

**Investment  
Benchmarking Analysis**  
(for the 5-year period ending December 31, 2023)

**UNJSPF**



# Key Takeaways

## Returns

- Your 5-year net total return was 7.9%. This was above both the Global median of 6.8% and the peer median of 7.3%.
- Your 5-year policy return was 7.5%. This was above both the Global median of 6.3% and the peer median of 6.5%.

## Value added

- Your 5-year net value added was 0.3%. This was slightly below the Global median of 0.6% and below the peer median of 1.1%.

## Cost

- Before adjusting for asset mix differences, your total investment cost of 31.6 bps was below the peer median of 47.7 bps.
- Your investment cost of 31.6 bps was above your benchmark cost of 30.4 bps. Your fund was slightly above benchmark cost because it had a higher cost implementation style. This added cost was mostly offset by paying less than peers for similar services.
- Your costs increased by 4.7 bps, from 26.9 bps in 2019 to 31.6 bps in 2023, primarily because you had a higher cost asset mix. This was partly offset by paying less in total for similar investment styles.

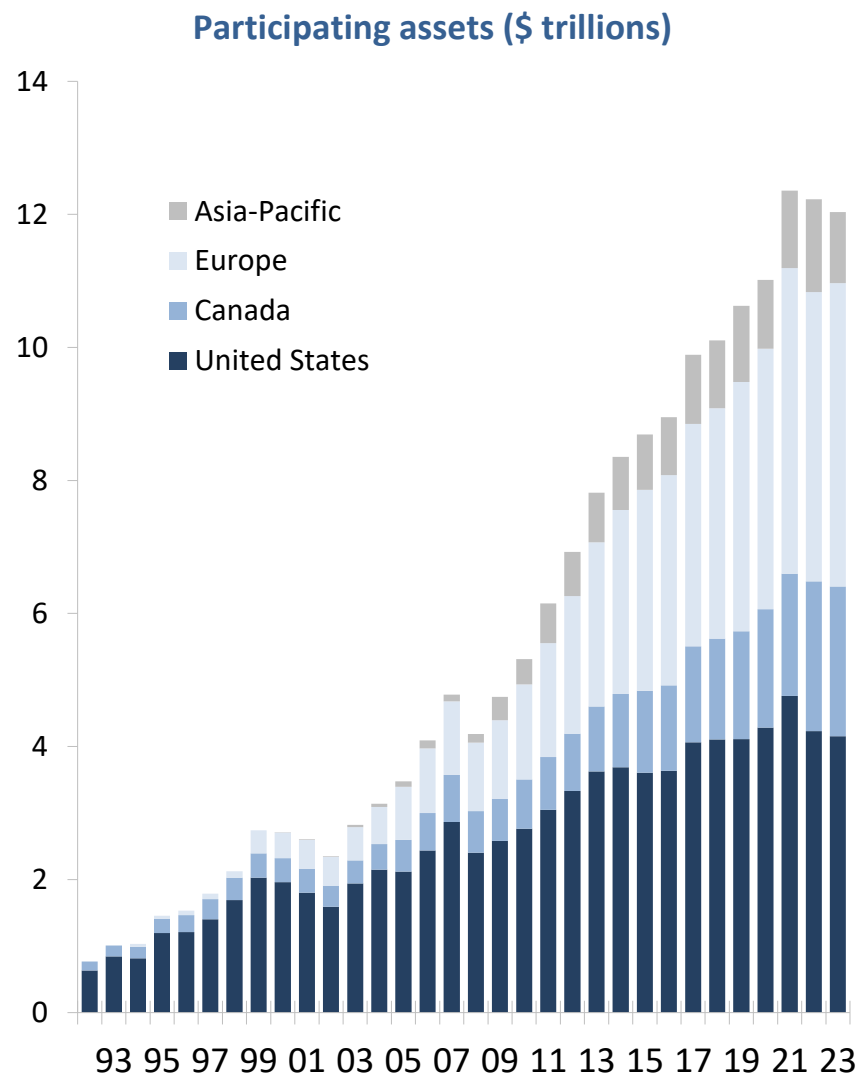
## Risk

- Your asset risk of 10.9% was above the Global median of 9.4%. Your asset-liability risk of 12.0% was above the Global median of 9.6%.
- Your 10-year realized Sharpe ratio of 0.4 was below the Global median of 0.6. Your 10-year surplus Sharpe ratio of 0.3 was below the Global median of 0.3.

## This benchmarking report compares your cost and performance to the 281 funds in CEM's extensive pension database.

- 143 U.S. pension funds participate. The median U.S. fund had assets of \$9.4 billion and the average U.S. fund had assets of \$29.0 billion. Total participating U.S. assets were \$4.2 trillion.
- 65 Canadian funds participate with assets totaling \$2.3 trillion.
- 63 European funds participate with aggregate assets of \$4.6 trillion. Included are funds from the Netherlands, Norway, Sweden, Finland, Ireland, Denmark and the UK.
- 6 Asia-Pacific funds participate with aggregate assets of \$1.1 trillion. Included are funds from Australia, New Zealand and South Korea.
- 4 funds from other regions participate.

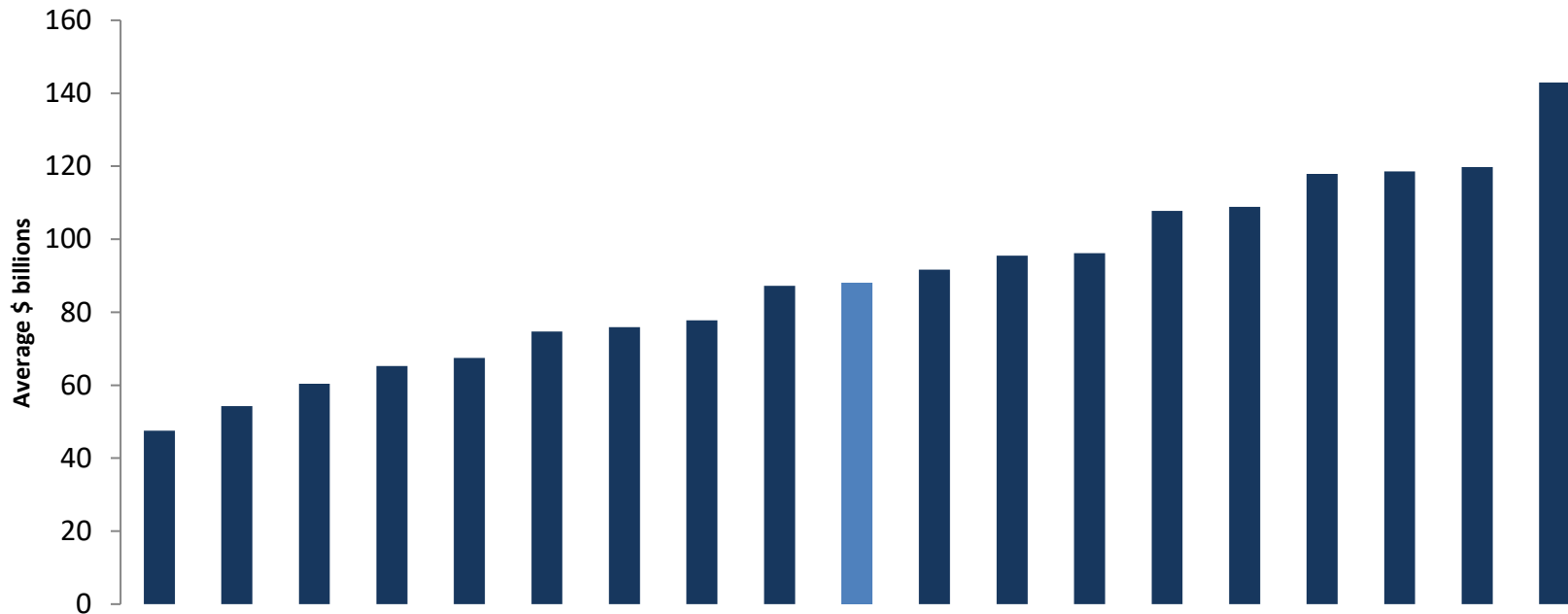
The most meaningful comparisons for your returns and value added are to the Global universe, which consists of 281 funds. The Global universe assets totaled \$12.2 trillion and the median fund had assets of \$9.8 billion.



# The most valuable comparisons for cost performance are to your custom peer group because size impacts costs.

## Peer group for UNJSPF

- 19 Global sponsors from \$47.5 billion to \$142.9 billion
- Median size of \$88.1 billion versus your \$88.1 billion



The names of the above fund sponsors in your peer group are confidential and may not be disclosed to third parties. All other information in this report is confidential and may not be disclosed to third parties without the express written mutual consent of CEM Benchmarking Inc and UNJSPF. For some of the peers, 2022 cost data was used as a proxy for 2023.

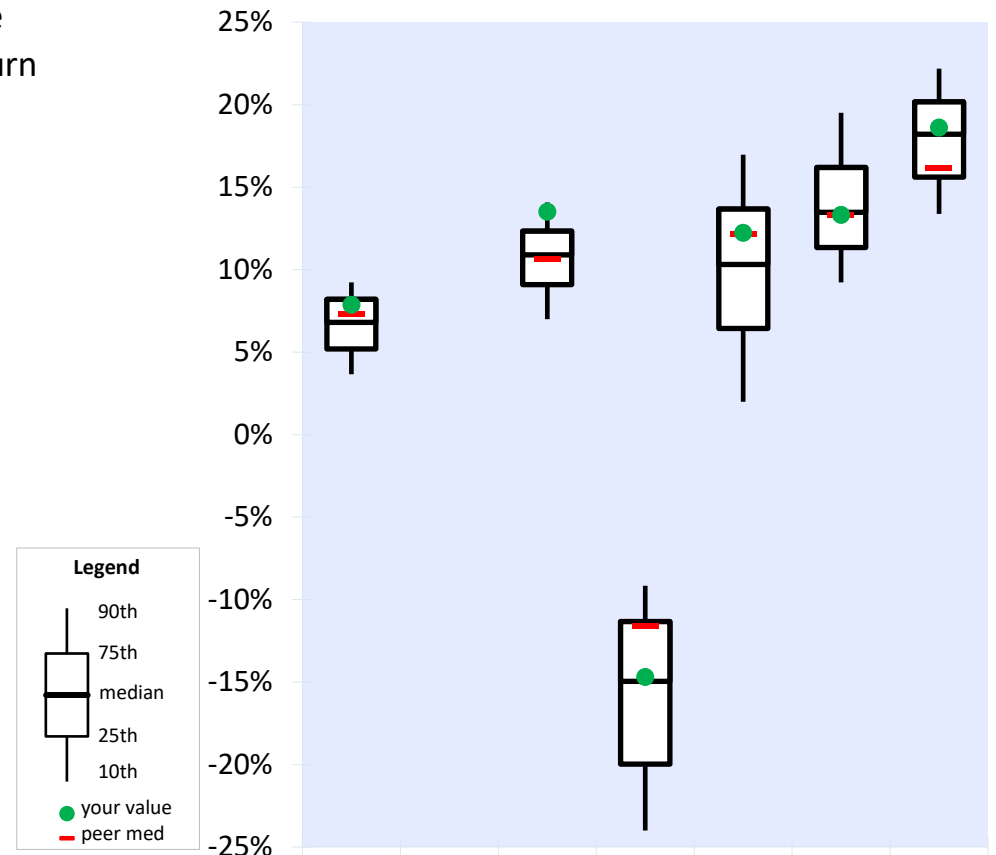
# Your 5-year net total return of 7.9% was above both the Global median of 6.8% and the peer median of 7.3%.

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

	Your 5-year
Net total fund return	7.9%
- Policy return	7.5%
= Net value added	0.3%

This approach enables you to understand the contribution from both policy mix decisions (which tend to be the board's responsibility) and implementation decisions (which tend to be management's responsibility).

Global net total returns - quartile rankings



	5-year	2023	2022	2021	2020	2019
You	7.9%	13.5%	-14.7%	12.2%	13.3%	18.6%
Peer median	7.3%	10.7%	-11.6%	12.2%	13.3%	16.1%
Global median	6.8%	10.9%	-15.0%	10.3%	13.5%	18.2%

Actual and policy returns have been converted to your currency using unhedged currency returns. A currency conversion table is provided in Appendix-B of the report.

# Your 5-year policy return of 7.5% was above both the Global median of 6.3% and the peer median of 6.5%.

Your policy return is the return you could have earned passively by indexing your investments according to your policy mix.

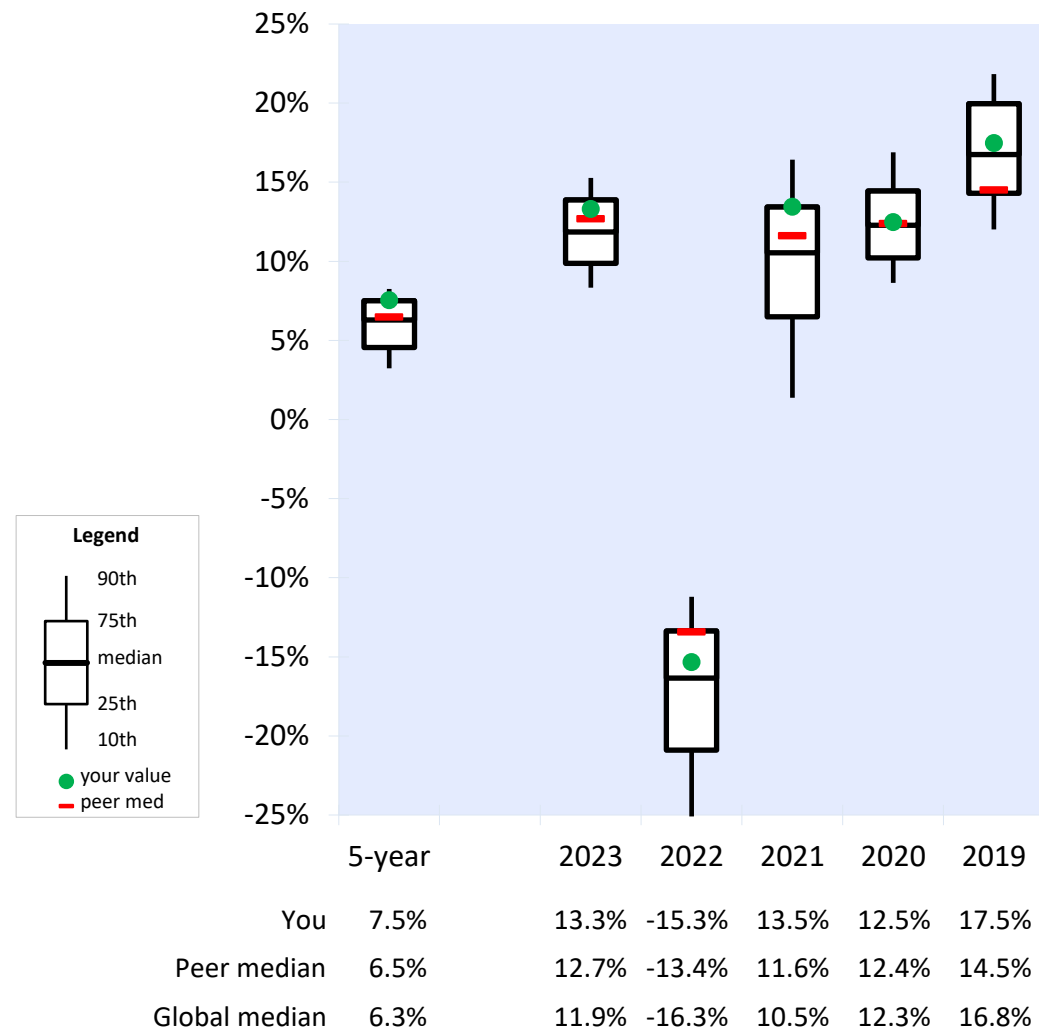
Having a higher or lower relative policy return is not necessarily good or bad. Your policy return reflects your investment policy, which should reflect your:

- Long term capital market expectations
- Liabilities
- Appetite for risk

Each of these three factors is different across funds. Therefore, it is not surprising that policy returns often vary widely between funds.

To enable fairer comparisons, the policy returns of all participants, including your fund, were adjusted to reflect private equity benchmarks based on lagged, investable, public-market indices. Prior to this adjustment, your 5-year policy return was 8.0%, 0.4% higher than your adjusted 5-year policy return of 7.5%. Mirroring this, your 5-year total fund net value added would be 0.4% lower.

Global policy returns - quartile rankings



## Differences in policy return are caused by differences in policy mix and benchmarks.

### Policy asset mix

Asset class	Your fund					Peer avg. 2023	Global avg. 2023
	2019	2020	2021	2022	2023		
Stock - Europe	10%	9%	8%	9%	8%	3%	1%
Stock - Asia-Pacific	6%	5%	4%	5%	5%	1%	0%
Stock - U.S.	29%	30%	31%	32%	34%	12%	8%
Stock - Emerging	12%	12%	11%	6%	6%	3%	2%
Stock - Global	0%	0%	0%	0%	0%	13%	15%
Other Stock <sup>1</sup>	2%	2%	1%	0%	0%	6%	9%
<b>Total Stock</b>	<b>58%</b>	<b>57%</b>	<b>56%</b>	<b>51%</b>	<b>52%</b>	<b>38%</b>	<b>35%</b>
Fixed income - U.S.	10%	10%	10%	19%	20%	7%	8%
Fixed income - Emerging	4%	4%	4%	1%	1%	1%	1%
Fixed income - Public mortgages	15%	15%	14%	9%	8%	1%	0%
Cash	1%	1%	1%	2%	2%	-1%	0%
Other Fixed Income <sup>1</sup>	0%	0%	0%	0%	0%	19%	31%
<b>Total Fixed Income</b>	<b>30%</b>	<b>30%</b>	<b>30%</b>	<b>31%</b>	<b>31%</b>	<b>28%</b>	<b>40%</b>
Hedge funds	0%	0%	0%	0%	0%	2%	2%
Real estate incl. REITs	7%	7%	7%	9%	8%	11%	8%
Other Real Assets <sup>1</sup>	0%	0%	0%	0%	0%	6%	5%
Private equity - Aggregate	5%	6%	7%	8%	9%	11%	7%
Private debt - Aggregate	0%	0%	0%	0%	0%	4%	4%
<b>Total</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>

1. Other stock includes: Stock - EAFE and Stock - ACWI x U.S.. Other fixed income includes: Fixed income - Canada, Fixed income - Long bonds, Fixed income - Inflation indexed, Fixed income - EAFE, Fixed income - Global and Fixed income - Bundled LDI. Other real assets include: Commodities, Natural resources and Infrastructure.

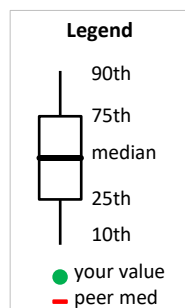
# Net value added is the component of total return from active management. Your 5-year net value added was 0.3%.

Net value added equals total net return minus policy return.

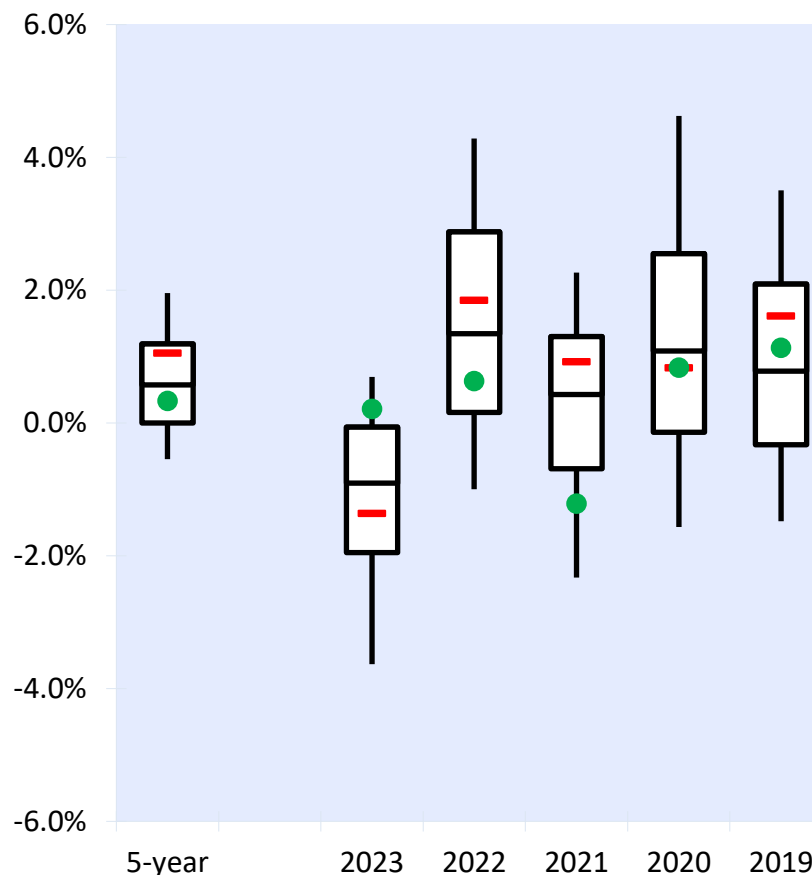
## Value added for UNJSPF

Year	Net return	Policy return	Net value added
2023	13.5%	13.3%	0.2%
2022	-14.7%	-15.3%	0.6%
2021	12.2%	13.5%	-1.2%
2020	13.3%	12.5%	0.8%
2019	18.6%	17.5%	1.1%
5-Year	7.9%	7.5%	0.3%

Your 5-year net value added of 0.3% compares to a median of 1.1% for your peers and 0.6% for the Global universe.



## Global net value added - quartile rankings



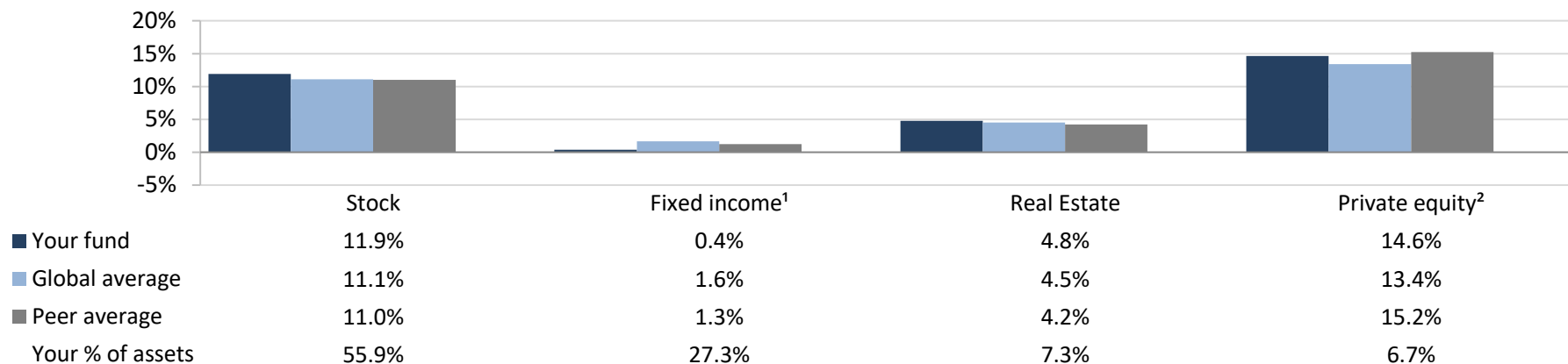
You	0.3%	0.2%	0.6%	-1.2%	0.8%	1.1%
Peer median	1.1%	-1.4%	1.9%	0.9%	0.8%	1.6%
Global median	0.6%	-0.9%	1.3%	0.4%	1.1%	0.8%

To enable fairer comparisons, the value added for each participant including your fund was adjusted to reflect private equity benchmarks based on lagged, investable public market indices. Prior to this adjustment, your fund's 5-year total fund net value added was -0.1%.

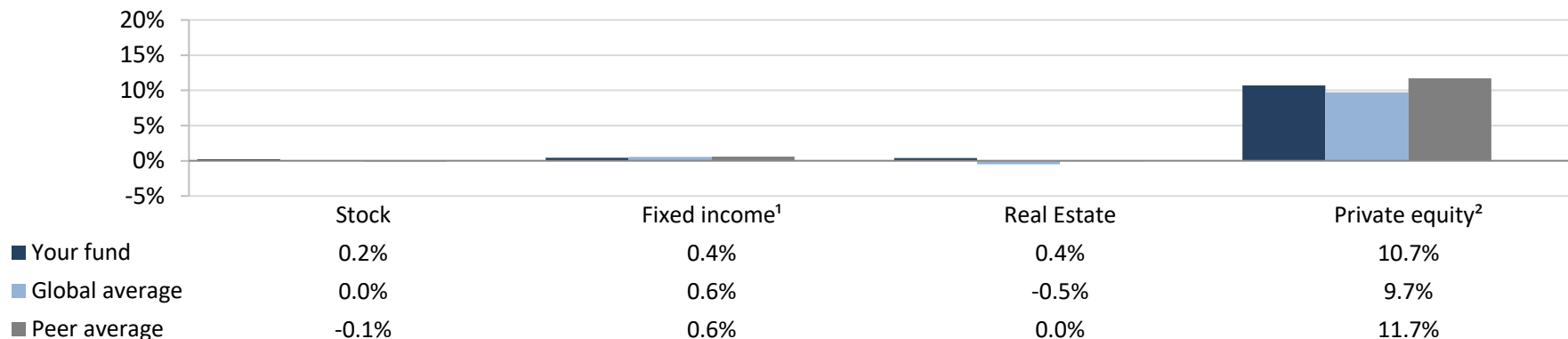


# Comparisons of your 5-year net return and net value added by major asset class:

## 5-year average net return by major asset class



## 5-year average net value added by major asset class



1. Excludes cash and leverage.

2. To enable fairer comparisons, the private equity benchmarks of all participants, including your fund were adjusted to reflect lagged, investable, public-market indices. Prior to this adjustment, your fund's 5-year private equity net value added was 0.9%.

## Your investment costs, excluding private asset performance fees, were \$278.1 million or 31.6 basis points in 2023.

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 <sup>1</sup>	
Stock - U.S.	13,278	327		12,941		26,546
Stock - Europe	2,675	109		2,828		5,611
Stock - Asia-Pacific	2,978	18		255		3,251
Stock - Emerging	5,449					5,449
Stock - other	798					798
Fixed income - U.S.	4,559	481	993			6,034
Fixed income - Emerging	720					720
Fixed income - Global	25					25
Fixed income - Public mortgages	4,760					4,760
Cash	754					754
Infrastructure - LP/Value add <sup>1</sup>		1,588		4,736	3,368	6,324
Real estate <sup>1</sup>		930		26,815	1,642	27,745
Real estate - LP/Value add <sup>1</sup>		3,335		67,092	3,692	70,428
Private equity - Diversified - LP/Value add <sup>1</sup>		6,093		104,403	69,846	110,496
Private equity - Diversified - Co-invest. <sup>1</sup>		570		0		570
<b>Total excluding private asset performance fees</b>						<b>269,512</b>
						<b>30.6bp</b>
<b>Oversight, custodial and other costs<sup>2</sup></b>						
Oversight & consulting						4,468
Trustee & custodial						1,228
Other						2,908
<b>Total oversight, custodial &amp; other costs</b>						<b>8,604</b>
						<b>1.0bp</b>
<b>Total investment costs (excl. transaction costs &amp; private asset performance fees)</b>						<b>278,116</b>
						<b>31.6bp</b>

### Footnotes

1. Total cost excludes carry/performance fees for real estate, infrastructure, natural resources and private equity. Performance fees are included for the public market asset classes and hedge funds.

2. Excludes non-investment costs, such as benefit insurance premiums and preparing cheques for retirees.

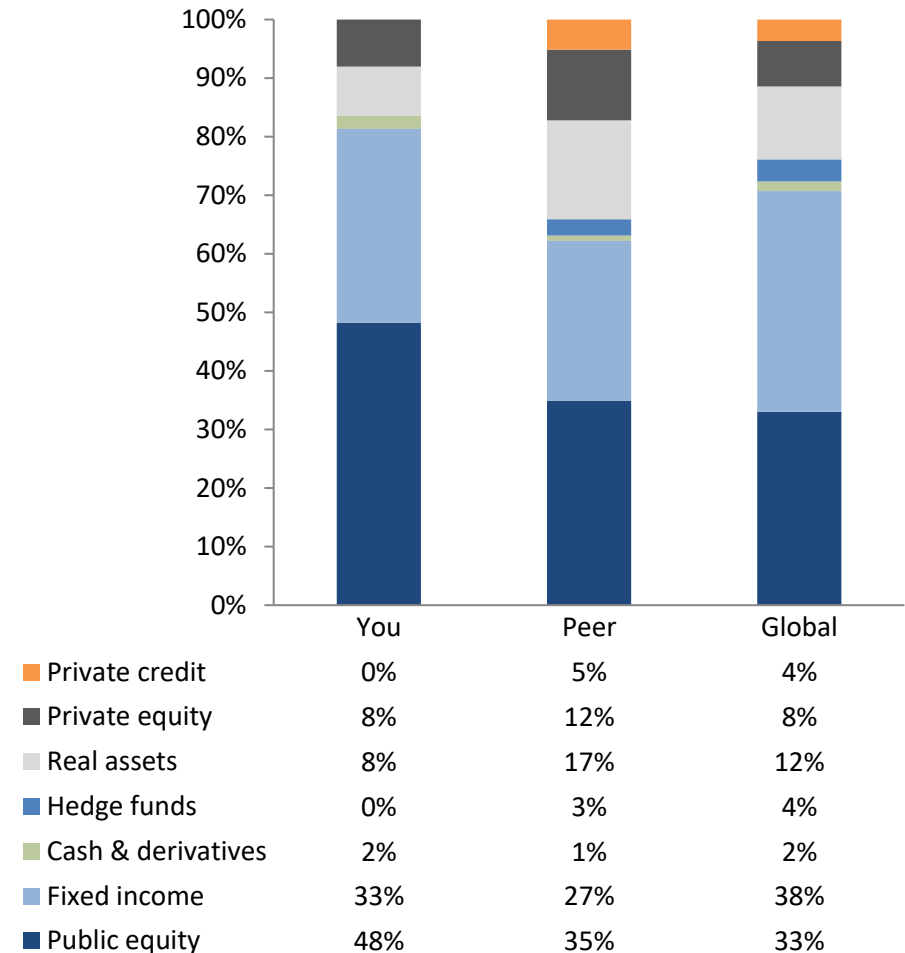
\* Internal FTE and support costs have been allocated to asset classes based on CEM methodology. Refer to Appendix A2 for details.

## High-cost assets equaled 16% of your assets at the end of 2023 versus a peer average of 37%.

Alternative asset classes, such as, real estate (excl. REITs), infrastructure, hedge funds, private equity and private credit are typically higher cost asset classes than public asset classes such as public equity and fixed income. You had a combined public market allocation of 81% at the end of 2023 versus a peer average of 61%.

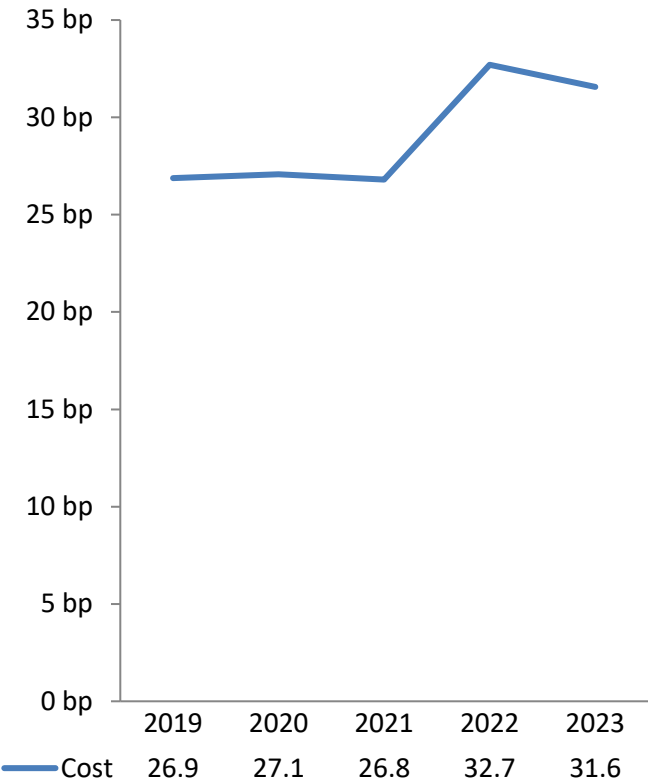
Your alternative asset classes represent 16% of your assets, but 78% of your total costs.

2023 Actual asset allocation



**Your costs increased by 4.7 bps, from 26.9 bps in 2019 to 31.6 bps in 2023, primarily because you had a higher cost asset mix. This was partly offset by paying less in total for similar investment styles.**

Trend in cost



Reasons why your costs increased by 4.7 bps

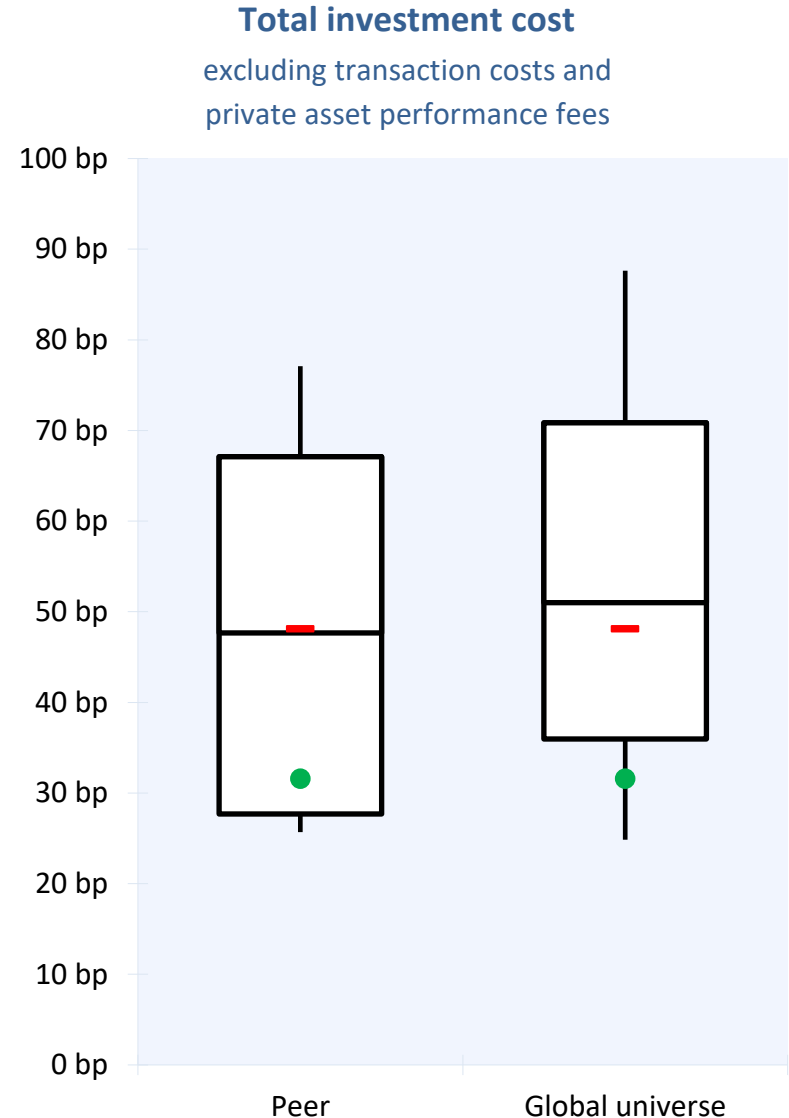
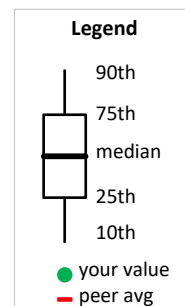
			Impact in bps
1. Higher cost asset mix			
• More Real estate ex-REITs: 2019 9% vs 2023 10%			1.3
• More Private equity: 2019 7% vs 2023 12%			7.2
• All other mix changes			(0.8)
			<hr/> 7.7
2. Lower cost implementation style			(0.7)
3. Paid less in total for similar investment styles	<u>2019 cost</u>	<u>2023 cost</u>	
• Lower Private Equity LP/Value add base fees	150.6 bp	113.5 bp	(4.1)
• Higher Real Estate base fees	76.3 bp	84.5 bp	0.3
• Higher internal investment management costs			1.8
• Lower oversight, custodial & other costs	1.2 bp	1.0 bp	(0.2)
• All other differences			(0.2)
			<hr/> (2.4)
<b>Total increase</b>			<hr/> <b>4.7</b> <hr/>

## Before adjusting for asset mix differences, your total investment cost of 31.6 bps was below the peer median of 47.7 bps.

Differences in total investment cost are often caused by two factors that are often outside of management's control:

- Asset mix - private asset classes are generally more expensive than public asset classes.
- Fund size - bigger funds have advantages of scale.

Therefore, to assess whether your costs are high or low given your unique asset mix and size, CEM calculates a benchmark cost for your fund. This analysis is shown on the following page.



## Benchmark cost analysis suggests that, after adjusting for fund size and asset mix, your fund was slightly above benchmark cost by 1.1 basis points in 2023.

Your benchmark cost is an estimate of what your cost would be given your actual asset mix and the median costs that your peers pay for similar services. It represents the cost your peers would incur if they had your actual asset mix.

Your total cost of 31.6 bp was slightly above your benchmark cost of 30.4 bp. Thus, your excess cost was 1.1 bp.

### Your cost versus benchmark

	\$000s	basis points
Your total investment cost	278,116	31.6 bp
Your benchmark cost	267,988	30.4 bp
Your excess cost	10,127	1.1 bp

**Your fund was slightly above benchmark cost because it had a higher cost implementation style. This added cost was mostly offset by paying less than peers for similar services.**

### Explanation of your cost status

	Excess Cost/ (Savings)	
	\$000s	bps
1. Higher cost implementation style		
• More active management, less lower cost passive	26,145	3.0
• Use of external management vs. lower cost internal	1,792	0.2
• More LPs as a percentage of external	6,257	0.7
• Less fund of funds	(3,787)	(0.4)
• Less co-investment as a percentage of LP/Co	6,976	0.8
• Less overlays	(3,620)	(0.4)
	<u>33,764</u>	<u>3.8</u>
2. Paying less than peers for similar services		
• External investment management costs	(13,239)	(1.5)
• Internal investment management costs	2,184	0.2
• Oversight, custodial & other costs	(12,581)	(1.4)
	<u>(23,636)</u>	<u>(2.7)</u>
<b>Total excess cost</b>	<b>10,127</b>	<b>1.1</b>

## Your implementation style was 3.8 bps higher cost than the peer average.

Implementation style is the way in which your fund implements asset allocation. Each implementation choice has a cost. Your first choice is how much to implement passively or actively. The table below summarizes your aggregate choices versus peers and their cost impact.

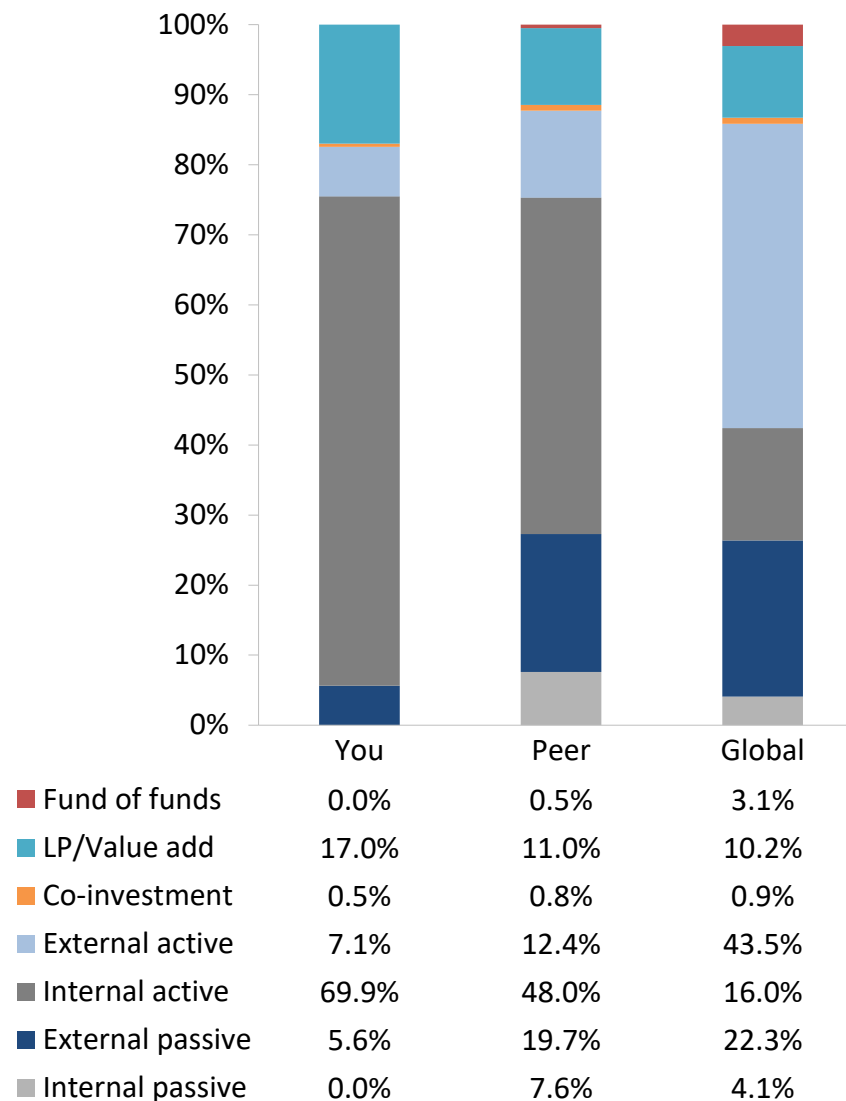
Implementation choices	Impact
More active, less passive	3.0 bp
Less internal as a % of passive	0.0 bp
More internal as a % of active	0.2 bp <sup>2</sup>
More LPs as a % of external	0.7 bp
Less fund of funds	(0.4) bp
Less co-investment as a percentage of LP/Co	0.8 bp
Less overlays	(0.4) bp
<b>Total impact</b>	<b>3.8 bp</b>

The peer and universe style was adjusted to match your asset mix. It equals their average style for each asset class weighted by your fee basis for the asset class. It shows how the average peer would implement your asset mix.

1. Implementation style is shown as a % of total fund fee basis because the fee basis is the primary driver of cost for private assets (e.g., new private equity LP commitments increase costs before LP NAV increases). Style weights are based on average holdings. Cash and derivatives are excluded.

2. Typically, more internal as a % of active is lower cost. But your mix of internal by asset class increased your cost.

Implementation style<sup>1</sup>





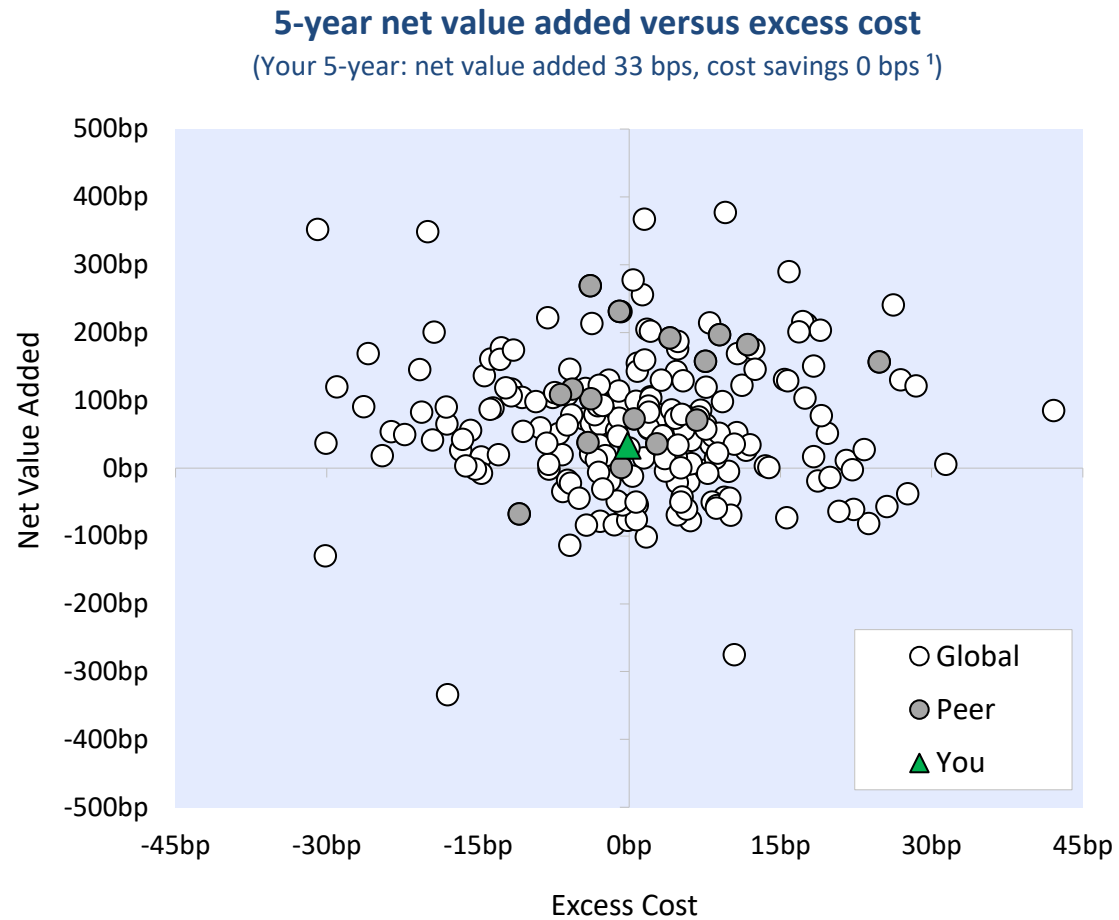
## The table below summarizes why your fund is high/low cost relative to the peer-median by asset class.

### Why are you high/(low) cost by asset class?

Asset class/category	Style weighted cost			Your average assets (or fee basis) <sup>2</sup>	Due to impl. style	Due to paying more/(less)	Total more/(less)
	Your cost	Peer median <sup>1</sup> = Benchmark	More/(less)				
	(A)	(B)	(C = A - B)	(D)			(C x D)
<b>Asset management costs</b>							
Stock - U.S.	10.1 bp	7.9 bp	2.2 bp	26,363	3,755	2,009	5,765
Stock - Europe	9.0 bp	9.2 bp	(0.2) bp	6,264	(296)	158	(138)
Stock - Asia-Pacific	8.2 bp	20.9 bp	(12.7) bp	3,951	(6,546)	1,528	(5,018)
Stock - Emerging	11.7 bp	24.0 bp	(12.3) bp	4,642	(5,698)	0	(5,698)
Stock - other	6.5 bp	6.8 bp	(0.2) bp	1,224	196	(226)	(30)
Fixed income - U.S.	2.8 bp	3.1 bp	(0.3) bp	21,198	(1,682)	1,049	(634)
Fixed income - Emerging	9.0 bp	27.0 bp	(18.1) bp	803	(1,612)	160	(1,452)
Fixed income - Global	8.5 bp	7.3 bp	1.2 bp	29	(2)	6	4
Fixed income - Public mortgages	6.6 bp	7.7 bp	(1.1) bp	7,203	(816)	0	(816)
Cash	3.8 bp	3.8 bp	0.0 bp	1,998	0	0	0
Real estate	114.9 bp	54.5 bp	60.4 bp	8,545	33,464	18,159	51,623
Infrastructure	155.1 bp	59.2 bp	95.9 bp	408	2,970	942	3,912
Private equity - Diversified	109.3 bp	130.1 bp	(20.8) bp	10,164	13,650	(34,841)	(21,191)
Derivatives/Overlays	0.0 bp	0.4 bp	(0.4) bp	88,104	(3,620)	0	(3,620)
Total asset management	30.6 bp	28.0 bp	2.6 bp	88,104	33,764	(11,056)	22,708
<b>Oversight, custody and other costs<sup>3</sup></b>							
Oversight of the Fund	0.5 bp	1.5 bp	(1.0) bp				
Trustee & Custodial	0.1 bp	0.3 bp	(0.2) bp				
Other	0.3 bp	0.1 bp	0.2 bp				
Total oversight, custody & other	1.0 bp	2.4 bp	(1.4) bp	88,104	n/a	(12,581)	(12,581)
<b>Total</b>	<b>31.6 bp</b>	<b>30.4 bp</b>	<b>1.1 bp</b>	<b>88,104</b>	<b>33,764</b>	<b>(23,636)</b>	<b>10,127</b>

1. The weighted peer median cost for asset management is the style-weighted average of the peer median costs for all implementation styles (e.g., internal passive, external active, fund of fund, etc.).
2. Total fund average holdings is used as the base when calculating the relative cost impact of the overlay programs.
3. Benchmarks for oversight total and individual lines are based on peer medians. Sum of the lines may be different from the total.

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



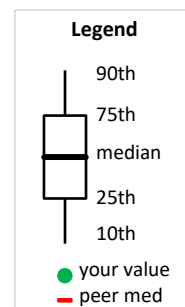
1. Your 5-year savings of 0.2 basis points is the average of your peer-based savings for the past 5 years.

	5-year	2023	2022	2021	2020	2019
Net value added	33.4bp	20.9bp	63.0bp	(121.3) bp	83.6bp	113.2bp
Excess cost	(0.2) bp	1.1bp	(1.3) bp	(0.2) bp	(0.1) bp	(0.3) bp

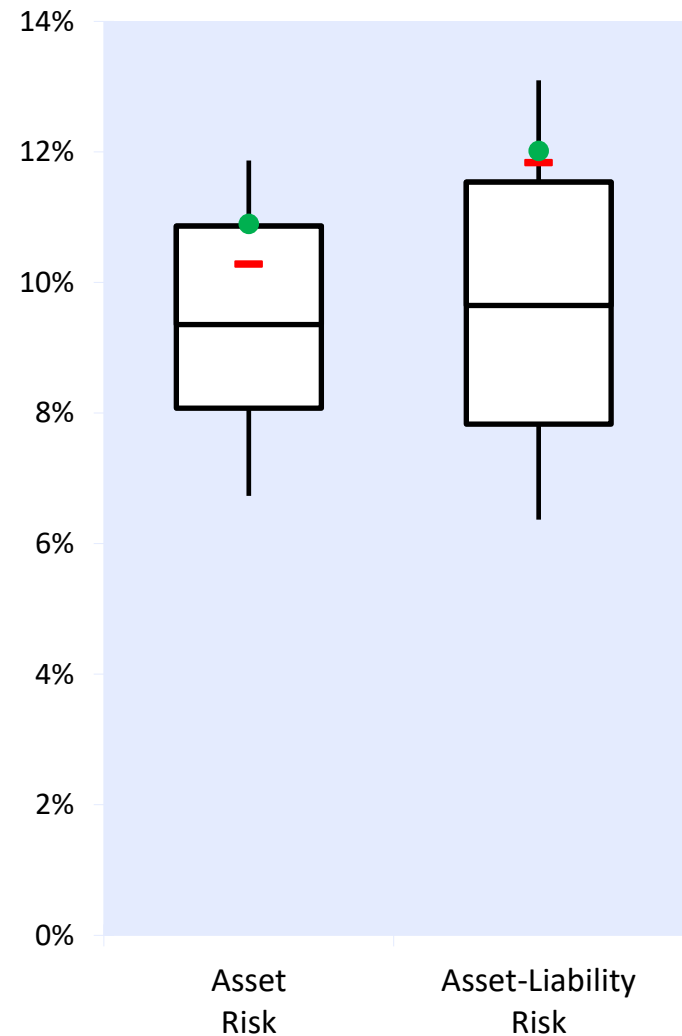
## Your asset risk of 10.9% was above the Global median of 9.4% and your asset-liability risk of 12.0% was also above the Global median of 9.6%.

The asset risk is the standard deviation of your policy mix at the end of the year. Your asset risk is calculated using standard asset class-specific policy benchmarks across all participants. The model uses the historical variance of, and covariance between, the asset classes in your policy mix.

Asset-liability risk is the standard deviation of funded status caused by market factors. It is a function of your asset risk, the standard deviation of your marked-to-market liabilities (i.e. liability returns) and the correlation between the two. The more similar your asset risk is to standard deviation of your liabilities, the lower your asset-liability risk is.



Global risk levels at December 31, 2023



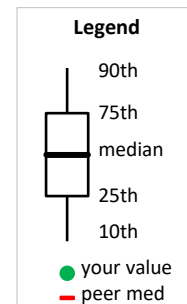
## Your 10-year realized Sharpe ratio of 0.4 was below the Global median of 0.6 and your 10-year surplus Sharpe ratio 0.3 was also below the Global median of 0.3.

Realized Sharpe ratio measures your portfolio's return on a risk-adjusted basis. It is calculated as your portfolio's actual net return, minus the risk-free rate, divided by the standard deviation (often called volatility) of your portfolio's excess return.

Sharpe Ratios tend to be positive when equity markets have positive returns. Your 10-year realized Sharpe ratio was 0.4, which was lower than the Global universe median of 0.6.

Surplus Sharpe ratio measures your portfolio's surplus risk-adjusted return. Your surplus Sharpe ratio was 0.3, which means that you generated better return than required to meet liabilities, by taking on more risk. The surplus Sharpe ratio is based on your portfolio's actual net return, minus the estimated liability return, divided by your portfolio's asset-liability risk.

Sharpe ratio is a useful metric to assess risk and return together, but it is not the only metric to consider when evaluating performance.



Global 10-year Sharpe ratio

