KPMG

Scottish Borders Council Pension Fund

Investment Strategy Health Check

–

August 2018

Contents

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Introduction

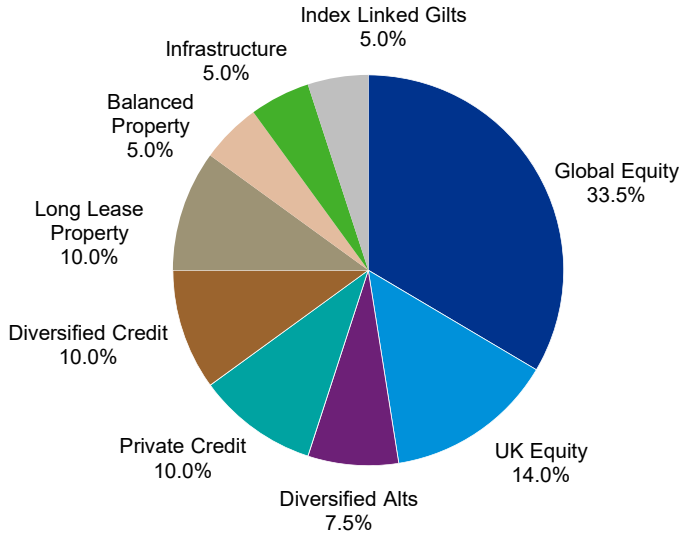
Addressee

- This report is addressed to Scottish Borders Council ("the Council") as administering authority of the Scottish Borders Council Pension Fund ("the Fund").
- The focus of the report is to review the Fund's existing investment arrangements and consider whether the strategy remains aligned with the Council's long term objectives for the Fund.

Background

- The Fund's investment strategy has delivered strong asset returns in recent years during a period in which most growth asset markets have trended upwards.
- Throughout this period the Committee has successfully evolved the investment strategy in order to exploit attractive market opportunities, whilst reducing risk.
- We have been engaged by the Council to undertake a review of the strategy to quantify the inherent risks and consider options for evolving the Fund's investment strategy. The strong investment growth over recent years has delivered a strong funding position.
- This paper provides an overview of:
  - The key objectives for the Fund;
  - The current investment strategy, including examining the expected funding trajectory and the inherent risks;
  - The key drivers of risk within the current strategy and how these can be managed in the current environment; and
  - Analysis of the current and alternative investment strategies for the Council to consider.
- The aim of this review is to consider the suitability of the current strategy, and focus on the longer-term direction of travel.

Target Strategic Benchmark



- As part of the Investment strategy review conducted in 2016, the Council agreed to reduce the Fund's strategic allocation to equities, in favour of assets that provide contractual returns and inflation protection in order to increase the certainty of the return profile and achieve a reduction in funding level volatility.
- This was achieved primarily via through the introduction of allocations to Private Credit, Long Lease Property and Infrastructure.
- The transition to move to the agreed strategy remains in progress as capital is drawn into private credit and infrastructure.
- Today, the Fund retains exposure to a blend of active and passive investment managers, across both public and private markets.

Objectives

Objectives

- We understand the Council's funding objectives are:
  - Set levels of employer contribution that will build up a fund of assets that will be sufficient to meet all future benefit payments from the Fund; and
  - Build up the required assets in such a way that produces levels of employer contribution that are as stable as possible through: ensuring effective and efficient management of employer's liabilities; and allowing the return from investments to be maximised within reasonable risk parameters.
- Thus the objective is to deliver a return that delivers full funding with as little volatility as possible (to maintain stable contributions). The assumptions underlying the Actuary's funding basis is an important factor in determining the return requirement.

Evolution

- The Fund remains open to new members and future accrual. It is therefore growing due to new liability accrual and also due to interest accruing on past service liabilities. The liabilities are also maturing (the proportion of pensions is growing) and this will change the cash flow profile of the Fund (making income and volatility key considerations going forward).
  - The Council, with KPMG, continues to consider the Fund's cashflow requirements, and how these are due to evolve both in the short and medium-term.
- The Fund is expected to grow at a rate above that of the growth in the Council budgets. This means that (all else being equal), absolute risk is growing over time. Maintaining 'stability' would require a gradual reduction in risk over time.

Key considerations

- The Council has developed a clear plan for managing the Fund's investment strategy to achieve the long term objectives for the Fund.

1. SPONSOR COVENANT
STRONG COUNCIL COVENANT BUT BUDGETS UNDER PRESSURE

2. FUNDING
ACTUARIES BASIS SETS REQUIRED RETURN

3. LIABILITIES
MATURING GRADUALLY AND GROWING VERSUS SPONSOR BUDGET

4. ASSET STRATEGY
DESIRE FOR RISKS TO BE MANAGED

- The Council has already taken steps to reduce the Fund's volatility by reducing the Fund's concentration in equities in favour of assets which provide more contractual income and, increasing the assets exposure to inflation to better match the Fund's inflation linked liabilities.
- We examine the current strategy and funding basis before looking at potential alternative strategies.

What return is required?

Overview

- The discount rate used to value the liabilities at the last actuarial valuation was 5.0%.
  - The discount rate can be interpreted as the Actuary's prudent assessment of the return the assets are expected to deliver over the long term.
  - The Actuary therefore requires the assets to deliver at least 5.0% p.a. to achieve full funding based on the agreed contributions (all else being equal).
- Whilst the valuation basis has no explicit link to Gilt markets, we would expect that there is an implicit connection – in the belief that the prospective future returns from all markets are inherently linked. Low prospective returns from gilt markets would imply lower future returns from other markets (assuming investors are rational).
- As at 31 March 2017, the date of the most recent Actuarial Valuation, the required return of 5.0% translated to a return of Gilts +3.1% p.a. (relative to a 20 year gilt yield). Whilst markets have been volatile in the interim period, gilt yields remain in a similar position as at 31 March 2018.
- We estimate the expected long term return for the current strategy is around Gilts + 4.6% p.a. The difference between the Gilts +4.6% p.a. best estimate and Gilts +3.1% p.a. basis in 2017 reflects an element of prudence.
- Given the strong funding position, we believe that the Committee's focus should continue to be on risk reduction in the investment strategy whilst maintaining a broadly similar target return to current.
- The Council should consult the Actuary on any proposed changes to the Fund's investment strategy, to understand the impact, if any, to the underlying funding basis.

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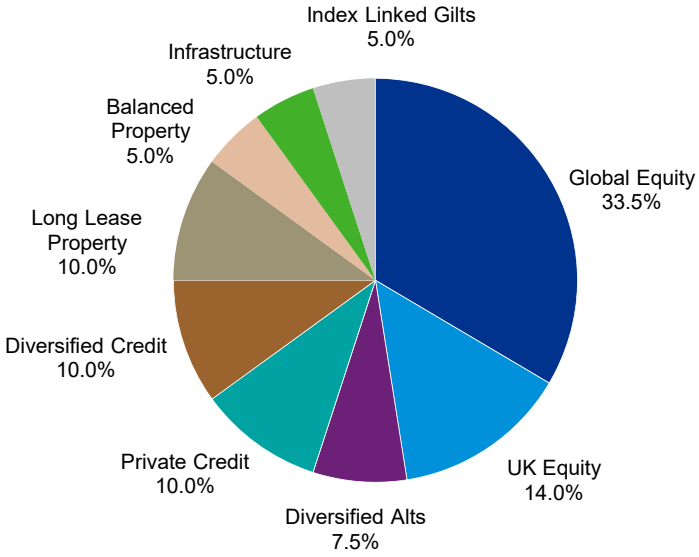
1. Current Strategy

Overview

Current Strategic Benchmark



Estimated Funding Position (31 March 2018)	
Assets	£677.6m
Estimated Liabilities (TP basis)	£579.7m
Estimated Funding Surplus	£97.9m

Current Strategy (as at 31 March 2018)	
Expected Return (p.a.)	Gilts + 4.6%
Return requirement (p.a.)	Gilts + 3.1%

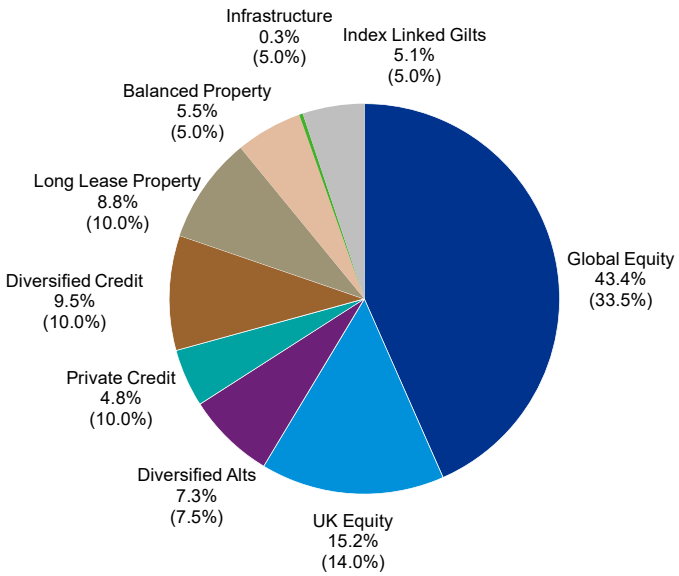
Observations

- The Fund's funding position has significantly improved over the past 3 years, with the surplus increasing from £2.9m to £80.6m primarily due to the strong investment performance.
- The Fund's investment strategy is well diversified across a range of both public and private markets.
- The Fund retains a material allocation to Equities to drive growth. Equities have performed strongly over recent years.
- The strong funding position provides an opportunity to further reduce risk.

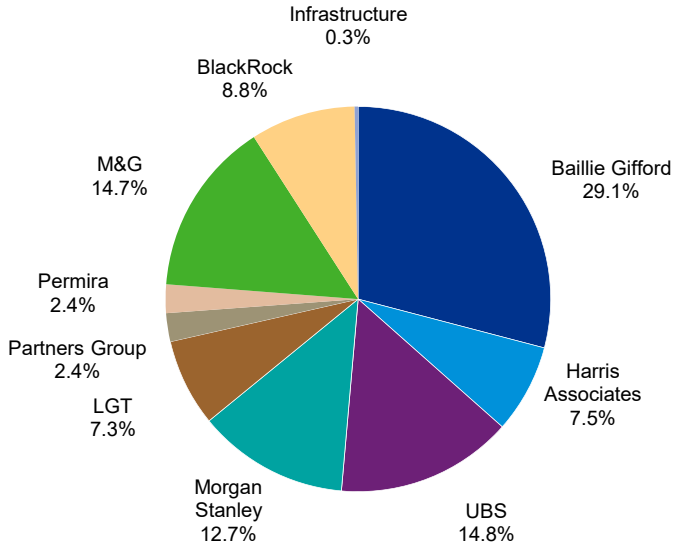
Source: Investment managers and KPMG based on Actuarial information provided by Barnett Wadingham

Strategy and structure

Actual Asset Allocation (vs Target)



Current Manager Allocation



Observations

- As at March 2018 the Fund's investment strategy comprised of 9 individual asset classes and 10 individual managers (excluding infrastructure) with exposures a blend of active and passive mandates across both public and private markets.
- The Private Credit and Infrastructure mandates draw capital as and when opportunities arise, as such these mandates are underweight relative to the strategic benchmark. Whilst this process is being carried out capital is being held within the Global Equity mandates on an interim basis (c. 10.0% overweight).
- The Fund's Infrastructure mandate is implemented in conjunction with the Lothian Pension Fund. The allocation is c.4.7% underweight vs a target of 5.0%.
- The Fund's private credit allocation is c.5.2% underweight vs a target of 10.0%. The Fund has agreed to commit a further 2.5% to Partners Group's 2018 Direct Lending (Private Credit) Fund. This should call down the committed capital over the next 12 months.

Notes: Totals may not sum due to rounding. Asset and manager allocation excludes cash allocation of 0.2%. Data as at 31 March 2018.Source KPMG, based on manage data.

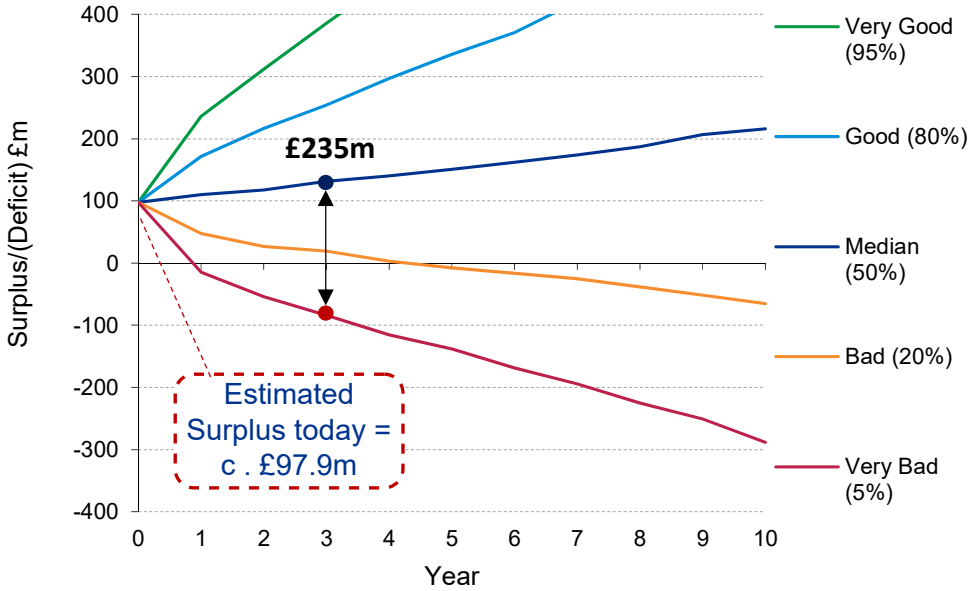
Strategy progress since 2016

Decision taken at 2016 Review	Summary and Rationale	Progress to date
1. Reduce reliance on equities	▪ The Council opted to reduce the Fund's strategic allocation to equities from 65% in favour of opportunities that target a similar level of return with a less volatile return profile and increased diversification benefits. ▪ As the sizeable equity allocation was the dominant driver of investment returns, reducing reliance on the asset class broadened the underlying return drivers for the Fund.	▪ Since 2016, the Fund has gradually reduced equity exposure up to 2018, but remains overweight relative to the strategic benchmark. ▪ The capital earmarked for the remaining drawdowns for the private market mandates is currently being held in equity, this position is expected to reduce as the capital committed to the private mandates is drawn.
2. Increase exposure to sources of inflation	▪ The Council agreed to increase the Fund's exposure to inflation-linked assets. ▪ The majority of the pension benefits in the Fund are linked to inflation. A higher allocation to inflation-linked assets provides a better match for pension payments linked to inflation and decreases the risk position of the Fund.	▪ The Council restructured the Fund's bond portfolio in August 2017 to focus on Index-linked Gilts, which provide direct inflation exposure. ▪ Additional direct inflation exposure is provided via the Long Lease Property mandate (invested during the course of 2017), and the infrastructure allocation which is in the process of being implemented in conjunction with the Lothian Fund.
3. Exploit long term investment horizon	▪ The Council agreed to increase exposure to illiquid assets to exploit it's ability to invest for the long term and earn an attractive illiquidity premium. ▪ Pension funds are one of the few investors able to exploit a return premium available to those who can tie up capital in long term opportunities.	▪ The Fund invested in two private credit mandates, managed by Partners Group and Permira, and a Long Lease Property mandate with BlackRock. ▪ The Long Lease Property mandate and private credit mandate with Permira mandate are now fully drawn. The initial commitment to Partners Group has been drawn, with the agreed commitment to their 2018 fund due to begin drawing capital later this year.

Looking forward - Current funding basis

Potential funding progression

(Current Strategic Benchmark)



Source: Investment managers and KPMG based on Actuarial information provided by Barnett Wadingham

Funding analysis over 3 years	
Expected Surplus	**+£133m**
1 in 5 chance (20%)	£11m
1 in 20 chance (5%)	(£103m)

- The central expectation is for the funding positon to continue to improve and increase over time (note, we have factored in the contribution rates agreed in the 2017 Actuarial Valuation).
- Although progress has been made since the 2016 strategy review, the analysis above highlights the degree of variation (both upside and downside) that the Fund's funding position remains exposed to under the current strategy – this could have a material impact on the funding strategy if the downside "bad experience" plays out.
- Given the strong funding position, there is scope to remove further risk and reduce the impact of any potential downside scenarios from the strategy.

Funding basis sensitivity

Sensitivity of funding position (31 March 2018)

	Current funding basis	Typical LGPS funding basis
Discount rate (Gilts plus % p.a.)	3.1%	1.8%
Current surplus / (deficit)	£98m	(£21m)
Current funding level	117%	97%
Expected surplus / (Deficit) in 3 years time	£133m	£29m
Expected surplus / (Deficit) in 10 years time	£219m	£152m

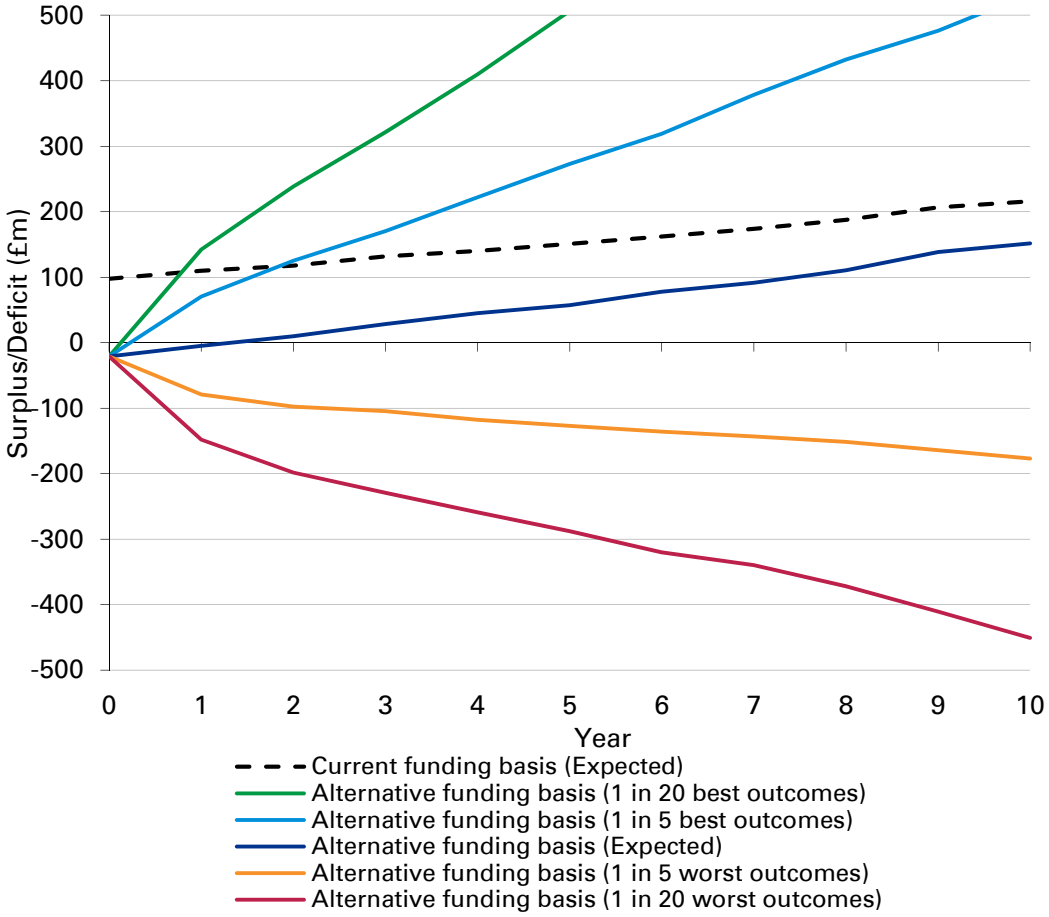
Source: KPMG calculations as at 31 March 2018, based on Actuarial information provided by Barnett Wadingham.

Observations

- In order to help the Committee assess the robustness of the current funding position and strategy, we have undertaken additional analysis using a revised funding basis measure. This basis is more closely aligned to some other Scottish LGPS Funds and uses a more conservative measure of the funding position.
- Based on the Fund's current discount rate assumption, the Fund has a funding level of c. 117%.
- When compared to the measurement of some other Scottish LGPS, the Fund's discount rate assumption is relatively high.
- Using a discount rate of Gilts + 1.8% p.a. (which is more consistent with some other LGPS), the Fund's funding level would drop to c. 97% and would have a deficit of c. £21m.

Looking forward - Alternative funding basis

Estimated funding progression - Expected progression on alternative funding basis



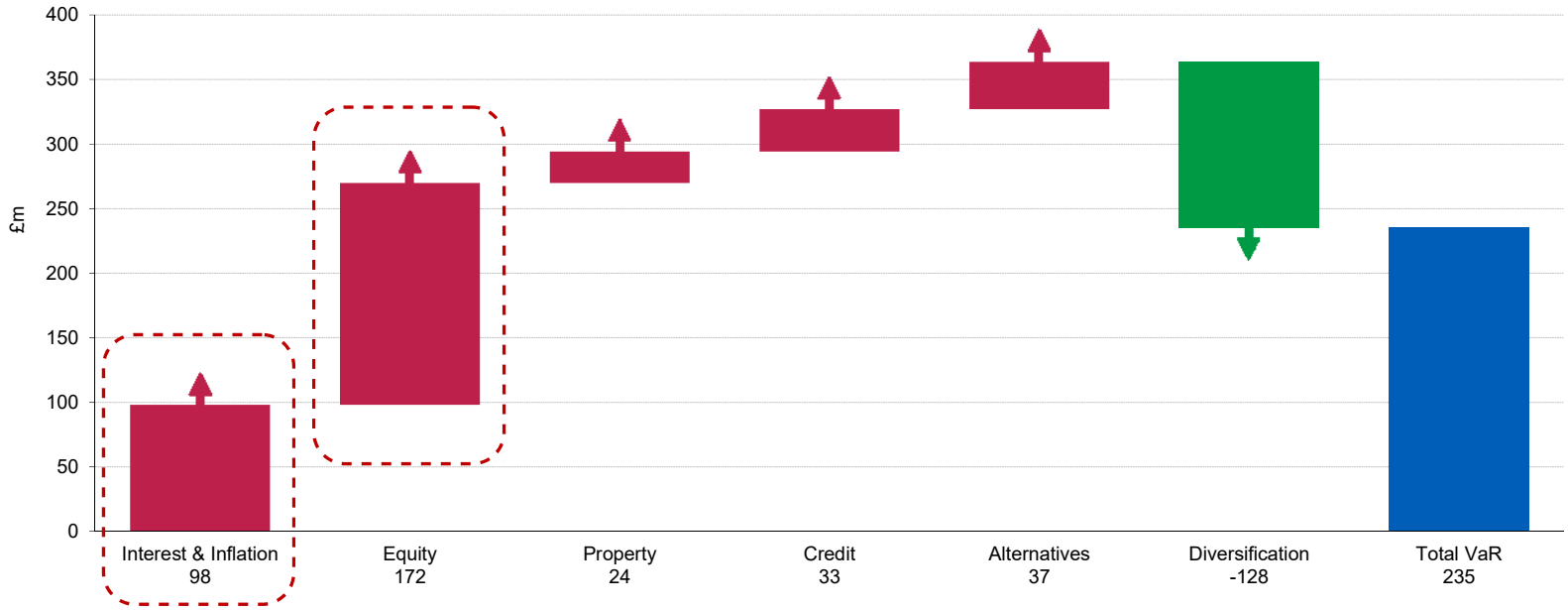
Funding analysis over 3 years	
Expected Surplus	**+£29m**
1 in 5 chance (20%)	(£104m)
1 in 20 chance (5%)	(£229m)

Notes: Estimated funding progression based on KPMG calculations using Actuarial data provided by Barnett Waddingham. Future service rates assumed unchanged from current funding basis.

Concentration of risk

Breakdown of risk

1 in 20 downside risk over 3 years



- The Fund's largest risk is equity risk, stemming from the 47.5% strategic allocation to Global and UK equities
  - Reducing this allocation will substantially reduce funding risk but will also have an impact on impact expected returns.
  - The analysis above is based on broad equity market exposure – the risk is mitigated at the margins by the Fund's active managers.
- Interest rate and inflation risk represents the second largest risk exposure
  - Action has been taken to address this via the introduction of Index-linked Gilt mandate and Long Lease Property mandate which both offer direct inflation protection. However, there is scope for this risk to be addressed further if desired.

Equity portfolio structure

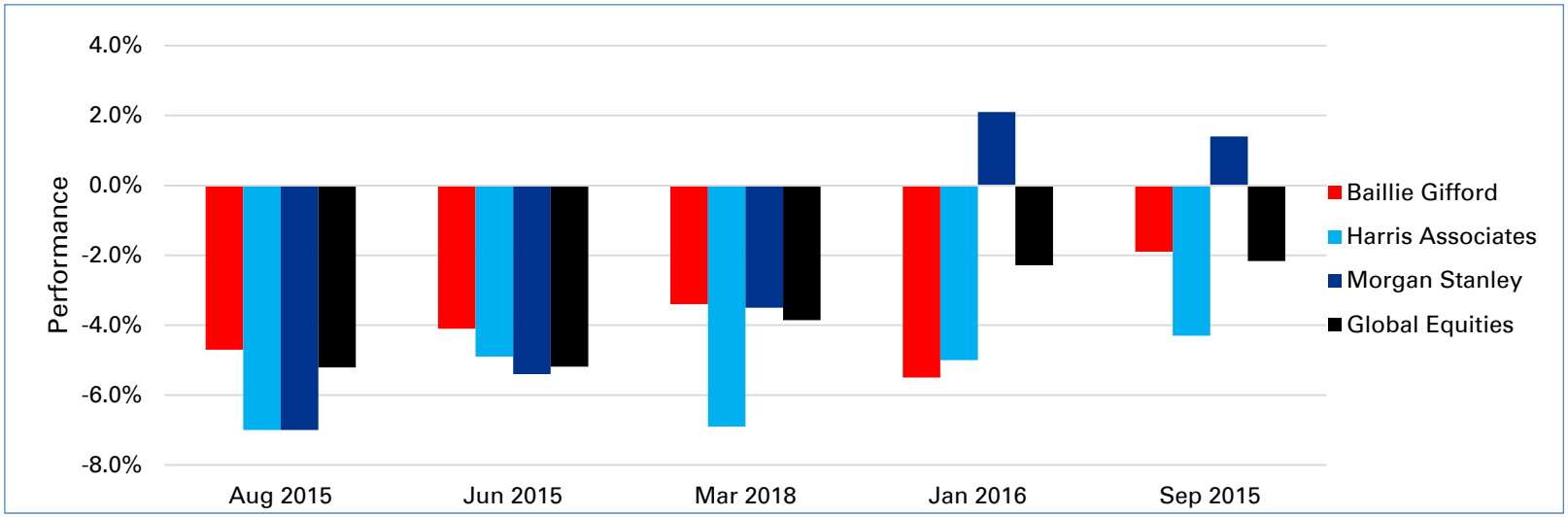
Structure of the Fund's equity portfolio

Manager	Geography	Style	Description
Baillie Gifford	UK	Active	Takes offsetting positions relative to a UK equity benchmark to hold stocks which will outperform.
UBS		Passive	Tracks a UK equity benchmark for broad market exposure.
Baillie Gifford	Global	Active – Growth	Focussed on **Growth stocks** (i.e. stocks which are expected to experience significant growth).
Harris Associates		Active – Value	Focussed on **Value stocks** (i.e. stocks which appear under- or over-valued), to benefit from pricing anomalies.
Morgan Stanley		Active – Large Brands	Focussed on **large cap, brand name stocks** which produce attractive dividend growth and modest capital growth.

- The equity portfolio is well diversified by region, manager style, and across active manager risk.
- We would expect that the active equity allocation to Morgan Stanley offers some defensive characteristics.
- We believe there may be value in analysing the historical performance of the mandates to determine how the overall mix behaves in a market downturn and where consideration should be given to changing this.

Performance in falling equity markets

Performance in worst 5 equity months over past 5 years

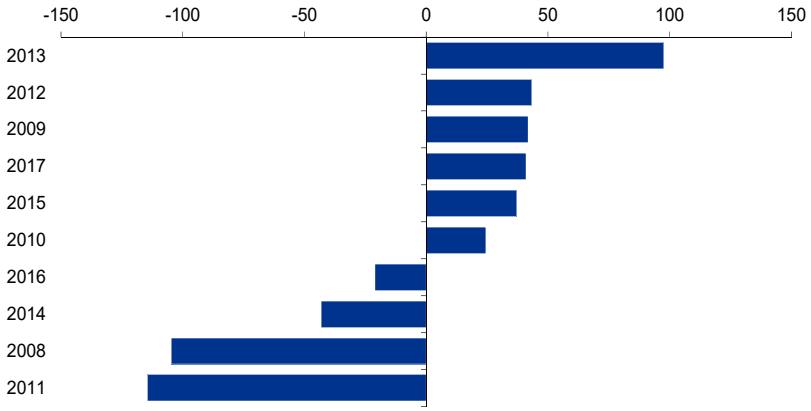


Performance in worst 5 equity months over past 5 years					
Month	**August 2015**	**June 2015**	**March 2018**	**January 2016**	**September 2016**
Baillie Gifford	-4.7%	-4.1%	-3.4%	-5.5%	-1.9%
Harris Associates	-7.0%	-4.9%	-6.9%	-5.0%	-4.3%
Morgan Stanley	-7.0%	-5.4%	-3.5%	2.1%	1.4%
MSCI World	-5.2%	-5.2%	-3.9%	-2.3%	-2.2%

Notes: Analysis is high level and for illustrative purposes only (due to short time period and limited performance data). More detailed analysis should be carried out if further consideration on the structure of the Fund's equity portfolio is to be carried out.

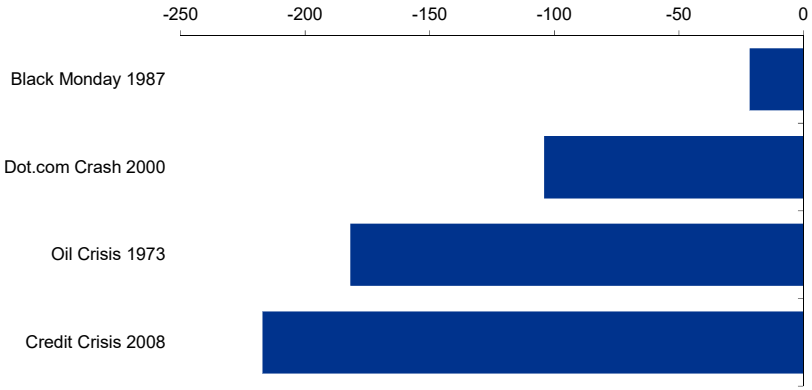
Historic scenario testing

Historic Scenario Analysis – impact (past 10 years)



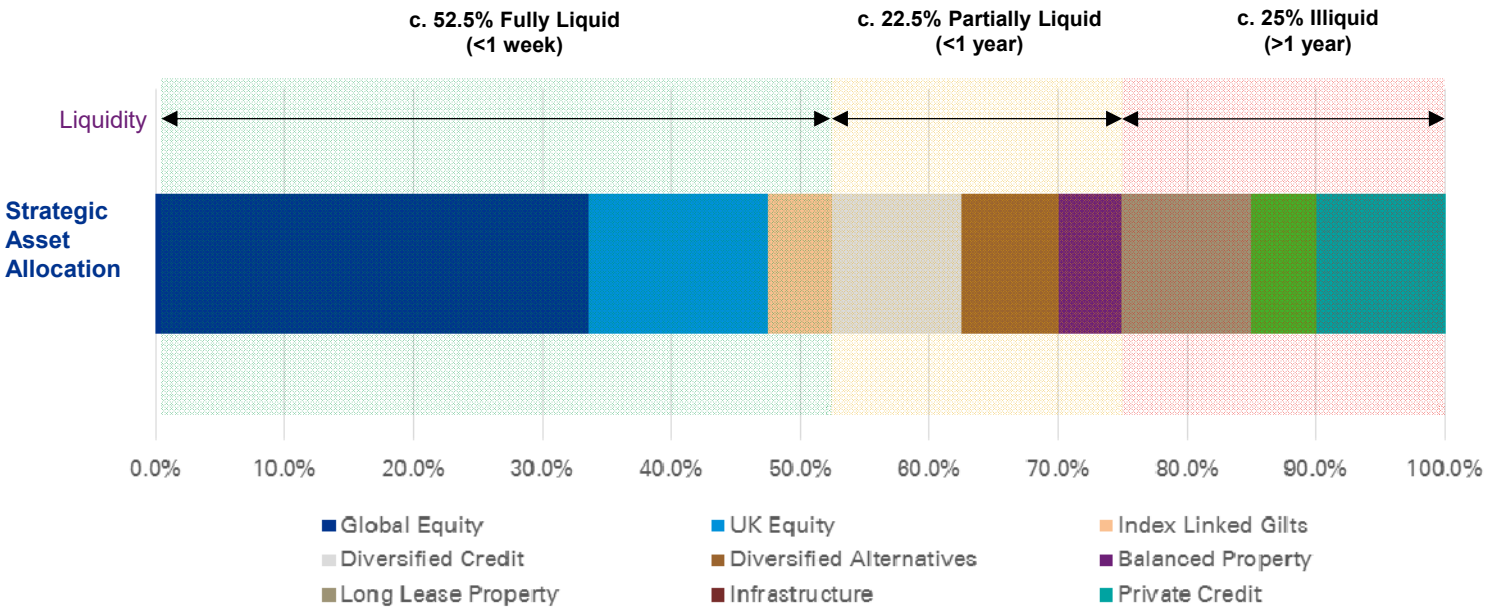
- The chart opposite shows the impact on the funding position if we were to re-run each of the past 10 calendar years from today. This is based on the agreed strategic allocation (we note that this actual allocation is not yet aligned with target).
- The target Strategic allocation of the Fund is generally well positioned to withstand a wide range of economic scenarios.

Past Crises Scenario Analysis – Impact



- The chart opposite shows the illustrative impact on the funding position should past crises play out again in today's market conditions.
- Though we note that these past crises events were extreme in nature and as a result of specific shocks to investment markets, they do show the Fund's sensitivity to significant market events, should anything similar occur in the future.

Liquidity profile



Observations

- We estimate most of the asset liquidity lies within 1 month, with c. 70% of assets able to liquidated over this period.
- Following the previous Investment strategy review, the Council opted to invest in a range of less liquid assets (Infrastructure, Private Credit and Long Lease Property) in order to try and exploit the illiquidity premium available on these investments.
- Given the liability profile of the Fund, we believe, there remains scope to increase the Fund's allocation to less liquid assets, above current cash flow requirements, in order to further increase the Fund's illiquidity premium and exploit your key advantage as a long-investor.
  - Currently, the Fund is paying out c.£19m p.a.in liability payments. This will increase as the Fund matures but there remains significant headroom. This does not account for any transfer value payments, these are variable and uncertain and would be in addition to the liability payments.

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2. Alternative Strategies

Potential direction of travel

Further reduce reliance on equities	▪ The Council has made good progress in diversifying return drivers to reduce the reliance on equities to generate return. ▪ Reducing equities further would impact expected returns but would add further diversification and remove a material level of risk.
Continue to allocate to illiquid assets	▪ To date, the Council has implemented a Long Lease Property mandate, and is in the process of implementing private credit and infrastructure mandates. ▪ A number of these allocations with continue to wind down, so continuing to allocate capital is important. We are continuing to identify good opportunities.
Add to inflation exposure	▪ The Council has increased the Fund's direct inflation exposure via the Long Lease Property mandate and the restructure of the bond portfolio to include Index-linked Gilts. Consideration could also be given to senior infrastructure debt, though we note that the additional premium needs to be balanced against the very significant illiquidity. ▪ Increasing inflation protection further will be helpful to manage risk.
Consider infrastructure mandate implementation	▪ The Council is in the process of implementing the agreed Infrastructure allocation in conjunction with Lothian. ▪ We understand that there is a desire to increase the allocation towards target more quickly. There are a range of equity and debt funds that could be considered in order to achieve this whilst complimenting the existing approach.
Management fees	▪ The Council should continue to identify ways to reduce fees and could streamline management arrangements.

Alternative strategies

Asset Classes	1. Current Strategic Benchmark	2. Introduce Junior Infrastructure Debt	3. Introduce Junior Infrastructure Debt and JCRED	4. Inflation and infrastructure focus	5. Infrastructure focus
Global Equity	33.5%	↓ 33.0%	↓ 31.5%	↓ 30.0%	↓ 30.0%
UK Equity	14.0%	↓ 12.0%	↓ 11.0%	↓ 10.0%	↓ 10.0%
Long Lease Property	10.0%	10.0%	10.0%	↑ 12.5%	10.0%
Balanced Property	5.0%	5.0%	↓ 2.5%	↓ 2.5%	5.0%
Diversified Alternatives	7.5%	↓ 5.0%	↓ 5.0%	↓ 0.0%	7.5%
Diversified Credit	10.0%	10.0%	10.0%	10.0%	10.0%
Direct Lending	10.0%	10.0%	10.0%	10.0%	10.0%
Index-linked Gilts	5.0%	5.0%	5.0%	↑ 10.0%	5.0%
Infrastructure Debt (Senior)	-	-	-	-	↑ 5.0%
Infrastructure Equity	5.0%	↑ 10.0%	↑ 10.0%	↑ 10.0%	↑ 7.5%
Infrastructure Debt (Junior)	-				
Commercial Real Estate Debt (Junior)	-	-	↑ 5.0%	↑ 5.0%	-
Exp. Return (Gils + p.a.)	4.6%	4.6%	4.7%	4.3%	4.5%
Expected funding Surplus (3 years)	£133m	£132m	£134m	£124m	£131m
1 in 20 Upside Position	£409m	£397m	£388m	£347m	£373m
1 in 20 Downside Position	(£100m)	(£92m)	(£84m)	(£72m)	(£87m)
Value at Risk (1 in 20 chance)	£235m	£225m	£218m	£196m	£218m

Notes: Value at Risk ("VaR") measure represents the increase in expected deficit in 3 years time under the 1 in 20 (5%) worst investment outcome.

Alternative strategy considerations

Consideration	Description	Comments
1. Infrastructure implementation	▪ Given the nature of infrastructure projects, the implementation period can lengthy and the diversification achieved through investing in projects directly can be limited.	▪ The Council could diversify and increase the speed of implementation of the infrastructure mandate by considering alternate implementation routes for equity and the introduction of debt.
2. Topping up the illiquid mandates to the strategic benchmark	▪ The Fund's allocation to the BlackRock Long Lease Property fund and illiquid credit mandate are strategically underweight.	▪ Consideration should be given if these should be topped up to the agreed benchmark weight as part of any strategy change.
3. Capital held in respect of private credit and infrastructure mandates	▪ Given the private credit and infrastructure mandates will draw down capital as and when opportunities arise, the Fund must hold the committed capital prior to this being called. ▪ Currently the capital is held in equities until drawn.	▪ Given the direction of travel is to reduce the equity allocation, we propose that this capital earmarked for infrastructure equity is held in equities and capital earmarked for direct lending is instead held in Diversified Credit until drawn. ▪ The diversified credit mandate is less volatile than equities and represents a better proxy than equity for the destination asset classes, ▪ This will still leave the option to draw the capital down as and when required, however, consideration needs to be given to the liquidity terms on offer.
4. Mandates to draw down as part of the reduction in equities	▪ Given the Fund has exposure to 5 equity funds via 4 different managers, there are several mandates which the Fund could draw upon to reduce the allocation. ▪ Consideration should be given to streamlining the active equity managers.	▪ Given the strong performance of the Baillie Gifford mandates, these mandates are overweight relative to their strategic benchmark. ▪ We propose the Fund looks to crystallise these recent gains, opting to reduce the Global Equity and/or UK Equity exposure the Fund has with Baillie Gifford to fund any strategy changes.

Alternative strategy considerations (cont.)

Consideration	Description	Proposal
5. Reducing the Diversified Alternatives mandate	▪ The Fund currently has a segregated diversified alternatives mandate with LGT. ▪ LGT have confirmed the minimum amount they would hold in respect of a segregated allocation is c.£35m or 5% of total assets.	▪ The strategies proposed have taken due consideration of the minimum threshold for LGT to maintain a segregated portfolio, and have ensured this is not breached. ▪ If this allocation is to be reduced, we propose to engage the manager to assess the most pragmatic reduction of the mandate. ▪ Consideration should be given to the relatively high fees in respect of the fund (c. 1.5% p.a.) and whether the Council believe this is appropriate given both the nature and past performance of this mandate. If the mandate is to be retained, we believe the Council should consider negotiating a lower fee scale with the manager.
6. Potential allocation to Diversified Growth Fund	▪ The Council had expressed an interest in investing in a diversified growth fund.	▪ Given the Fund size, we believe the Fund already has access to a diverse range of asset classes directly, with greater efficiency and control and more cost effectively.
7. Transaction costs	▪ There is explicit transition costs associated with the movement of any assets.	▪ The estimated round trip transaction costs in normal market conditions for the asset classes considered (as a % of assets moved) are : ▪ Equity: up to c. 0.3% ▪ Property: up to c. 7.0%* ▪ Diversified Alternatives: c. 0.5% ▪ Diversified Credit: c. 0.5% ▪ Infrastructure Equity (Pooled): Up to c. 1.0% ▪ Junior CRED: None expected ▪ Infrastructure Debt: c. 0.5%

* Many property funds can currently be exited at a premium to reported value on the secondary market.

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3. Summary and Next Steps

Summary and next steps

Summary

- The Fund has delivered strong investment returns in recent years during a period in which most asset markets have trended upwards.
- Throughout this period the Committee has successfully evolved the investment strategy in order to exploit attractive market opportunities and reduce risk. This has come with some increased governance for the investment management arrangements as the manager roster has grown.
- The implementation of the current strategy is not yet complete. The Council should consider whether:
  - Any action to top up the LLP and Direct Lending allocations is desired
  - Any action to accelerate the allocation into infrastructure is desired.
- The Fund has achieved a strong funding level (c.114% according to the most recent Actuarial valuation as at 31 March 2017). So whilst the current investment strategy is robust, it is delivering more returns and more risk that is strictly required.
- It is possible for the Council to continue to take advantage of current market conditions and reduce risk further while looking to broadly maintain the current level of returns.
- We have analysed several alternative strategies and new asset classes for consideration, to illustrate how the risk/return profile of the current strategy can continue towards.
- We are conscious that the Council should consider both the number of managers and potential costs in making any further changes.

Next steps

- The Council should consider:
  - The implementation of the existing strategy and whether a top up to the allocations to LLP and Direct Lending is desired.
  - Its view on the proposed investment strategy and whether there is an appetite to exploit further any of the alternatives proposed.
- Whilst secondary to the decision on the strategic asset allocation, the Council will also have to consider the Fund's investment manager line-up and whether any streamlining of this might be desired. In particular, the Council should consider the equity allocation and whether a more streamlined/defensive structure is desired.
- We look forward to discussing this report with the Council.

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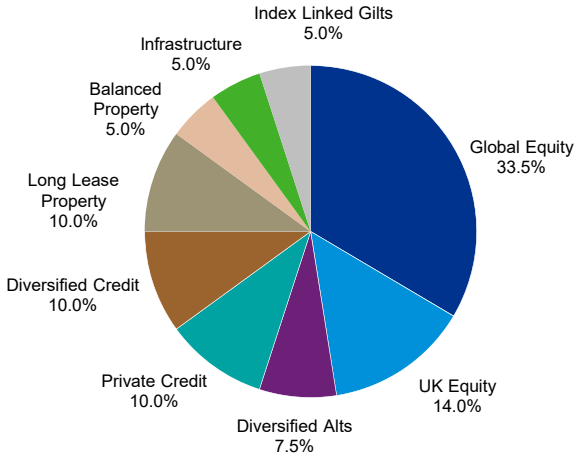
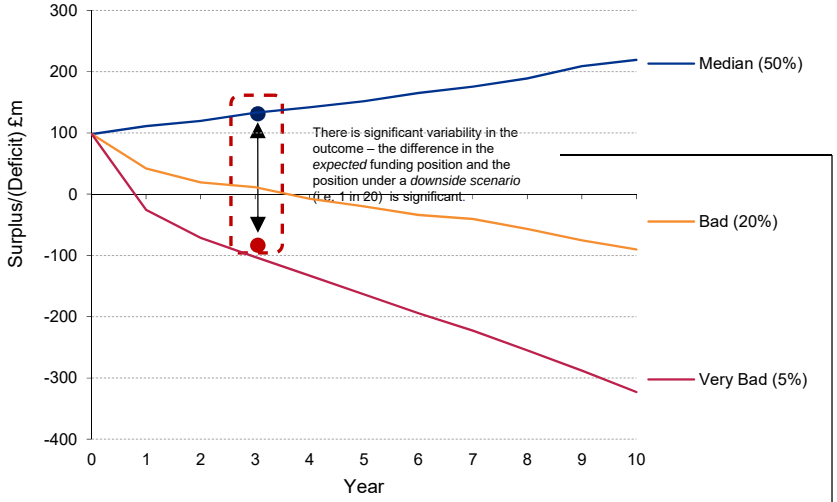
Appendices

A1. Current strategy - Summary

Current Asset Allocation
(Strategic Benchmark Weights)



Expected Funding Level Progression
(Funding Basis)



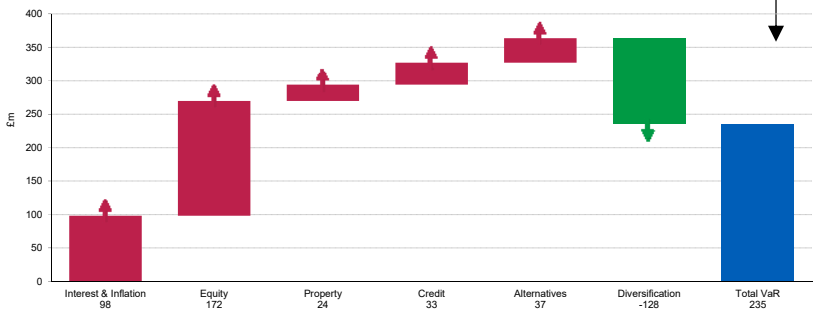
Summary

Key Characteristics	Funding Basis
Expected return (gilts plus)	4.6%
3 year 95% VAR	£235m
Deficit level in 3 years (95% worst outcome)	(£103m)

Notes: Calculations based on the 31 March 2017 actuarial valuation, rolled forward to 31 March 2018, asset valuations as at 31 March 2018 and KPMG's long term modelling assumptions.

VaR: 3 year 95% Value at Risk represents the increase in expected deficit in 3 years time under the 1in 20 worst investment outcome.

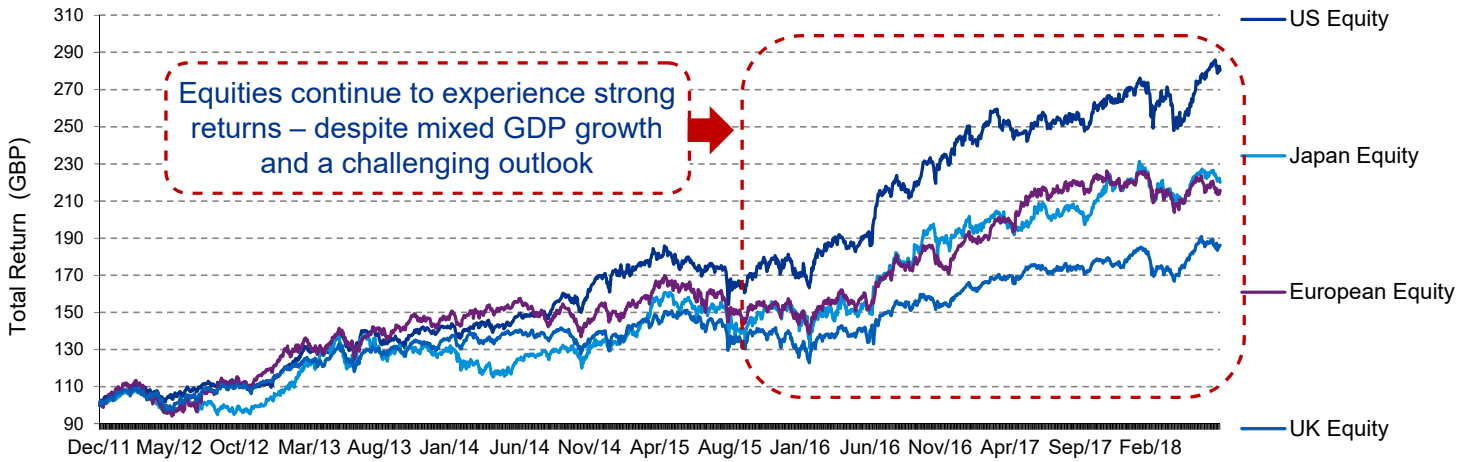
3 year 95% Value at Risk (VaR) decomposition
(Funding Basis)



A2. Key risk exposures - Equity risk

Equity risk

- The Council retains a significant allocation to UK and global equities (c. 47.5% of Fund assets) as a driver of long term returns.
- Given the requirement to generate high returns, we believe equities will remain at the heart of the long term growth focussed investment strategy for the Fund given its long term investment horizon and ability to tolerate some short term volatility.
- To date, this equity risk has paid off for the Fund with equity markets marching higher supported by global quantitative easing and central government stimulus despite a challenging economic backdrop. It is inherently difficult to time entry and exit from equity markets and tactical calls on markets are extremely difficult for even the most well resourced and highly regarded asset managers.
  - Equity markets have performed extremely well since 2009 and many developed market indices have hit new or multi decade highs.
  - A number of market valuations now look relatively stretched (the US in particular) on a number of measures (i.e. cyclically-adjusted price earnings, price/ earnings, price to book).
  - In the current environment, we believe there is a reasonable rationale to reduce equity risk to exploit a wider range of high returning investment opportunities that should prove more robust if the economic environment deteriorates.

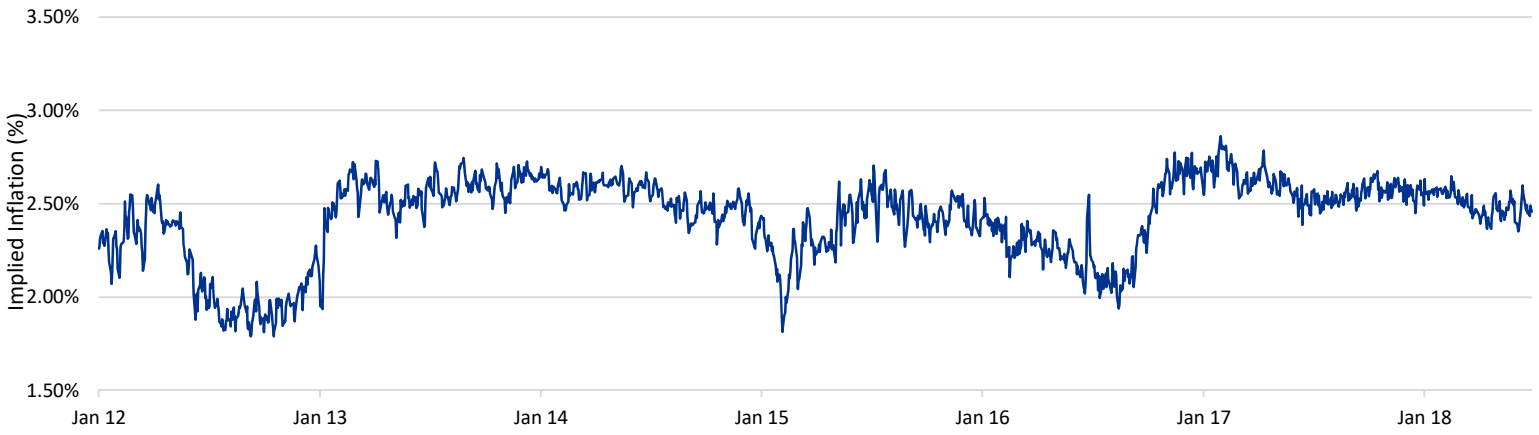


A2. Key risk exposures - Inflation risk

Inflation risk

- Despite a benign inflation environment over the past few years, recent market events and easing monetary policy have increased upward inflation pressures (both UK and global) and inflation is expected to increase over the next few years. As the assets do not currently have a significant link to inflation, any rapid increase in inflation would be detrimental.
- The Fund could consider increasing the allocation to assets directly linked to inflation.

20 Year Implied Inflation (CPI)



A3. Asset class assumptions

Introduction to the assumptions

- These are our "best estimate" asset class return, volatility and correlation assumptions. We believe there is a 50:50 chance that the actual outcome will be above/below our assumptions.
- The assumptions are long-term, for a 10-year period.
- Return assumptions are:
  - Annualised (i.e. geometric averages), net of management fees.
  - Expressed relative to the yield on fixed interest gilts (the annual yield at the 10-year tenor on the Bank of England spot curve). This yield was 1.3% at 31 March 2018.
  - Before tax. UK pension schemes are exempt from tax on investments. The impact of taxation may reduce returns for other investors.
- Volatility assumptions are based on the standard deviation of annual returns over a 10-year period.
- Bond volatilities are sensitive to the duration of the index. Our Fixed Interest Gilts (FIG) and Index-Linked Gilts (ILG) assumptions both relate to Over 15 Year indices, but the cashflow profile of the ILG index is considerably longer than the FIG index. Hence the difference in volatilities does not necessarily mean that real yields are assumed to be more volatile than fixed yields.
- Please note that the assumptions have a subjective element, particularly for asset classes with less history and greater reliance on active management.

Asset Class	Sector [1]	Return [2]	Volatility [3]
Global Equity	Developed (passive)	4.0%	20.0%
	Developed (core active)	4.5%	20.5%
	Developed (unconstrained)	5.0%	21.0%
	Emerging (passive)	5.0%	30.0%
Alternatives	Hedge Funds: Multi-Strat FoF	2.5%	10.0%
	Private Equity	7.0%	30.0%
	Diversified Alternatives	6.0%	22.0%
Property	UK Balanced	1.5%	13.0%
	Long Lease	1.0%	8.0%
DGF	Diversified Growth Funds	3.5%	12.0%
Gilts	Fixed Interest Gilts (passive) 4	0.0%	6.5%
	Index-Linked Gilts (passive) 4	0.0%	11.0%
Credit	Investment Grade (passive) 4,5	1.3%	6.5%
	Diversified Credit 5	2.1%	10.0%
	Distressed Debt	6.0%	26.0%

Notes: 1 Includes active management except where specified as passive
2 Expected return per annum, net of fees, relative to the yield on fixed-interest gilts
3 Expected standard deviation of absolute annual returns
4 Long-dated bonds (>15yr index); note durations for FIG and ILG differ considerably
5 Includes an allowance for downgrades and defaults (0.2% for Investment Grade)

Source: KPMG

A4. Modelling methodology

Modelling Principles

- SOFIA is a stochastic model that simulates a large number of possible future economic outcomes, in which financial conditions develop in a number of different ways, defined by assumptions for average outcomes and the range of variability. The results of the projections are shown by ranking the calculated outcomes from best to worst and presenting the following scenarios:
  - Median: this is the middle outcome and can be thought of as the "expected result". Half of the modelled outcomes are better than this and half are worse.
  - Bad: this splits the results so that there is a one in five (20%) chance of having a worse outcome. This is a measure of risk.
  - Very Bad: this splits the results at a one in twenty (5%) chance of having a worse result. This is a more extreme measure of downside risk.
  - Good and Very Good (where shown): these illustrate possible positive outcomes.
- The "Value at Risk", where shown, is defined as the difference between the Median scenario and the Bad or Very Bad scenario, i.e. it represents the variability of funding outcomes and shows the magnitude of the possible downside from the expected result. Please note that this is not the same as the possible downside loss from the starting position.

Investment Strategy

- Different investment strategies are modelled in order to illustrate the effects of different risk/return trade-offs. For each portfolio, the model assumes that the chosen strategy remains fixed over the full projection period. Assets are annually rebalanced back to the original allocations.

Investment Strategy

- Where the model illustrates a scheme-specific funding basis, the funding basis is calculated in the same way across all the investment portfolios modelled. We therefore focus on the effect of investment strategies on asset values and hence surplus/deficits, without the distorting effect of differing liability methodologies. However, in cases where the discount rate allows for a risk premium, the magnitude of the risk premium may depend on the proportion of return-generating assets in the portfolio, and therefore in practice the funding basis may be different under different investment strategies.

A4. Modelling methodology (cont.)

Modelling Principles (cont.)

Contribution Basis

- The model's projections may be based on either fixed or variable contributions:
  - "Fixed contributions" means that the current schedule of deficit contributions is assumed to remain in place for the full projection period. The purpose of this is to illustrate pure investment risk, showing the effect of differing investment strategies without the distorting effect of different amounts of money being contributed. In practice, however, the long-term downside scenarios would be less likely to be reached, as poor intermediate outcomes would lead to a requirement for additional contributions after future valuations.
  - "Variable contributions" means that the model simulates future actuarial valuations every three years, and calculates the future deficit contributions that might be required under the particular situations being projected. This illustrates the range of possible future contribution requirements.
- In addition to the deficit contributions, the model also calculates contributions required to fund future service accrual, if there are active members accruing additional pension entitlements. In this case a small amount of variability arises from the range of possible future inflation projections. Therefore the "fixed contribution" projections may still show minor differences in contributions between, for example, Median and Bad scenarios.

A5. Disclaimers

- The information contained herein is provided for the Scottish Borders Council. Although we endeavour to provide accurate and timely information, there can be no guarantee that such information is accurate as of the date it is received or that it will continue to be accurate in the future. No one should act on such information without appropriate professional advice after a thorough examination of the particular situation.
- The output from our modelling is based on a large number of underlying assumptions. Changes to these assumptions can have a material impact on the results of the modelling.
- The outcomes shown are not intended to be the best possible, or worst possible outcomes. The actual outcome could be better than the 5th percentile, or worse than the 95th percentile.
- The modelling analysis is based on portfolios containing a wide range of asset classes and different approaches to fund management. Clients should not make decisions to invest in these asset classes or approaches to fund management based solely on the modelling analysis.
- Cashflow profile and liability figures are based on data provided by Barnett Wadingham.
- The only risk factors we have considered in our modelling are those that affect the values of pension schemes' assets and the financial assumptions used to value schemes' liabilities. Some of the risks we have not considered include demographic risks such as the life expectancy of pension schemes' members and future changes to members' benefits.
- Past performance cannot be relied upon as a guide to the future.

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