



Pennsylvania Public School Employees Retirement System

CEM Investment Benchmarking Report DB - 2024

December 12, 2025

Key Takeaways

Returns

- Your 5-year net total return was 7.5%. This was equal to the U.S. Public median of 7.5%.
- Your 5-year policy return was 6.0%¹. This was below the U.S. Public median of 6.6%¹.

Value added

- Your 5-year net value added was 1.5%. This was above the U.S. Public median of 0.8%.
- Your 1.5% 5-year value added translates into approximately \$4.6 billion of cumulative value added over 5 years.

Cost

- Your CY24 investment cost of 50.8 bps was above your benchmark cost of 41.7 bps.
- Your fund was above benchmark cost because it paid more than peers for some services and it had a higher cost implementation style.
- Your costs decreased by 51.9 bps, from 102.7 bps in 2020 to 50.8 bps in 2024, because you had a lower cost asset mix and paid less in total for similar investment styles.

1. 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.

This benchmarking report compares your cost and performance to the 269 funds in CEM's extensive pension database.

- 136 U.S. pension funds participate. The median U.S. fund had assets of \$8.3 billion and the average U.S. fund had assets of \$30.4 billion. Total participating U.S. assets were \$4.1 trillion.

- 61 Canadian funds participate with assets totaling \$2.4 trillion.

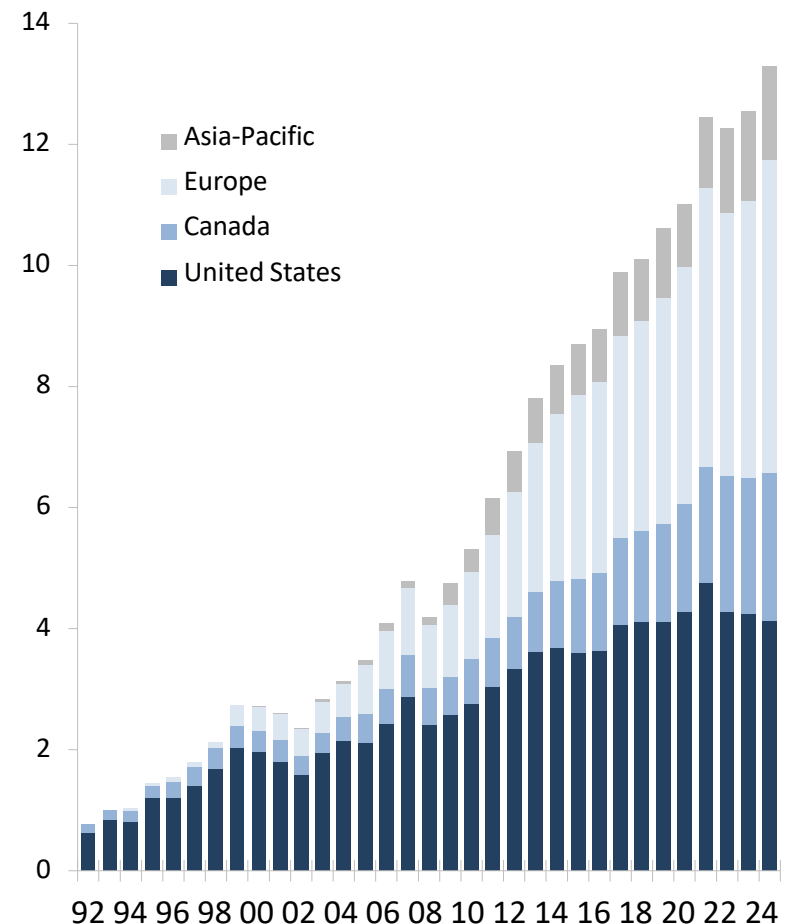
- 61 European funds participate with aggregate assets of \$5.2 trillion. Included are funds from the Netherlands, Norway, Sweden, Finland, Ireland, Denmark and the UK.

- 8 Asia-Pacific funds participate with aggregate assets of \$1.6 trillion. Included are funds from New Zealand, South Korea, and Australia.

- 3 funds from other regions participate.

The most meaningful comparisons for your returns and value added are to the U.S. Public universe, which consists of 39 funds. The U.S. Public universe assets totaled \$3.0 trillion and the median fund had assets of \$45.2 billion.

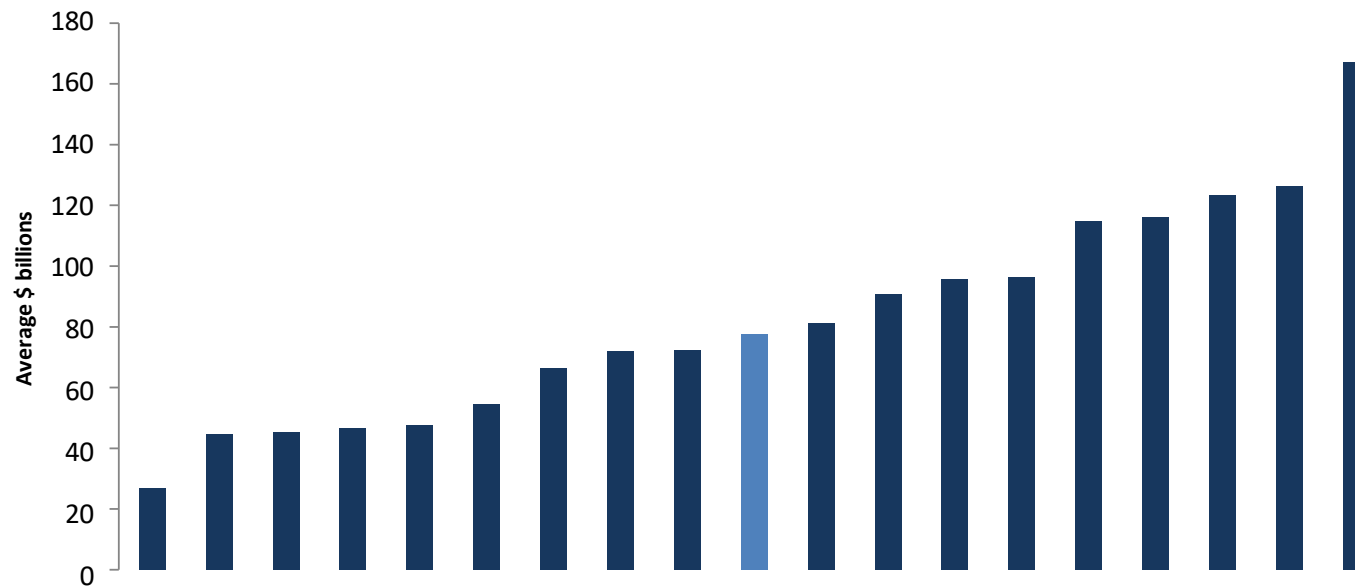
Participating assets (\$ trillions)



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

Peer group for Pennsylvania Public School Employees Retirement System

- 19 U.S. sponsors from \$26.8 billion to \$167.1 billion
- Median size of \$77.7 billion versus your \$77.7 billion



To preserve client confidentiality, given potential access to documents as permitted by the Freedom of Information Act, we do not disclose your peers' names in this document. For some of the peers, 2023 cost data was used as a proxy for 2024.

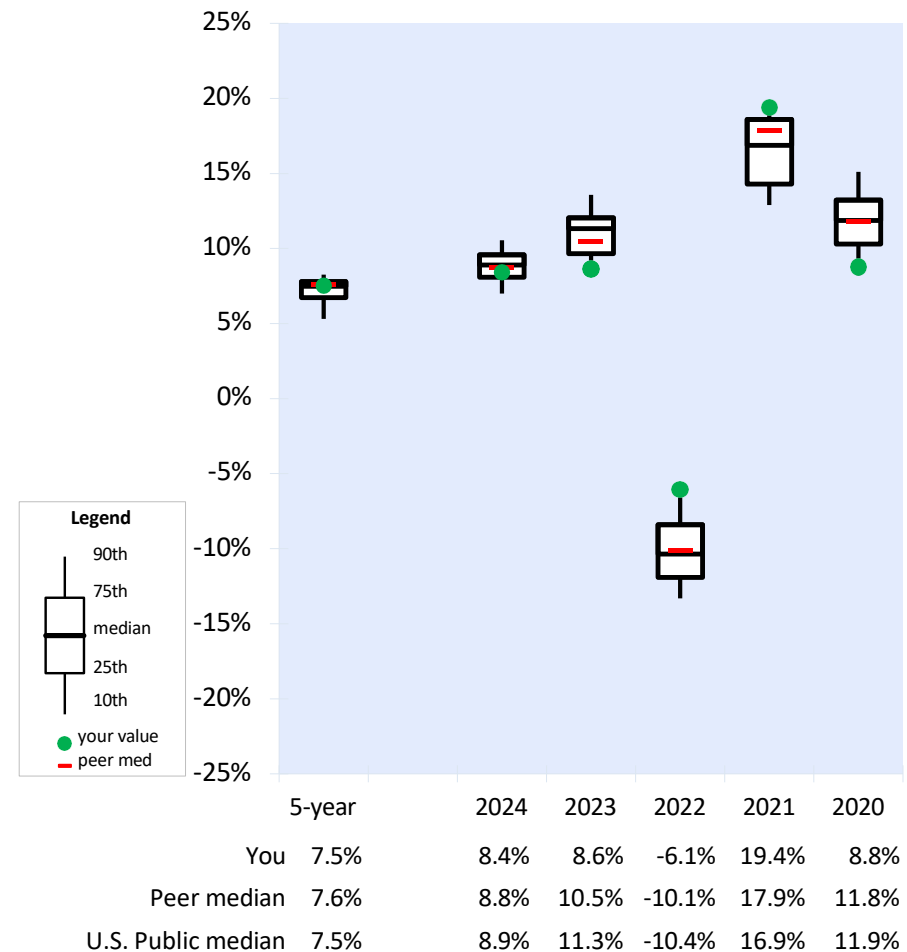
Your 5-year net total return of 7.5% was equal to the U.S. Public median of 7.5% and close to the peer median of 7.6%.

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	7.5%
- Policy return	6.0%
= Net value added	1.5%

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).

U.S. Public net total returns - quartile rankings



Your 5-year policy return of 6.0% was below the U.S. Public median of 6.6% primarily because of:

- The negative impact of a lower allocation to total stock, one of the higher returning asset classes over the past 5 years.
- The offsetting impact of a higher allocation to private equity, one of the higher returning asset classes over the past 5 years.

5-year average policy mix¹

	Your Fund	U.S. Publ Avg.	More/ Less
Total Stock ²	30%	45%	-15%
Total Fixed Income	27%	26%	2%
Commodities	8%	1%	7%
Total public market	65%	72%	-7%
Hedge funds	5%	3%	3%
Risk parity	0%	1%	-1%
Infrastructure	4%	2%	2%
Real estate ex-REITs	8%	9%	-1%
Other Real Assets ³	0%	1%	-1%
Private equity	16%	12%	5%
Private debt	8%	3%	6%
Total private market	42%	30%	12%
Cash/-Explicit leverage	-7%	-1%	-6%
Total	100%	100%	

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

2. Total stock includes REITs and other listed real assets.

3. Other real assets include: Commodities, Natural resources and REITs.

Net value added is the component of total return from active management. Your 5-year net value added was 1.5%.

Net value added equals total net return minus policy return.

Value added for Pennsylvania Public School Employees Retirement System

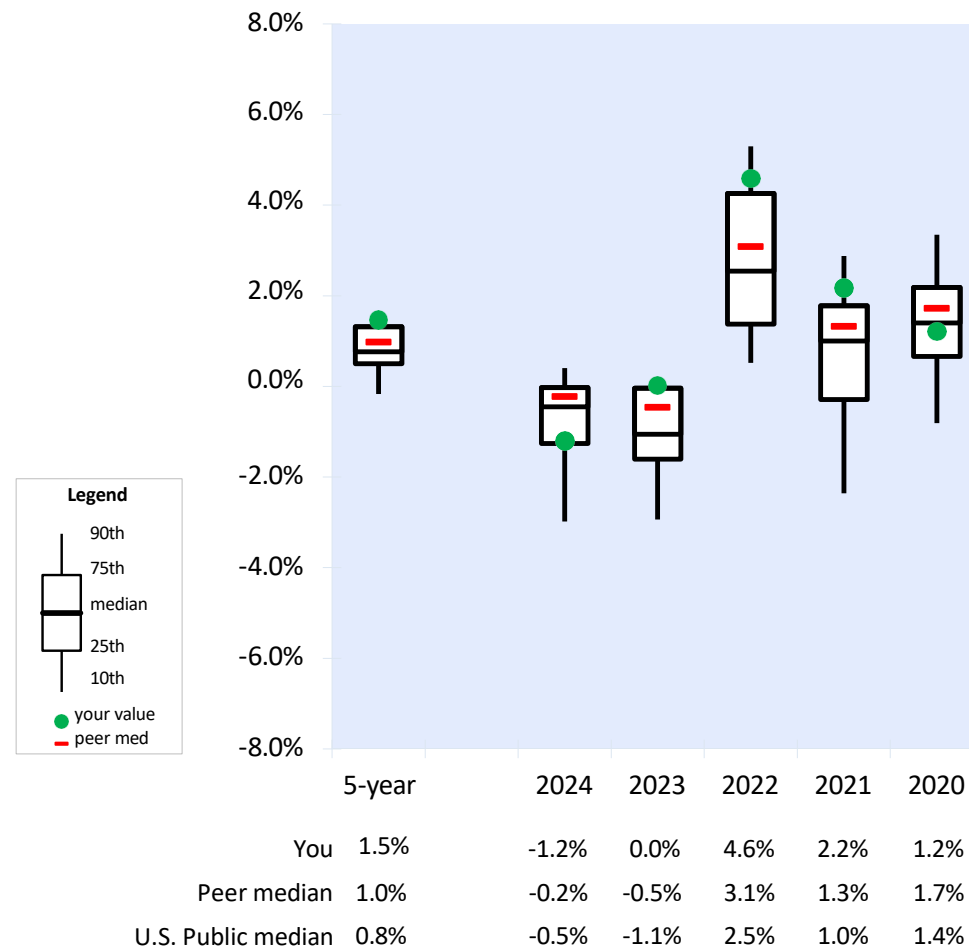
Year	Net return	Policy return	Net value added
2024	8.4%	9.6%	-1.2%
2023	8.6%	8.6%	0.0%
2022	-6.1%	-10.6%	4.6%
2021	19.4%	17.2%	2.2%
2020	8.8%	7.6%	1.2%
5-Year	7.5%	6.0%	1.5%

Your 5-year net value added of 1.5% compares to a median of 1.0% for your peers and 0.8% for the U.S. Public universe.

Your 1.5% 5-year value added translates into approximately \$4.6 billion of cumulative value added over 5 years.

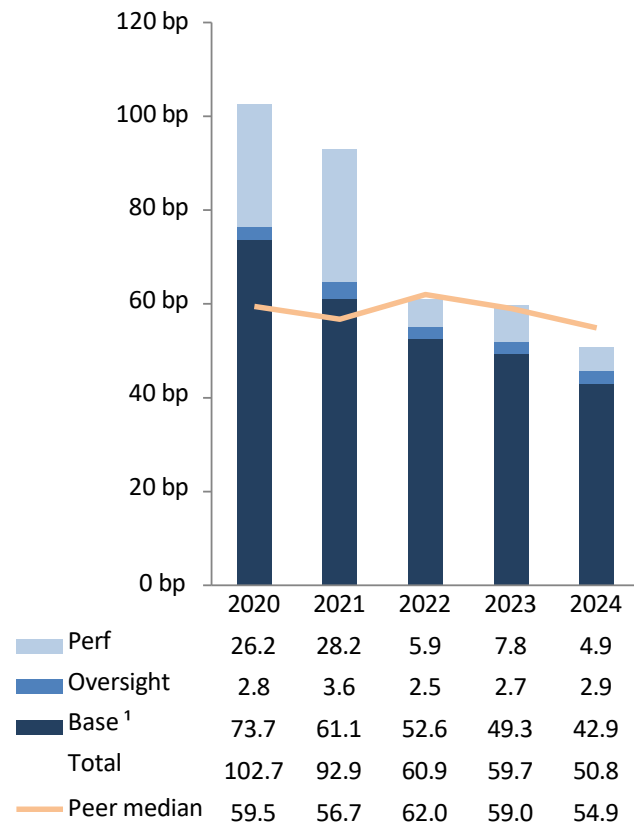
To enable fairer comparisons, the value added for each participant including your fund was adjusted to reflect private equity benchmarks based on lagged, investable public market indices. Prior to this adjustment, your fund's 5-year total fund net value added was 0.9%.

U.S. Public net value added - quartile rankings



Your costs decreased by 51.9 bps, from 102.7 bps in 2020 to 50.8 bps in 2024, because you had a lower cost asset mix and paid less in total for similar investment styles.

Trend in cost



Reasons why your costs decreased by 51.9 bps

	Impact in bps	
1. Lower cost asset mix		
• Mix of Fixed income		(3.2)
• Less Real estate ex-REITs: 2020 11% vs 2024 7%		(3.0)
• Less Hedge funds & multi-asset: 2020 16% vs 2024 1%		(25.4)
• Less Private debt: 2020 10% vs 2024 7%		(3.1)
• All other mix changes		0.2
		<u>(34.4)</u>
2. Lower cost implementation style		
• Less passive, more active		6.9
• More internal as a % of active		(7.6)
• All other implementation style changes		(0.5)
		<u>(1.1)</u>
3. Paid less in total for similar investment styles	<u>2020 cost</u>	<u>2024 cost</u>
• Lower Private Equity LP/Value add base fees	180.9 bp	102.5 bp
• Lower external active ACWI X U.S. Stock costs	171.2 bp	79.4 bp
• Lower external active Emerging Stock costs	552.7 bp	36.6 bp
• Higher internal investment management costs		0.1
• All other differences		3.2
		<u>(16.5)</u>
Total decrease		<u>(51.9)</u>

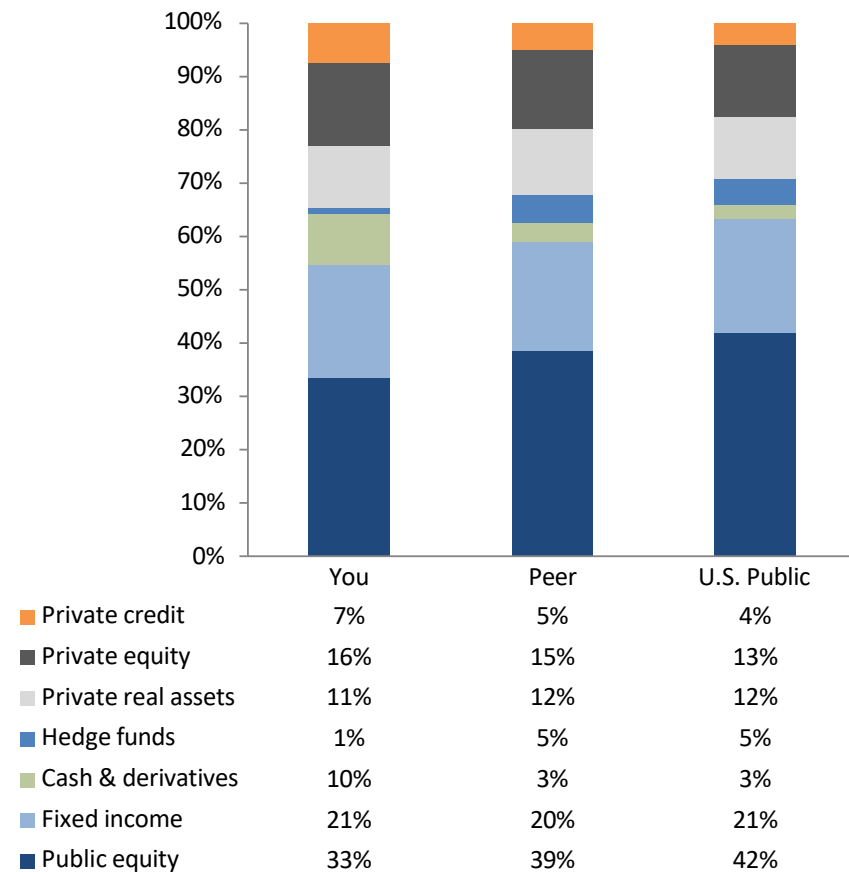
1. Includes fees for managing internal assets and internal costs of monitoring external programs, where allocated.

Private assets equaled 36% of your assets at the end of 2024 versus a peer average of 38%.

Private 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, including cash and derivatives, of 64% at the end of 2024 versus a peer average of 62%.

Your alternative asset classes represent 36% of your assets, but 74% of your total costs.

2024 Actual asset allocation

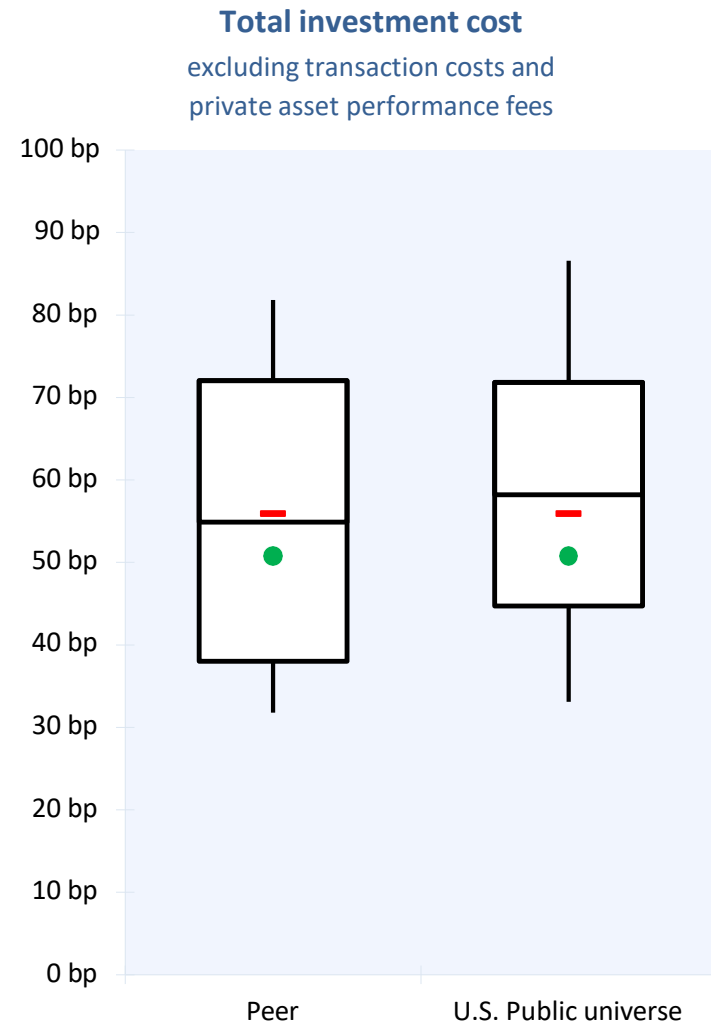
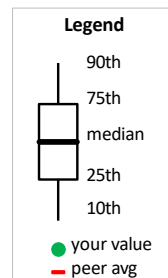


Before adjusting for asset mix differences, your total investment cost of 50.8 bps was slightly below the peer median of 54.9 bps.

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 above benchmark cost by 9.1 basis points in 2024.

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 50.8 bp was above your benchmark cost of 41.7 bp. Thus, your excess cost was 9.1 bp.

Your cost versus benchmark

	\$000s	basis points
Your total investment cost	394,203	50.8 bp
Your benchmark cost	323,770	41.7 bp
Your excess cost	70,433	9.1 bp

Your fund was above benchmark cost because it paid more than peers for some services and it had a higher cost implementation style.

Explanation of your cost status

	Excess Cost/ (Savings)	
	\$000s	bps
1. Higher cost implementation style		
• More active management, less lower cost passive	17,623	2.3
• Less external management, more lower cost internal	(17,281)	(2.2)
• More LPs as a percentage of external	24,702	3.2
• Less fund of funds	(2,423)	(0.3)
• Less co-investment as a percentage of LP/Co	3,947	0.5
• More overlays	805	0.1
	27,372	3.5
2. Paying more than peers for some services		
• External investment management costs	34,479	4.4
• Internal investment management costs	(4,074)	(0.5)
• Oversight, custodial & other costs	12,656	1.6
	43,061	5.5
Total excess cost	70,433	9.1

If your internally managed assets were managed externally and you paid the peer median costs, your costs would increase by around \$56M or 7.2 bps.

Cost savings achieved by managing assets in-house

	Style ¹	Your average	Cost in bps			Total more/ (less)
		holdings (mils) ²	Your	Peer median	More/ (less)	
Public market assets managed in-house						
		(A)	(B)	(C)	(D = B - C)	(A x D)
Stock - U.S. large cap ³	Active	10,384	1.2 bp	29.7 bp	(28.5) bp	(29,557)
Stock - U.S. mid cap ³	Active	626	1.9 bp	53.9 bp	(52.0) bp	(3,254)
Stock - U.S. small cap	Active	282	1.7 bp	62.3 bp	(60.7) bp	(1,713)
Stock - ACWI x U.S.	Active	3,730	1.8 bp	40.0 bp	(38.2) bp	(14,256)
Fixed income - U.S.	Passive	403	0.5 bp	0.7 bp	(0.2) bp	(8)
Fixed income - U.S.	Active	1,155	1.9 bp	12.5 bp	(10.5) bp	(1,217)
Fixed income - Emerging ⁴	Passive	305	1.0 bp	7.5 bp	(6.5) bp	(199)
Fixed income - Inflation indexed	Passive	3,924	1.0 bp	2.6 bp	(1.7) bp	(655)
Fixed income - Inflation indexed ³	Active	1,088	1.3 bp	9.2 bp	(7.9) bp	(862)
Fixed income - High yield	Active	91	5.8 bp	34.1 bp	(28.3) bp	(258)
Fixed income - Long bonds ³	Passive	5,928	1.3 bp	1.8 bp	(0.5) bp	(309)
Fixed income - Cash	Active	3,445	2.6 bp	Excluded	--	--
Real assets - REITs ⁴	Passive	376	0.7 bp	5.9 bp	(5.2) bp	(194)
Real assets - Other listed real assets	Passive	4,435	1.1 bp	8.6 bp	(7.5) bp	(3,307)
Total internally managed assets			1.4 bp	8.6 bp ⁵	(7.2) bp	(55,790)

1. Your internally managed programs are compared against the relevant lowest cost external style, e.g. LPs for internally managed private equity as opposed to fund of funds. Your projected cost savings would have been even higher, if the more expensive external styles had been chosen for this comparison.

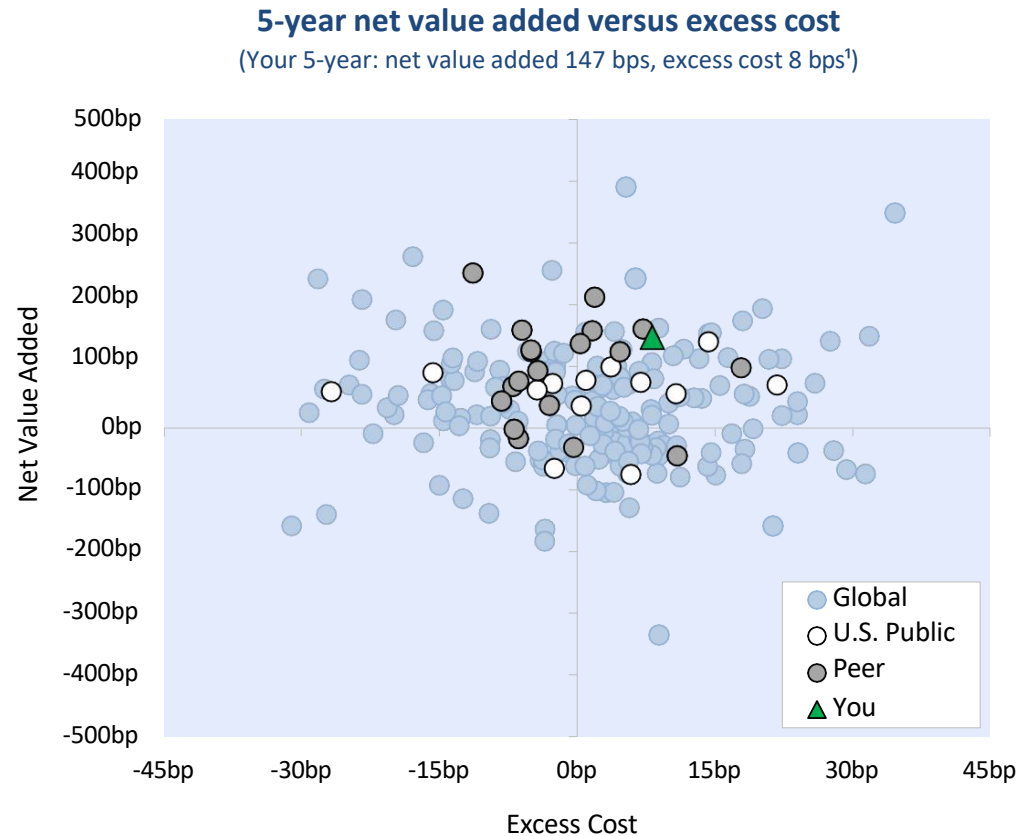
2. 'Amount fees are based on' is the basis for calculating costs manager base fees for private assets.

3. Universe median used because peer data was insufficient.

4. Database median are used because peer and universe data were insufficient.

5. This cost represents the aggregate cost of managing all internal assets externally, paying peer median costs. It is a calculated number and does not come directly from peers.

Your fund achieved a 5-year net value added of 147 bps and excess cost of 8 bps on the cost-effectiveness chart.



1. Your 5-year excess cost of 8.2 basis points is the average of your peer-based excess cost for the past 5 years.

	5-year ¹	2024	2023	2022	2021	2020
Net value added	146.8bp	(120.3) bp	1.6bp	458.7bp	217.3bp	121.3bp
Excess cost	8.2bp	9.1bp	6.3bp	(9.3) bp	14.3bp	20.6bp

Summary of key takeaways

Returns

- Your 5-year net total return was 7.5%. This was equal to the U.S. Public median of 7.5%.
- Your 5-year policy return was 6.0%¹. This was below the U.S. Public median of 6.6%¹.

Value added

- Your 5-year net value added was 1.5%. This was above the U.S. Public median of 0.8%.
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Cost and cost effectiveness

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Thank you



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