

Northern LGPS

Investment Benchmarking Results

For the 5 year period ending March 31, 2018



1 Change Alley
London, EC3V 3ND
+44 203 887 9289

www.cembenchmarking.com

This report will help you to satisfy your oversight responsibilities by:

- Comparing your investment performance with other funds.
- Highlighting returns that come from:
 - Strategic asset allocation decisions (typically the responsibility of the funds), and
 - The implementation of the strategy (increasingly the responsibility of the pool).
- Comparing the level of risk inherent in your portfolio and relative to liabilities.
- Comparing investment costs and explaining why costs compare as they do.
- Considering how and why costs have changed over time.
- Looking at value-for-money – ‘did paying more get you more’?

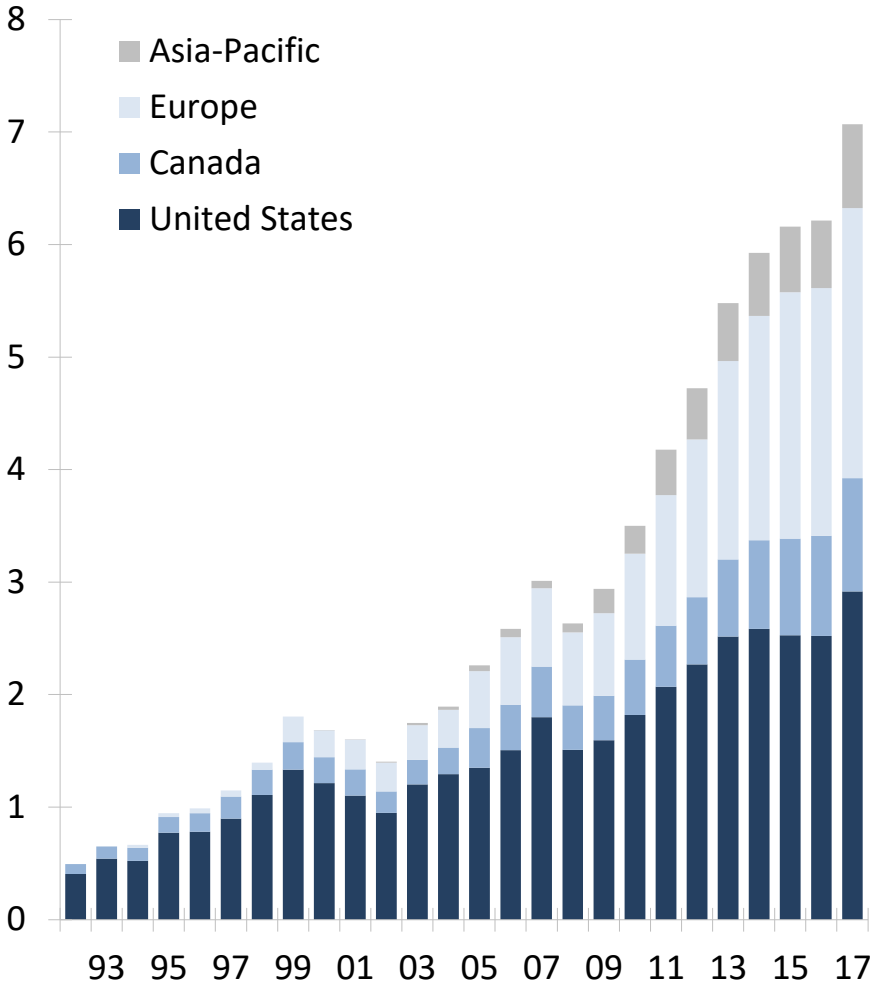
The report is based on standardised data submitted to CEM by your fund, and a wider universe of funds from around the world. Care is taken to validate the data contained in the report. This includes automated validations on outlying or unusual data as it is submitted, and an additional manual data ‘clean’ where our analysts interact with fund personnel to ensure the data is fit for purpose. The information in this report is confidential and should not be disclosed to third parties without the express written consent of CEM. CEM will not disclose any of the information in the report without your express written consent.

This benchmarking report compares your cost and return performance to the 328 funds in CEM's extensive pension database.

- 168 U.S. pension funds participate. The median U.S. fund had assets of £6.5 billion and the average U.S. fund had assets of £17.4 billion. Total participating U.S. assets were £2.9 trillion.
- 79 Canadian funds participate with assets totaling £1.0 trillion.
- 68 European funds participate with aggregate assets of £2.4 trillion. Included are funds from the Netherlands, Norway, Sweden, Finland, Ireland, Denmark and the U.K.
- Of the European funds, there are 29 U.K. funds with aggregate assets of £419.4 billion.
- 8 Asia-Pacific funds participate with aggregate assets of £0.7 trillion. Included are funds from Australia, New Zealand, China and South Korea.
- 3 Gulf region funds participate.

The most meaningful comparisons for your returns and value added are to the U.K. universe.

Participating assets (£ trillions)



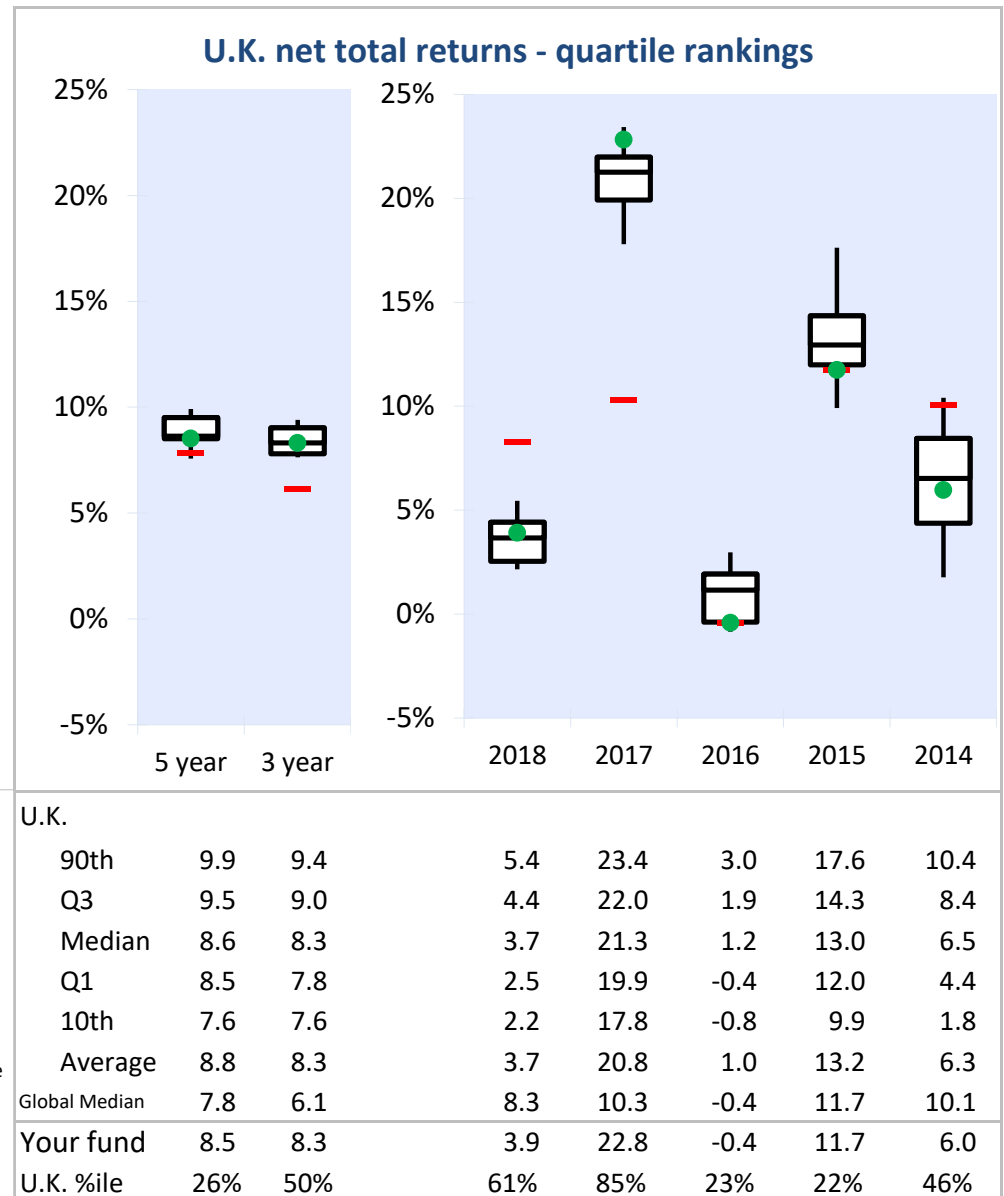
Your 5-year net total return of 8.5% was close to the U.K. median of 8.6% and above the Global median of 7.8%.

Total returns, by themselves, provide little insight into the reasons behind relative performance. Therefore, we separate total return into its more meaningful components:

- Strategic asset mix return: The return from strategic asset allocation decisions. These decisions are typically made by the local Pensions Committee.
- Value added: A function of active management decisions, including tactical asset allocation, manager selection, stock selection, etc. These 'implementation' decisions tend to be made by management (increasingly within pools in England and Wales).

These are discussed on the pages that follow.

Global return comparisons have been particularly influenced by the relative strength of the \$US over the period covered by this report and by the depreciation of the £ in 2016/17, i.e. there is some currency 'noise' in the global comparison.

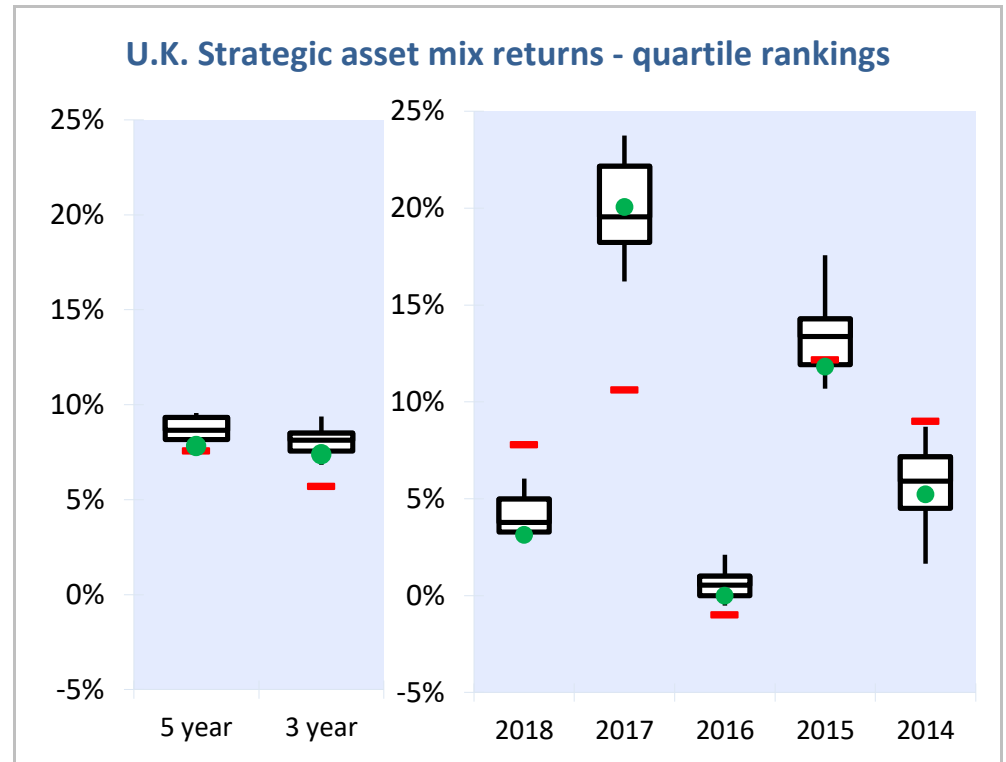


Your 5-year strategic asset mix return of 7.8% was below the U.K. median of 8.7% and above the Global median of 7.6%.

Your strategic asset mix return is the return you could have earned passively by indexing your investments according to your strategic asset mix. The strategic asset mix return is typically the most significant driver of total returns.

Having a higher or lower relative strategic asset mix return is not necessarily good or bad. Your strategic asset mix return reflects your asset mix which in turn reflects your funding position, long-term capital market expectations, liabilities, employer covenant and appetite for risk.

Each of these factors is different across funds. Therefore, it is not surprising that strategic asset mix returns often vary widely between funds. In the following page we explore how your asset mix impacts your strategic asset mix returns relative to peers.



Legend		U.K.							
90th		90th	9.6	9.4	6.0	23.7	2.1	17.6	8.7
75th		Q3	9.3	8.5	5.0	22.2	1.0	14.3	7.2
median		Median	8.7	8.1	3.8	19.6	0.5	13.4	5.9
25th		Q1	8.2	7.6	3.3	18.2	0.0	11.9	4.5
10th		10th	7.7	6.8	2.8	16.2	-0.5	10.7	1.6
		Average	8.6	8.1	4.1	19.9	0.7	13.5	5.7
● your value		Global Median	7.6	5.7	7.8	10.6	-1.0	12.2	9.0
— Global med		Your fund	7.8	7.4	3.1	20.1	0.0	11.8	5.2
		U.K. %ile	11%	18%	21%	58%	27%	22%	35%

Differences in strategic asset mix return are caused by differences in benchmarks and asset mix.

Your 5-year strategic asset mix return was below the U.K. median primarily because of:

- The choice of private equity benchmarks within your pool. Some are using fixed or cash-based benchmarks.
- At an aggregate level your pool has had a higher weight to U.K. stock compared to the U.K. average. You had 27% allocated to U.K. stock versus a U.K. average of 15% over a period of time where U.K. stock underperformed other public equity markets in particular.

	5-Year average strategic asset mix ¹			5-year bmk. return	
	Your Fund	U.K. Avg.	More/ Less	Your Fund	U.K. Avg.
Asia-Pacific Stock	8%	3%	5%	9.2%	9.0%
U.K. Stock	27%	15%	12%	6.6%	7.0%
Europe exUK Stock	9%	4%	6%	10.0%	9.3%
U.S. Stock	10%	5%	4%	14.6%	13.9%
Emerging Market Stock	5%	4%	2%	8.2%	6.8%
Global Stock	1%	24%	-23%	n/a ³	10.5%
Other Stock ²		3%	-3%		n/a ³
Total Stock	60%	57%	3%	9.1%	9.7%
Fixed Income - UK	2%	4%	-3%	4.6%	5.0%
Fixed Income - UK Gov't	4%	1%	3%	4.3%	5.7%
Fixed Income - UK Credit	4%	1%	3%	3.5%	4.8%
Inflation Indexed Bonds	5%	5%	0%	6.9%	7.8%
Global Bonds	3%	6%	-3%	3.2%	2.2%
Cash	3%	1%	3%	0.3%	0.3%
Other Fixed Income ²	1%	3%	-2%	n/a ³	n/a ³
Total Fixed Income	21%	20%	1%	4.0%	4.6%
Hedge Funds	2%	2%	0%	3.4%	2.9%
Balanced Funds		2%	-2%		7.3%
Infrastructure	3%	3%	-1%	3.1%	4.5%
Global Property ex-listed	2%	4%	-2%	10.4%	10.6%
Domestic Property	6%	5%	1%	7.4%	10.2%
Other Real Assets ²	1%	1%	0%	n/a ³	n/a ³
Private Equity	5%	5%	0%	4.0%	16.4%
Total	100%	100%	0%		

1. 5-year weights are based only on plans with 5 years of continuous data.

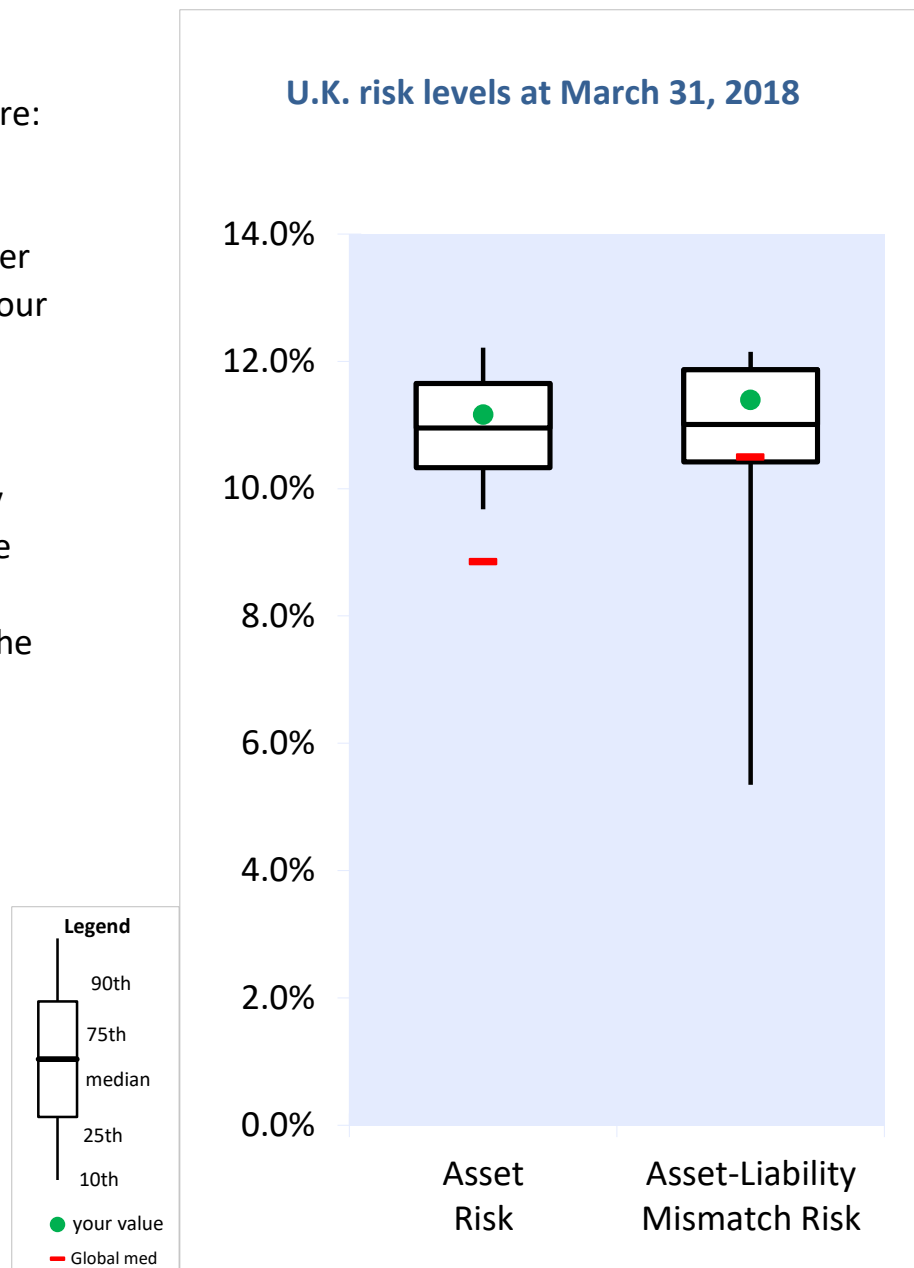
2. Other stock includes Canadian, EAFE and ACWIxUS stock. Other fixed income includes Canada, U.S., long bonds and EAFE bonds. Other real assets includes commodities, natural resources and REITS.

3. A value of 'n/a' is shown if asset class return are not available for the full 5 years or if they are broad and incomparable.

Your strategic asset allocation is largely a function of your appetite for risk.

The two key risks for the Pension Committee to consider are:

- **Asset Risk** - A higher asset risk is indicative of a higher weighting to more volatile assets (and vice-versa). Your asset risk of 11.2% was above the U.K. median of 11.0%.
- **Asset-liability mismatch risk** - A higher asset-liability mismatch risk is indicative a willingness to take more risk to improve the funding level. Lower asset risk is indicative of either better funding, concerns about the employer covenant or a desire for stability in contributions. A lower asset-liability mismatch risk means you are closer to a 'fully-matched' position. Your asset-liability risk of 11.4% was above the U.K. median of 11.0%.

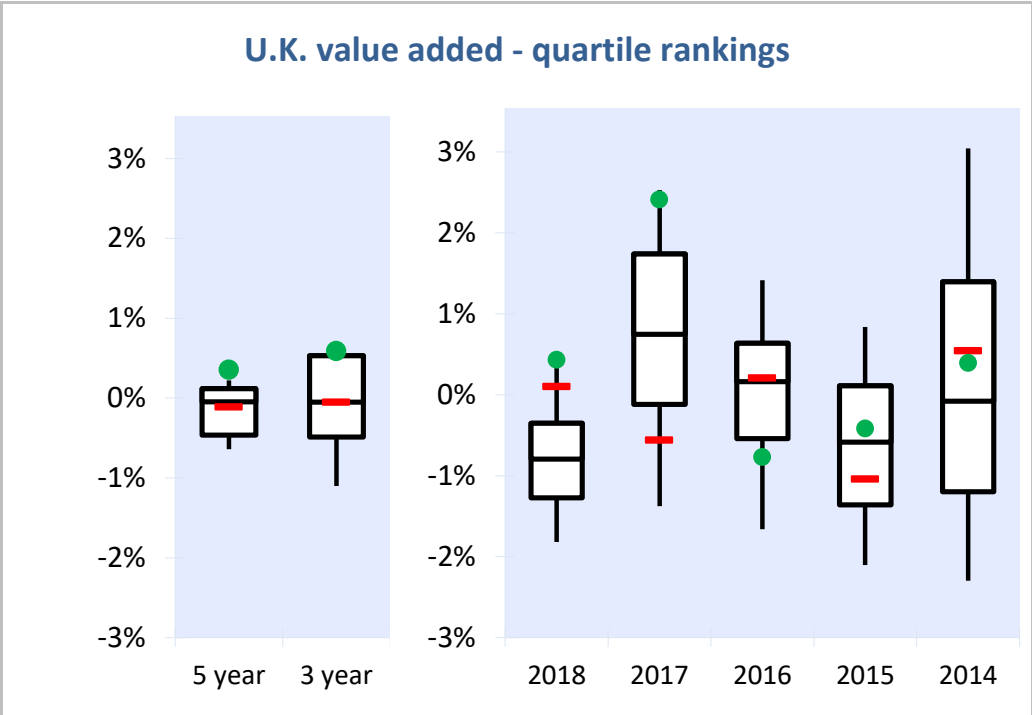


Net value added is the component of total return from active management. This is typically the responsibility of management (increasingly within pools in England and Wales). Your 5-year net value added was 0.7%.

Net value added equals total net return minus strategic asset mix return.

It is a function of active management decisions which includes tactical asset allocation, manager selection, stock selection, choice of benchmarks, hedging, overlays, etc.

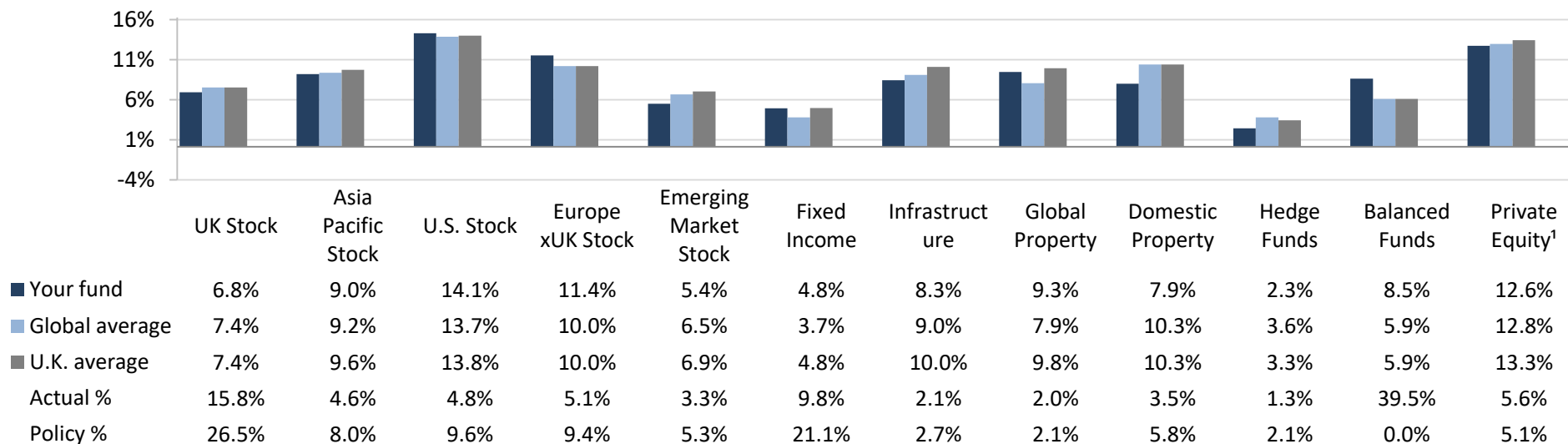
Your 5-year net value added of 0.7% compares to a median of 0.3% for the U.K. universe and 0.2% globally.



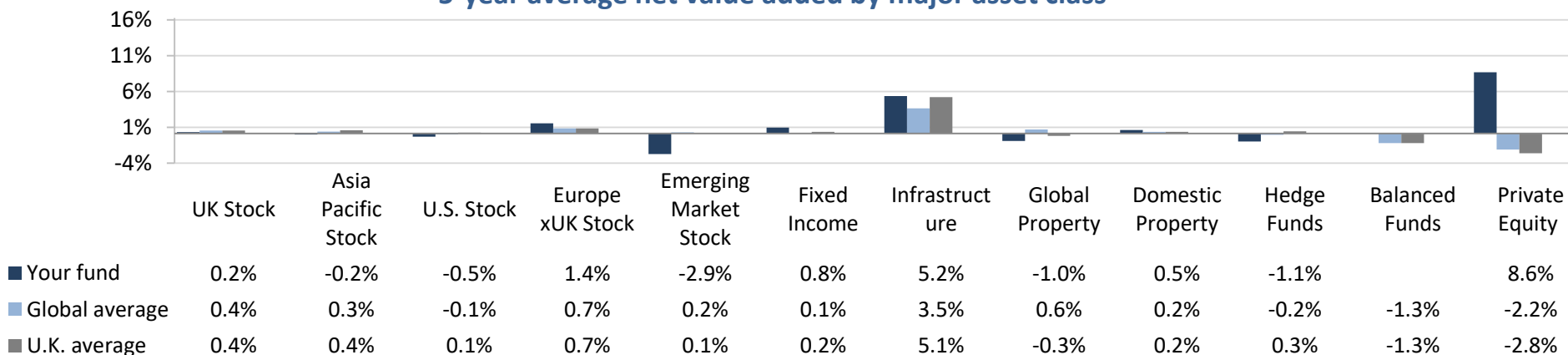
Legend		U.K.								
	90th	0.6	1.0	0.9	2.9	1.8	1.2	3.4		
	75th	0.5	0.9	0.0	2.1	1.0	0.5	1.7		
	Median	0.3	0.3	-0.4	1.1	0.5	-0.2	0.3		
	25th	-0.1	-0.1	-0.9	0.2	-0.2	-1.0	-0.9		
	10th	-0.3	-0.8	-1.5	-1.0	-1.3	-1.8	-1.9		
	Average	0.2	0.2	-0.5	0.9	0.4	-0.3	0.6		
	Global Median	0.2	0.3	0.5	-0.2	0.6	-0.7	0.9		
	Your fund	0.7	0.9	0.8	2.8	-0.4	-0.1	0.7		
	U.K. %ile	100%	86%	86%	81%	15%	58%	55%		

Here is how your net returns and net value added compare.

5-year average net return by major asset class



5-year average net value added by major asset class



We compare your costs to the following custom peer group:

- 21 Global sponsors from £16.4 billion to £65.1 billion
 - Median size of £44.7 billion versus your £44.3 billion
- Peers are selected based on size (because size impacts costs) and to include both LGPS and non-LGPS funds (to help you understand how your costs compare with a broad cross-section of funds).

LGPS Pools/Funds

Border to Coast Pool
Central Pool
Northern LGPS
Strathclyde Pension Fund
Welsh Pool

UK Peers

BT Pension Scheme Management
Lloyds Number 1
Shell Contributory Pension Fund
Universities Superannuation Scheme Ltd.

AustralianSuper

European

BPF voor de Bouwnijverheid
Pensioenfonds Metalektro
Keva
Varma Mutual Pension Insurance Company

Canada

Alberta Investment Management (Total Fund)
Healthcare of Ontario
Ontario Municipal Employees Ret. Sys.

United States

General Motors Corp.
Oregon Public Employees Retirement Fund
Regents of the University of California
STRS Ohio

The names of the above fund sponsors in your peer group are confidential and may not be disclosed to third parties.

We are benchmarking investment costs of £197.3 million or 45.4 basis points in 2017/18.

Asset management costs by asset class and style (£000s)	Internal Mgmt		External Management			Total
	Active	Overseeing of external	Passive fees	Active base fees	Perform. fees ²	
Equity, Fixed Income, Cash and Balanced Funds	4,473	470	2,380	33,569		40,893
Hedge Fund - External Not Fund of Fund		51		2,697	2,298	5,047
Hedge Fund - FoFs		49		2,082	1,013	3,143
Global Property ¹	3	222		4,224	26	4,474
Global Property - LPs ¹		74		10,704	665	11,443
Global Property - FoFs		9		587	369	965
Infrastructure ¹	1,909					1,909
Infrastructure - LPs ¹		257		15,338	8,780	24,374
Domestic Property	526	23		4,787	331	5,667
Other Real Assets		27		4,748	2,185	6,960
Diversified Private Equity - LPs ¹		400		24,336	16,922	41,657
Diversified Private Equity - FoFs		145		18,711	15,706	34,561
Other Private Equity - LPs ¹		148		7,562	4,048	11,758
Derivatives/Overlays			150	1		151
Total						193,003 44.4bp
Oversight, custodial and other costs ³						
Oversight of the fund						2,172
Trustee & custodial						1,083
Consulting and performance measurement						831
Audit						122
Other						77
Total oversight, custodial & other costs						4,285 1.0bp
Total investment costs (excl. transaction costs)						197,288 45.4bp

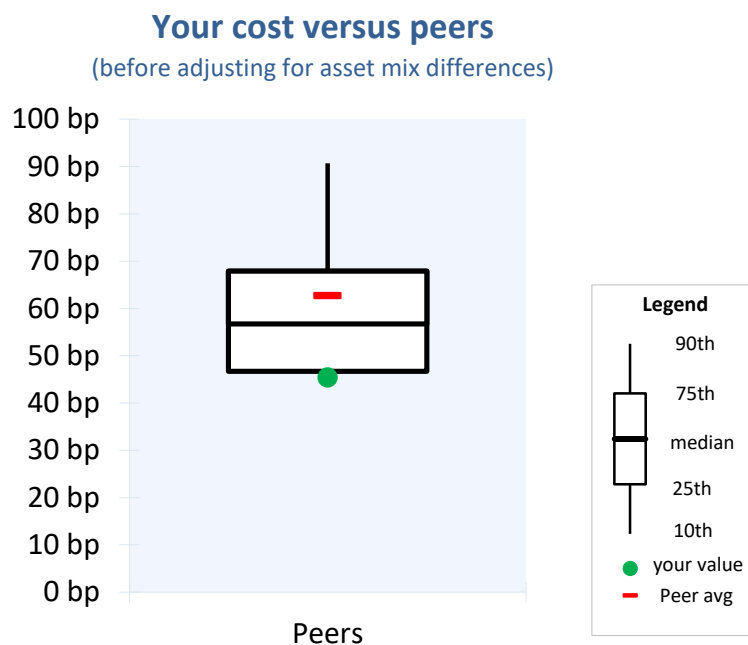
Footnotes

1. Default costs have been added at an individual fund level where the fund was unable to supply costs, or where costs provided were outside our acceptable range and where the fund was unable to substantiate those costs. The individual defaults are too numerous to list here but are most prevalent in private equity and in fund-of-fund structures in all private market asset classes.
2. Total cost includes carry/performance fees for all asset classes.
3. Excludes pension administration costs.

Your cost of 45.4 bps was below your benchmark cost of 50.0 bps.

Comparison of costs before adjusting for asset mix:

Before adjusting for differences in asset mix, your costs of 45.4 bps were 11.4 bps below the peer median of 56.7 bps.



Comparison of costs after adjusting for asset mix:

To calculate a benchmark cost we apply peer median costs at an asset class level to your asset mix (i.e., we adjust for differences in asset mix).

Your cost versus benchmark

(after adjusting for asset mix differences)

	£000s	basis points
Your total investment cost	197,288	45.4 bp
Your benchmark cost	217,272	50.0 bp
Your excess cost	(19,984)	(4.6) bp

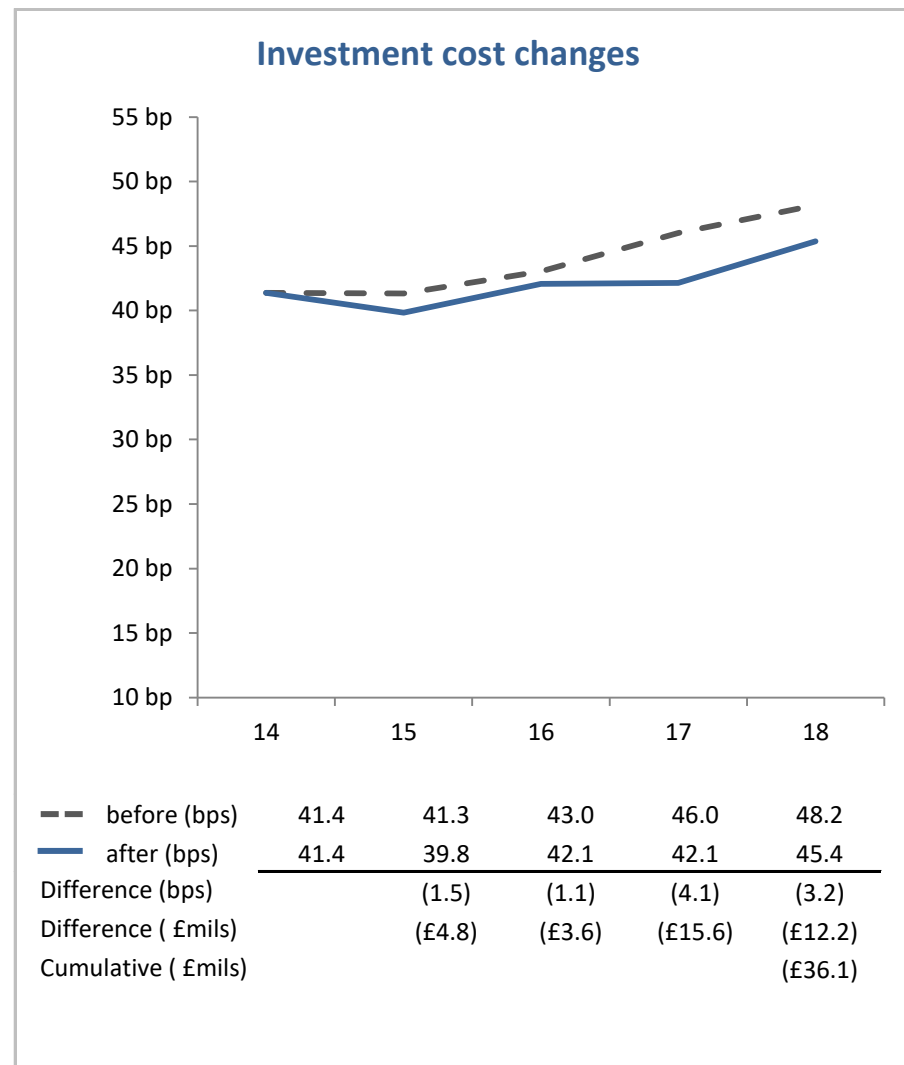
Your fund was slightly low cost because you paid slightly less than peers for similar services. These savings were partly offset by your higher cost implementation style.

Reasons for your low cost status

	Excess Cost/ (Savings)	
	£000s	bps
1. Higher cost implementation style		
• Use of active management vs. lower cost passive	6,136	1.4
• More external management vs. lower cost internal	10,885	2.5
• More partnerships as a percentage of external	7,096	1.6
• Use of fund of funds	394	0.1
• Less overlays	(2,062)	(0.5)
	<u>22,449</u>	<u>5.2</u>
2. Paying less than peers for similar services		
• External investment management costs	(39,500)	(9.1)
• Internal investment management costs	(657)	(0.2)
• Oversight, custodial & other costs	(2,277)	(0.5)
	<u>(42,434)</u>	<u>(9.8)</u>
Total savings	(19,984)	(4.6)

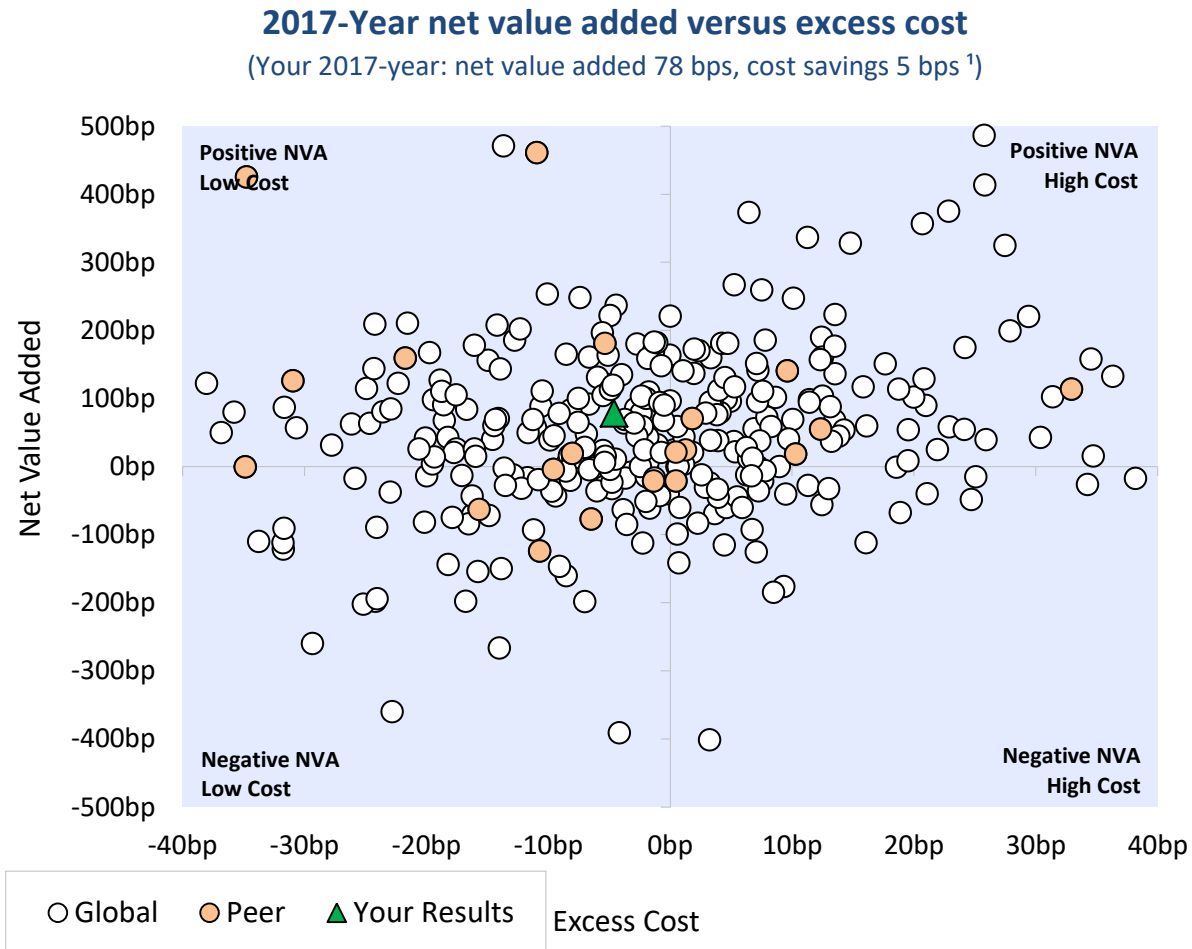
Your cost increased from 41.4 bps in 2013/14 to 45.4 bps in 2017/18.

	Bps	£000s
Investment cost reported in 2013	39.2 bp	£110,947
Impact of methodology changes ¹		
• Inclusion of hedge fund performance fees	2.2 bp	£9,605
• Inclusion of private market performance fees	0.0 bp	£0
Restated costs for 2013 ¹	41.4 bp	£120,552
Impact of changes in assets and asset mix		
• Increase in assets ²	n/a	£59,311
• Higher cost asset mix	6.8 bp	£29,677
• Reduced use of overlays	(0.0) bp	£-80
Cost after asset mix impact	48.2 bp	£209,461
Impact of changes within the same asset classes		
• More passive (less active)	(0.6) bp	
• More external management (vs. internal)	1.5 bp	
• Less fund-of-funds management	(0.7) bp	
Higher/-lower fees for:		
• Stock and fixed Income	(0.5) bp	
• Private markets and hedge funds:		
Lower base fees	(6.8) bp	
Higher performance fees	4.5 bp	
• Lower oversight and other changes	(0.6) bp	
Total changes within the same asset classes	(3.2) bp	£-13,903
Investment cost in 2017	<u>45.4 bp</u>	<u>£197,288</u>

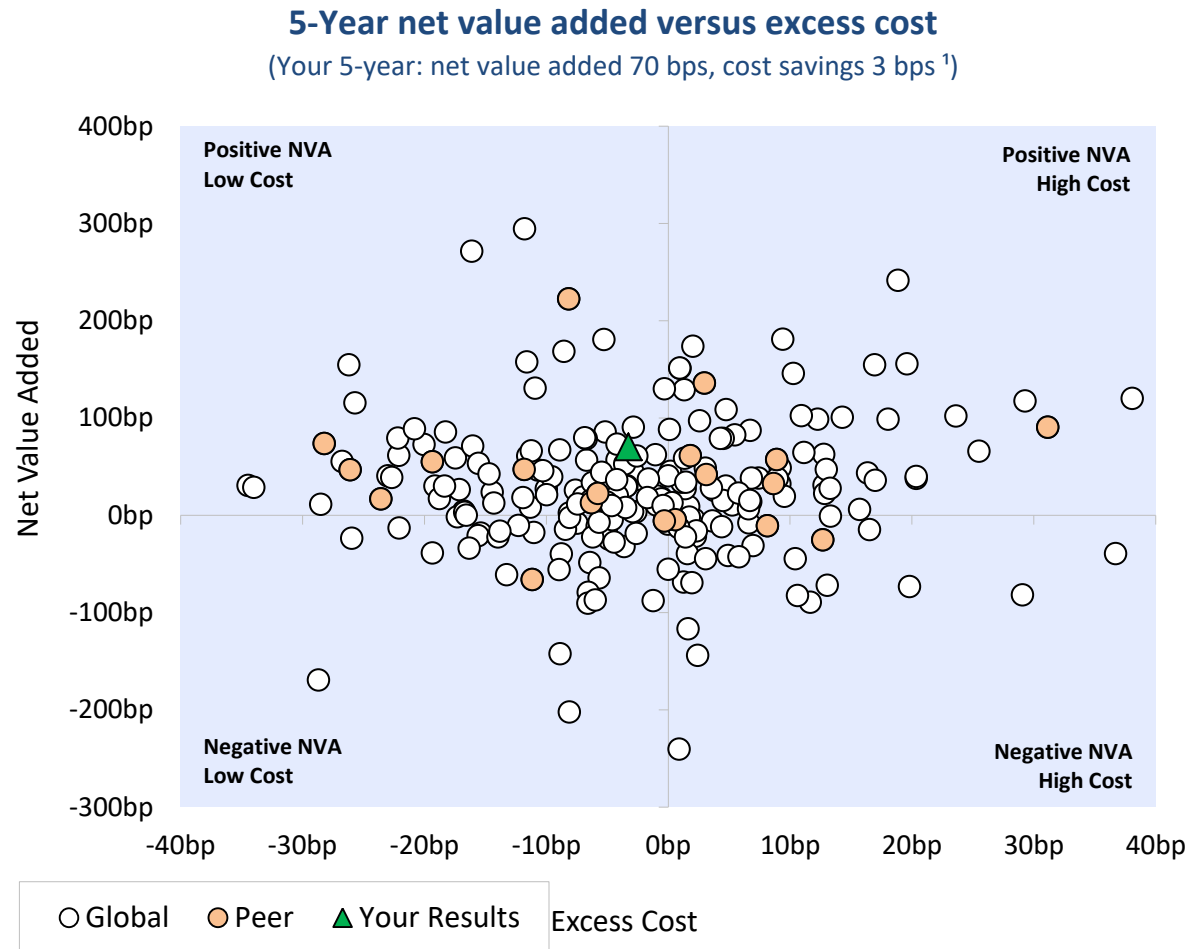


1. To enable a meaningful comparison, we have adjusted your reported 2013 cost to allow for the fact that we started to collect more costs at a later date. The reported cost is increased as if you were paying the same amount in bps in 2013 for each asset class. For example, we started to collect hedge fund performance fees in 2014. If your hedge fund performance fees were 50 bps at that time, then we assume you were paying 50 bps in 2013 and that your 'implementation style' was
2. Assumes all costs increase in line with the value of assets.

Your 2017/18 performance placed in the positive value added, low cost quadrant of the cost effectiveness chart.



Your 5-year performance placed in the positive value added, low cost quadrant of the cost effectiveness chart.



1. Your 5-year cost savings of 3 basis points is the average of your cost savings for the past 5 years. Cost savings before 2016/17 are calculated using regression analysis which suggests a benchmark cost for a fund of your size and with your assets. The explanatory power of the regression is good but not perfect and is not as robust as a peer based benchmark. For this reason the 5-year cost analysis in the scatter graph needs to be interpreted cautiously (though the net value added is robust and based on comparable data).

Key takeaways

Returns

- Your 5-year net total return was 8.5%. This was close to the U.K. median of 8.6% and above the global median of 7.8%.
- Your 5-year strategic asset mix return was 7.8%. This was below the U.K. median of 8.7% and above the global median of 7.6%.

Risk

- Your asset risk of 11.2% was above the U.K. median of 11.0%.
- Your asset-liability risk of 11.4% was above the U.K. median of 11.0%.

Value added

- Your 5-year net value added was 0.7%. This was above the U.K. median of 0.3% and above the global median of 0.2%.

Cost

- Your investment cost of 45.4 bps was below your benchmark cost of 50.0 bps. This suggests that your fund was slightly low cost compared to your peers.
- Your fund was slightly low cost because you paid slightly less than peers for similar services. These savings were partly offset by your higher cost implementation style.
- Your cost increased from 41.4 bps in 2013/14 to 45.4 bps in 2017/18.
- Your costs increased because of asset mix changes. These increases were largely offset by a more efficient implementation approach. In particular, base fees for private assets fell in the later period.