

Oregon Public Employees Retirement Fund Investment Benchmarking Results

For the 5 year period ending December 2014

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Key takeaways

Returns

- Your 5-year net total return was 10.3%. This was above the U.S. Public median of 9.8% and above the peer median of 10.1%.
- Your 5-year policy return was 10.4%. This was above the U.S. Public median of 9.7% and above the peer median of 9.7%.

Value added

- Your 5-year net value added was -0.1%. This was close to the U.S. Public median of 0.0% and close to the peer median of 0.1%.

Cost

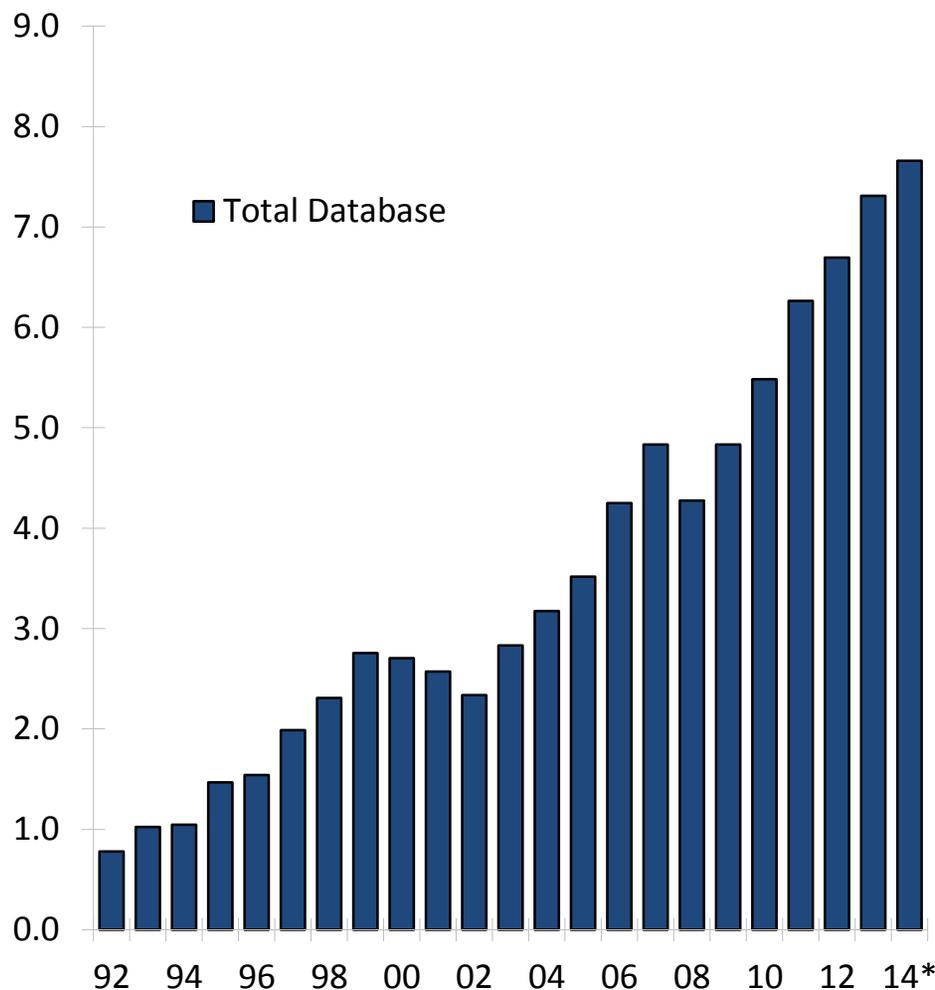
- Your investment cost of 75.5 bps was above the peer median cost of 58.2. You were higher cost because your investments were more heavily weighted in inherently higher cost private asset classes. However, your cost was below your benchmark cost of 77.5 bps. This suggests that your fund was low cost compared to your peers for similar assets.
- Your fund was low cost as a result of offsetting factors. You paid less than peers for similar services, which was partly offset because you had a higher cost implementation style.

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

- 149 U.S. pension funds participate. The median U.S. fund had assets of \$9.6 billion and the average U.S. fund had assets of \$22.6 billion. Total participating U.S. assets were \$3.4 trillion.
- 73 Canadian funds participate with assets totaling \$718 billion.
- 49 European funds participate with aggregate assets of \$2.3 trillion. Included are funds from the Netherlands, Norway, Sweden, Finland, Ireland, Denmark and the U.K.
- 6 Asia-Pacific funds participate with aggregate assets of \$286 billion. Included are funds from Australia, New Zealand, China and South Korea.
- 2 Gulf region funds participate.

The most meaningful comparisons for your returns and value added are to the U.S. Public universe which consists of 57 funds.

Participating assets (\$ trillions)

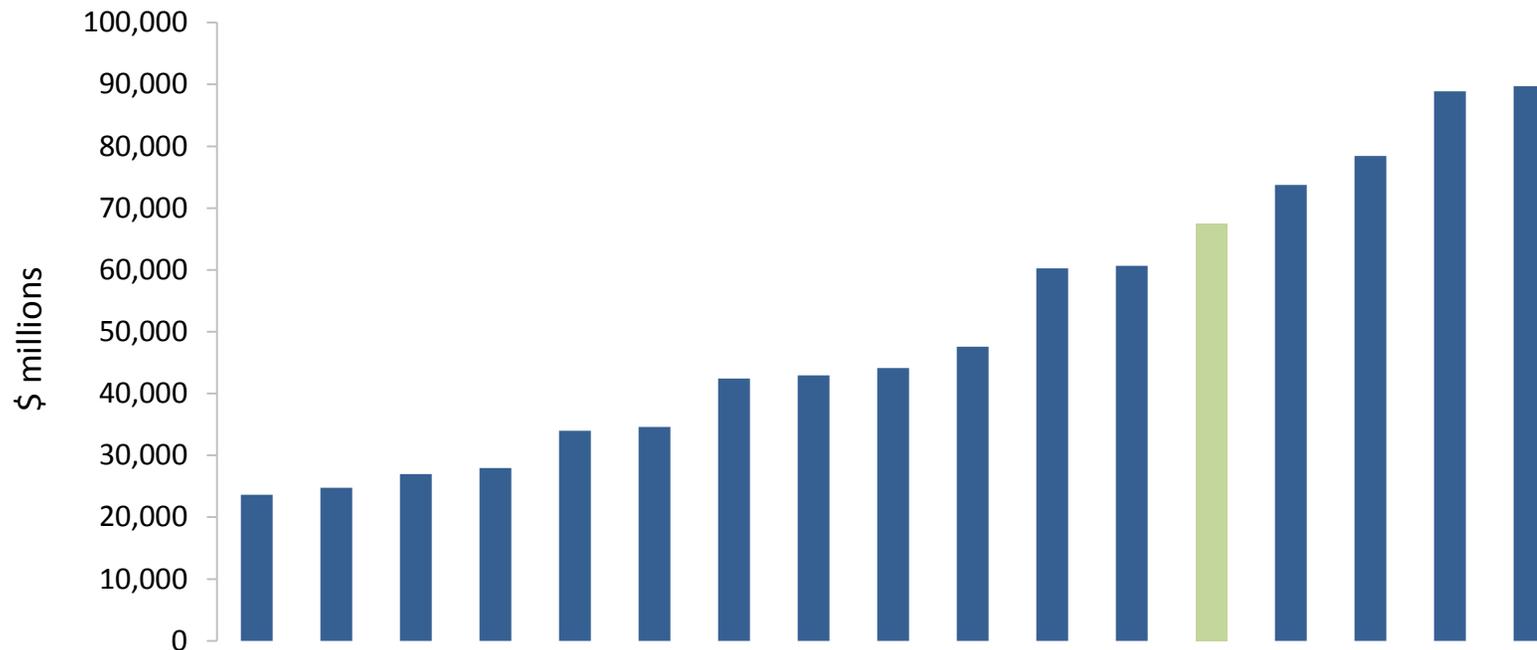


* 2014 reflects both received and expected data.

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

Peer group for Oregon Public Employees Retirement Fund

- 17 U.S. public sponsors from \$24 billion to \$90 billion
- Median size of \$44 billion versus your \$67 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.

What gets measured gets managed, so it is critical that you measure and compare the right things:

1. Returns

Why do total returns differ from other funds? What was the impact of your policy mix decisions versus implementation decisions?

2. Net value added

Are your implementation decisions (i.e., the amount of active versus passive management) adding value?

3. Costs

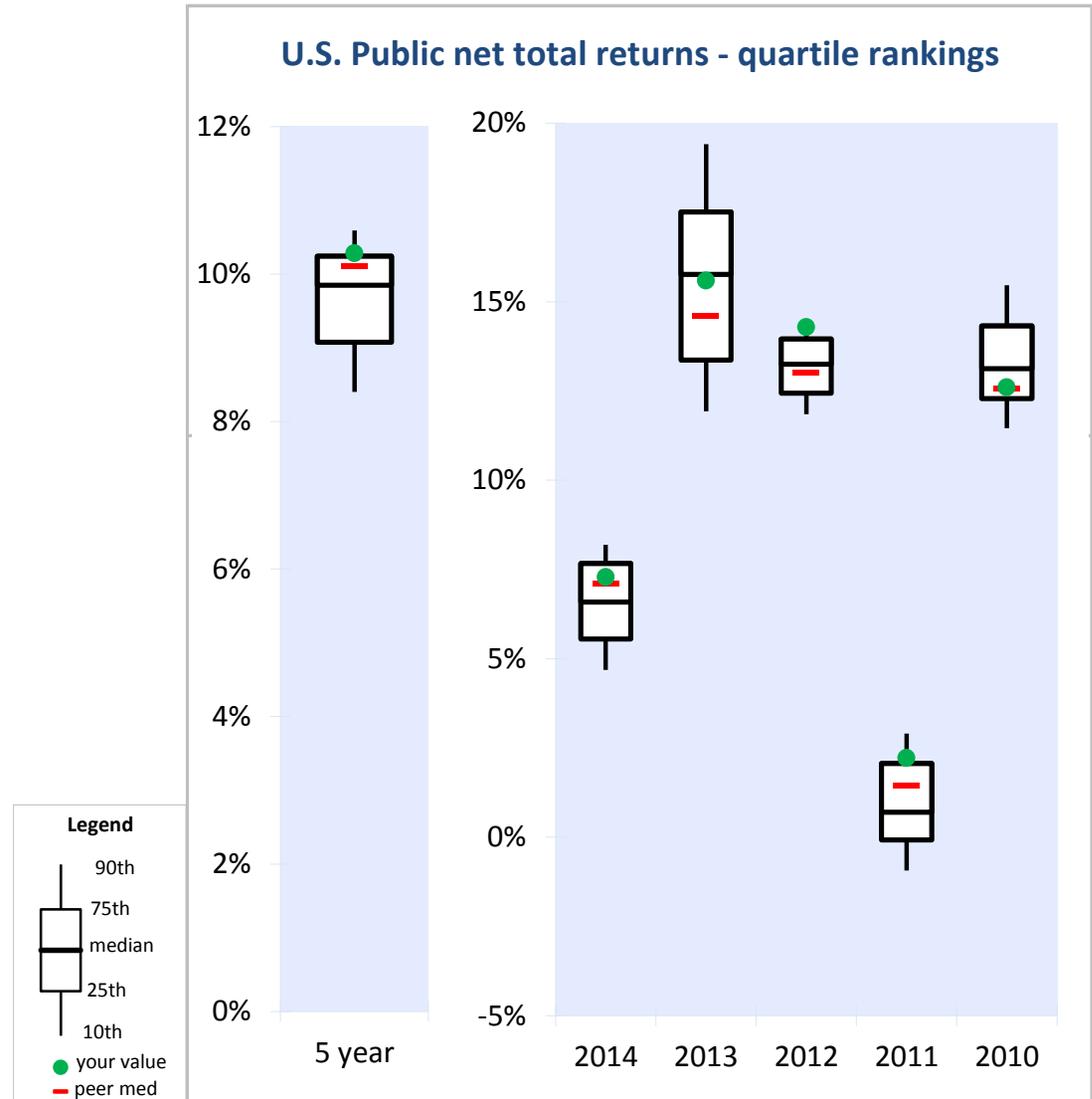
Are your costs reasonable? Costs matter and can be managed.

Your 5-year net total return of 10.3% was in the top quartile versus both the U.S. Public universe (median of 9.8%) and the peer group (median of 10.1%).

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	10.3%
- Policy return	10.4%
= Net value added	-0.1%

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).



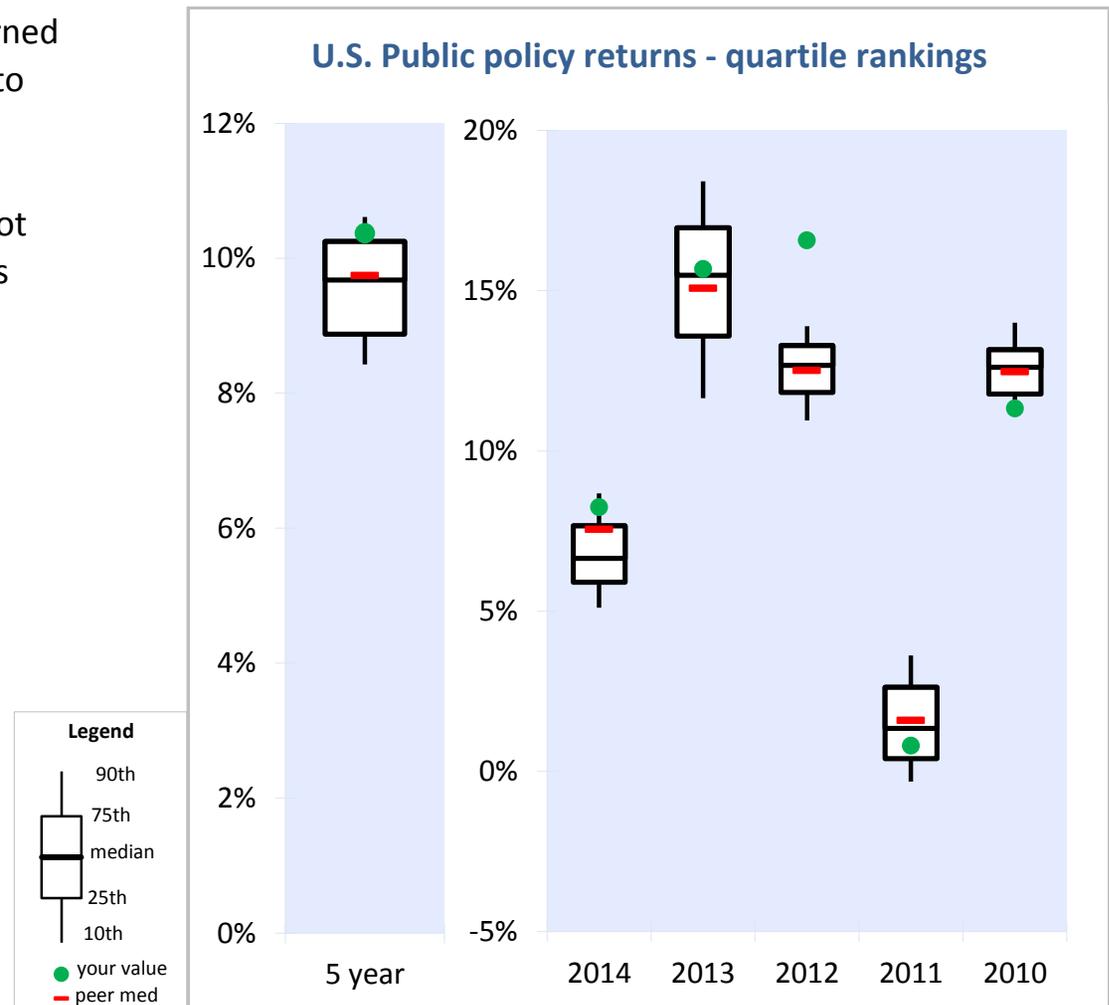
Your 5-year policy return of 10.4% was above both the U.S. Public median of 9.7% and the peer median of 9.7%.

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:

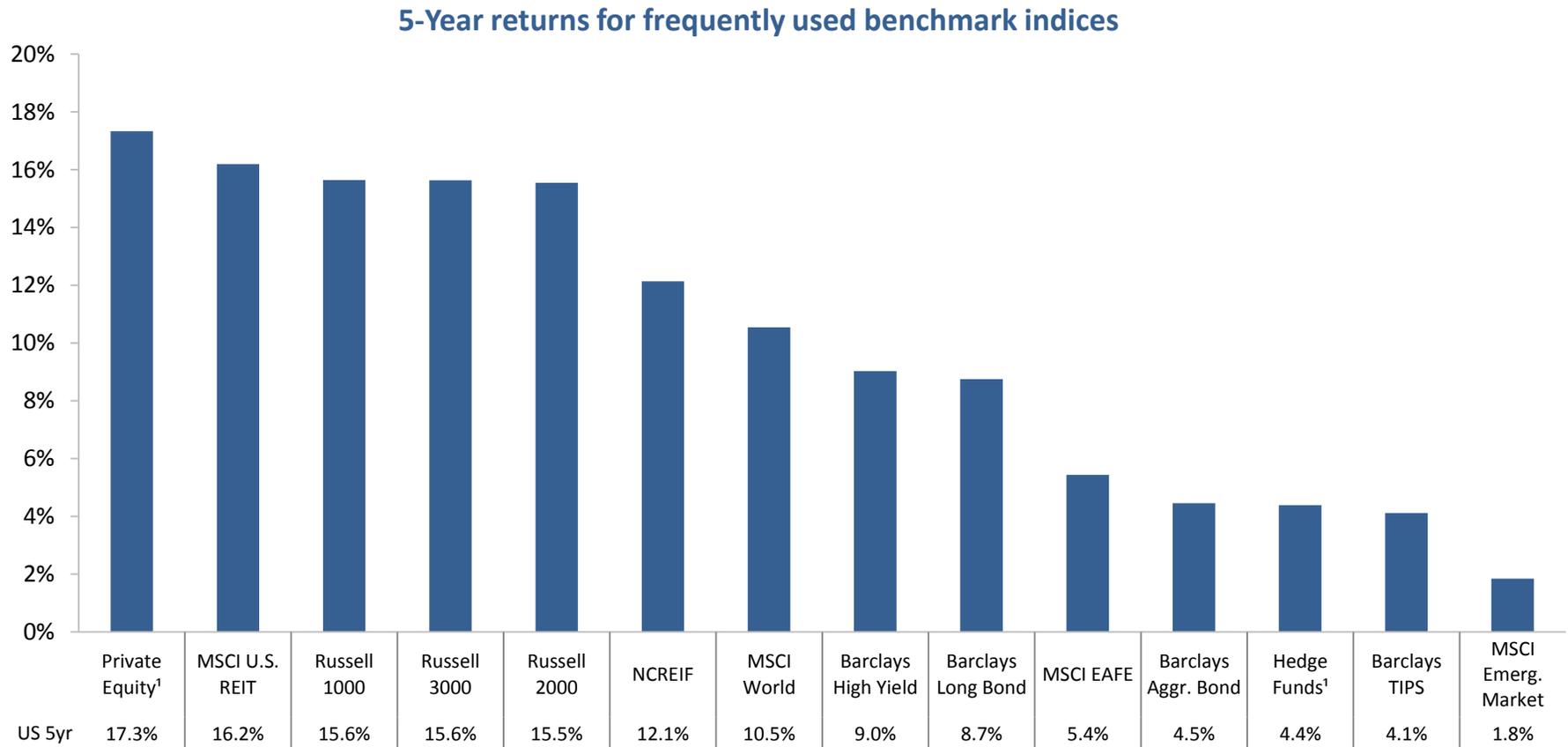
- Long term capital market expectations
- Liabilities
- Appetite for risk

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 except your fund were adjusted to reflect private equity benchmarks based on lagged, investable, public-market indices. If CEM used this same adjustment for your fund, your 5-year policy return would be 9.9%, 0.5% lower than your actual 5-year policy return of 10.4%. Mirroring this, your 5-year total fund net value added would be 0.5% higher. Refer to the Research section pages 6-7 for details.

Differences in policy returns are caused by differences in benchmarks and policy mix.



1. The private equity benchmark is the average of the default private equity benchmark returns applied to U.S. participants. The hedge fund benchmark is the average benchmark return reported by U.S. participants.

Your 5-year policy return was above the U.S. Public median primarily because of:

- The positive impact of your higher weight in one of the better performing asset classes of the past 5 years: Private Equity (your 19% 5-year average weight versus a U.S. average of 8%).

5-Year average policy mix

	Your Fund	Peer Avg.	U.S. Public Avg.
U.S. Stock	0%	23%	25%
ACWIxUS Stock	0%	8%	9%
Global Stock	43%	7%	7%
EAFE/Emerging	0%	10%	10%
Total Stock	43%	48%	52%
U.S. Bonds	21%	20%	19%
Long Bonds	0%	0%	1%
Other Fixed Income ¹	4%	9%	8%
Total Fixed Income	25%	29%	27%
Hedge Funds	0%	3%	4%
Real Estate incl. REITS	12%	9%	7%
Other Real Assets ¹	2%	1%	2%
Private Equity	19%	9%	8%
Total	100%	100%	100%

1. Other fixed income includes Inflation Indexed, High Yield and Global bonds. Other real assets includes commodities, natural resources and infrastructure.

Your policy asset mix has changed over the past 5 years. At the end of 2014 your policy mix compared to your peers and the U.S. universe as follows:

Policy asset mix

Asset class	Your fund					Peer avg.	U.S. Public avg.
	2010	2011	2012	2013	2014	2014	2014
U.S. Stock	0%	0%	0%	0%	0.0%	22%	23%
ACWixUS Stock	0%	0%	0%	0%	0.0%	7%	9%
Global Stock	46%	43%	43%	42%	41.5%	8%	8%
EAFE/Emerging	0%	0%	0%	0%	0.0%	10%	11%
Total Stock	46%	43%	43%	42%	41.5%	47%	51%
U.S. Bonds	27%	19%	19%	17%	23.5%	19%	16%
Long Bonds	0%	0%	0%	0%	0.0%	0%	2%
Other Fixed Income ¹	0%	6%	6%	7%	0.0%	9%	7%
Total Fixed Income	27%	25%	25%	24%	23.5%	27%	25%
Hedge Funds	0%	0%	0%	0%	0.0%	4%	4%
Real Estate incl. REITS	11%	11%	11%	13%	12.5%	9%	8%
Other Real Assets ¹	0%	0%	5%	3%	2.5%	1%	3%
Private Equity	16%	21%	16%	20%	20.0%	10%	9%
Total	100%	100%	100%	100%	100.0%	100%	100%

1. Other fixed income includes Inflation Indexed, High Yield and Global bonds. Other real assets includes commodities, natural resources and infrastructure.

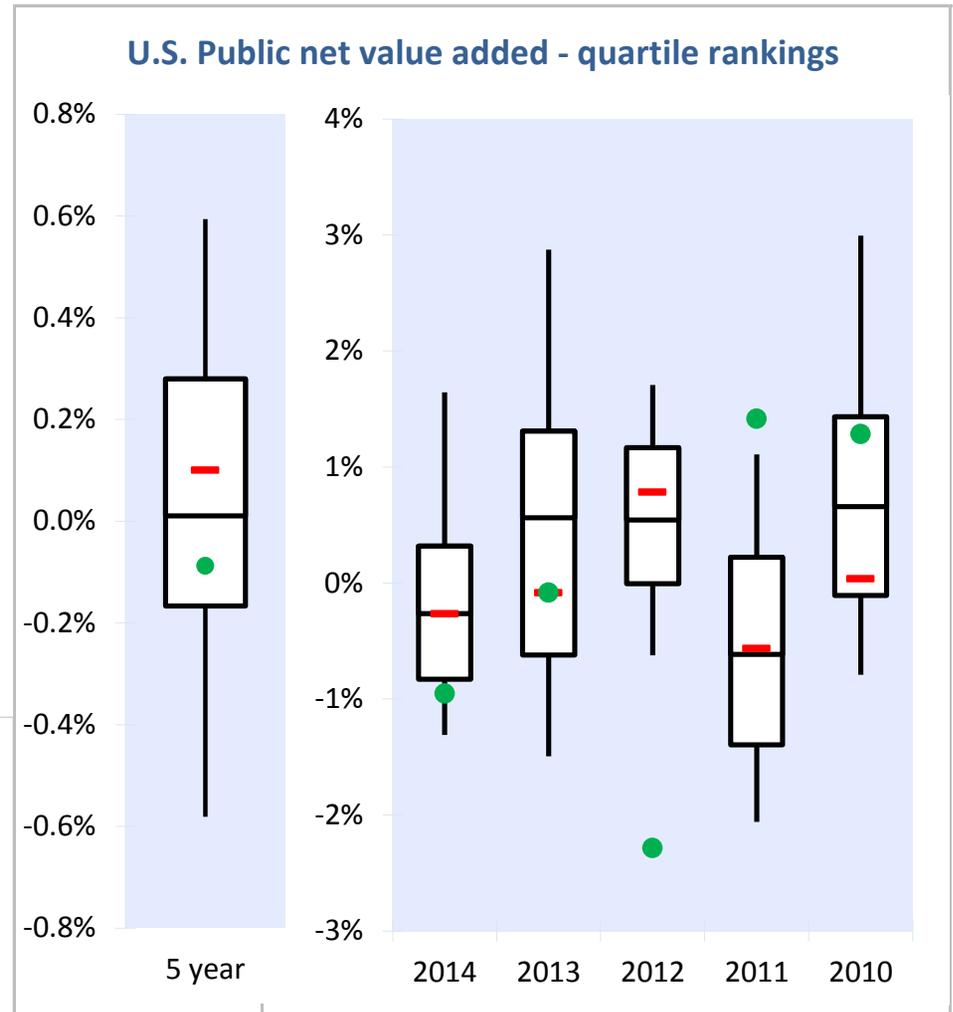
Net value added is the component of total return from active management. Your 5-year net value added was -0.1%.

Net value added equals total net return minus policy return.

Value added for Oregon Public Employees Retirement Fund

Year	Net Return	Policy Return	Net value Added
2014	7.3%	8.2%	(1.0%)
2013	15.6%	15.7%	(0.1%)
2012	14.3%	16.6%	(2.3%)
2011	2.2%	0.8%	1.4%
2010	12.6%	11.3%	1.3%
5-year	10.3%	10.4%	(0.1%)

Your 5-year net value added of -0.1% compares to a median of 0.1% for your peers and 0.0% for the U.S. Public universe.



Your value added was impacted by your choice of benchmarks for private equity. CEM suggests using lagged, investable benchmarks for private equity (see Research section, pages 6-7, for reasons why). If your fund used the private equity benchmark suggested by CEM, your 5-year total fund value added would have been 0.5% higher.

Your investment costs were \$509.6 million or 75.5 basis points in 2014.

Asset management costs by asset class and style (\$000s)	Internal Management			External Management			Total	
	Passive	Active	Overseeing of external	Passive fees	Active base fees	Perform. fees ³		
U.S. Stock - Broad/All			259		6,243	588	7,089	
U.S. Stock - Large Cap	16		522	168	10,343		11,049	
U.S. Stock - Small Cap	130		83		8,207		8,420	
Stock - Emerging		187	122		11,096		11,405	
Stock - ACWIxU.S.			747	585	38,895		40,227	
Stock - Global			235	405	3,696		4,336	
Fixed Income - U.S.			526		5,188		5,714	
Fixed Income - U.S. Gov't			135		4,337		4,472	
Fixed Income - Other			391		21,508		21,899	
Cash		358					358	
REITs			77		6,172		6,249	
Real Estate			770		14,855		15,625	
Real Estate - LPs			1,158		46,862		48,020	
Other Real Assets			1,424		30,670		32,094	
Diversified Private Equity			3,656		248,465 ¹		252,121	
Diversified Priv. Eq.- Fund of Funds			194		23,486 ²		23,681	
Other Private Equity			768		12,450		13,218	
Overlay Programs			16		580		596	
Total asset management costs excluding private asset performance fees							506,572	75.0bp
Oversight, custodial and other costs ⁴								
Oversight & consulting							2,625	
Trustee & custodial							138	
Other							308	
Total oversight, custodial & other costs							3,070	0.5bp
Total investment cost (excluding transaction and private asset performance fees)							509,643	75.5bp

Footnotes

¹ Cost derived from the partnership level detail you provided. Costs are based on partnership contract terms.

² Default underlying costs of 159 bps added to provided top-layer costs.

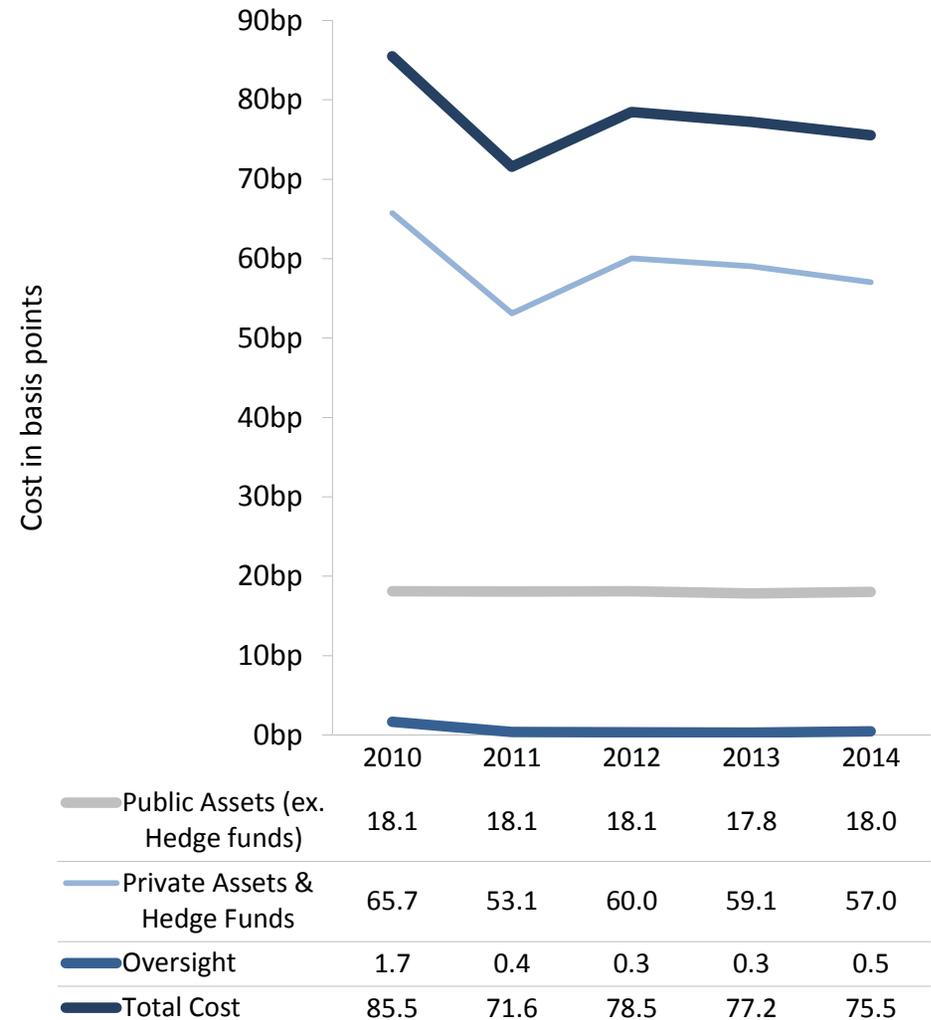
³ Total cost excludes carry/performance fees for real estate, infrastructure, natural resources and private equity. Performance fees are included for the public market asset classes and hedge funds.

⁴ Excludes non-investment costs, such as PBGC premiums and preparing checks for retirees.

Your costs decreased slightly between 2010 and 2014.

Your reduction in costs is almost entirely due to a reduction in private equity fees. This reduction could reflect a maturing, as opposed to growing private equity program. The amount on which private equity fees are based is usually the commitment amount during commitment period and net asset value afterwards.

Trend in your investment costs

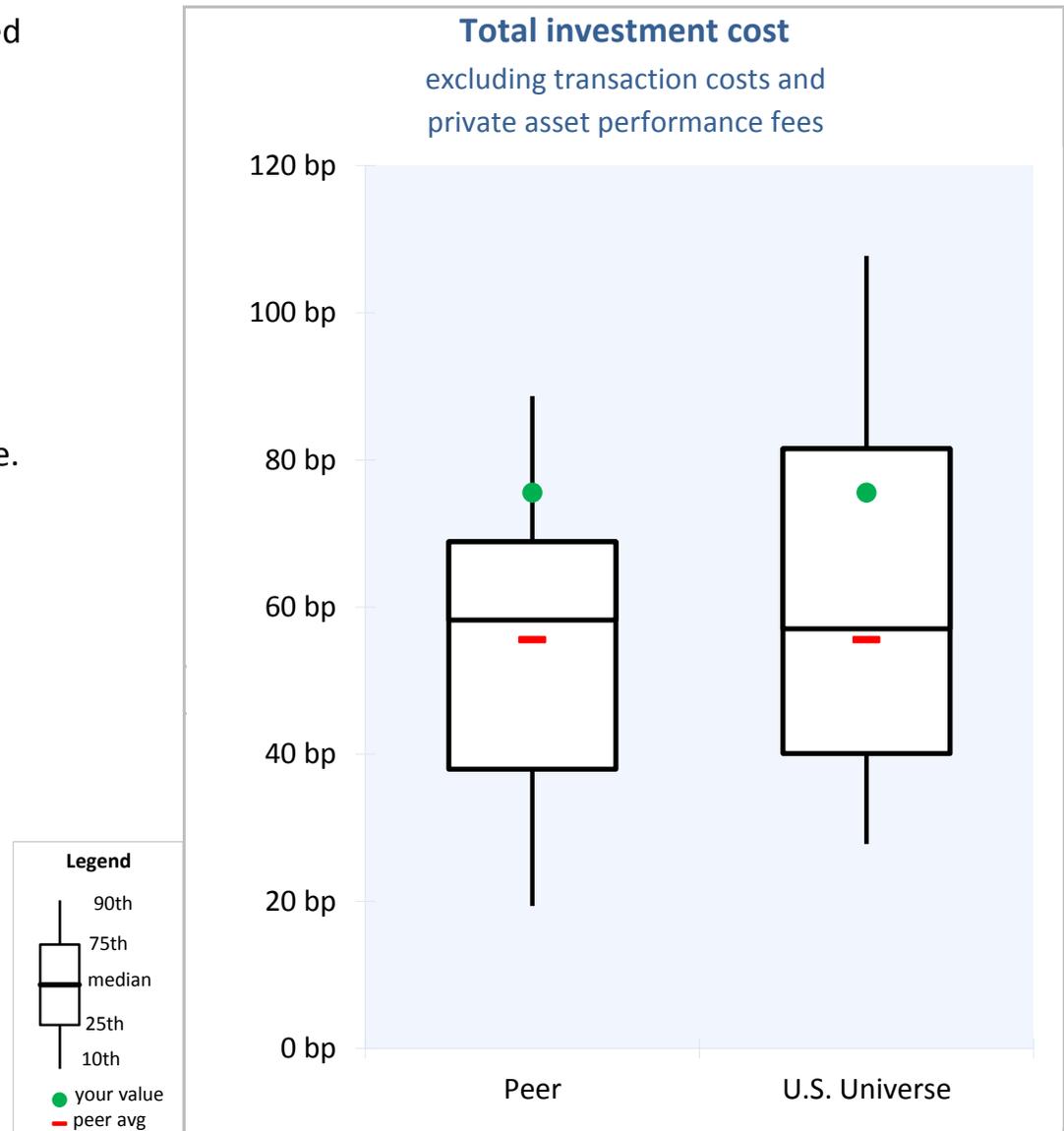


Your total investment cost of 75.5 bps was above the peer median of 58.2 bps.

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

- Asset mix, particularly holdings of the highest cost asset classes: real estate (excl REITS), infrastructure, hedge funds and private equity. These high cost assets equaled 32% of your funds assets at the end of 2014 versus a peer average of 23%.
- 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 low cost by 2.0 basis points in 2014.

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 75.5 bp was below your benchmark cost of 77.5 bp. Thus, your cost savings was 2.0 bp.

Your cost versus benchmark

	\$000s	basis points
Your total investment cost	509,643	75.5 bp
Your benchmark cost	523,048	77.5 bp
Your excess cost	(13,406)	(2.0) bp

Your fund was low cost as a result of offsetting factors. You paid less than peers for similar services, which was partly offset because you had a higher cost implementation style.

Reasons for your low cost status

	Excess Cost/ (Savings)	
	\$000s	bps
1. Higher cost implementation style		
• Use of fund of funds	(123)	(0.0)
• More external active management (less lower cost passive and internal)	30,484	4.5
• More overlays	620	0.1
• Other style differences	(960)	(0.1)
	<u>30,021</u>	<u>4.5</u>
2. Paying less than peers for similar services		
• External investment management costs	(37,865)	(5.6)
• Internal investment management costs	(39)	(0.0)
• Oversight, custodial & other costs	(5,522)	(0.8)
	<u>(43,427)</u>	<u>(6.4)</u>
Total savings	(13,406)	(2.0)

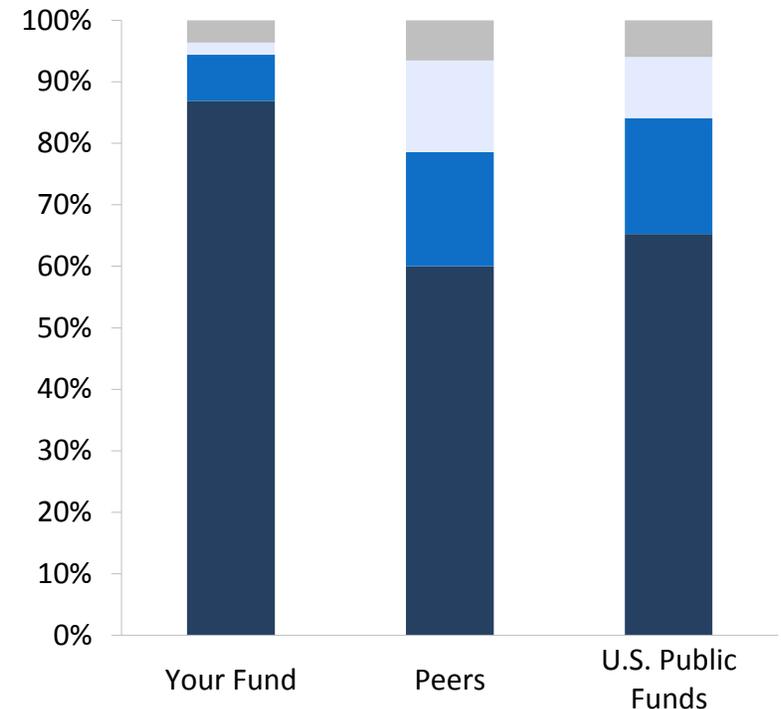
Differences in cost performance are often caused by differences in implementation style.

Implementation style is defined as the way in which your fund implements asset allocation. It includes internal, external, active, passive and fund of funds styles.

The greatest cost impact is usually caused by differences in the use of:

- External active management because it tends to be much more expensive than internal or passive management. You used more external active management than your peers (your 87% versus 60% for your peers).
- Within external active holdings, fund of funds usage because it is more expensive than direct fund investment. You had less in fund of funds. Your 5% of hedge funds, real estate and private equity in fund of funds compared to 10% for your peers.

Implementation style¹



■ Internal passive	4%	7%	6%
■ Internal active	2%	15%	10%
■ External passive	8%	19%	19%
■ External active	87%	60%	65%

1. The graph above does not take into consideration the impact of derivatives.

Differences in implementation style cost you 4.5 bp relative to your peers.

Calculation of the cost impact of differences in implementation style

Asset class	Your avg holdings in \$mils (A)	% External active			Premium vs passive & internal ¹ (C)	Cost/ (savings) \$000s bps (A X B X C)	
		You	Peer average	More/ (less) (B)			
U.S. Stock - Broad/All	1,924	100.0%	27.7%	72.3%	30.4 bp	4,234	
U.S. Stock - Large Cap	8,629	56.7%	20.5%	36.3%	24.4 bp	7,641	
U.S. Stock - Small Cap	1,916	59.0%	75.3%	(16.3%)	62.9 bp	(1,963)	
Stock - Emerging	1,978	88.3%	74.5%	13.9%	50.4 bp	1,383	
Stock - ACWixU.S.	11,190	82.5%	64.6%	17.9%	31.4 bp	6,274	
Stock - Global	1,743	54.5%	64.2%	(9.7%)	33.9 bp	(572)	
Fixed Income - U.S.	5,322	100.0%	53.6%	46.4%	10.1 bp	2,491	
Fixed Income - U.S. Gov't	4,914	100.0%	100.0%	0.0%		0	
Fixed Income - Other	4,423	100.0%	95.9%	4.1%	Insufficient ²	0	
REITs	1,715	100.0%	86.6%	13.4%	44.8 bp	1,033	
Real Estate ex-REITs	5,895	100.0%	90.5%	9.5%	55.4 bp	3,092	
of which Ltd Partnerships represent:		66.4%	40.8%	25.6%	45.5 bp	6,869	
Other Real Assets	988	100.0%	100.0%	0.0%		0	
Diversified Private Equity	19,339	100.0%	100.0%	0.0%	Insufficient ²	0	
Other private equity	911	100.0%	80.9%	19.1%	Insufficient ²	0	
Impact of less/more external active vs. lower cost styles						30,484	4.5 bp
		<u>Fund of funds % of LPs</u>			<u>vs. direct LP¹</u>		
Real Estate ex-REITs - LPs	3,914	0.0%	0.1%	(0.1%)	Insufficient ²	0	
Diversified Private Equity - LPs	19,339	6.3%	6.4%	(0.1%)	47.9 bp	(123)	
Impact of less/more fund of funds vs. direct LPs						(123)	(0.0) bp
<u>Overlays and other</u>							
Impact of higher use of portfolio level overlays						620	0.1 bp
Impact of mix of internal passive, internal active, and external passive ³						(960)	(0.1) bp
Total impact of differences in implementation style						30,021	4.5 bp

Footnotes

1. The cost premium is the additional cost of external active management relative to the average of other lower cost implementation styles - internal passive, internal active and external passive.
2. A cost premium listed as 'Insufficient' indicates that there was not enough peer data to calculate the premium.
3. The 'Impact of mix of internal passive, internal active and external passive' quantifies the net cost impact of differences in cost between, and your relative use of, these 'low-cost' styles.

The net impact of paying more/less for external asset management costs saved 5.6 bps.

Cost impact of paying more/(less) for external asset management

	Your avg holdings in \$mils (A)	Cost in bps			Cost/(savings)	
		Your Fund	Peer median	More/ (less) (B)	in \$000s (A X B)	bps
U.S. Stock - Broad/All - Active	1,924	36.8 ¹	31.5	5.4	1,037	
U.S. Stock - Large Cap - Passive	2,080	1.5	0.9	0.6	125	
U.S. Stock - Large Cap - Active	4,896	21.9	27.1	(5.2)	(2,550)	
U.S. Stock - Small Cap - Active	1,131	73.3	66.2	7.1	802	
Stock - Emerging - Active	1,748	64.2	61.4	2.8	493	
Stock - ACWIxU.S. - Passive	1,957	3.6	5.2	(1.6)	(321)	
Stock - ACWIxU.S. - Active	9,233	42.8	36.6	6.2	5,739	
Stock - Global - Passive	794	7.4	5.6	1.9	148	
Stock - Global - Active	949	39.5	39.5	0.0	0	
Fixed Income - U.S. - Active	5,322	10.7	12.8	(2.1)	(1,097)	
Fixed Income - U.S. Gov't - Active	4,914	9.1	13.0*	(3.9)	(1,937)	
Fixed Income - Other - Active	4,423	49.5	49.5	0.0	0	
REITs - Active	1,715	36.4	47.0	(10.5)	(1,809)	
Real Estate ex-REITs - Active	1,981	78.9	65.6	13.3	2,627	
Real Estate ex-REITs - Limited Partnership	3,914	122.7	111.1	11.5	4,518	
Other Real Assets - Active	988	324.8	Excluded			
Diversified Private Equity - Active	18,130	139.1	165.0	(25.9)	(47,016)	
Diversified Private Equity - Fund of Fund	1,209	195.8	212.9	(17.1)	(2,065)	
Other Private Equity - Active	911	145.1	102.4	42.7	3,893	
	<i>Notional</i>					
Derivatives/Overlays - Passive Beta	1,765	3.4	5.9*	(2.6)	(454)	
Total impact of paying more/less for external management					(37,865)	(5.6) bp

'Excluded' indicates that the asset class was excluded from this analysis due to comparability concerns with peers.

*Universe median used as peer data was insufficient.

¹ You paid performance fees in these asset classes.

The net impact of paying more/less for internal asset management costs rounds to 0.0 bps.

Cost impact of paying more/(less) for internal asset management

	Your avg holdings in \$mils (A)	Cost in bps			Cost/(savings)	
		Your Fund	Peer median	More/ (less) (B)	in \$000s (A X B)	bps
U.S. Stock - Large Cap - Passive	1,653	0.1	0.1	0.0	2	
U.S. Stock - Small Cap - Passive	785	1.7	2.2	(0.5)	(41)	
Stock - Emerging - Active	231	8.1	8.1	0.0	0	
Total impact of paying more/less for internal management					(39)	(0.0) bp

The net impact of differences in oversight, custodial & other costs saved 0.8 bps.

Cost impact of differences in oversight, custodial & other costs

	Your avg holdings in \$mils (A)	Cost in bps			Cost/(savings)	
		Your fund	Peer median	More/ (less) (B)	in \$000s (A X B)	bps
Oversight & consulting	67,460	0.4	0.9	(0.5)	(3,564)	
Custodial	67,460	0.0	0.2	(0.2)	(1,371)	
Audit	67,460	0.0	0.0	(0.0)	(251)	
Other	67,460	0.0	0.1	(0.0)	(337)	
Total					(5,522)	(0.8) bp

Benchmark cost analysis suggests that, after adjusting for fund size and asset mix, your fund was low cost by 2.0 basis points in 2014.

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

Asset class/category	Due to impl. style \$000s	Due to paying more/ (less)	Total \$000s	Total bps
U.S. Stock - Broad/All	4,234	1,037	5,272	0.8 bp
U.S. Stock - Large Cap	6,840	(2,423)	4,417	0.7 bp
U.S. Stock - Small Cap	(2,055)	762	(1,293)	(0.2) bp
Stock - Emerging	1,318	493	1,810	0.3 bp
Stock - ACWIxU.S.	6,274	5,418	11,692	1.7 bp
Stock - Global	(572)	148	(424)	(0.1) bp
Fixed Income - U.S.	2,491	(1,097)	1,395	0.2 bp
Fixed Income - U.S. Gov't	0	(1,937)	(1,937)	(0.3) bp
Fixed Income - Other	0	0	0	N/A
Cash	0	0	0	N/A
REITs	1,033	(1,809)	(776)	(0.1) bp
Real Estate ex-REITs	9,962	7,145	17,107	2.5 bp
Other Real Assets	0	Excluded	0	N/A
Diversified Private Equity	(123)	(49,081)	(49,204)	(7.3) bp
Other private equity	0	3,893	3,893	0.6 bp
Overlays	620	(454)	166	0.0 bp
Oversight, Custodial & Other		(5,522)	(5,522)	(0.8) bp
Total	30,021	(43,427)	(13,406)	(2.0) bp

Summary of key takeaways

Returns

- Your 5-year net total return was 10.3%. This was above the U.S. Public median of 9.8% and above the peer median of 10.1%.
- Your 5-year policy return was 10.4%. This was above the U.S. Public median of 9.7% and above the peer median of 9.7%.

Value added

- Your 5-year net value added was -0.1%. This was close to the U.S. Public median of 0.0% and close to the peer median of 0.1%.

Cost

- Your investment cost of 75.5 bps was above the peer median cost of 58.2. You were higher cost because your investments were more heavily weighted in inherently higher cost private asset classes. However, your cost was below your benchmark cost of 77.5 bps. This suggests that your fund was low cost compared to your peers for similar assets.
- Your fund was low cost as a result of offsetting factors. You paid less than peers for similar services, which was partly offset because you had a higher cost implementation style.