectors or markets that have outperformed and reinvesting towards those that are now cheaper in a relative sense.

We understand that LGPS Central will explore the development of a factor-based fund, potentially including some element of carbon-based investing.

We suggest the ISC is delegated to consider whether this factor-based fund would be an appropriate replacement for some of the passive management when further details are available. Meanwhile we remain comfortable with using RAFI as part of the passive equity structure within the Europe and US allocations, given the desirable features captured through the construct of the index as outlined above.

Emerging Markets

We understand that LGPS Central is currently processing the tendering of managers for the Emerging Markets active equity sub-fund offering. We would anticipate the Fund making use of this sub-fund in place of Delaware, subject to suitable due diligence by the Officers and ISC.

Private equity

The Fund has its existing private equity exposure through Adams Street. This investment is through closed-ended funds, and by their nature will continue to be held separate from the LGPS Central Pool.

In terms of ongoing investments required to maintain the Fund's exposure we would expect these to be via the LGPS Central offering rather than any new commitments to Adams Street, subject to its suitability for the Fund's private equity exposure.

The Fund has agreed to make an initial commitment of £10m to the LGPS Central private equity 2018 fund. At the time of writing, no capital has been drawn down from the Fund in respect of this allocation.

We believe that a 2019 vintage will be available from mid-2019. We propose that the LPC delegate to the Officers to review whether any commitments to private equity are required in 2019 in order to maintain the target weight over time, and that the ISC are delegated to agree whether to commit assets to the LGPS Central 2019 programme if a further commitment is necessary.

Currency hedge

Currently the Fund operates a currency hedging programme in respect of 50% of the equity exposure and the Fund's other USD holdings, with Kames, alongside the index-linked gilt mandate.

If there is an objective of reducing the number of mandates outside the Pool, it would be possible to remove this mandate by using LGIM's currency hedged equity pooled fund range - LGIM operate versions of their passive pooled funds with currency hedging so clients can select their target level of currency hedging (noting that this would not allow the active adjusting of hedge ratio on a currency-by-currency basis currently offered by Kames).

Alternatively, it may be worth having discussions with LGPS Central on whether they could operate a currency hedging programme. We propose that the ISC review the structure of the Fund's currency hedging programme and how best to implement the hedge post pooling.

6 Real assets

Index-linked gilts

The Fund currently has an index-linked gilt ('ILG') holding with Kames. The ILGs are held in a segregated mandate and Kames manage this holding against an FTSE All-Stock Index-linked index. At the end of December, the ILG portfolio at Kames totalled c.£300m.

As with our comments on currency hedging, if there is a desire to minimise the number of investments held outside of the Pool, it would be possible to terminate the relationship with Kames and replicate the ILG exposure using either LGPS Central offering (if they can manage the assets internally) or using LGIM passive funds.

LGIM offer a range of passive index-linked funds which can be easily accessed via the National Framework. We understand the Pool will offer some internal management of index-linked gilts. We propose that the decision on whether to use the LGPS Central offering or LGIM, and the timing of any switch, is delegated to the ISC.

Infrastructure

The current strategic allocation to infrastructure is 6%. At present the actual allocation is 4.9%, with the allocation between the three managers, namely KKR (Funds I, II, and III), IFM and JP Morgan.

The KKR funds are closed ended. This means commitments are drawn down when new investments are identified and distributions paid to clients over the lifetime of the funds. The IFM and JPMorgan funds are semi-open, with matching by the manager of clients seeking to invest/disinvest providing some liquidity scope, although we note that the JPMorgan fund has a liquidity lock of 6 years in exchange for a lower LGPS fee scale.

Having made the additional commitments last year to reach the 6% strategic target (total outstanding commitments are 1.8% we understand), we do not propose any further amendments to the existing allocation at present.

LGPS Central will launch its infrastructure sub-fund shortly, and the LPC should consider scope to use this as the ongoing vehicle for future commitments. We propose this is delegated to the ISC, although there is no imperative to make any initial commitment to the sub-fund given the current Fund allocations and commitments. There may be the potential scope to transition existing holdings into this sub-fund although in the absence of any details relating to what the Central Pool offering will look like we do not anticipate this is likely.

Timberland

An additional allocation to Stafford was made last year, with the aim of increasing the target allocation to 3% of Fund assets.

We are not aware of LGPS Central having any plans to include timberland in its range of offerings, and therefore we expect the existing holdings will continue to be held outwith the Pool.

As assets are returned to the Fund through distributions a decision will be required as to whether to continue to allocate new money to Timberland held outwith the Pool, or to reinvest proceeds as part of the broader Property/Infrastructure allocation. From a Governance perspective the latter simplifies the Fund's investment arrangements and would make greater use of the Pool, and in practice this may be the only option under Statutory Pooling guidance, although we note this will also remove the Fund's exposure to this asset class over time.

If distributions are invested into the Pool, then we suggest the ISC determines each year whether they are redeployed into infrastructure or property, on the basis of relative attractiveness.

Property

The current strategic allocation to property is 10% as set out below (as at 30 September 2018):

	Holding (£m)	Holding (%)	Strategic weight (%)
Kames Active Value I and II	87.2	2.1%	
La Salle	201.3	4.7%	
Colliers	102.1	2.4%	
Total	390.6	9.2%	10.0%

Given our current caution of UK property, we do not see any pressing need to increase the Fund's allocation towards target, but equally remain comfortable with the 10% long-term strategic target.

There are a number of property sub-sectors that could be considered by the LPC. Some of these are expected to be added value relative to core property, while others are more defensive lower risk in nature.

Although the added value strategies are currently limited to the Kames Active Value strategies in the Fund's strategic implementation, the La Salle (formerly Aviva) mandate is a fund-of-funds mandate, which also provides scope for the manager to access markets where they consider them to be particularly attractive.

In 2016 annual review we included analysis on more long-term secure income property strategies, which are particularly suitable for pension funds with long-term inflation linked liabilities. However, given the existing allocation to property, we are still of the view that there is insufficient marginal benefit incurring the cost of switching from the core holdings to secure property sectors.

The initial proposals from LGPS Central included the intention to launch an open-ended directly invested property fund. However, the timing of this is very uncertain.

Given our current cautious outlook for UK property we would be comfortable maintaining an underweight allocation to property, which is currently the position). However, we would seek to avoid a material reduction in the allocation just because LGPS Central does not have a vehicle for the Fund to invest in as it takes time to build an allocation to property. Hence, in order to achieve and maintain the strategic allocation of 10% of Fund assets, if Colliers and La Salle identify opportunities to buy into attractive property (or have proceeds from redemptions to reinvest), the LPC could approve the ongoing funding of investments with these managers, subject to any constraints that come out of the Consultation on Statutory Pooling (which do appear more lenient than for other assets). Alternatively proceeds from sales will need to be redeployed elsewhere, which we propose is delegated to the ISC. We note that the Colliers mandate is now very small for a directly managed portfolio, and this limits the number of properties it can hold and the degree of diversification in the portfolio. Therefore if LGPS Central do launch a direct property portfolio (managed internally or delegated), we suggest the ISC are delegated responsibility to review its suitability as a long-term alternative vehicle, and the scope to transition the Colliers portfolio into it.

7 Alternatives

Targeted return

Nearly one half of the Alternatives allocation is invested in Targeted Return, with an allocation range of 9.5%-11.5% to three strategies. As noted in our September paper to the ISC, the aim of the portfolio, along with the wider Alternative portfolio that it forms part of, is to provide the Fund with expected returns in the range of cash +3-4% p.a., equivalent to a return in excess of CPI+3% long-term, and to provide diversification from the Equity portfolio, which is the single largest asset allocation for the Fund.

In addition, the Millennium active currency overlay can be considered part of the Targeted Portfolio. The Millennium mandate does not require allocated capital, but the aim is to achieve a positive return of 1.5% p.a. on a notional exposure of £340m, which represented 10% of Fund assets at time of inception, but equates to nearer c.8% of Fund assets at 30 September 2018. We allow for approximately 2/3rds of the target return in our overall expected return, i.e. outperformance of 1.0% p.a.

Reflecting the Targeted Return discretionary managers' ability to invest across a range of asset classes, we expect the portfolio to have some correlation to equities. The correlations of the Targeted Return portfolio mandates are expected to vary over time depending on the managers' views of market conditions, but over the long-term the portfolio should provide diversification away from equities and in the event of equity sell off, we would expect the Targeted Return managers to deliver some downside protection and to outperform the Fund's equity investments. This can be seen in the final quarter of 2018 when both Pictet and Ruffer fell by around 50% of the fall in global equity markets.

Following the review of Ruffer and the Targeted Return Portfolio discussed in the October meeting, the ISC agreed a more balanced mix within the Targeted Return portfolio, bringing the strategic Ruffer allocation down to 4.0% of total Fund assets and increasing the Pictet allocation to 4.0% of total Fund assets.

The Fund's allocation at 30 September 2018 and agreed allocation is summarised below:

	Aspect Capital	Pictet	Ruffer	Combined	Millennium overlay
Prior strategic target	3.5%	2.0%	6.0%	11.5%	10% notional
Actual allocation	3.2%	2.8%	6.0%	12.0%	8% notional
Current agreed target	3.5% (35%)	4.0% (40%)	4.0% (40%)	11.5%	8% notional

In due course LGPS Central will provide a Targeted Return solution. Once launched, subject to due diligence that the Central Pool solution provides what the Fund is targeting, we would envisage the Fund adopting the Central Pool solution rather than retaining the current mandates, including Millenium, outside of the Central Pool.

We do not expect Central Pool to launch a Targeted Return sub-fund until later into 2019 at the earliest, so our comments below relate to the existing mandates.

- The returns from Fund's three diversified multi-asset managers have been broadly in line with target over the longer term, but less inspiring in recent periods, especially over 2017/18. Over the final quarter of 2018 all three managers delivered negative primarily due to exposure to equity markets. This does not mean that the mangers or the combined portfolio of mangers will not be able to deliver attractive positive returns in line with target performance in future, but highlights the incidence of returns is not predictable. This is relevant when we consider the relative attraction of credit markets below.

- In addition to the review of Ruffer, we have carried out a review of the Aspect portfolio. This is included as an appendix. In our opinion the strategy offers a sufficiently different potential return profile to the other Targeted Return mandates, coupled with diversifying characteristics, to believe that, despite recent poor performance, it merits being retained as part of the current Targeted Return Portfolio.
- In July we carried out a review of Millennium for the ISC, and concluded that it was appropriate to retain the Millennium mandate. The ISC discussed the disappointing performance from the mandate over the last 3 years and agreed to review the allocation with the benefit of another 6 months' performance. This is shown below.

Millennium mandate	H1 2018	H2 2018	3 years to 31 Dec 18	5 years to 31 Dec 18	Since inception
Absolute gross return	+0.15%	-0.75%	-0.95% p.a.	0.55% p.a.	0.45% p.a.

Over the second half of 2018 the currency strategy has continued to underperform although longer-term performance remains positive. With increasing levels of potential divergence between regional economies the opportunity set for currency managers remains. Hence, we do not see any need to remove the mandate ahead of transitioning the Targeted Return portfolio into the Central Pool, but suggest that this is maintained at a notional exposure of £340m rather than increased to 10% of Fund value.

In summary, we propose retaining the current structure of the Targeted Return allocation, albeit with the reduced exposure to Ruffer and higher allocation to Pictet until the Central Pool launches its Targeted Return sub-fund. Subject to confirmation that the objectives of that sub-fund are consistent with the Fund's current objectives, we would expect the four mandates, i.e. including Millennium, to be replaced with the Central Pool solution.

Turning to the strategic allocation, as identified in our market views and comments below, we are more positive about the level of credit spreads, which have been particularly tight on higher yielding credit. We have proposed a higher target strategic weight to credit markets, and given our higher relative conviction in the predictability and delivery of returns, propose this is funded from the Targeted Return allocation.

Credit + EMD

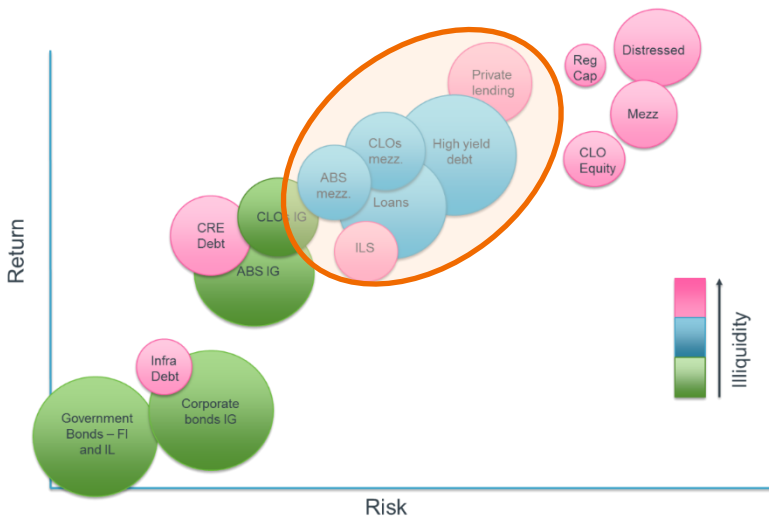
The Fund's global credit + EMD allocation is currently split as follows (as at 30 September 2018 adjusted to allow for Partners capital calls over Q4 2018):

	Holding (£m)	Weight (%)	Strategic Allocation
Ashmore Emerging Market Debt	105.0	2.5%	2.5%
Partners Multi Credit Funds (originated private lending) 2014, 2016, 2017*	253.2	5.9%	7.5%
M&G UK Financing Fund	2.6	0.1%	
JPMorgan multi-credit (liquid markets)	27.0	0.6%	
Total*	387.8	9.1%	10.0%

*Allowing for Q4 2018 Partners capital calls

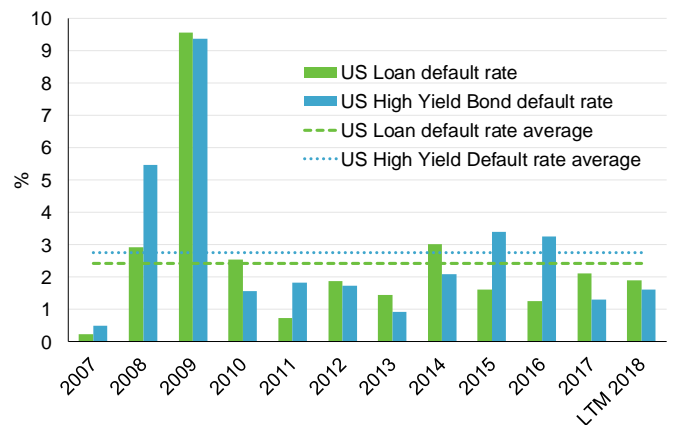
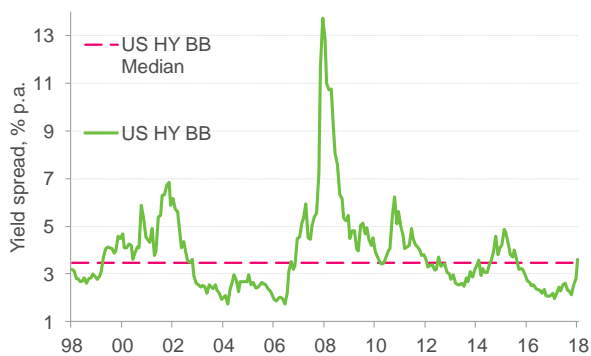
Following the 2017 strategy review, the Fund increased the strategic allocation to corporate debt from 5% to 7.5% through allocations to Partners 2016 and 2017 Funds. With market volatility and uncertainty over the return prospects of equity markets, our preference over the last two years has been to favour relatively short-dated corporate lending with greater predictability of returns. With low yields and comparatively tight credit spreads in liquid bond markets, we favoured the characteristics of originated lending, where the investor has more control over the terms of lending and where the expected return is not dissimilar to the expected return on global equities. These funds have continued to deliver predictable yield based returns.

We believe it makes sense for the Fund to continue to hold a meaningful strategic allocation to the predictability of returns provided by diversified higher yielding credit. The shaded area in the chart below highlights the type of credit based investments we consider should be included.



Through the Partners private lending mandate the Fund has a reasonable allocation to private lending. However, the allocation to liquid markets is limited to the small allocation to the JPMorgan fund. Over the final quarter of 2018 credit spreads have widened on liquid credit markets, both investment grade and sub-investment grade.

While underlying interest rates remain low, the prospective returns from investment grade corporate bonds remain relatively unattractive. However, for sub-investment grade liquid bonds, typically included in mandates like the JPMorgan mandate, prospective spreads have, in our view, moved to fairer value, while default rates remain below average. This is illustrated in the charts below.



We recommend the LPC increases the target strategic allocation to Credit by 2.5%, specifically targeting a higher allocation to liquid market debt. This would be funded by a reduction in the Targeted return allocation.

LGPS Central is due to launch investment grade and multi-asset credit sub-funds in 2019. In principle, we propose Fund use the Central Pool multi-asset credit sub-fund, subject to due diligence. Assuming the Central Pool solution is established in 2019 and is suitable for the Fund, the strategic allocations changes can be made as part of this transition.

It is not clear at this stage whether this will include both liquid credit markets and illiquid lending, nor whether it will include Emerging Market debt. The Fund should continue to hold the existing closed-ended exposure to private lending but look to LGPS Central to provide a vehicle for future allocations to private lending. The LPC should also seek a Pool solution that acts as a replacement for the Fund's active Emerging Market debt currently held through the Ashmore Fund.

Opportunity pool

The purpose of the opportunities pool is to make available a modest proportion the Fund's assets to invest in opportunities that are not necessarily suitable for a strategic allocation, but still provide an attractive return proposition. When investing, we would typically expect a minimum absolute return target of c.7.5% p.a. and typically above 10% p.a. The level of risk associated with each opportunity will vary reflecting the target level of return.

There are two main reasons that a product or asset might fall into this category: the nature of the investment means it is only suitable for a small allocation and/or the opportunity is unlikely to persist and therefore the investment may be a "one-off" rather than a strategic allocation.

In combination, the holdings in the opportunity pool are expected to make a sufficiently meaningful contribution to the Fund's return, while also providing a diversified source of return.

Having made allocations to M&G's DOF IV, Infracapital and Standard Life Capital's private equity secondaries fund III, the Fund has made allocations currently equivalent to 5.0% of total assets. The target range is between 4% and 8%, having increased the upper range from 6% to 8% last year. The total invested allocation as at 30 September 2018 was 3.2%.

Manager	Target	Actual (Sept 2018)
M&G DOF series	2.5%	
CRC	1%	
Infracapital	0.75%	
SLC secondaries	0.75%	
Total	5.0%	3.2%
Strategic target	4.0% - 8.0%	

Markham Rae did not complete any deals before the technical deadline to put fund into wind down, and is therefore excluded from the above table.

It is our understanding that there is no particular expectation of developing a formal Opportunity Pool type solution with the Central Pool. This means the Fund's opportunity assets will remain outwith the Central Pool, and also means that any future commitments would need to be made and held separately by the Fund.

At this stage we understand the required resources and governance for making and maintaining commitments to new opportunities is limited, and in any event the Statutory Pooling guidance may restrict further investments.

Therefore we propose that the Fund maintain its existing investments but does not look to actively make new commitments to the Opportunities Pool allocation.

The one exception to this is distressed debt (currently covered by the M&G DOF investments). This has the potential to be an attractive part of the market as we reach the end of the current market cycle. As with other closed-ended fund commitments, subject to suitable due diligence, we propose the Fund continues to make top up commitments to the M&G DOF series as new funds are created, if permitted so to do. Alternatively, and in line with likely Statutory Pooling guidance, this will not be permitted, and the Fund should seek a solution from LGPS Central that includes the distressed debt opportunity. We propose this is delegated to the ISC.

8 Summary of recommendations

Recommendations - strategy

As per previous strategy reviews, our recommendations continue the direction of travel towards an investment strategy with greater focus on predictable and sustainable income based returns. To take advantage of more attractive spreads on higher yielding bonds following the fall in markets over the last quarter of 2018, we propose increasing the strategic allocation to credit by 2.5% from 10% to 12.5%, funded from the targeted return allocation. This maintains the Fund's current target return at CPI+3.4%, but with more certainty.

We also note that without on-going investment into the opportunities pool the allocation to opportunities will reduce beyond 2019. The LPC will need to decide where to allocate this element of the strategy budget, although this does not need to be considered as part of the 2019 review.

Recommendations - implementation

With LGPS Central now launching sub-funds, the LPC need to determine when to use Central Pool funds and when to retain external funds. We have assumed that where possible, the LPC will use LGPS Central funds, although we note that the timing of launch of each sub-fund will mean the Fund needs to retain a number of its existing investments for some time.

We set out below a summary of our proposed use of LGPS Central sub-funds. Changes are highlighted in red with the figures in brackets representing the current target. With little detail to go on at this stage for many funds, we stress the need to assess the appropriateness of each fund relative to the LPC's current investment strategy and objectives prior to investing. This should be delegated to the ISC to consider throughout 2019.

	Proposed target weight (%)	Retain, Central or remove
Equities (44-48%)		
Listed equity	40.0-44.0	Retain through LGPS Central negotiated fee
LGIM passive/RAFI		Central
Emerging markets active		Central
Global active		Central
Currency hedging		Move to LGIM or Central
Private equity	4.0	Retain existing, new commitments to Central
Real (26.5%)		
Inflation-linked bonds	7.5	Move to Central or LGIM
Infrastructure	6.0	Retain existing, new commitments to Central
Timberland	3.0	Retain existing, but review long-term hold
Property	10.0	Retain, but review Central offering
Alternatives/Diversifiers (25.5%)		
Targeted return	9.0 (9.5-11.5)	Move to Central
Currency overlay (notional)	0.0	Remove when move Targeted return to Central
Emerging market debt	2.5	Retain until solution included in Pool
Global credit (inc private debt)	10.0 (7.5)	Central for liquid market multi-credit; Retain Partners for existing private lending, but look to Pool to provide solution for new investments
Opportunity pool	c.4.0% (4.0-8.0)	Retain existing holdings; look to Pool for distressed debt solution to replace M&G DOF over time
Total	100.0	Removes 9 external mandates initially, excluding closed ended funds that wind down over time.

Appendix: Aspect Capital review

Background

The Fund invests in Aspect Capital's Diversified Fund within its Alternatives portfolio, specifically within its Targeted Return portfolio. The target allocation to Aspect Capital is 3.5% of total Fund assets and the allocation sits alongside two other investments: one in Ruffer's Absolute Return Fund and one in Pictet's Dynamic Asset Allocation Fund. The aim of the Targeted Return portfolio, along with the wider Alternatives portfolio that it forms part of, is to provide the Fund with both attractive returns and diversification away from its Equity portfolio, which has the single largest allocation.

Aspect Capital's Diversified Fund is a hedge fund strategy that employs a managed futures approach, specifically a trend-following (or "momentum") approach so we begin below by providing an overview of this investment approach before moving into the specifics of the Fund's investment with Aspect Capital.

Trend-Following Strategies

A trend-following strategy seeks to benefit from trends across a wide range of assets and capital markets. An investment manager utilising this approach typically follows technical analysis; forecasting the direction of prices through the study of past market data, primarily price and volume, to try to identify trends in various markets. This is in contrast to investing in assets using fundamental analysis which attempts to determine the 'intrinsic value' of an asset looking at factors such as the overall state of the economy, interest rates, growth forecasts, and company balance sheets. In essence, there is no interest in the "value" of an asset, but merely in the price direction. As with all managed futures strategies, trend-following strategies access markets through the use of future or forward contracts. These contracts are derivative instruments, the values of which depend on the value of underlying assets. The strategy takes a systematic approach which means that trading is computer-driven rather than at the subjective discretion of a portfolio manager.

Key characteristics:

- **Liquid:** Trend-following strategies are trading in very liquid and active markets and are therefore able to provide investors with a high level liquidity and transparency.
- **Non-directional:** The strategies provide an opportunity to profit from both upward and downward price trends in a wide range of underlying assets. This provides the potential to provide protection against market downturns due to the ability to exploit downward trending markets.
- **Diversification:** The strategy exhibits one of the lowest correlations with both alternative and traditional assets which will help to reduce overall portfolio volatility.
- **Exposure to momentum:** In finance, technical analysis is a technique used to forecast the direction of prices through the study of past market data, primarily price and volume. This is in contrast to investing in assets using fundamental analysis which attempts to determine the 'intrinsic value' of an asset looking at factors such as the overall state of the economy, interest rates, growth forecasts, and company balance sheets. Trend-following strategies typically follow technical analysis. These two methods can produce complementary approaches to investing since it is widely recognised that global financial markets are driven by both fundamental and momentum factors.

Aspect Capital – Diversified Fund

Aspect Capital was founded in 1997 and manages a range of systematic strategies across three main areas: managed futures; alternative risk premia; and currencies (as well as providing a multi-strategy solution incorporating each area). The firm had assets of \$8.1 billion as at 30 September 2018, of which \$3.9 billion (just under half) are invested in its Diversified strategy. The Fund invests in the pooled vehicle, the Diversified Fund, which had assets of \$451 million at 30 September 2018.

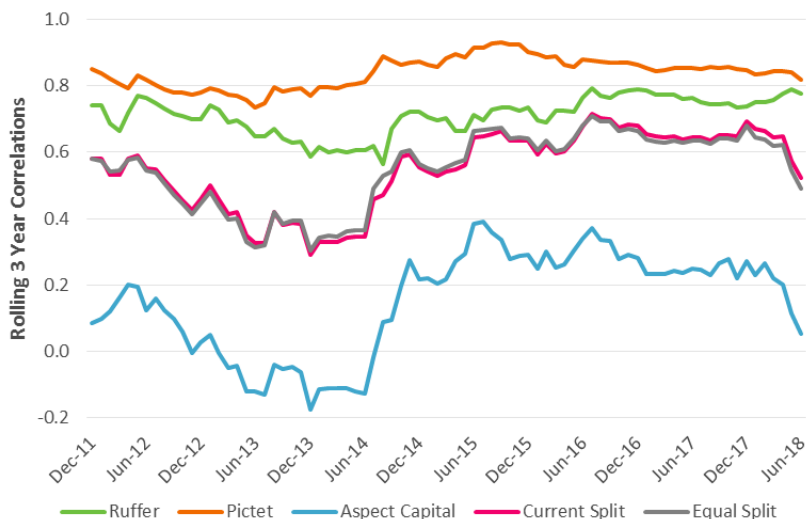
The key characteristics of the Diversified Fund can be found in the following table:

Objective	Targeted long-term average volatility of 17% p.a.
Currency	GBP
Fees	Annual Management Fee: 0.9% Performance Fee: 18%
Liquidity	Weekly
Strategy Inception	December 1998 (GBP vehicle inception in December 2008)
Initial Investment (Fund)	November 2012

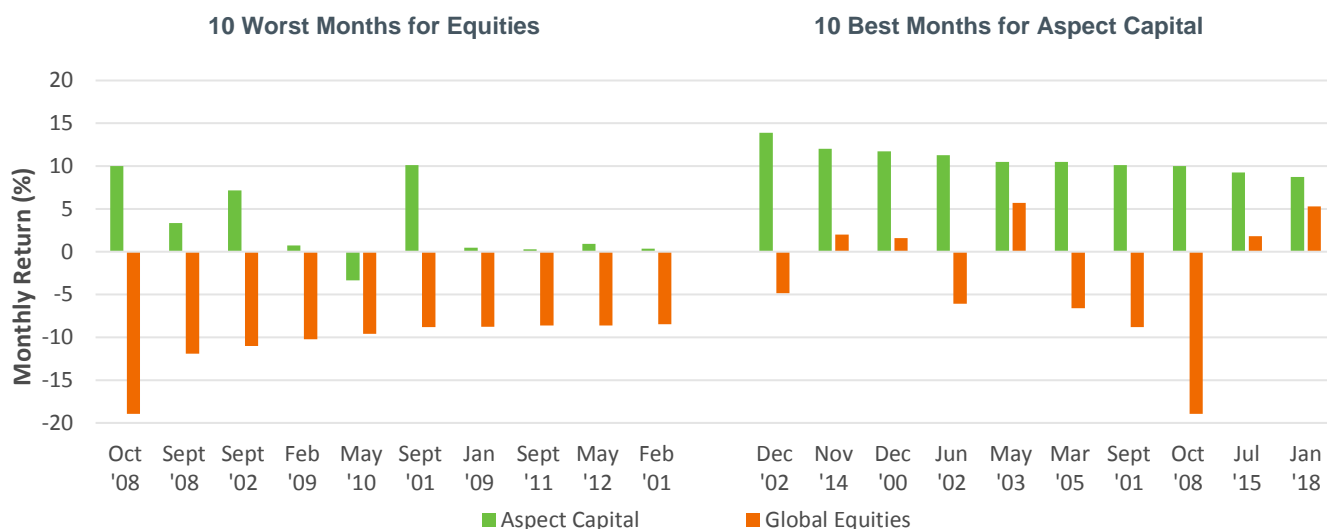
The Diversified Fund seeks to generate sustainable, high levels of returns that are uncorrelated to major traditional asset classes such as equities. While it has no defined target performance level, it aims to deliver a long-term average volatility of c.17% p.a. which over the long-term should result in mid-to-high single digit returns. The strategy looks to exploit pricing trends (both upward and downward) that have persisted for more than 2-3 months and trades in over 180 financial and commodity markets where it uses futures, currency forwards cleared interest swaps and credit default swaps to implement its positions – using both long and short positions. The different asset classes it targets are: equities (based on indices); fixed income (credit and bonds); currencies; interest rates; and commodities (agricultural, metals and energy).

A key benefit of the Fund's allocation to a managed futures strategy is that it offers a sufficiently different return profile than the Fund's two other holdings in the Targeted Return portfolio, Ruffer and Pictet. Both of these strategies tend to be more sensitive to the performance of overall equity markets, as illustrated below.

Targeted Return manager correlation to Global Equities



Managed futures strategies, such as Aspect Capital's, can perform well during sustained periods where equities sell off due to their trend-following approaches. The following charts, which analyses how Aspect Capital has performed relative to equities since the strategy was created in 1998 (in US dollar terms), illustrate just how different its return stream is than equities. In particular, the strategy managed to deliver a positive return in nine of the ten worst performing months for global equities since 2008.



Pictet and Ruffer will instead try to minimise drawdowns through defensive asset allocations, particularly de-risking from equities into bonds, which may still result in negative returns. Therefore an allocation to Aspect Capital's strategy alongside Pictet and Ruffer offers a complementary return profile that in our opinion improves the overall Targeted Return portfolio.

Performance Review

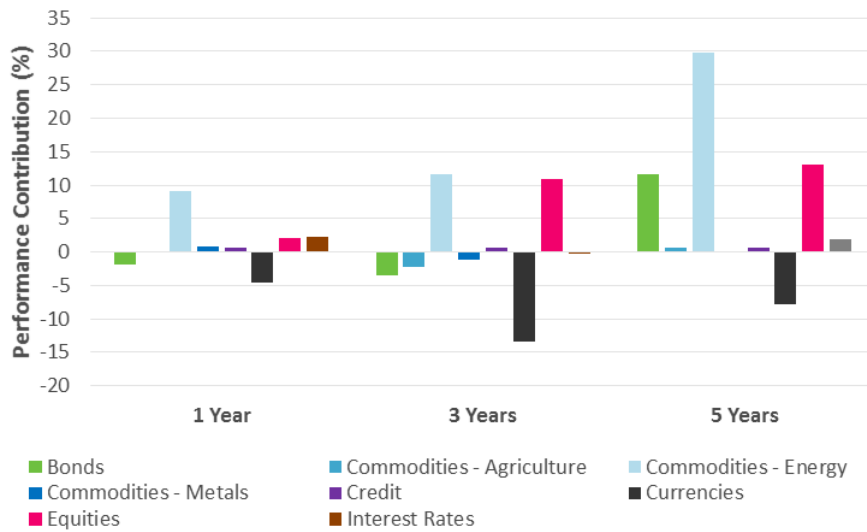
The net performance of the Diversified Fund (in GBP terms) is summarised in the table below. Since inception performance relates to the inception of the Fund's mandate with Aspect Capital in November 2012:

Performance Over Periods to 30 Sept 2018 (GBP)	Return				Volatility	Correlation to Equities
	1 Year	3 Years (p.a.)	5 Years (p.a.)	Since Inception (p.a.) ¹	Since Inception (p.a.) ¹	Since Inception ¹
Aspect Capital	4.3%	-2.8%	6.1%	3.6%	14.3%	0.19
Global Equities ²	12.9%	19.2%	13.5%	14.4%	9.4%	1.00
Trend Index ³	4.3%	-2.9%	3.4%	2.5%	10.7%	0.34

Source: Aspect Capital. 1. Inception date is November 2012. 2. MSCI AC World Index. 3. Societe Generale Trend Index (USD).

The strategy has returned 3.6% p.a. since the Fund's initial investment with Aspect Capital in November 2012. This has been a volatile period for trend-following strategies with the volatility since inception being 14.3%, far higher than that experienced in global equity markets. The Fund's investments suffered significant declines in late 2012 and 2013 which has impacted the since inception performance, although performance improved significantly during 2014. 2015 was a strong year for the strategy but 2016 gave away all these returns. Overall, the correlation to global equities since the initial investment has been 0.19, meaning it has a low positive correlation to equities.

The following chart shows the sources of performance over the 1, 3 and 5 years to 30 September 2018:



The performance attribution of the strategy shows that energy commodities have been the single largest positive contributor to the strategy’s overall returns over each time period. Equities have the second largest positive contribution, although the contribution from bonds has tailed off significantly over the recent years. On the negative side, currencies have consistently detracted. The key takeaway of this attribution is that although equities provide a significant positive contribution to overall performance, performance hasn’t been solely reliant on equities.

We understand that provisional performance for the strategy has been negative due to a very poor October (-9% and much greater than fall in equities), as markets reversed their upward trend. Returns for November and December are -2% and -1% (beating equities), meaning a return of c-12% for the final quarter of 2018.

One of the attractions of investing in a trend-following strategy such as Aspect Capital’s Diversified Fund is its aim of delivering returns with a low correlation to traditional asset classes such as equities. The following chart shows the rolling 3 year correlations of the USD-denominated vehicle with global equities (measured by the MSCI AC World Index).



The chart shows that Aspect Capital’s rolling 3 year correlation to global equities (the green line) does vary; it was initially strongly negative in the strategy’s early years but rose significantly between 2005 and mid-2006 to be strongly positive. It has subsequently range-traded between -0.2 and +0.2 since 2009.

Aspect Capital’s equity correlations have closely mirrored that of the Societe Generale Trend Index (the orange line). The conclusions that can be drawn from this performance is that while correlations can change significantly

over a reasonably short period of time, over the long-term trend-following strategies demonstrate good diversification benefits relative to equities.

Hymans Robertson View

Further to the views stated in our paper to the ISC discussed in October 2018, we believe that the return profile of Aspect Capital's strategy offers good diversification for the Fund, both relative to its equity holdings but also relative to its two other targeted return allocations: Ruffer and Pictet. While the fees payable to Aspect Capital on the mandate are high, including the 18% performance fee, we believe that Aspect Capital has demonstrated a strong performance track record over the long-term to justify such fees and we note that the Fund currently receives discounted management and performance fee rates compared to standard arrangements.