

**Investment
Benchmarking Analysis**
(for the 5-year period ending December 31, 2022)

South Carolina Retirement System Investment Commission



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Key Takeaways

2022 Calendar Year

- Your 2022 total plan return after deducting all costs was -7.3%. This was above both the benchmark return of -12.4% and the peer median net return of -10.2%, resulting in a one-year value add of 5.1%.
- Within that return, costs were 110.8 bps, below the benchmark by 12.4 bps. This was above last year's cost of 87.8 bps, largely due to 43.7 bps in performance fees from asset classes that beat their benchmark by 26.7% on average.
- Your fund was low cost because it had a lower cost implementation style and it paid less than peers for similar services.
- You placed in the low cost, positive net value added quadrant for 2022. This contributed to maintaining the same low cost, positive net value added position you achieved over the most recent 5- and 10-year periods.

5-year Returns

- Your 5-year net total return was 5.9%. This was equal to the U.S. Public median of 5.9% and slightly below the peer median of 6.1%.
- Your 5-year policy return was 4.1%. This was below both the U.S. Public median of 4.8% and the peer median of 5.1%.

5-year Value added

- Your 5-year net value added above your policy return was 1.8%. This was above both the U.S. Public median of 1.2% and the peer median of 1.2%.

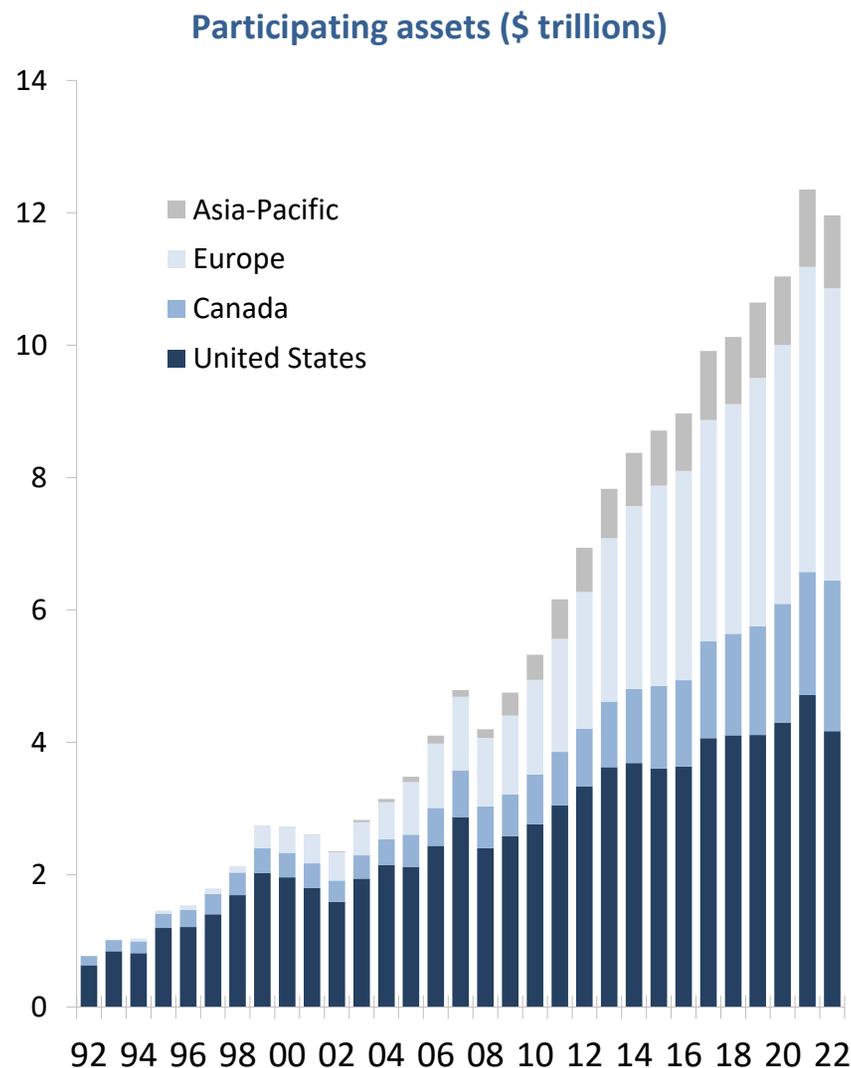
5-year Cost

- Your 5-year average costs were 81.4 bps. This was below your benchmark over the period, providing an average annual savings of 12bps.
- Your costs increased by 43.8 bps, from 67.0 bps in 2018 to 110.8 bps in 2022, primarily because you you paid more in performance fees for better returning assets.

This benchmarking report compares your cost and return performance to the 294 funds in CEM's extensive pension database.

- 147 U.S. pension funds participate. The median U.S. fund had assets of \$8.5 billion and the average U.S. fund had assets of \$28.4 billion. Total participating U.S. assets were \$4.2 trillion.
- 72 Canadian funds participate with assets totaling \$2.3 trillion.
- 66 European funds participate with aggregate assets of \$4.4 trillion. Included are funds from the Netherlands, Norway, Sweden, Finland, Ireland, Denmark and the U.K.
- 7 Asia-Pacific funds participate with aggregate assets of \$1.1 trillion. Included are funds from Australia, New Zealand, China and South Korea.
- 2 funds from other regions participate.

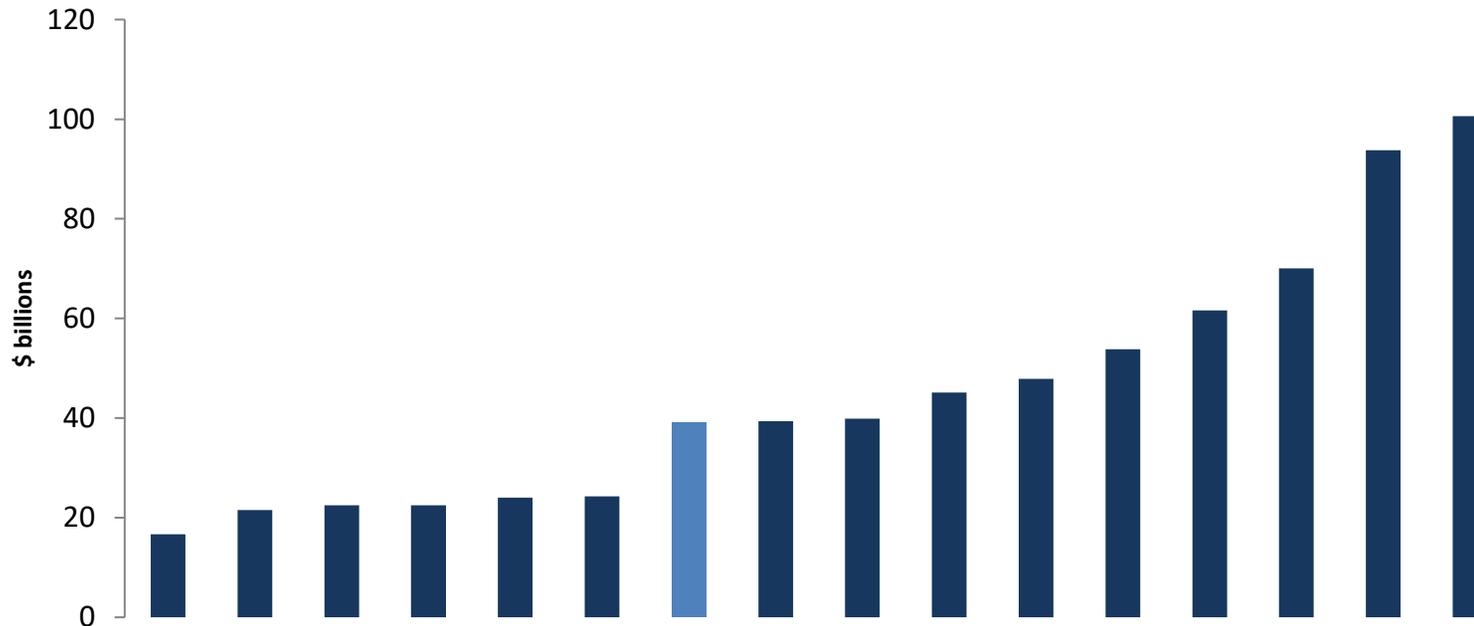
The most meaningful comparisons for your returns and value added are to the U.S. Public universe, which consists of 41 funds.



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

Peer group for South Carolina Retirement System Investment Commission

- 16 U.S. Public sponsors from \$16.7 billion to \$100.6 billion
- Median size of \$39.6 billion versus your \$39.1 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 adding value (i.e., mostly the effectiveness of active management, as well as the amount of active management versus passive management)?

3. Costs

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

4. Cost effectiveness

Net implementation value added versus excess cost. Does paying more get you more?

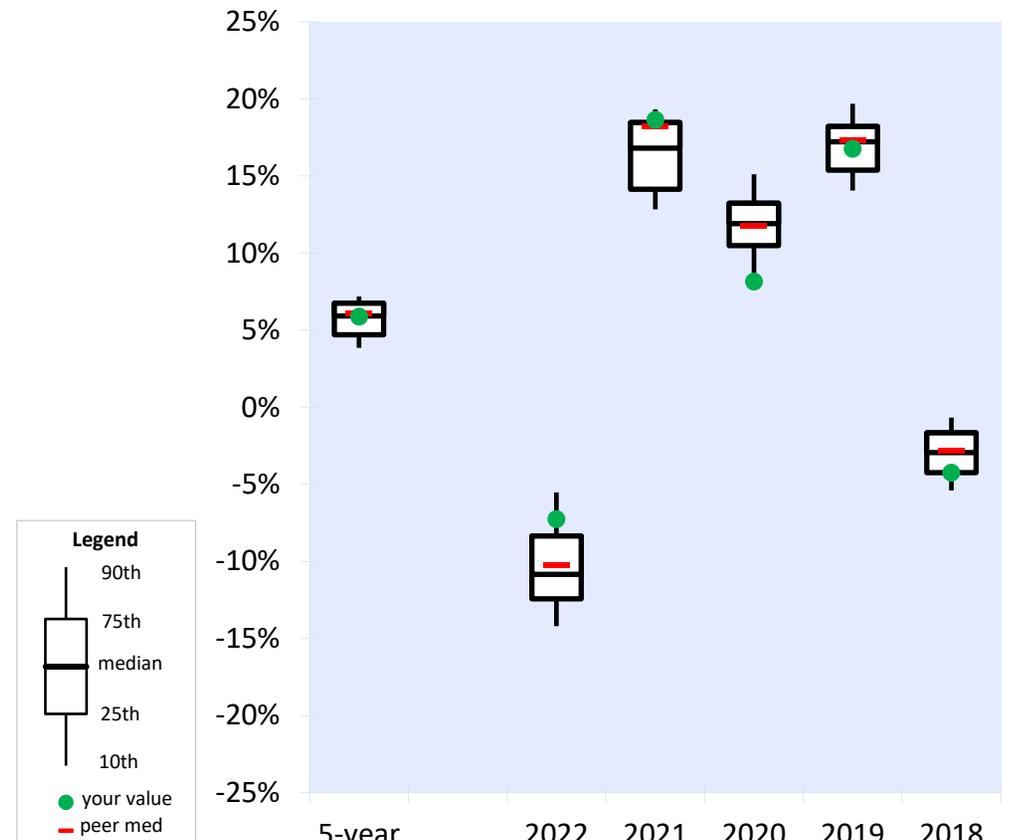
Your 5-year net total return of 5.9% was equal to the U.S. Public median of 5.9% and slightly below the peer median of 6.1%. Your 5-year net value added above your policy return was 1.8%.

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	5.9%
- Policy return	4.1%
= Net value added	1.8%

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



	5-year	2022	2021	2020	2019	2018
You	5.9%	-7.3%	18.6%	8.2%	16.8%	-4.2%
Peer median	6.1%	-10.2%	18.2%	11.8%	17.3%	-2.8%
U.S. Public median	5.9%	-10.8%	16.8%	11.9%	17.2%	-2.9%

Your 5-year policy return of 4.1% was below both the U.S. Public median of 4.8% and the peer median of 5.1%.

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

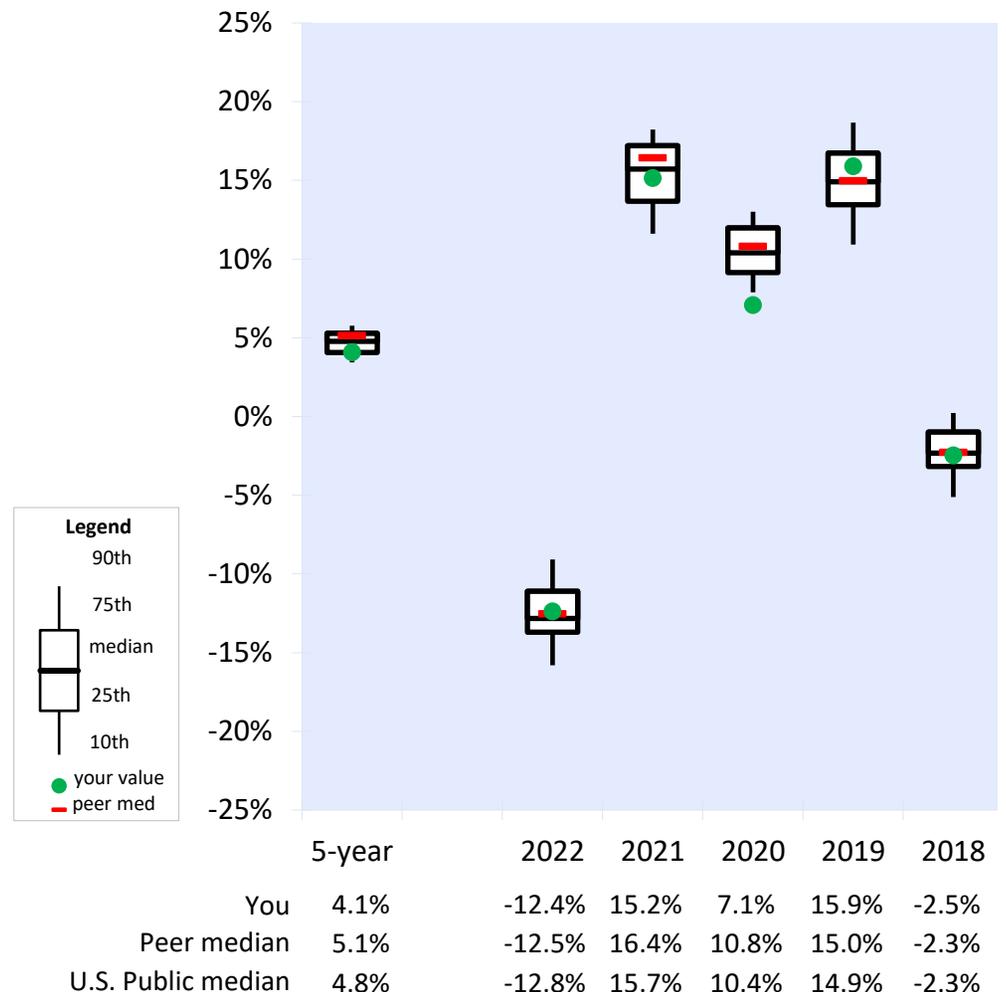
Having a higher or lower relative policy return is not necessarily good or bad. Your policy return reflects your investment policy, which should reflect your:

- 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.

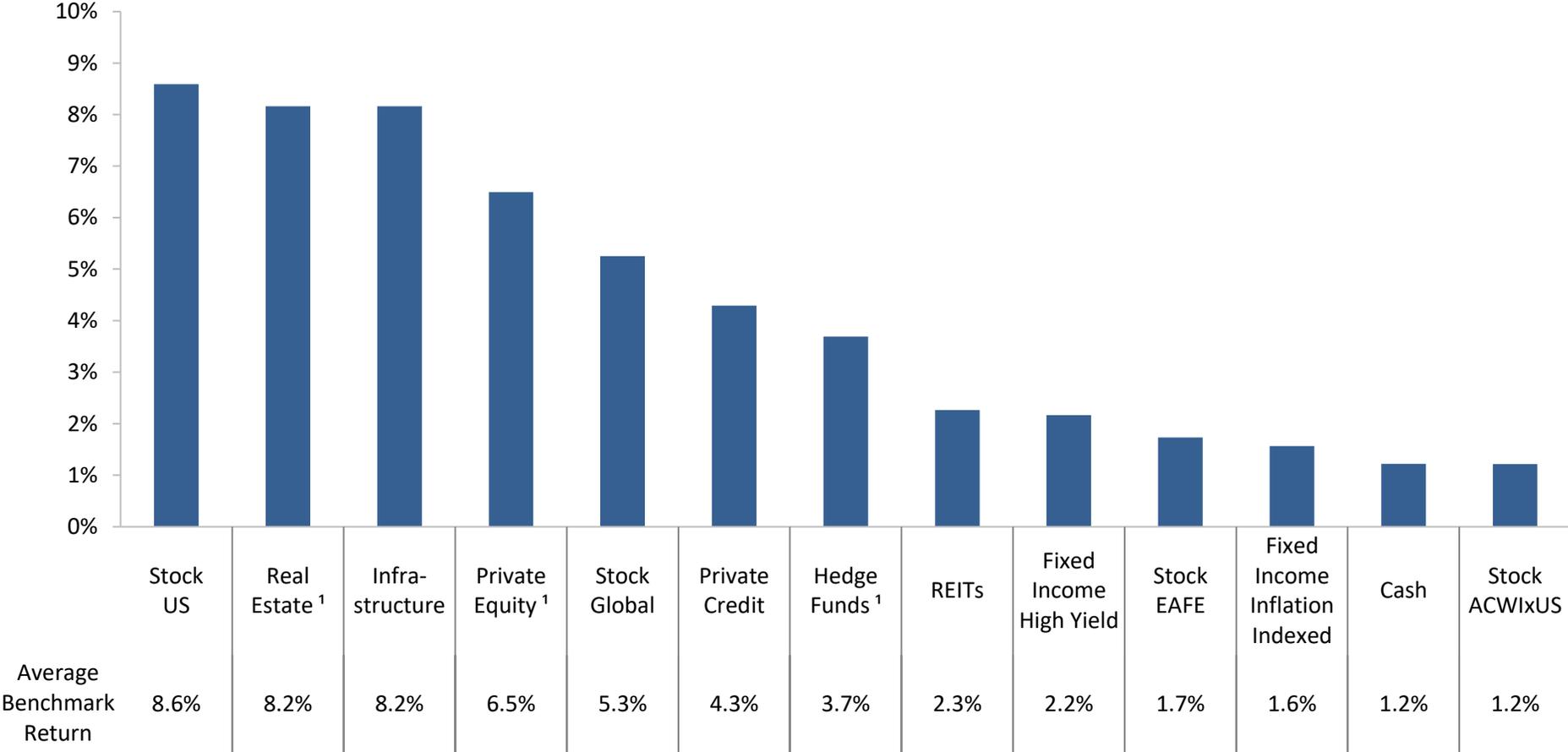
To enable fairer comparisons, the policy returns of all participants, including your fund, were adjusted to reflect private equity benchmarks based on lagged, investable, public-market indices. Prior to this adjustment, your 5-year policy return was 4.7%, 0.6% higher than your adjusted 5-year policy return of 4.1%. Mirroring this, your 5-year total fund net value added would be 0.6% lower.

U.S. Public policy returns - quartile rankings



Differences in policy returns are caused by differences in benchmarks and policy mix. The two best performing asset classes for the 5 years ending 2022 were Stock - U.S. and Real Estate.

Average reported benchmark returns for common asset classes - 5-year returns



1. The private equity benchmark is the average of the default private equity benchmark returns applied to U.S. Public participants based on a blend of listed small cap proxies. The hedge fund and real estate benchmarks are the averages of benchmark returns reported by U.S. Public participants.

Your 5-year policy return of 4.1% was slightly below the U.S. Public average of 4.5% primarily because of:

- The negative effect of a lower benchmark return in infrastructure than the U.S. Public average.
- The negative effect of a slightly lower allocation to real estate and private equity than the U.S. Public average, two of the higher performing asset classes of the last 5 years.
- Offset by a slightly higher benchmark return in total stock than the U.S. Public average.

	5-year average policy mix ¹			5-year benchmark return	
	Your Fund	U.S. Publ Avg.	More/ Less	Your Fund	U.S. Publ Avg.
Stock - U.S.	14%	17%	-4%	7.5%	8.6%
Stock - EAFE	1%	5%	-4%	n/a ³	1.7%
Stock - Emerging	5%	2%	3%	2.7%	-1.0%
Stock - ACWI x U.S.	2%	5%	-3%	n/a ³	1.2%
Stock - Global	24%	14%	10%	5.6%	5.3%
Other Stock	0%	2%	-2%	n/a ³	n/a ³
Total Stock	46%	46%	0%	5.9%	5.4%
Fixed income - U.S.	20%	17%	2%	0.0%	0.2%
Fixed income - Inflation ind.	0%	3%	-3%	n/a ³	1.6%
Cash	1%	-1%	2%	2.0%	1.2%
Other Fixed Income ²	4%	7%	-3%	n/a ³	n/a ³
Total Fixed Income	25%	26%	-1%	0.1%	0.0%
Global TAA	3%	1%	2%	2.6%	3.2%
Hedge funds	0%	3%	-3%	2.6%	3.7%
Infrastructure	3%	1%	2%	4.3%	8.2%
REITs	1%	1%	1%	3.7%	2.3%
Real estate ex-REITs	8%	9%	-1%	8.1%	8.2%
Other Real Assets ²	0%	2%	-2%	n/a ³	n/a ³
Private equity	8%	10%	-2%	6.5%	6.5%
Private debt	7%	2%	5%	4.5%	4.3%
Total	100%	100%			

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

2. Other fixed income includes: Fixed income - U.S. gov't and Fixed income - High yield. Other real assets include: Commodities and Natural resources.

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

Net value added is the component of total return from active management. Your 5-year net value added was 1.8%.

Net value added equals total net return minus policy return.

Value added for South Carolina Retirement System Investment Commission

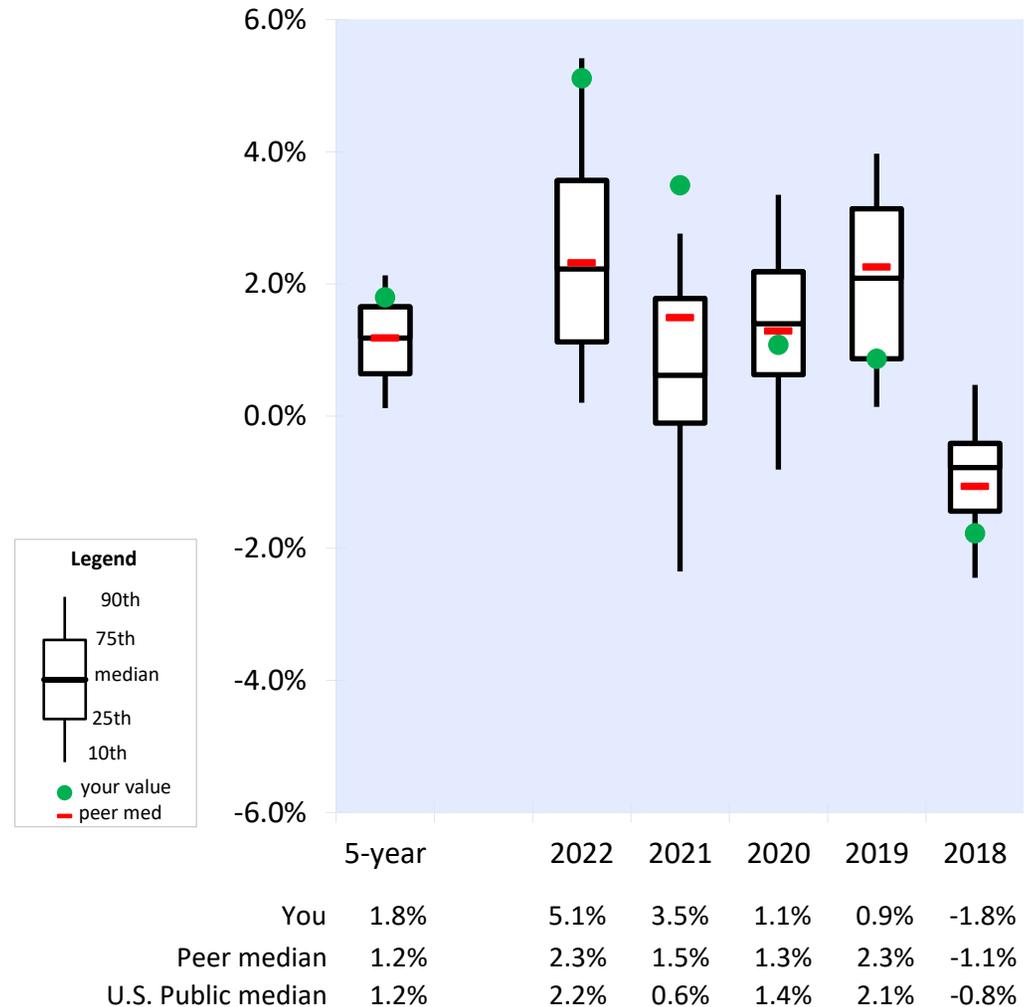
Year	Net return	Policy return	Net value added
2022	-7.3%	-12.4%	5.1%
2021	18.6%	15.2%	3.5%
2020	8.2%	7.1%	1.1%
2019	16.8%	15.9%	0.9%
2018	-4.2%	-2.5%	-1.8%
5-Year	5.9%	4.1%	1.8%

Your 5-year net value added of 1.8% compares to a median of 1.2% for your peers and 1.2% for the U.S. Public universe.

Your 1.8% 5-year value added translates into approximately \$3.4 billion of cumulative value added over 5 years.

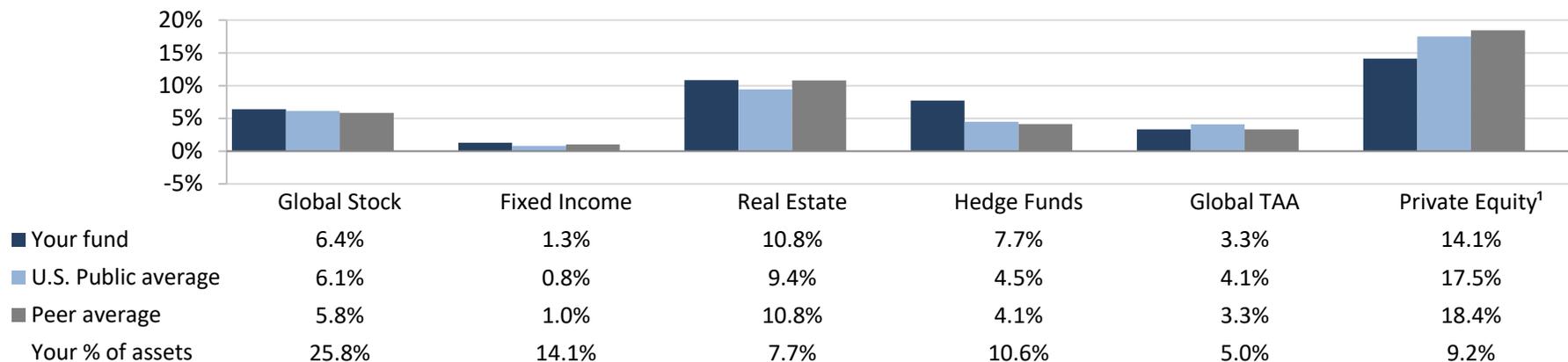
To enable fairer comparisons, the value added for each participant including your fund was adjusted to reflect private equity benchmarks based on lagged, investable public market indices. Prior to this adjustment, your fund's 5-year total fund net value added was 1.2%.

U.S. Public net value added - quartile rankings

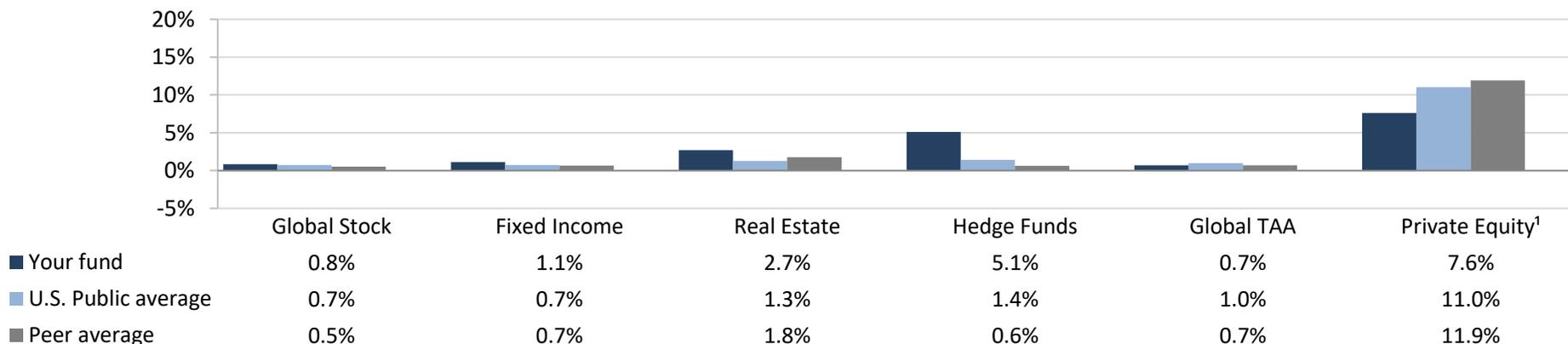


Comparisons of your 5-year net return and net value added by major asset class:

5-year average net return by major asset class



5-year average net value added by major asset class



1. 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 -1.9%.

Your investment costs, excluding private asset performance fees, were \$433.5 million or 110.8 basis points in 2022.

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 ³		
Stock - U.S. small cap		243	583			826	
Stock - EAFE		161	243			404	
Stock - Emerging		52		154		206	
Stock - Global		2,979	2,332			5,311	
Fixed income - U.S.	3	97		1,283		1,383	
Fixed income - Emerging		13		136		148	
Fixed income - High yield		288		5,197		5,486	
Cash	181	80		59		320	
REITs		86		1,200		1,286	
Infrastructure ³		86		3,073	2,465	3,159	
Infrastructure - LP ^{1 3}		171		11,151	17,794	11,322	
Infrastructure - Co-invest. ³		48		372	-491	420	
Real estate ex-REITs - LP ^{1 3}		848		28,980	27,797	29,827	
Real estate ex-REITs - Co-invest. ³		27		381	2,009	409	
Global TAA		200		8,806	33,820	42,826	
Hedge funds - External active		542		50,756	115,308	166,606	
Hedge funds - FoFs		469		26,431	21,699	48,599	
Private equity - Diversified - LP ^{1 3}		679		57,539	-2,609	58,219	
Private equity - Diversified - Co-invest. ³		518		4,462	18,321	4,980	
Private equity - Diversified - FoFs ^{2 3}		200		15,049	4,697	15,249	
Private credit - LP ^{1 3}		551		24,853	14,168	25,403	
Private credit - Co-invest. ³		353		5,228	3,713	5,581	
Derivatives/Overlays		176	928			1,104	
Total excluding private asset performance fees						429,072	109.7bp
Oversight, custodial and other costs ⁴							
Oversight of the fund						1,349	
Trustee & custodial						1,187	
Consulting and performance measurement						1,253	
Audit						278	
Other						357	
Total oversight, custodial & other costs						4,424	1.1bp
Total investment costs (excl. transaction costs & private asset performance fees)						433,497	110.8bp

Footnotes

1. Fees are the weighted average management cost calculated using the detailed limited partnership survey provided.

2. Default underlying costs were added: Private equity - Diversified - FoFs 154 bps.

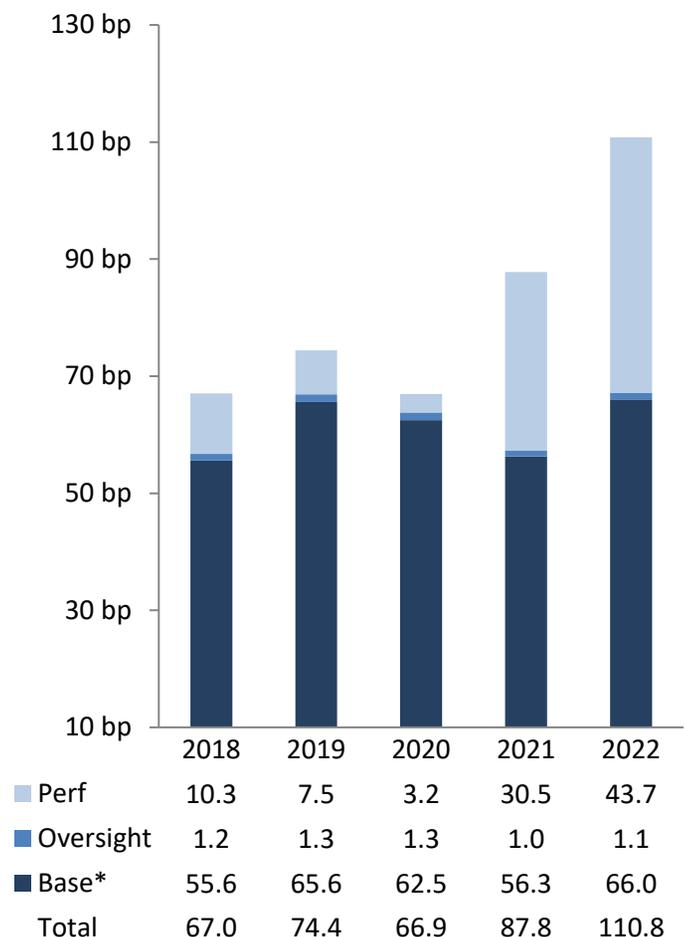
Refer to Appendix A for full details regarding defaults.

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 benefit insurance premiums and preparing cheques for retirees.

Your costs increased by 43.8 bps, from 67.0 bps in 2018 to 110.8 bps in 2022, primarily because you paid more in performance fees for better returning assets.

Trend in cost



Reasons why your costs increased by 43.8 bps

	Impact in bps		
1. Higher cost asset mix			
• Mix of Stock		(4.8)	
• Less Fixed income: 2018 19% vs 2022 7%		(3.0)	
• More Real estate ex-REITs: 2018 6% vs 2022 8%		2.1	
• Less Hedge funds & multi-asset: 2018 20% vs 2022 13%		(2.4)	
• More Private equity: 2018 9% vs 2022 16%		10.3	
• More Private debt: 2018 8% vs 2022 11%		2.3	
• All other mix changes		0.2	
		<hr/> 4.6	
2. Lower cost implementation style			
• More passive, less active		(3.4)	
• Less evergreen, more LP & FoF		1.8	
• More co-investment as a % of LP/Co		(3.1)	
• All other implementation style changes		(0.2)	
		<hr/> (4.9)	
3. Paid more in total for similar investment styles			
	<u>2018 cost</u>	<u>2022 cost</u>	
• Higher Hedge Funds base fees	118.2 bp	221.4 bp	6.1
• Lower Private Equity Co-investment base fees	85.3 bp	25.6 bp	(3.0)
• Higher Hedge Funds and Active TAA performance fees			32.9
• Similar internal investment management costs			0.0
• All other differences			8.0
			<hr/> 44.1
Total increase			<hr/> <hr/> 43.8

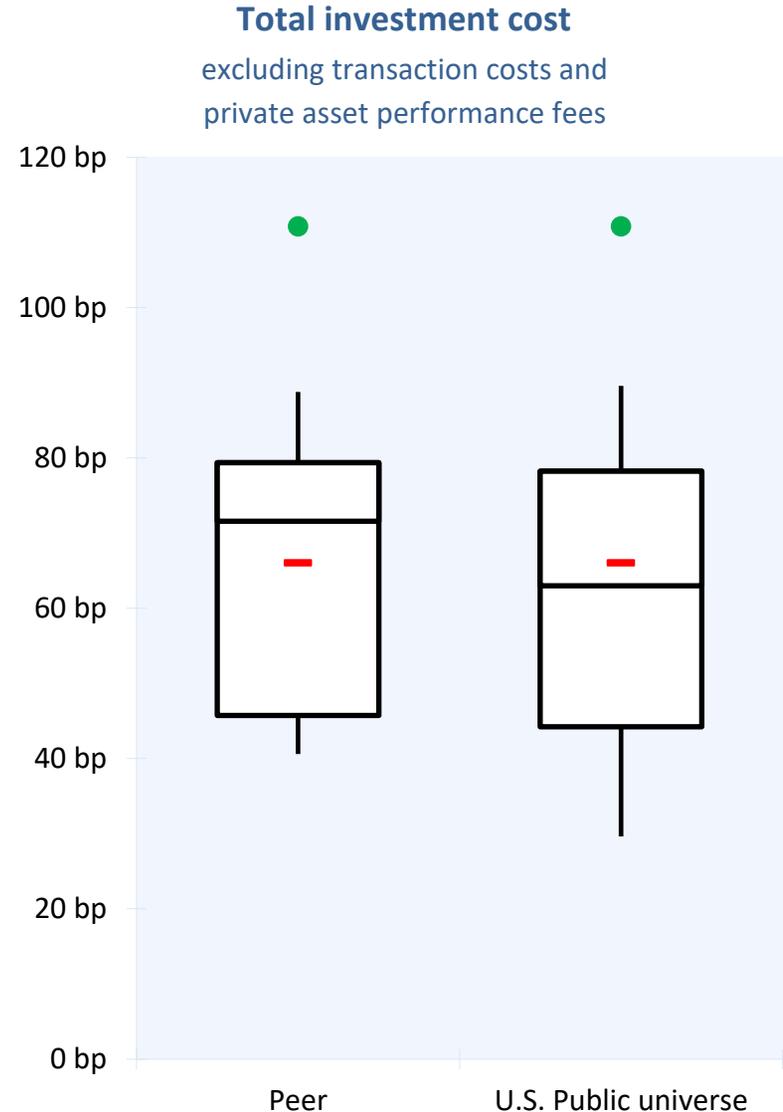
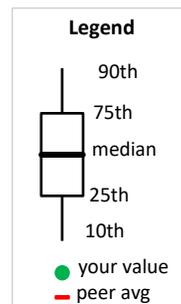
*Includes fees for managing internal assets and internal costs of monitoring external programs, where allocated.

Your total investment cost of 110.8 bps was above the peer median of 71.6 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, private equity and private credit. These high cost assets equaled 48% of your assets at the end of 2022 versus a peer average of 35%.
- 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 12.4 basis points in 2022.

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 110.8 bp was below your benchmark cost of 123.3 bp. Thus, your cost savings were 12.4 bp.

Your cost versus benchmark

	\$000s	basis points
Your total investment cost	433,497	110.8 bp
Your benchmark cost	482,194	123.3 bp
Your excess cost	(48,698)	(12.4) bp

Your fund was low cost because it had a lower cost implementation style and it paid less than peers for similar services.

Reasons for your low cost status

	Excess Cost/ (Savings)	
	\$000s	bps
1. Lower cost implementation style		
• Less active management, more lower cost passive	(22,972)	(5.9)
• More external management, less lower cost internal	1,601	0.4
• More LPs as a percentage of external	23,760	6.1
• Use of fund of funds	(691)	(0.2)
• More co-investment as a percentage of LP/Co	(28,171)	(7.2)
• Less overlays	(1,425)	(0.4)
	<u>(27,898)</u>	<u>(7.1)</u>
2. Paying less than peers for similar services		
• External investment management costs	(18,333)	(4.7)
• Internal investment management costs	(1)	(0.0)
• Oversight, custodial & other costs	(2,466)	(0.6)
	<u>(20,800)</u>	<u>(5.3)</u>
Total savings	(48,698)	(12.4)
Neutralized differences due to performance fees specific to 2022:		
• Paying more for hedge fund performance fees	78,549	20.1
• Paying more for Global TAA performance fees	38,665	9.9
	<u>117,214</u>	<u>30.0</u>

Your implementation style was 7.1 bps lower 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.

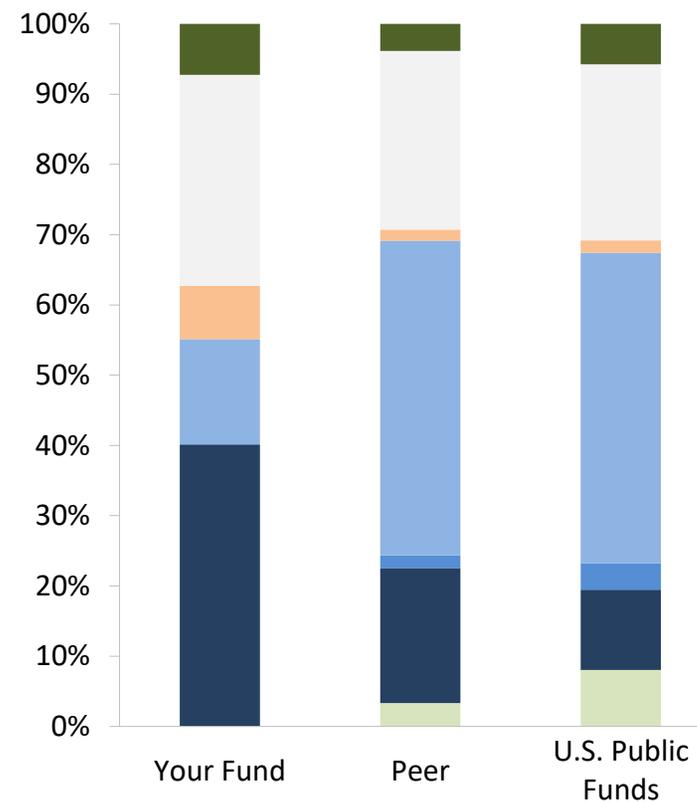
Implementation choices	Impact
More passive, less active	(5.9) bp
Less internal as a % of passive	(0.2) bp ²
Less internal as a % of active	0.6 bp
Less evergreen % in private assets, excl. PE	6.1 bp
More fund of funds	(0.2) bp ²
More co-investment as a percentage of LP/Co	(7.2) bp
Less overlays	(0.4) bp
Total impact	(7.1) bp

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.

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.

2. Typically, less internal as a % of active is higher cost. But your mix of internal decreased your cost. Typically, more fund of funds as a % of LP/Co/FoF is higher cost. But your mix of fund of funds decreased your cost.

Implementation style¹



Fund of funds	7.2%	3.8%	5.8%
LP	30.1%	25.4%	25.1%
Co-investment	7.6%	1.6%	1.8%
External active	15.0%	44.8%	44.2%
Internal active	0.0%	1.8%	3.7%
External passive	40.1%	19.2%	11.4%
Internal passive	0.0%	3.3%	8.1%

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

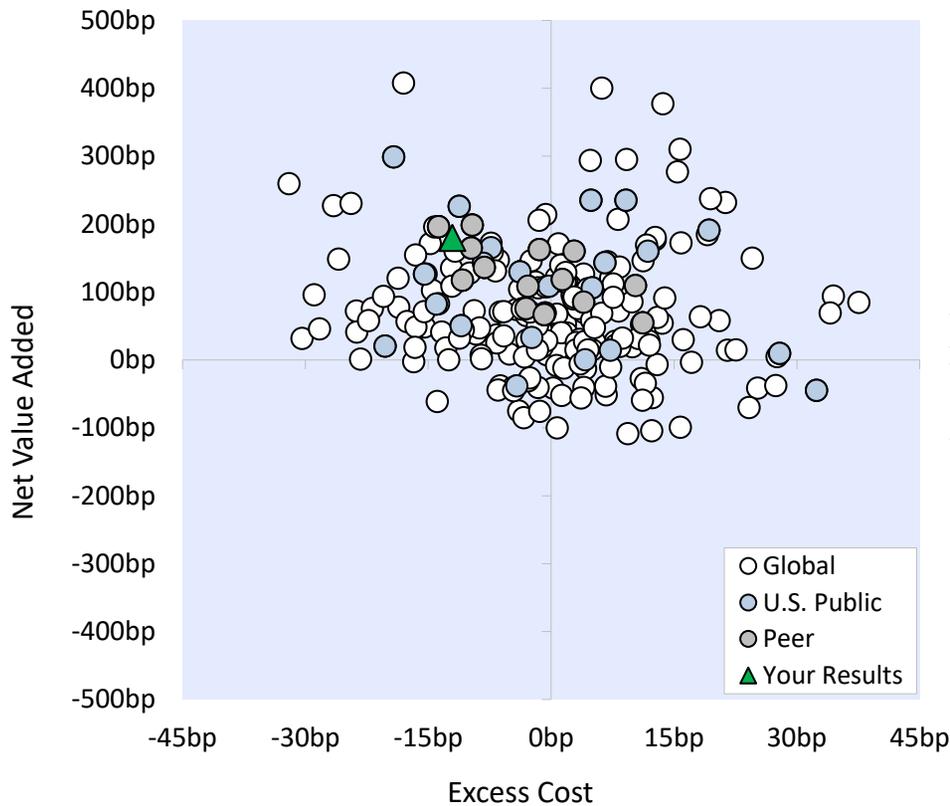
Why are you high/(low) cost by asset class?

Asset class/category	Impl. style \$000s	Paying more/(less) \$000s	Total \$000s	Total bps
Stock - U.S. small cap	(3,222)	619	(2,603)	(24.6) bp
Stock - EAFE	(2,019)	80	(1,939)	(27.9) bp
Stock - Emerging	475	(1,029)	(555)	(24.3) bp
Stock - Global	(19,148)	157	(18,991)	(13.8) bp
Fixed income - U.S.	175	757	932	16.3 bp
Fixed income - Emerging	16	(63)	(47)	(8.1) bp
Fixed income - High yield	107	1,506	1,613	12.9 bp
REITs	190	(7)	183	5.2 bp
Real estate ex-REITs	11,878	(11,812)	66	0.2 bp
Infrastructure	(950)	(1,678)	(2,629)	(16.2) bp
Hedge funds	6,557	4,244	10,801	24.6 bp
Global TAA	92	0	92	1.4 bp
Private equity - Diversified	(23,361)	5,084	(18,277)	(29.0) bp
Private credit	2,738	(16,192)	(13,454)	(30.6) bp
Derivatives and overlays	(1,425)	0	(1,425)	(0.4) bp
Oversight, custodial & other	n/a	(2,466)	(2,466)	(0.6) bp
Total	(27,898)	(20,800)	(48,698)	(12.4) bp

Your 10-year performance placed in the positive value added, low cost quadrant of the cost effectiveness chart.

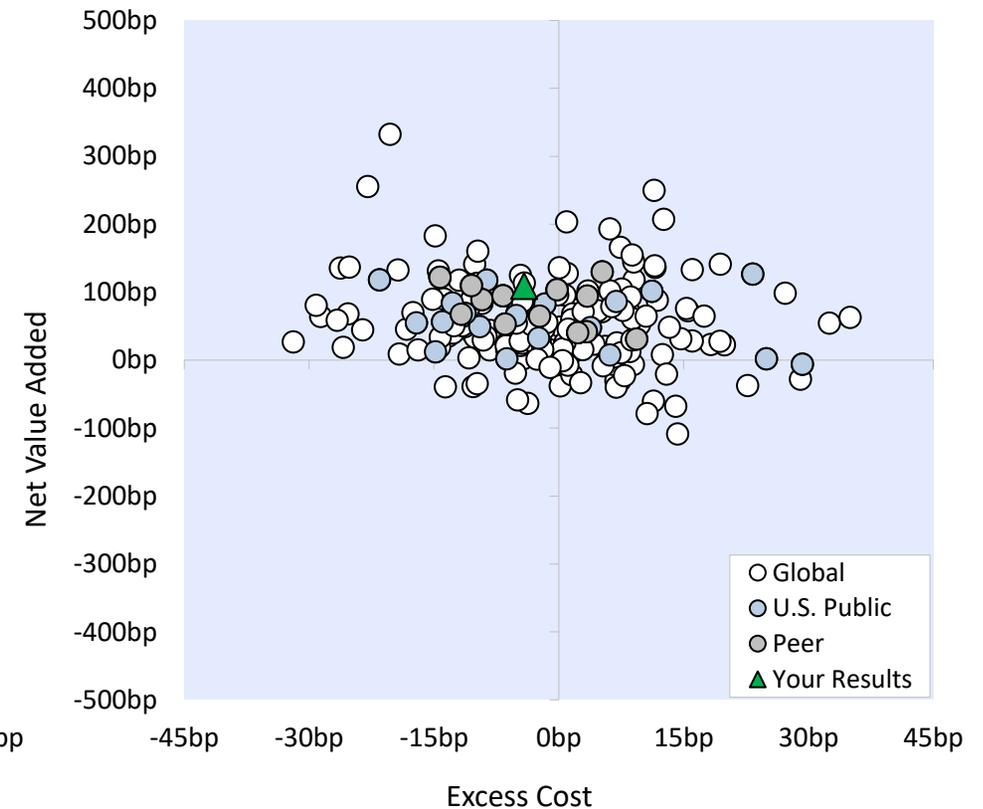
5-Year net value added versus excess cost

(Your 5-year: net value added 180 bps, cost savings 12 bps)



10-year net value added versus excess cost

(Your 10-year: net value added 109 bps, cost savings 4 bps)



1. Your 10-year cost savings of 4 basis points is the average of your cost savings for the past 10 years.

	2022	2021	2020	2019	2018	2017	2016	2015	2014	2013	10-year
Net value added	511.3 bp	349.2 bp	107.7 bp	86.6 bp	(177.6) bp	55.2 bp	(56.1) bp	57.9 bp	21.2 bp	107.2 bp	109.1 bp
Excess cost	(12.4) bp	(8.7) bp	(18.5) bp	(11.0) bp	(9.6) bp	(1.5) bp	(1.0) bp	5.1 bp	13.8 bp	2.4 bp	(4.1) bp

Summary of key takeaways

Returns

- Your 5-year net total return was 5.9%. This was equal to the U.S. Public median of 5.9% and slightly below the peer median of 6.1%.
- Your 5-year policy return was 4.1%. This was below both the U.S. Public median of 4.8% and the peer median of 5.1%.

Value added

- Your 5-year net value added above your policy return was 1.8%. This was above both the U.S. Public median of 1.2% and the peer median of 1.2%.

Cost and cost effectiveness

- Your investment cost of 110.8 bps was below your benchmark cost of 123.3 bps. This suggests that your fund was low cost compared to your peers.
- Your fund was low cost because it had a lower cost implementation style and it paid less than peers for similar services.
- Your costs increased by 43.8 bps, from 67.0 bps in 2018 to 110.8 bps in 2022, primarily because you you paid more in performance fees for better returning assets.

2

Description of peer group and universe

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Peer group

Your peer group is comprised of 16 global funds, with assets ranging from \$16.7 billion to \$100.6 billion versus your \$39.1 billion. The median size is \$39.6 billion.

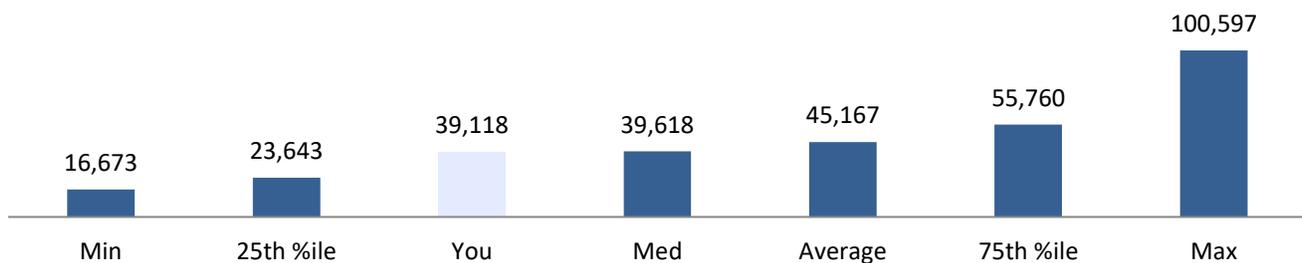
In order to preserve client confidentiality, we do not disclose your peers' names in this document due to the Freedom of Information Act. Your peer group consist of plans with the following characteristics:

Peer Group Characteristics - 2022

	You	Peers	U.S. Public average
<u>Plan Assets (\$ billions)</u>			
Range	39.1	16.7 - 100.6	1.1 - 479.3
Median		39.6	39.3
<u># of Plans</u>			
Corporate		0	0
Public	1	14	41
Other		2	0
Total		16	41
<u>Implementation style</u>			
% External active	57.6	69.6	63.8
% External passive	40.9	21.7	21.4
% Internal active	1.5	5.3	8.4
% Internal passive	0.0	3.4	6.4
<u>Asset mix</u>			
% Stock	40.2	39.0	41.1
% Fixed Income	7.4	21.6	24.9
% Real Assets	14.1	13.0	12.8
% Private Equity	14.3	14.6	12.4
% Private Credit	9.7	3.2	2.3
% Hedge Funds & Other	14.3	8.6	6.5

Your peer group is selected such that your fund size is usually close to the median of your peer group. Size is the primary criteria for choosing your peer group, because size greatly impacts how much you pay for services. Generally, the larger your fund, the smaller your unit operating costs (i.e., the economies of scale impact).

Total fund assets (\$ millions) - you versus peers

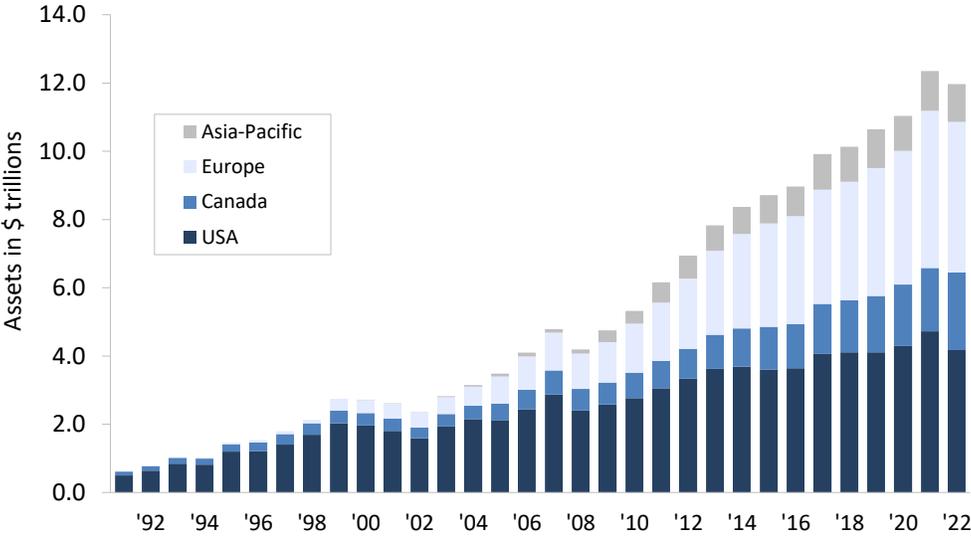


CEM global universe

CEM has been providing investment benchmarking solutions since 1991. The 2022 survey universe is comprised of 294 funds representing \$12.1 trillion in assets. The breakdown by region is as follows:

- 147 U.S. pension funds with aggregate assets of \$4.2 trillion.
- 72 Canadian pension funds with aggregate assets of \$2.3 trillion.
- 66 European pension funds with aggregate assets of \$4.4 trillion. Included are funds from the Netherlands, Norway, Sweden, Finland, Denmark, UK, and Ireland.
- 7 Asia-Pacific pension funds with aggregate assets of \$1.1 trillion.

CEM global universe



Universe subsets

CEM's global survey universe is comprised of 294 funds with total assets of \$12.1 trillion. Your fund's returns and costs are compared to the following two subsets of the global universe:

- Peers - Your peer group is comprised of 16 funds ranging in size from \$16.7 - \$100.6 billion. The peer median of \$39.6 billion compares to your \$39.1 billion.
- U.S. Public - The U.S. Public universe is comprised of 41 funds ranging in size from \$1.1 - \$479.3 billion. The median fund is \$39.3 billion.

Universe subsets by number of funds and assets

	Peer group ¹	Global by type				Global by Country				
		Corp.	Public	Other	Total	U.S.	Canada	Europe	Asia-Pacific	Total
# of funds										
2022	16	128	117	49	294	147	72	66	9	294
2021	16	128	123	43	294	145	69	68	12	294
2020	18	136	138	41	315	161	70	73	11	315
2019	17	135	139	44	318	155	72	75	16	318
2018	17	147	148	45	340	170	78	77	15	340
# of funds with uninterrupted data for:										
1 yr	16	128	117	49	294	147	72	66	9	294
2 yrs	15	117	104	40	261	131	63	58	9	261
3 yrs	15	114	101	38	253	128	61	56	8	253
4 yrs	15	105	98	36	239	119	59	53	8	239
5 yrs	15	101	97	35	233	116	58	51	8	233
Total assets (\$ billions)										
2022	723	1,378	7,886	2,823	12,086	4,169	2,277	4,416	1,224	12,086
2021	772	1,866	8,172	2,517	12,554	4,720	1,855	4,611	1,369	12,554
2020	704	1,722	7,323	2,150	11,195	4,297	1,796	3,914	1,188	11,195
2019	642	1,638	6,970	2,208	10,816	4,111	1,644	3,747	1,314	10,816
2018	584	1,549	6,835	1,894	10,279	4,109	1,532	3,468	1,170	10,279
2022 asset distribution (\$ billions)										
Avg	45.2	10.8	67.4	57.6	41.1	28.4	31.6	66.9	136.0	41.1
Max	100.6	68.1	1,740.3	731.1	1,740.3	479.3	427.4	1,740.3	700.7	1,740.3
75th %ile	55.8	13.9	53.8	51.9	27.2	24.1	14.4	43.4	81.8	27.2
Median	39.6	5.3	13.9	13.9	8.5	8.5	5.1	13.6	71.9	8.5
25th %ile	23.6	2.0	4.7	3.1	3.0	2.8	2.1	5.0	38.9	3.0
Min	16.7	0.1	0.3	0.1	0.1	0.3	0.1	0.6	3.4	0.1

1. Peer group statistics are for your 2022 peer group only as your peer group may have included different funds in prior years.

Implementation style, actual mix and policy mix by universe subset

Implementation style, actual mix and policy mix - 2022 (as a % of year-end assets)

	Your fund ¹	Peer group	Global by type				Global by Country				
			Corp.	Public	Other	Total	U.S.	Canada	Europe	Asia-Pacific	Total
Implementation style											
External Active	50.2	67.1	75.1	57.3	60.7	65.6	74.3	61.5	53.2	46.9	65.6
Fund of funds	7.4	2.4	3.2	3.7	2.4	3.3	3.1	2.6	4.5	2.0	3.3
External passive	40.9	21.7	16.3	15.2	17.1	16.0	16.1	11.3	20.8	14.5	16.0
Internal Active	1.5	5.3	4.1	18.5	15.6	11.7	3.8	19.7	18.2	29.7	11.7
Internal Passive	<u>0.0</u>	<u>3.4</u>	<u>1.4</u>	<u>5.4</u>	<u>4.2</u>	<u>3.5</u>	<u>2.6</u>	<u>4.8</u>	<u>3.3</u>	<u>6.8</u>	<u>3.5</u>
Total	100	100	100	100	100	100	100	100	100	100	100
Actual asset mix											
Stock	40.2	39.0	25.0	43.2	39.4	34.6	31.0	32.9	43.2	46.4	34.6
Fixed Income ²	8.8	23.0	53.9	24.1	32.9	38.6	44.6	34.0	31.1	30.7	38.6
Global TAA	1.7	0.2	0.4	0.8	0.1	0.5	0.5	0.2	0.9	0.0	0.5
Real Assets	14.1	13.0	8.0	16.4	15.0	12.5	8.1	20.3	13.9	12.1	12.5
Hedge Funds	11.2	5.7	3.9	2.8	2.2	3.2	4.6	2.3	1.2	1.8	3.2
Balanced Funds	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.1	0.0	0.0
Risk Parity	0.0	1.3	0.3	0.4	0.0	0.3	0.6	0.0	0.0	0.0	0.3
Private Debt	9.7	3.2	2.4	3.2	5.1	3.2	2.0	4.6	4.5	1.3	3.2
Private Equity	<u>14.3</u>	<u>14.6</u>	<u>6.0</u>	<u>9.0</u>	<u>5.4</u>	<u>7.1</u>	<u>8.6</u>	<u>5.8</u>	<u>5.1</u>	<u>7.6</u>	<u>7.1</u>
Total	100	100	100	100	100	100	100	100	100	100	100
Policy asset mix											
Stock	46.0	43.5	26.1	44.5	39.3	35.6	33.0	34.0	41.0	52.5	35.6
Fixed Income	26.0	24.0	55.5	24.6	34.4	39.7	46.2	34.9	31.4	29.5	39.7
Global TAA	0.0	0.1	0.4	0.6	0.1	0.4	0.5	0.1	0.6	0.0	0.4
Real Assets	12.0	12.5	7.0	16.5	14.7	12.1	7.5	19.2	14.8	11.3	12.1
Hedge funds	0.0	3.8	3.4	1.9	1.6	2.5	3.7	1.7	0.9	1.3	2.5
Balanced Funds	0.0	0.0	0.0	0.3	0.0	0.1	0.0	0.0	0.5	0.0	0.1
Risk Parity	0.0	1.4	0.4	0.4	0.0	0.3	0.6	0.0	0.0	0.0	0.3
Private Debt	7.0	2.8	2.2	3.7	5.1	3.3	1.5	5.4	5.2	0.9	3.3
Private Equity	<u>9.0</u>	<u>11.8</u>	<u>4.7</u>	<u>7.7</u>	<u>4.7</u>	<u>5.9</u>	<u>7.1</u>	<u>4.7</u>	<u>4.9</u>	<u>4.4</u>	<u>5.9</u>
Total	100	100	100	100	100	100	100	100	99	100	100

1. Since your fund provided average assets, the above tables show your implementation style and asset mix using average assets rather than year-end.

2. Includes derivatives and overlays.

Implementation style, actual mix and policy mix trends

Implementation style, actual mix and policy mix - 2018 to 2022 (as a % of year-end assets)

	Your fund ¹					Peer average ²					U.S. Public average ²				
	2022	2021	2020	2019	2018	2022	2021	2020	2019	2018	2022	2021	2020	2019	2018
Implementation style															
External active	50.2	48.0	59.8	78.1	79.1	66.8	62.9	62.4	63.7	65.0	59.3	56.5	56.3	58.1	59.1
Fund of funds	7.4	7.6	5.6	5.2	6.3	2.6	2.5	2.1	2.2	2.2	2.7	2.4	1.7	1.9	1.8
External passive	40.9	44.4	30.9	10.6	10.0	23.0	25.5	26.2	24.7	23.1	21.9	24.3	24.6	23.4	22.7
Internal active	1.5	0.0	3.8	6.1	4.6	4.8	6.0	6.1	6.1	6.6	9.3	9.3	10.1	9.8	9.9
Internal passive	<u>0.0</u>	<u>0.0</u>	<u>0.0</u>	<u>0.0</u>	<u>0.0</u>	<u>2.7</u>	<u>3.1</u>	<u>3.2</u>	<u>3.2</u>	<u>3.1</u>	<u>6.9</u>	<u>7.5</u>	<u>7.2</u>	<u>6.9</u>	<u>6.5</u>
Total	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
Actual asset mix															
Stock	40.2	46.9	40.0	35.7	34.3	37.7	42.7	43.9	43.7	43.0	40.2	44.9	45.3	45.2	45.0
Fixed income ³	8.8	11.2	19.3	20.3	21.5	23.1	24.2	26.0	26.9	27.4	25.9	26.2	28.1	28.2	28.1
Global TAA	1.7	1.6	4.1	8.4	9.4	0.2	0.2	0.4	0.6	0.7	0.5	0.6	1.1	1.3	1.4
Real assets	14.1	11.6	11.9	11.7	10.7	13.2	10.2	10.6	11.2	11.5	12.8	10.3	10.2	10.4	10.5
Hedge funds	11.2	10.6	10.1	10.2	10.9	6.1	5.5	4.6	4.7	5.0	4.5	4.1	3.5	3.9	4.2
Balanced Funds	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Risk Parity	0.0	0.0	0.0	0.0	0.0	1.4	1.2	1.1	0.8	0.8	1.2	1.1	1.1	0.8	1.1
Private credit	9.7	8.2	7.9	6.4	5.9	3.2	2.5	2.2	1.7	1.5	2.4	1.8	1.7	1.6	1.5
Private equity	<u>14.3</u>	<u>10.0</u>	<u>6.7</u>	<u>7.3</u>	<u>7.5</u>	<u>15.0</u>	<u>13.4</u>	<u>11.3</u>	<u>10.2</u>	<u>10.1</u>	<u>12.5</u>	<u>10.9</u>	<u>9.1</u>	<u>8.5</u>	<u>8.2</u>
Total	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
Policy asset mix															
Stock	46.0	46.0	47.4	44.8	44.1	42.2	43.1	43.1	44.0	45.2	43.6	44.7	44.7	44.9	45.9
Fixed income	26.0	26.0	26.0	22.4	23.2	24.1	25.5	26.6	26.9	26.4	25.8	26.1	26.6	26.3	25.8
Global TAA	0.0	0.0	0.0	7.0	7.0	0.1	0.1	0.0	0.5	0.5	0.6	0.8	0.9	1.1	1.1
Real assets	12.0	12.0	12.0	12.0	12.0	12.8	11.8	12.6	12.9	12.5	12.6	12.1	12.0	12.3	11.8
Hedge funds	0.0	0.0	0.0	1.0	1.0	4.1	3.9	3.9	2.8	3.2	3.0	2.8	3.2	3.4	4.1
Balanced Funds	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Risk Parity	0.0	0.0	0.0	0.0	0.0	1.5	1.5	1.0	0.8	0.8	1.3	1.3	1.0	0.7	0.9
Private credit	7.0	7.0	7.0	6.6	5.8	3.0	2.6	2.7	2.3	2.1	2.2	2.1	1.9	2.1	1.6
Private equity	<u>9.0</u>	<u>9.0</u>	<u>7.6</u>	<u>6.2</u>	<u>7.0</u>	<u>12.1</u>	<u>11.5</u>	<u>10.2</u>	<u>9.7</u>	<u>9.3</u>	<u>11.0</u>	<u>10.2</u>	<u>9.5</u>	<u>9.2</u>	<u>8.7</u>
Total	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100

1. Due to the fact that your fund provided average assets, the above tables show your trend in implementation style and asset mix using average assets rather than year-end.

2. Trends are based on the 36 U.S. Public and 15 peer funds with 5 or more consecutive years of data ending 2022.

3. Includes derivatives and overlays.

Implementation style by asset class

Implementation style impacts your costs, because external active management tends to be more expensive than internal or passive (or indexed) management and fund-of-funds usage is more expensive than direct fund investment.

Implementation style by asset class - 2022 (as a % of average assets)

	Your fund %				Peer average %				U.S. Public average %						
	External		Internal		External		Internal		External		Internal				
	Active	FOFs	Index	Active	Index	Active	FOFs	Index	Active	FOFs	Index	Active	Index		
Stock - U.S. broad/all					26.5	66.0	0.0	7.5	8.8	69.2	1.9	20.1			
Stock - U.S. large cap					25.1	46.9	15.1	12.9	25.1	50.4	8.6	16.0			
Stock - U.S. mid cap					55.4	4.4	24.0	16.2	66.8	1.1	8.7	23.4			
Stock - U.S. small cap	0.0	100.0	0.0	0.0	56.5	28.8	5.7	8.9	72.3	17.8	6.8	3.1			
Stock - EAFE	0.0	100.0	0.0	0.0	58.9	32.1	8.9	0.0	66.2	22.4	6.0	5.4			
Stock - Global	0.0	100.0	0.0	0.0	42.1	49.9	0.3	7.7	46.1	27.9	4.3	21.6			
Stock - Other					37.6	0.0	53.6	8.8	58.1	14.1	23.1	4.8			
Stock - Emerging	100.0		0.0	0.0	55.5	24.7	3.2	16.6	71.7	18.3	5.3	4.7			
Stock - ACWI x U.S.					76.8	22.3	0.0	1.0	56.4	40.4	2.5	0.7			
Stock - Aggregate	1.5	98.5	0.0	0.0	45.5	41.0	6.2	7.3	43.0	38.7	5.8	12.5			
Fixed income - U.S.	97.8		0.0	2.2	0.0	66.2	10.6	22.8	0.4	57.3	17.8	23.2	1.7		
Fixed income - U.S. gov't					0.0	78.1	0.0	21.9	0.0	67.2	4.0	28.8			
Fixed income - U.S. credits					100.0	0.0	0.0	0.0	42.4	5.3	52.3	0.0			
Fixed income - EAFE					100.0	0.0	0.0	0.0	100.0	0.0	0.0	0.0			
Fixed income - Global					90.7	9.3	0.0	0.0	48.7	2.4	48.9	0.0			
Fixed income - Other					99.8	0.2	0.0	0.0	99.9	0.1	0.0	0.0			
Fixed income - Long bonds					38.3	61.7	0.0	0.0	48.7	18.7	6.2	26.3			
Fixed income - Emerging	100.0		0.0	0.0	89.1	8.1	2.8	0.0	95.8	2.0	2.2	0.0			
Fixed income - Inflation indexed					47.5	52.5	0.0	0.0	22.3	70.5	1.2	6.1			
Fixed income - High yield	100.0		0.0	0.0	96.2	0.0	3.8	0.0	84.1	2.5	13.4	0.0			
Fixed income - Absolute return bond:					0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
Fixed income - Bundled LDI					0.0	0.0	0.0	0.0	100.0	0.0	0.0	0.0			
Fixed income - Convertibles					0.0	0.0	0.0	0.0	100.0	0.0	0.0	0.0			
Public mortgages					100.0	0.0	0.0	0.0	73.9	0.0	26.1	0.0			
Cash	45.2		54.8		270.8		-170.8		41.3		58.7				
Fixed income - Aggregate	80.2		0.0	19.8	0.0	66.1	23.3	8.3	2.3	56.5	18.6	20.9	4.0		
Commodities					100.0	0.0	0.0	0.0	63.0	10.3	8.1	18.6			
Infrastructure	100.0	0.0		0.0	98.5	1.5		0.0	98.7	0.7		0.6			
Natural resources					100.0	0.0		0.0	98.6	1.4		0.0			
REITs	100.0		0.0	0.0	82.0	0.0	11.1	6.9	41.9	44.1	2.7	11.3			
Real estate ex-REITs	100.0	0.0		0.0	90.3	0.2		9.6	91.4	0.2		8.4			
Other real assets					100.0	0.0		0.0	100.0	0.0		0.0			
Other listed real assets					100.0	0.0	0.0	0.0	85.3	14.7	0.0	0.0			
Real assets - Aggregate	100.0	0.0	0.0	0.0	92.2	0.3	0.0	7.3	0.2	89.1	0.3	3.2	6.4	1.0	
Hedge funds	52.8	47.2			84.5	15.5			76.0	24.0					
Global TAA	100.0			0.0	96.7			3.3	85.5			14.5			
Risk parity					100.0			0.0	89.8			10.2			
Private credit	100.0	0.0		0.0	100.0	0.0		0.0	99.2	0.0		0.8			
Private mortgages					100.0			0.0	99.3			0.7			
Private equity - Diversified	85.5	14.5		0.0	89.1	10.9		0.0	80.5	19.4		0.0			
Venture capital					27.9	72.1		0.0	58.7	41.3		0.0			
LBO					97.4	2.6		0.0	96.8	3.2		0.0			
Private equity - Other					100.0	0.0		0.0	100.0	0.0		0.0			
Private equity - Aggregate	85.5	14.5		0.0	89.5	10.5		0.0	82.9	17.1		0.0			
Total Fund - Avg. Holdings	50.2	7.4	40.9	1.5	0.0	67.1	2.4	21.7	5.3	3.4	60.6	3.2	21.4	8.4	6.4

Actual mix

Actual asset mix - 2018 to 2022 (as a % of total average assets)

	Your fund ¹					Peer average %					U.S. Public average %				
	2022	2021	2020	2019	2018	2022	2021	2020	2019	2018	2022	2021	2020	2019	2018
Stock - U.S. broad/all		2.1	5.6	8.8	8.7	6.6	7.8	9.4	8.6	8.5	6.2	7.1	7.3	6.3	6.0
Stock - U.S. large cap						9.1	9.5	10.7	11.6	11.4	10.6	11.0	10.6	12.2	11.9
Stock - U.S. mid cap						0.5	0.4	0.6	0.5	0.5	0.8	0.5	0.6	0.7	1.0
Stock - U.S. small cap	2.7	3.1	2.0			1.2	1.4	1.4	1.4	1.6	2.0	1.8	1.9	1.9	2.2
Stock - EAFE	1.8	3.2	2.0			2.5	2.8	2.8	3.1	3.7	6.1	6.4	6.5	6.8	7.1
Stock - Global	35.1	36.9	23.3	17.3	16.4	7.8	8.7	7.0	5.6	4.5	6.5	8.4	8.1	6.3	6.5
Stock - Other						1.1	0.9	0.8	1.0	0.9	1.0	1.0	0.9	0.7	0.8
Stock - Emerging	0.6	1.7	6.2	6.2	5.8	1.3	2.0	2.3	2.3	2.4	2.9	3.1	3.5	3.6	3.8
Stock - ACWI x U.S.		0.0	1.0	3.4	3.4	9.0	9.2	11.4	11.2	10.8	5.0	5.3	6.3	6.1	5.8
Stock - Aggregate	40.2	46.9	40.0	35.7	34.3	39.0	42.7	46.4	45.4	44.4	41.1	44.5	45.7	44.7	45.1
Fixed income - U.S.	1.5	2.3	2.4	2.4	2.8	10.6	10.5	12.3	12.6	14.0	11.6	11.8	12.0	12.5	13.1
Fixed income - U.S. gov't						2.1	2.1	1.7	2.1	2.0	1.3	1.7	2.3	2.1	1.6
Fixed income - U.S. credits						0.4	0.2	0.1			0.7	0.6	0.6	0.3	0.3
Fixed income - EAFE						0.1	0.2	0.2	0.2	0.3	0.1	0.0	0.0	0.0	0.0
Fixed income - Global						0.5	0.7	0.9	1.0	0.5	0.8	0.9	1.3	1.7	1.8
Fixed income - Other						0.7	0.6	0.7	0.8	0.9	0.9	0.8	0.7	0.7	0.8
Fixed income - Long bonds						0.7	0.7	0.7	0.7	0.5	1.2	1.4	1.9	1.4	1.4
Fixed income - Emerging	0.1	0.8	2.9	3.7	4.7	0.8	1.0	0.9	1.0	1.0	1.2	1.2	1.4	1.4	1.3
Fixed income - Inflation indexed						3.3	2.7	2.0	2.4	2.4	2.0	2.0	1.4	1.6	1.7
Fixed income - High yield	3.2	4.0	4.4	4.1	4.8	1.9	1.8	1.9	1.7	1.9	1.6	1.7	1.9	1.7	1.8
Fixed income - Absolute return bonds															
Fixed income - Bundled LDI											1.2	0.8	0.3	0.3	0.2
Fixed income - Convertibles							0.1	0.0	0.2	0.2	0.0	0.1	0.1	0.1	0.1
Public mortgages						0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.0
Cash	2.6	2.8	6.8	7.6	6.7	0.4	1.8	2.1	1.9	2.1	2.3	2.2	2.5	1.7	2.4
Fixed income - Aggregate	7.4	9.8	16.4	17.7	18.9	21.6	22.2	23.6	24.7	25.6	24.9	25.4	26.4	25.6	26.5
Commodities						0.1	0.1	0.7	0.9	1.0	0.3	0.3	0.4	0.5	0.5
Infrastructure	3.2	2.8	3.0	2.6	2.0	1.3	0.9	0.7	0.7	0.6	1.0	0.9	0.7	0.9	0.5
Natural resources						1.1	0.8	0.8	1.0	0.9	0.9	0.8	0.7	0.9	0.9
REITs	0.9	1.1	1.5	1.6	2.5	0.5	0.6	0.5	0.7	0.8	0.7	0.9	0.7	0.7	0.8
Real estate ex-REITs	10.0	7.7	7.4	7.5	6.1	9.5	7.5	7.1	7.4	8.0	9.2	7.1	7.1	7.6	7.7
Other real assets						0.1	0.0	0.0	0.1	0.1	0.2	0.2	0.5	0.4	0.4
Other listed real assets						0.5	0.3	0.3	0.3		0.4	0.4	0.3	0.2	
Real assets - Aggregate	14.1	11.6	11.9	11.7	10.7	13.0	10.2	10.1	10.9	11.3	12.8	10.5	10.5	11.2	10.8
Hedge funds	11.2	10.6	10.1	10.2	10.9	5.7	6.2	4.6	4.7	5.1	4.4	4.2	4.1	4.3	4.6
Global TAA	1.7	1.6	4.1	8.4	9.4	0.2	0.2	0.3	0.6	0.6	0.4	0.6	0.9	1.5	1.2
Risk parity						1.3	1.1	0.9	0.7	0.7	1.0	0.9	0.9	0.9	1.1
Private mortgages						0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1
Private credit	9.7	8.2	7.9	6.4	5.9	3.2	2.5	2.2	2.0	1.9	2.3	2.0	1.9	2.0	2.0
Private equity - Diversified	14.3	10.0	6.7	7.3	7.5	13.7	12.1	9.6	8.8	8.7	9.5	8.3	6.9	6.7	6.2
Venture capital						0.0	0.2	0.2	0.2	0.2	0.5	0.6	0.5	0.5	0.5
LBO						0.7	1.0	0.9	0.9	0.8	2.2	2.2	1.7	1.7	1.6
Private equity - Other						0.2	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.1
Private equity - Aggregate	14.3	10.0	6.7	7.3	7.5	14.6	13.4	10.8	10.0	9.9	12.4	11.3	9.1	9.0	8.4
Derivatives/Overlays Mkt Value	1.3	1.3	2.9	2.6	2.6	1.4	1.4	1.2	1.0	0.6	0.6	0.5	0.5	0.6	0.4
Total Fund	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
Count	1	1	1	1	1	16	16	18	17	17	41	45	52	50	57
Median Assets (\$ billions)	39.1	39.0	31.5	31.6	31.3	39.6	43.8	32.9	31.9	30.5	39.3	39.0	22.3	21.2	19.1

1. Your asset mix is based on average assets rather than year-end.

Policy mix

Policy asset mix - 2018 to 2022 (as a % of total assets)

	Your fund %					Peer average %					U.S. Public average %				
	2022	2021	2020	2019	2018	2022	2021	2020	2019	2018	2022	2021	2020	2019	2018
Stock - U.S. broad/all			23.9	16.3	16.4	9.8	10.0	12.0	10.7	12.7	7.5	6.6	8.1	7.2	8.0
Stock - U.S. large cap						8.6	6.5	7.6	8.0	8.3	8.9	8.2	8.0	9.4	8.9
Stock - U.S. mid cap						0.4	0.2	0.4	0.4	0.4	0.2	0.1	0.3	0.4	0.7
Stock - U.S. small cap	6.1	3.0	2.9			0.8	0.5	0.5	0.4	0.4	1.4	1.2	1.2	1.3	1.5
Stock - EAFE	3.8	2.0				2.2	2.1	1.8	2.0	2.1	4.4	4.9	4.9	5.1	5.3
Stock - Global	34.6	35.8	12.2	18.3	17.7	10.7	11.1	8.9	8.8	8.5	13.5	14.6	12.2	10.5	11.3
Stock - Other						0.4	4.2	3.9	4.4	0.9	0.8	2.2	2.0	1.8	0.7
Stock - Emerging	1.5	5.2	6.2	6.6	6.3	0.9	1.1	1.0	1.1	1.1	2.2	2.2	2.4	2.7	2.9
Stock - ACWI x U.S.			2.2	3.6	3.7	9.5	8.4	10.0	10.3	12.7	5.4	4.6	5.7	5.7	6.7
Stock - Aggregate	46.0	46.0	47.4	44.8	44.1	43.5	44.2	46.1	46.0	47.0	44.2	44.6	44.9	44.2	46.1
Fixed income - U.S.	24.0	24.0	26.0	11.0	13.0	13.5	15.7	17.2	17.7	17.6	14.0	14.5	14.2	14.6	14.4
Fixed income - U.S. gov't						1.8	1.9	1.6	1.6	1.6	1.3	1.4	2.3	1.8	1.4
Fixed income - U.S. credits						0.4	0.3	0.2			0.9	0.8	0.5	0.3	0.5
Fixed income - EAFE						0.1	0.1	0.2	0.2	0.2	0.0	0.0	0.0	0.0	0.0
Fixed income - Global						0.6	1.0	1.0	0.5	0.5	0.9	0.9	1.0	1.3	1.6
Fixed income - Other						0.5	0.3	0.4	0.2	0.3	0.7	0.7	0.8	0.5	0.4
Fixed income - Long bonds						0.7	0.8	0.7	0.7	0.5	1.9	2.1	2.4	2.0	2.0
Fixed income - Emerging	1.0	1.0		4.0	4.0	0.8	0.9	0.8	0.9	0.9	1.3	1.1	1.3	1.4	1.2
Fixed income - Inflation indexed						3.0	3.0	2.3	2.6	2.4	2.8	2.9	2.2	2.6	2.6
Fixed income - High yield	1.0	1.0		4.4	5.2	1.5	1.6	1.8	1.9	1.6	1.4	1.6	1.8	1.7	1.6
Fixed income - Absolute return bonds															
Fixed income - Bundled LDI											1.0	0.9	0.2	0.3	0.2
Fixed income - Convertibles									0.2	0.2	0.0	0.1	0.1	0.1	0.1
Public mortgages						0.0					0.1	0.1	0.1	0.1	0.0
Cash				3.0	1.0	0.9	0.8	0.8	0.9	0.9	-0.9	-0.9	-0.6	-1.5	-0.9
Fixed income - Aggregate	26.0	26.0	26.0	22.4	23.2	24.0	26.4	26.9	27.5	26.7	25.5	26.3	26.2	25.2	25.3
Commodities						0.2	0.3	1.0	1.0	1.0	0.4	0.6	0.7	1.0	1.0
Infrastructure	3.0	3.0	3.0	3.0	3.0	1.5	1.3	1.0	0.9	0.3	1.3	1.4	1.2	1.2	0.6
Natural resources						0.8	0.7	0.6	1.0	0.6	0.8	0.8	0.7	0.8	0.7
REITs	1.0	1.0		1.5	3.1	0.5	0.5	0.3	0.6	0.6	0.5	0.7	0.6	0.6	0.8
Real estate ex-REITs	8.0	8.0	9.0	7.5	5.9	9.1	8.1	8.4	8.5	8.4	9.1	8.1	8.1	8.5	8.0
Other real assets						0.2	0.1		0.0	0.5	0.5	0.2	0.7	0.6	0.7
Other listed real assets						0.2					0.2	0.3	0.1		
Real assets - Aggregate	12.0	12.0	12.0	12.0	12.0	12.5	11.0	11.4	11.9	11.4	12.8	12.2	12.1	12.7	11.7
Hedge funds				1.0	1.0	3.8	3.6	3.3	2.5	2.8	2.9	2.9	3.9	3.9	4.4
Global TAA				7.0	7.0	0.1	0.1		0.4	0.4	0.6	0.8	0.8	1.3	1.1
Risk parity						1.4	1.4	0.8	0.7	0.7	1.1	1.0	0.7	0.8	0.8
Private mortgages								0.1	0.1	0.2	0.0	0.0	0.1	0.2	0.1
Private credit	7.0	7.0	7.0	6.6	5.8	2.8	2.4	2.2	2.0	2.2	1.9	2.1	2.0	2.2	2.1
Private equity - Diversified	9.0	9.0	7.6	6.2	7.0	11.0	10.2	8.3	8.5	8.2	9.0	8.2	7.5	7.6	6.7
Venture capital						0.1	0.1	0.1	0.3	0.1	0.3	0.2	0.2	0.3	0.3
LBO						0.5	0.5	0.8	0.2	0.3	1.5	1.6	1.5	1.4	1.4
Private equity - Other						0.3					0.3	0.1	0.0	0.2	0.1
Private equity - Aggregate	9.0	9.0	7.6	6.2	7.0	11.8	10.7	9.2	9.0	8.6	11.0	10.1	9.2	9.5	8.4
Total Fund	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
Count	1	1	1	1	1	16	16	18	17	17	41	45	52	50	57

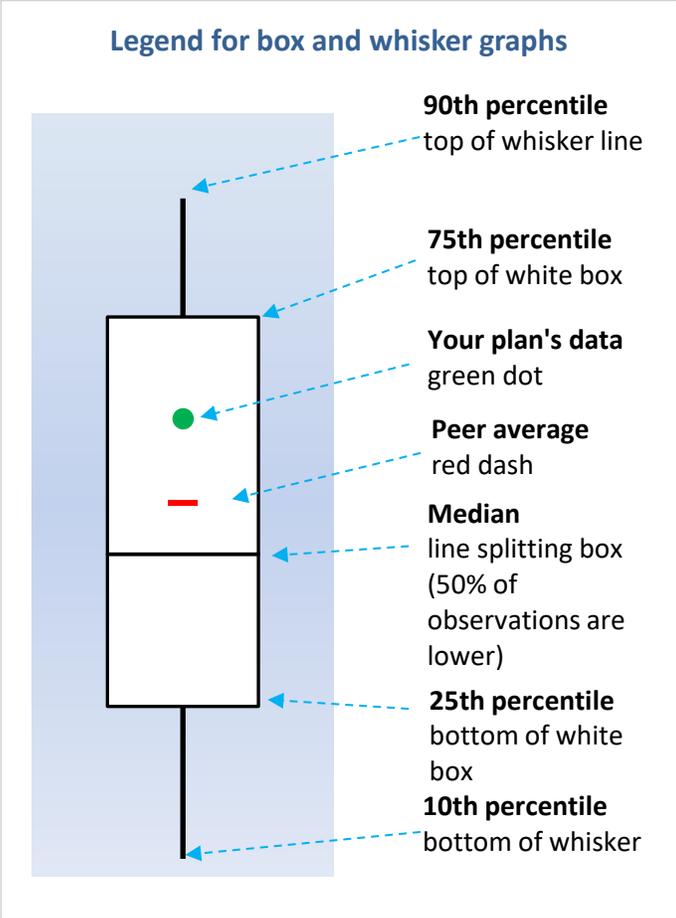
3

Returns, Benchmarks and Value Added

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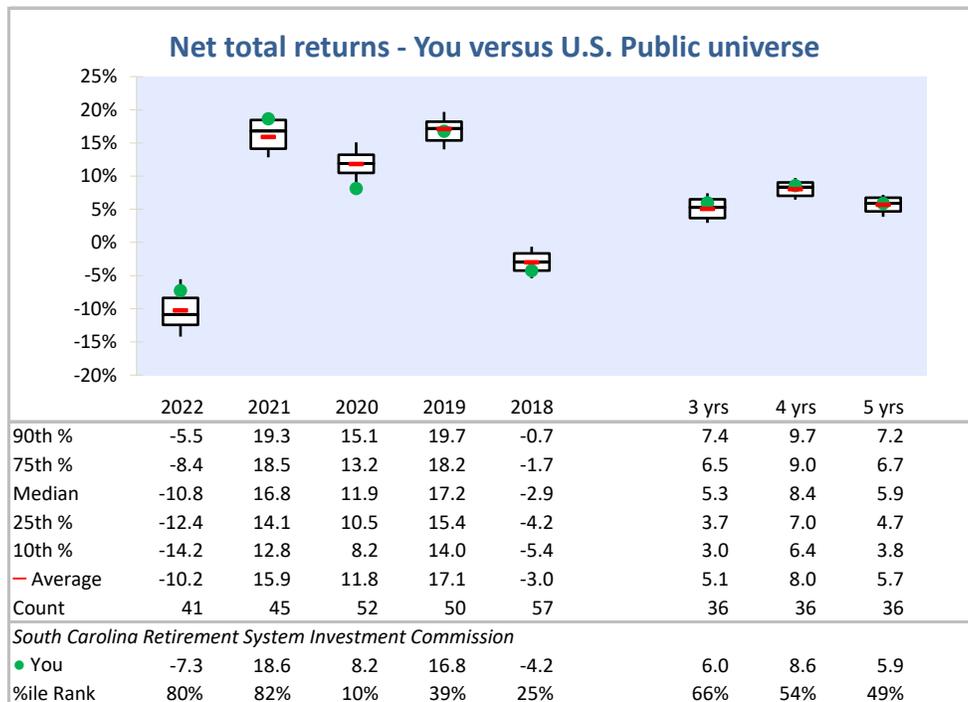
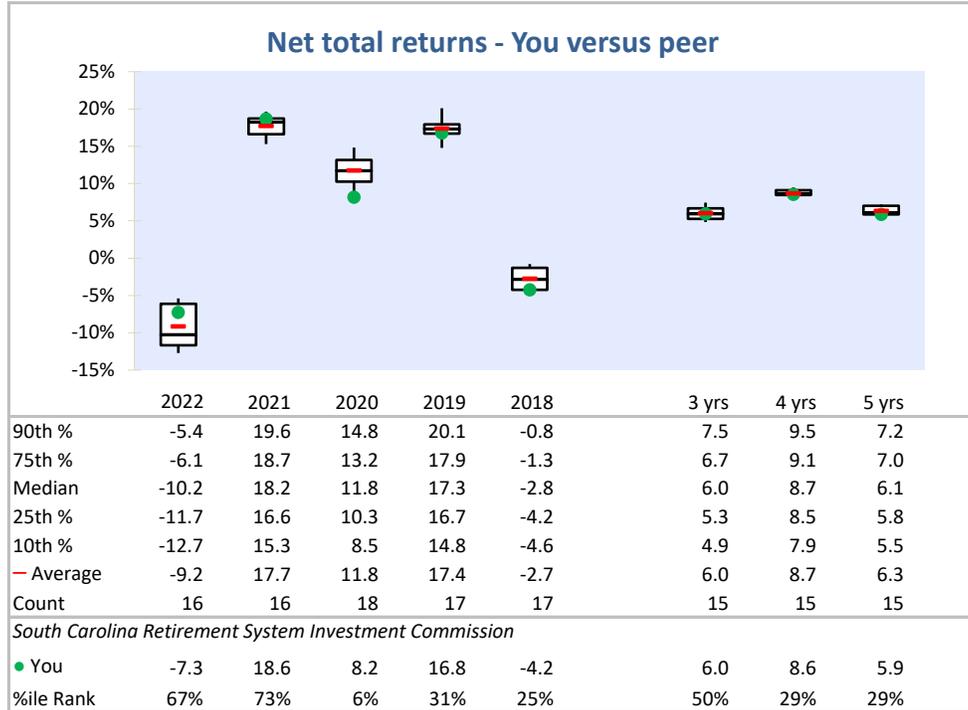
Interpreting box and whisker graphs

Box and whisker graphs are used extensively in this report because they show visually where you rank relative to all observations. At a glance you can see which quartile your data falls in.



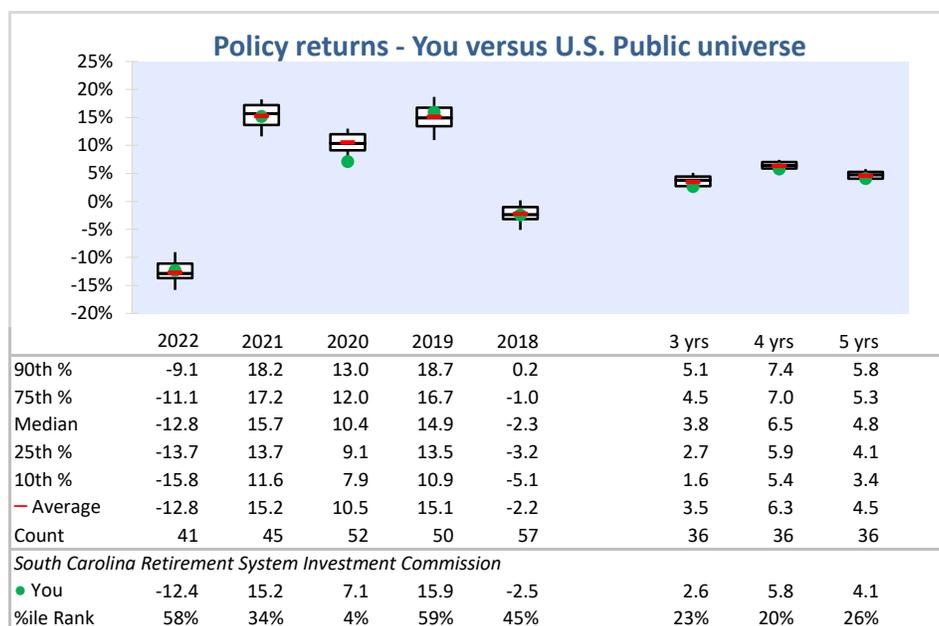
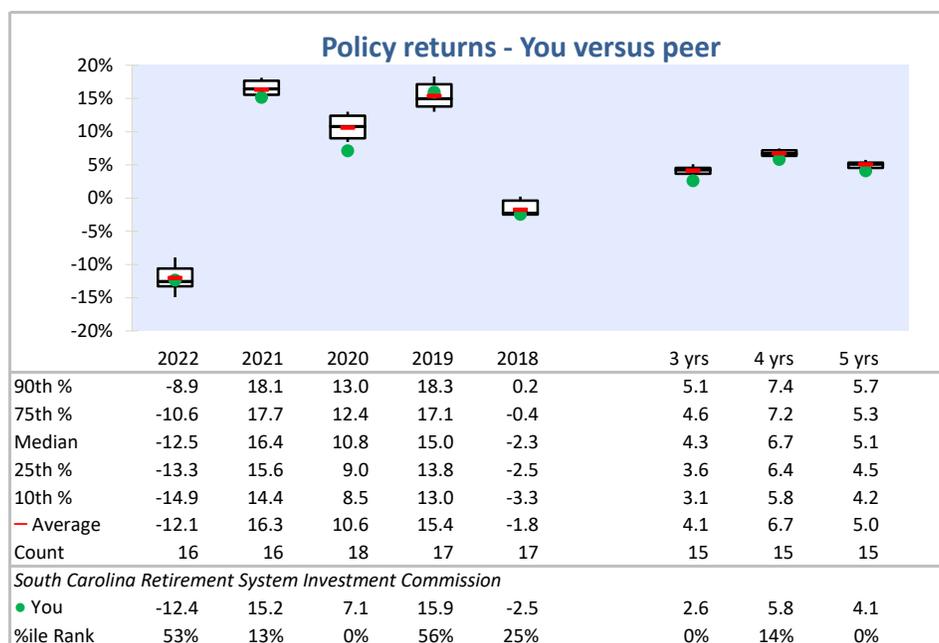
Net total returns

Your 5-year net total return of 5.9% was below the peer median and close to the U.S. Public universe median. Comparisons of total return do not help you understand the reasons behind relative performance. To understand the relative contributions from policy asset mix decisions and implementation decisions we separate total return into its more meaningful components - policy return and implementation value added.



Policy returns

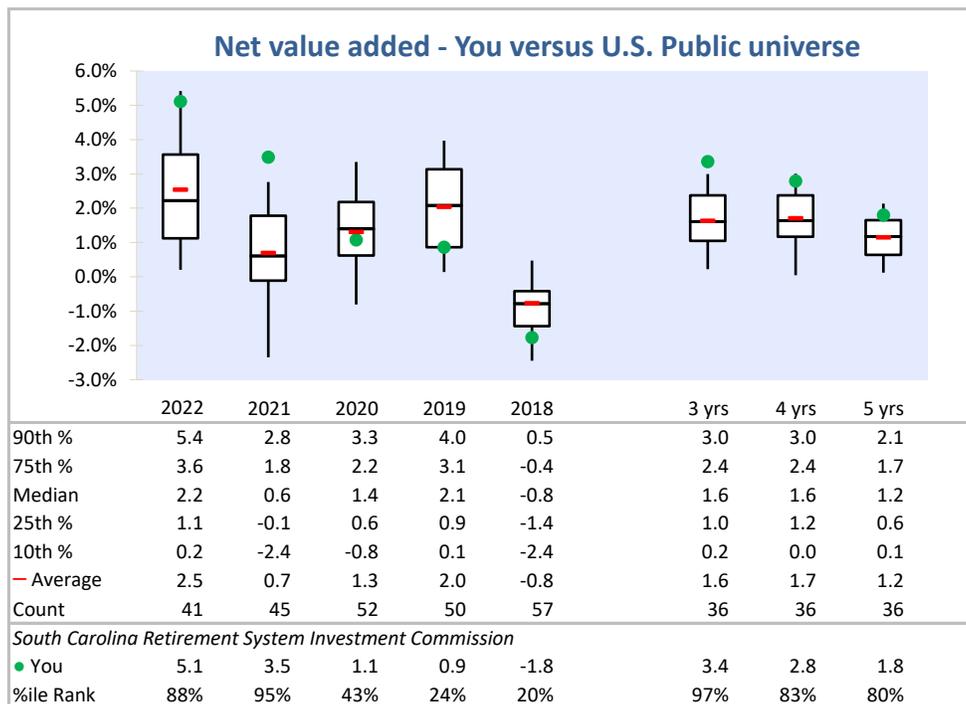
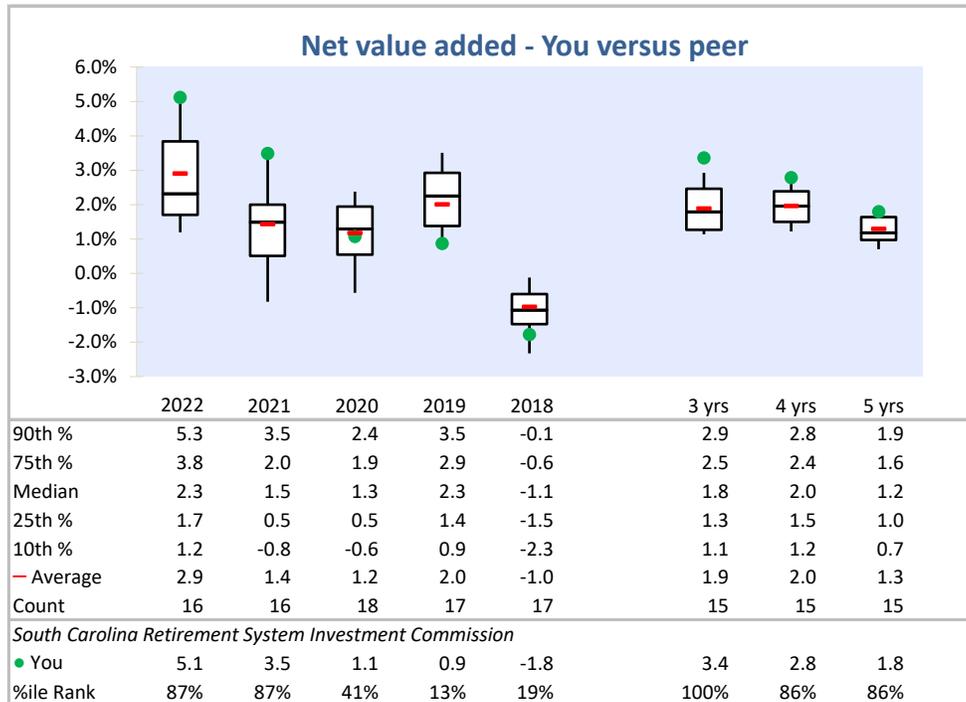
Your 5-year policy return of 4.1% was below the peer median and below the median of the U.S. Public universe. Policy return is the return you would have earned had you passively implemented your policy asset mix decision through your benchmark portfolios.



To enable fairer comparisons, the policy returns of all participants with policy weight in private equity were adjusted to reflect private equity benchmarks based on lagged, investable, public-market indices. Refer to the appendix of this section for details.

Net value added

Your 5-year net value added of 1.8% was among the highest in your peer group and among the highest in the U.S. Public universe. Net value added is the difference between your net total return and your policy return.



Net returns by asset class

Asset class	Your fund %						Peer average %						U.S. Public average %					
	2022	2021	2020	2019	2018	5-yr ¹	2022	2021	2020	2019	2018	5-yr ¹	2022	2021	2020	2019	2018	5-yr ¹
Stock - U.S. broad/all			<i>-11.7</i>	19.6	-7.9		-17.6	25.7	13.5	28.9	-5.6	8.1	-19.3	25.2	17.8	29.6	-5.3	8.3
Stock - U.S. large cap							-16.7	28.0	18.2	34.3	-5.5	9.9	-18.6	26.4	20.0	31.3	-4.9	9.3
Stock - U.S. mid cap							-18.2	23.6	18.4	32.3	-8.8	8.0	-19.0	23.0	20.3	31.2	-9.5	6.6
Stock - U.S. small cap	-17.2	19.4					-16.7	22.7	17.3	26.1	-10.4	6.3	-16.9	20.9	17.2	26.8	-11.0	5.8
Stock - EAFE	-20.0	11.5					-15.8	13.5	9.4	22.7	-13.6	2.4	-16.0	11.6	11.8	22.8	-13.9	2.2
Stock - Global	-18.1	18.9	21.6	26.7	-9.0	6.4	-15.1	18.4	15.4	20.9	-8.6	5.8	-16.4	18.6	16.9	25.1	-8.4	6.1
Stock - Other							0.8	32.0	3.9	19.2	-14.1	5.8	-15.2	11.4	2.2	16.6	-11.7	4.3
Stock - Emerging	-18.0	18.0	<i>11.5</i>	18.8	-16.6	<i>1.3</i>	-20.1	2.5	19.5	20.2	-15.6	-0.3	-21.4	1.7	19.5	20.3	-15.6	-0.8
Stock - ACWI x U.S.			<i>-9.5</i>	<i>-28.2</i>	<i>23.4</i>	<i>-18.6</i>	<i>-16.3</i>	<i>8.7</i>	<i>9.0</i>	<i>23.0</i>	<i>-15.4</i>	<i>1.6</i>	<i>-18.6</i>	<i>8.4</i>	<i>11.9</i>	<i>22.2</i>	<i>-14.4</i>	<i>1.6</i>
Stock - Aggregate	<i>-18.1</i>	<i>18.4</i>	<i>15.5</i>	<i>23.3</i>	<i>-11.0</i>	<i>4.2</i>	<i>-16.8</i>	<i>19.2</i>	<i>15.2</i>	<i>26.0</i>	<i>-10.3</i>	<i>5.2</i>	<i>-17.6</i>	<i>18.4</i>	<i>16.3</i>	<i>26.2</i>	<i>-9.9</i>	<i>5.3</i>
Fixed income - U.S.	-12.1	4.0	10.2	8.6	-0.4	1.7	-13.2	-0.7	8.9	9.4	-0.1	0.4	-12.7	-0.7	8.3	9.1	0.0	0.5
Fixed income - U.S. gov't							-9.3	-1.5	8.4	6.9	0.9	0.8	-12.4	-2.8	10.8	9.0	-0.3	0.0
Fixed income - U.S. credits							-6.8	23.4	11.5				-8.8	3.8	9.0	15.8	-0.1	1.7
Fixed income - EAFE							-13.7	-5.4	10.2	10.0	-4.9	-1.2	-8.0	-7.1	11.5	6.1	-0.4	-2.1
Fixed income - Global							-10.7	-1.7	6.2	8.4	1.6	0.3	-9.4	-2.6	1.5	7.4	-2.0	0.5
Fixed income - Other							-1.0	7.5	-1.2	7.2	2.3	4.4	-2.4	3.8	1.0	7.4	1.4	3.5
Fixed income - Long bonds							-32.1	-3.3	17.1	-3.5	-3.5		-30.6	-3.4	14.9	14.1	-3.6	-1.6
Fixed income - Emerging	-9.6	-3.8	1.1	13.2	-6.6	-1.5	-14.5	-3.2	5.0	14.9	-5.6	-1.3	-14.4	-4.6	5.3	13.6	-5.9	-1.8
Fixed income - Inflation indexed							-14.9	7.2	13.2	8.9	-1.1	2.4	-10.4	5.8	10.6	7.9	-1.3	2.0
Fixed income - High yield	-4.4	5.3	4.0	7.3	0.5	2.4	-9.5	5.6	5.7	13.7	-1.8	2.5	-8.4	5.8	5.9	12.6	-1.5	2.7
Fixed income - Absolute return bonds																		
Fixed income - Bundled LDI													-12.9	-3.2	9.7	16.1		
Public mortgages							-1.6	5.0	-0.7	5.5	4.2	2.4	-9.0	2.5	3.3	8.4	3.5	2.1
Fixed income - Convertibles								-9.1	56.3	22.1	-1.9		-12.1	-0.9	21.4	19.2	-1.3	3.3
Cash	0.8	-0.1	-0.5	2.7	1.2	0.8	1.6	0.1	1.2	3.5	2.1	1.6	-1.2	-2.3	-0.5	0.3	-0.1	-2.6
Fixed income - Aggregate	-4.2	2.7	2.5	6.8	-1.2	1.3	-11.4	0.8	8.5	9.5	-0.4	1.0	-11.4	0.1	8.2	11.6	-0.7	0.8
Commodities							16.5	12.2	-4.8	10.0	-11.1	6.8	12.9	18.4	-0.2	3.8	-11.3	3.4
Infrastructure	2.9	12.5	0.5	26.5	-6.7	6.6	7.5	9.1	4.3	12.8	5.1	9.3	9.4	16.0	4.5	9.3	7.0	9.3
Natural resources							11.6	11.0	-2.5	-0.2	4.3	5.2	15.2	18.0	-7.4	1.1	3.0	5.0
REITs	-22.5	44.1	-1.3	27.0	-5.2	5.8	-17.2	38.4	-2.1	25.7	-4.5	3.6	-20.7	36.6	-3.9	25.2	-4.7	2.9
Real estate ex-REITs	15.5	24.3	0.4	5.6	9.9	10.8	15.1	21.4	1.2	6.8	9.0	10.8	15.4	22.2	0.3	5.8	7.7	9.4
Other real assets							9.3	10.9	15.0	5.1	0.3	5.6	12.0	13.4	-2.6	6.3	-2.5	5.8
Real assets - Aggregate	10.2	23.2	0.2	13.3	3.2	9.7	12.2	21.7	0.1	8.0	5.0	9.5	10.6	23.0	-0.6	7.2	4.5	8.1
Hedge funds	10.5	12.8	8.9	4.4	2.5	7.7	5.5	8.6	4.5	5.2	-1.2	4.1	5.7	10.0	3.9	4.9	-1.1	4.5
Global TAA	12.3	1.2	-7.5	20.3	-6.9	3.3	-1.7	6.2	2.3	20.4	-6.9	3.3	-4.1	8.5	5.3	15.3	-6.2	4.1
Risk parity							-23.9	12.8	13.8	21.2	-6.7	1.6	-18.9	11.3	6.8	15.7	-8.0	0.8
Private mortgages							9.0	10.2	9.1	10.1	2.1		3.3	6.2	7.3	6.9	3.1	5.4
Private credit	4.0	19.6	-0.4	6.4	3.3	6.4	1.2	12.8	16.2	6.8	7.2	7.2	1.6	13.9	9.6	6.7	6.9	6.9
Private equity - Diversified	5.9	49.0	6.9	7.7	6.6	14.1	0.6	51.0	17.1	11.3	18.0	18.2	-0.2	48.5	16.5	10.2	16.1	16.3
Venture capital							-20.0	61.4	20.9	18.1	23.2	18.2	-11.5	63.2	31.7	14.1	20.1	21.4
LBO							2.8	49.6	10.5	9.9	16.2	20.1	4.7	44.1	13.6	13.0	17.1	17.7
Private equity - Other							0.4	22.9	10.1	6.1	5.8	8.8	1.0	31.0	10.4	22.9	23.3	16.0
Private equity - Aggregate	5.9	49.0	6.9	7.7	6.6	14.1	0.1	51.7	18.0	11.2	17.9	18.4	0.0	49.8	18.0	11.3	16.8	17.5
Total Fund Return	-7.3	18.6	8.2	16.8	-4.2	5.9	-9.2	17.7	11.8	17.4	-2.7	6.3	-10.2	15.9	11.8	17.1	-3.0	5.7

You were not able to provide full year returns for all of the components of returns of asset classes with values shown in italics. The composite calculation only uses those components with a full year return.

1. The 5-year return number only includes funds with continuous data over the last 5 years.

Benchmark returns by asset class

Asset class	Your fund %						Peer average %						U.S. Public average %					
	2022	2021	2020	2019	2018	5-yr ¹	2022	2021	2020	2019	2018	5-yr ¹	2022	2021	2020	2019	2018	5-yr ¹
Stock - U.S. broad/all			20.7	26.6	-5.7		-19.1	25.6	19.8	30.4	-5.2	8.5	-20.1	25.8	21.0	31.0	-5.2	8.7
Stock - U.S. large cap							-18.5	27.8	19.3	28.9	-4.6	9.3	-19.7	27.2	20.7	30.9	-4.6	9.1
Stock - U.S. mid cap							-16.5	22.9	17.3	29.5	-7.5	7.6	-16.6	23.3	19.3	27.1	-8.0	7.3
Stock - U.S. small cap	-17.6	19.1	35.8				-19.1	17.7	20.4	26.3	-9.8	4.5	-19.7	18.1	19.0	26.2	-10.3	4.4
Stock - EAFE	-14.3	11.1	10.7				-13.9	10.9	8.6	22.6	-13.9	1.8	-15.0	11.4	8.5	22.4	-13.8	1.7
Stock - Global	-18.1	18.5	15.9	27.7	-8.7	5.6	-18.3	18.4	16.3	26.8	-9.3	5.3	-18.0	18.3	16.1	26.6	-9.3	5.3
Stock - Other							4.5	27.9	-3.4	23.0	-11.6	5.8	-15.3	19.0	-0.5	21.8	-9.3	4.5
Stock - Emerging	-19.8	18.8	18.3	18.9	-14.6	2.7	-19.6	1.2	18.2	18.1	-14.8	-0.5	-19.4	-1.0	18.4	18.3	-14.5	-1.0
Stock - ACWI x U.S.		11.1	10.7	21.5	-14.2		-16.0	8.9	10.9	21.7	-13.8	1.2	-16.1	8.8	10.8	21.7	-13.6	1.2
Stock - Aggregate	-17.8	18.3	19.6	25.5	-8.9	5.9	-16.5	19.1	16.2	25.9	-9.1	5.7	-17.4	18.3	16.0	26.2	-9.1	5.4
Fixed income - U.S.	-13.0	-1.5	7.5	8.7	0.0	0.0	-13.4	-1.6	7.8	8.6	-0.2	0.0	-12.9	-1.6	7.8	8.7	-0.1	0.1
Fixed income - U.S. gov't							-9.5	-1.5	8.4	6.9	0.9	0.8	-13.6	-2.7	10.5	8.7	-0.4	0.0
Fixed income - U.S. credits							-7.3	5.3	10.0				-10.4	0.1	8.4	14.7	-1.4	0.7
Fixed income - EAFE							-16.3	-4.7	10.1	5.1	-2.2	-2.0	-17.6	-7.1	10.1	5.1	-2.2	-3.1
Fixed income - Global							-11.5	-1.6	5.7	9.0	1.7	-0.1	-10.5	-1.9	5.4	9.8	-0.8	0.2
Fixed income - Other							-5.7	3.1	3.5	10.0	1.0	3.2	-5.1	3.3	4.4	8.9	0.4	2.1
Fixed income - Long bonds							-29.2	-4.6	16.7	7.8	-4.3	-2.2	-29.3	-3.7	13.5	13.6	-3.3	-2.3
Fixed income - Emerging	-6.9	-1.8	5.3	14.3	-5.2	0.8	-14.7	-3.9	4.8	15.0	-4.7	-1.0	-14.8	-4.5	5.1	13.9	-5.0	-1.3
Fixed income - Inflation indexed							-18.5	6.6	13.8	8.9	-2.1	0.9	-11.5	5.7	10.3	7.9	-1.2	1.6
Fixed income - High yield	-6.0	5.2	5.1	11.5	-0.8	2.8	-10.2	5.2	4.9	14.2	-2.0	2.0	-9.4	4.8	5.4	13.6	-1.8	2.2
Fixed income - Absolute return bonds																		
Fixed income - Bundled LDI													-12.8	-3.2	9.7	17.3	-3.3	1.0
Public mortgages													-12.5	1.7	2.5	8.5	2.8	0.9
Fixed income - Convertibles									7.7	23.2	0.2		-17.7	10.0	24.6	23.0	0.4	9.5
Cash	4.9	0.2	0.7	2.3	1.9	2.0	1.6	0.1	0.8	2.3	1.7	1.3	1.3	0.0	0.8	2.3	1.6	1.2
Fixed income - Aggregate	-12.5	-1.3	7.5	9.4	-1.0	0.1	-12.9	-0.1	8.2	9.2	-0.6	0.4	-14.6	-0.5	9.2	11.4	-1.3	0.0
Commodities							10.9	21.9	-4.9	9.4	-11.7	3.2	11.7	24.6	-5.1	8.5	-10.7	4.6
Infrastructure	-6.6	19.9	-7.0	28.7	-7.9	4.3	3.6	13.7	1.6	13.2	4.3	7.1	6.4	14.5	2.4	12.1	4.1	8.2
Natural resources							11.2	13.4	4.8	7.8	6.9	8.7	11.2	19.2	-3.6	5.7	1.0	5.4
REITs	-24.4	43.2	-8.0	26.0	-4.6	3.7	-21.5	29.8	-5.9	23.9	-2.7	2.4	-21.9	34.0	-7.8	22.7	-4.3	2.3
Real estate ex-REITs	6.5	21.1	0.3	5.4	8.4	8.1	15.4	17.1	1.4	5.4	7.4	9.3	11.0	18.1	0.3	6.2	6.6	8.2
Other real assets							6.0	5.7	7.8	12.3	2.5	8.9	5.8	15.0	1.8	10.1	0.1	8.5
Real assets - Aggregate	0.7	22.6	-1.5	13.8	0.9	6.9	10.8	17.7	0.7	7.5	4.6	8.1	7.6	19.4	-0.4	8.2	3.6	7.4
Hedge funds	-15.3	8.5	11.9	18.2	-6.4	2.6	-1.3	7.0	7.4	13.0	0.2	4.8	-0.1	5.8	6.2	7.1	-0.1	3.7
Global TAA	-15.3	8.5	11.9	18.2	-6.4	2.6	-15.8	9.7	12.7	19.7	-6.4	2.6	-10.2	8.6	7.6	14.6	-3.7	3.2
Risk parity							-17.5	14.2	22.3	19.1	-5.3	3.4	-17.0	11.9	10.7	15.4	-4.7	2.2
Private mortgages							-5.5	2.5	6.7	8.3	-0.2		-9.9	0.1	7.0	7.9	0.7	0.1
Private credit	-1.0	9.9	2.6	4.6	6.7	4.5	-1.3	9.0	3.3	7.7	3.8	5.0	-3.0	7.2	4.9	9.5	1.9	4.2
Private equity - Diversified	-16.3	51.5	0.3	-13.4	24.3	6.5	-16.3	51.5	0.3	-13.4	24.3	6.5	-16.3	51.5	0.3	-13.4	24.3	6.5
Venture capital							-16.3	51.5	0.3	-13.4	24.3	6.5	-16.3	51.5	0.3	-13.4	24.3	6.5
LBO							-16.3	51.5	0.3	-13.4	24.3	6.5	-16.3	51.5	0.3	-13.4	24.3	6.5
Private equity - Other							-16.3	51.5	0.3	-13.4	24.3	6.5	-16.3	51.5	0.3	-13.4	24.3	6.5
Private equity - Aggregate	-16.3	51.5	0.3	-13.4	24.3	6.5	-16.3	51.5	0.3	-13.4	24.3	6.5	-16.3	51.5	0.3	-13.4	24.3	6.5
Total Policy Return	-12.4	15.2	7.1	15.9	-2.5	4.1	-12.1	16.3	10.6	15.4	-1.8	5.0	-12.8	15.2	10.5	15.1	-2.2	4.5

1. The 5-year return number only includes funds with continuous data over the last 5 years.

2. To enable fairer comparisons, the policy returns of all participants with policy weight in private equity were adjusted to reflect private equity benchmarks based on lagged, investable, public-market indices. Refer to the appendix of this section for details.

Net value added by asset class

Asset class	Your fund %						Peer average %						U.S. Public average %						
	2022	2021	2020	2019	2018	5-yr ¹	2022	2021	2020	2019	2018	5-yr ¹	2022	2021	2020	2019	2018	5-yr ¹	
Stock - U.S. broad/all			<i>-32.4</i>	<i>-7.0</i>	<i>-2.2</i>		1.7	0.5	-6.4	-1.4	-0.3	-0.3	1.1	-0.3	-3.5	-1.3	-0.1	-0.3	
Stock - U.S. large cap							2.3	0.2	-1.1	5.4	-0.9	1.0	1.1	-0.8	-0.1	0.4	-0.3	0.2	
Stock - U.S. mid cap							-2.8	0.6	1.1	2.8	-1.4	1.4	-2.8	-0.4	1.8	4.1	-1.5	-0.6	
Stock - U.S. small cap	0.4	0.3					2.3	4.9	-1.4	-0.2	-0.5	1.8	2.7	3.2	-1.4	0.6	-0.5	1.3	
Stock - EAFE	-5.7	0.3					-1.9	2.6	1.1	0.1	0.2	0.5	-1.3	0.1	3.3	0.3	-0.1	0.4	
Stock - Global	0.0	0.3	5.7	-0.9	-0.3	0.8	3.2	0.0	-1.0	-5.9	0.7	0.5	1.5	0.3	0.8	-1.5	0.9	0.7	
Stock - Other							4.2	1.0	11.5	-1.6	-2.5	-0.2	-0.8	-6.2	4.1	-4.1	-1.3	1.1	
Stock - Emerging	1.8	-0.8	<i>-6.9</i>	<i>-0.1</i>	<i>-2.1</i>	<i>-1.4</i>	-0.5	1.0	1.3	2.2	-0.8	0.1	-1.9	2.6	1.1	2.0	-1.1	0.2	
Stock - ACWI x U.S.			<i>-20.6</i>	<i>-38.9</i>	<i>1.9</i>	<i>-4.4</i>	-0.2	-0.2	-1.8	1.3	-1.4	0.4	-2.4	-0.4	1.1	0.5	-0.8	0.4	
Stock - Aggregate	-0.4	<i>0.1</i>	<i>-4.2</i>	<i>-2.2</i>	<i>-2.1</i>	<i>-1.7</i>	-0.2	0.2	-1.0	0.1	-1.2	-0.5	-0.2	0.1	0.3	0.1	-0.7	-0.1	
Fixed income - U.S.	0.9	5.6	2.7	-0.1	-0.4	1.7	0.0	0.9	1.1	0.8	0.1	0.4	0.2	0.9	0.5	0.4	0.1	0.3	
Fixed income - U.S. gov't							0.2	0.0	0.0	0.0	0.0	0.0	1.3	-0.2	0.4	0.0	0.1	0.0	
Fixed income - U.S. credits							0.5	18.1	1.5				1.2	3.4	0.6	0.7	1.3	1.0	
Fixed income - EAFE							2.6	-0.7	0.1	4.9	-2.8	0.8	9.6	0.0	1.4	1.0	1.8	1.0	
Fixed income - Global							0.7	0.2	0.5	-0.6	-0.1	0.4	0.7	0.0	-4.3	-1.9	-1.4	0.3	
Fixed income - Other							4.7	3.5	-4.8	-2.7	1.7	1.0	2.9	0.5	-3.4	-1.5	1.1	1.2	
Fixed income - Long bonds							-2.9	1.3	0.3	0.0	0.8		-1.5	0.2	0.5	1.3	-0.3	0.3	
Fixed income - Emerging	-2.7	-2.0	-4.2	-1.0	-1.5	-2.3	0.2	0.4	0.1	-0.1	-0.8	-0.4	0.4	-0.1	0.8	-0.3	-1.2	-0.5	
Fixed income - Inflation indexed							3.6	0.7	-0.6	0.1	1.0	1.5	1.3	0.1	-0.1	0.1	-0.2	0.4	
Fixed income - High yield	1.6	0.0	-1.1	-4.2	1.3	-0.4	0.5	0.4	0.8	-0.5	0.2	0.3	0.6	0.9	0.5	-0.9	0.3	0.3	
Fixed income - Absolute return bonds																			
Fixed income - Bundled LDI													-0.1	0.0	-0.1	-1.2			
Public mortgages													-0.2	-0.5	2.8	0.5	0.0	0.9	
Fixed income - Convertibles									48.6	-1.1	-2.1		5.6	-6.8	-3.2	-3.8	-1.7	-6.2	
Cash	-4.1	-0.3	-1.2	0.5	-0.7	-1.1	0.0	0.0	0.4	1.2	0.2	0.3	-2.4	-2.3	-1.3	-1.9	-1.7	-3.8	
Fixed income - Aggregate	8.3	4.0	-5.0	-2.6	-0.2	1.1	1.4	0.9	0.2	0.3	0.1	0.7	3.2	0.5	-1.0	0.2	0.6	0.7	
Commodities							0.4	-14.9	1.2	0.6	0.5	0.4	0.7	-7.2	5.2	-4.9	-0.7	-1.8	
Infrastructure	9.5	-7.4	7.4	-2.2	1.2	2.3	5.7	-4.9	1.4	2.4	1.8	2.1	3.7	1.2	1.7	-1.2	2.2	0.8	
Natural resources							2.5	-1.8	-7.6	-6.4	-2.7	-2.8	3.6	0.5	-4.9	-4.2	2.0	-0.9	
REITs	1.9	0.9	6.7	1.0	-0.6	2.2	3.1	7.2	3.8	1.9	-1.8	0.2	2.1	2.0	3.9	2.1	-0.4	0.5	
Real estate ex-REITs	9.0	3.2	0.1	0.3	1.5	2.7	0.1	4.3	-0.2	1.3	1.7	1.8	4.3	4.0	0.0	-0.4	0.9	1.3	
Other real assets							-9.4	0.0	7.2	-7.2	-1.1	-1.0	-2.0	-3.0	-3.4	-5.3	-2.2	-2.0	
Real assets - Aggregate	9.6	0.6	1.7	-0.5	2.2	2.8	1.8	4.1	-0.6	0.5	0.4	1.6	3.0	3.6	-0.3	-1.0	0.8	0.7	
Hedge funds	25.8	4.3	-3.0	-13.8	8.9	5.1	10.9	2.1	-3.5	-8.3	-0.8	0.6	5.7	4.4	-2.3	-2.3	-0.9	1.4	
Global TAA	27.6	-7.3	-19.3	2.1	-0.6	0.7	14.1	-3.5	-10.4	0.8	-0.6	0.7	5.5	0.3	-2.3	0.4	-2.7	1.0	
Risk parity							-6.4	-1.3	1.1	2.1	-1.4	-1.9	-2.0	-0.6	-0.2	-0.4	-3.3	-1.4	
Private mortgages							16.6	7.4	-0.8	2.3	3.0		12.0	4.7	-1.3	-0.7	2.7	5.3	
Private credit	5.0	9.7	-3.0	1.8	-3.4	1.9	4.9	3.5	14.0	-0.6	3.4	2.5	4.9	6.1	5.2	-2.9	5.0	2.8	
Private equity - Diversified	22.1	-2.5	6.6	21.1	-17.7	7.6	16.9	-0.5	16.8	24.7	-6.3	11.7	16.1	-2.9	16.2	23.7	-8.3	9.8	
Venture capital							-3.7	9.9	20.6	31.5	-1.1	11.7	4.8	11.8	31.4	27.5	-4.2	14.9	
LBO							19.0	-1.9	10.1	23.3	-8.1	13.6	20.9	-7.4	13.3	26.4	-7.2	11.2	
Private equity - Other							16.6	-28.6	9.7	19.5	-18.5	2.3	17.3	-20.5	10.1	36.3	-1.0	9.5	
Private equity - Aggregate	22.1	-2.5	6.6	21.1	-17.7	7.6	16.3	0.2	17.7	24.6	-6.4	11.9	16.2	-1.6	17.6	24.7	-7.5	11.0	
Total Fund Return	5.1	3.5	1.1	0.9	-1.8	1.8	2.9	1.4	1.2	2.0	-1.0	1.3	2.5	0.7	1.3	2.0	-0.8	1.2	

Total net value add is determined by both actual and policy allocation. It is the outcome of total net return (page 6) minus total benchmark return (page 7). Aggregate net returns are an asset weighted average of all categories that the fund has an actual allocation to. Aggregate benchmark returns are a policy weighted average and includes only those categories that are part of your policy fund's mix.

You were not able to provide full year returns for all of the components of returns of asset classes with values shown in italics. The composite calculation only uses those components with a full year return.

1. The 5-year return number only includes funds with continuous data over the last 5 years.
2. To enable fairer comparisons, the policy returns of all participants with policy weight in private equity were adjusted to reflect private equity benchmarks based on lagged, investable, public-market indices. Refer to the appendix of this section for details.

Your policy return and value added calculation - 2022

2022 Policy Return and Value Added

Asset class	Policy weight	Benchmark Description	Return	Net return	Value added
Stock - U.S. small cap	6.1%	MSCI US Small Cap Net Index	-17.6%	-17.2%	0.4%
Stock - EAFE	3.8%	MSCI World Ex US Net Index	-14.3%	-20.0%	-5.7%
Stock - Global	34.6%	MSCI World Net Dividend	-18.1%	-18.1%	0.0%
Stock - Emerging	1.5%	MSCI Emerging Market IMI Net	-19.8%	-18.0%	1.8%
Fixed income - U.S.	24.0%	Barclays US Aggregate	-13.0%	-12.1%	0.9%
Fixed income - Emerging	1.0%	JP Morgan EMBI GD	-6.9%	-9.6%	-2.7%
Fixed income - High yield	1.0%	50%Bar U.S. High Yield 2% / 50%S&P LSTA Lever	-6.0%	-4.4%	1.6%
Cash		ICE LIBOR USD 3 Month Index	4.9%	0.8%	-4.1%
Infrastructure	3.0%	Dow Jones Brookfield Global Infrastructure Net I	-6.6%	2.9%	9.5%
REITs	1.0%	Your REIT benchmark	-24.4%	-22.5%	1.9%
Real estate ex-REITs	8.0%	NCREIF ODCE Index	6.5%	15.5%	9.0%
Hedge funds		50% MSCI World Net/50% Barclays US Aggregate	-15.3%	10.5%	25.8%
Global TAA		50% MSCI World Net/50% Barclays US Aggregate	-15.3%	12.3%	27.6%
Private credit	7.0%	S&P/LSTA + 150 Bps 3 Month Lag	-1.0%	4.0%	5.0%
Private equity - Diversified	9.0%	Custom lagged small-cap equity	-16.3%	5.9%	22.1%
Total	100.0%				
Net Actual Return (reported by you)					-7.3%
Calculated Policy Return = sum of (policy weights X benchmark returns)				-12.9%	
Adjustment to reflect rebalancing and overlay impacts				<u>0.5%</u>	
Policy Return (reported by you)					<u>-12.4%</u>
Net Value Added (Net Return - Policy Return)					5.1%

Your policy return and value added calculations - 2018 to 2021

2021 Policy Return and Value Added

Asset class	Policy	Benchmark		Net return	Value added
	weight	Description	Return		
Stock - U.S. broad/all		MSCI US IMI Ne			
Stock - U.S. small cap	3.0%	MSCI US Small C	19.1%	19.4%	0.3%
Stock - EAFE	2.0%	MSCI World Ex l	11.1%	11.5%	0.3%
Stock - Global	35.8%	MSCI World Net	18.5%	18.9%	0.3%
Stock - Emerging	5.2%	MSCI Emerging I	18.8%	18.0%	-0.8%
Stock - ACWI x U.S.		MSCI ACWI x/U!	11.1%	-9.5%	-20.6%
Fixed income - U.S.	24.0%	Barclays US Agg	-1.5%	4.0%	5.6%
Fixed income - Emerging	1.0%	JP Morgan EMB	-1.8%	-3.8%	-2.0%
Fixed income - High yield	1.0%	50%Bar U.S. Hig	5.2%	5.3%	0.0%
Cash		ICE LIBOR USD 3	0.2%	-0.1%	-0.3%
Infrastructure	3.0%	Dow Jones Broo	19.9%	12.5%	-7.4%
REITs	1.0%	Your REIT bench	43.2%	44.1%	0.9%
Real estate ex-REITs	8.0%	NCREIF ODCE In	21.1%	24.3%	3.2%
Hedge funds		50% MSCI Work	8.5%	12.8%	4.3%
Global TAA		50% MSCI Work	8.5%	1.2%	-7.3%
Private credit	7.0%	S&P/LSTA + 150	9.9%	19.6%	9.7%
Private equity - Diversified	9.0%	Custom lagged s	51.5%	49.0%	-2.5%
Total	100.0%				
Net Return (reported by you)					18.6%
Calculated policy return (sum: Policy weights x benchmarks)				16.1%	
Adjustment to reflect rebalancing and overlay impacts				-1.0%	
Policy return (reported by you)					<u>15.2%</u>
Net Value Added (Net Return - Policy Return)					3.5%

2019 Policy Return and Value Added

Asset class	Policy	Benchmark		Net return	Value added
	weight	Description	Return		
Stock - U.S. broad/all	16.3%	MSCI US IMI Ne	26.6%	19.6%	-7.0%
Stock - Global	18.3%	MSCI World Net	27.7%	26.7%	-0.9%
Stock - Emerging	6.6%	MSCI Emerging I	18.9%	18.8%	-0.1%
Stock - ACWI x U.S.	3.6%	MSCI ACWI x/U!	21.5%	23.4%	1.9%
Fixed income - U.S.	11.0%	Barclays US Agg	8.7%	8.6%	-0.1%
Fixed income - Emerging	4.0%	50% JPM EMBI C	14.3%	13.2%	-1.0%
Fixed income - High yield	4.4%	50%Bar U.S. Hig	11.5%	7.3%	-4.2%
Cash	3.0%	BofA Merrill Lyn	2.3%	2.7%	0.5%
Infrastructure	3.0%	Dow Jones Broo	28.7%	26.5%	-2.2%
REITs	1.5%	Your REIT bench	26.0%	27.0%	1.0%
Real estate ex-REITs	7.5%	NCREIF ODCE In	5.4%	5.6%	0.3%
Hedge funds	1.0%	50% MSCI Work	18.2%	4.4%	-13.8%
Global TAA	7.0%	50% MSCI Work	18.2%	20.3%	2.1%
Private credit	6.6%	S&P/LSTA + 150	4.6%	6.4%	1.8%
Private equity - Diversified	6.2%	Custom lagged s	-13.4%	7.7%	21.1%
Total	100.0%				
Net Return (reported by you)					16.8%
Calculated policy return (sum: Policy weights x benchmarks)				16.1%	
Adjustment to reflect rebalancing and overlay impacts				-0.2%	
Policy return (reported by you)					<u>15.9%</u>
Net Value Added (Net Return - Policy Return)					0.9%

2020 Policy Return and Value Added

Asset class	Policy	Benchmark		Net return	Value added
	weight	Description	Return		
Stock - U.S. broad/all	23.9%	MSCI US IMI Ne	20.7%	-11.7%	-32.4%
Stock - U.S. small cap	2.9%	MSCI US Small C	35.8%		
Stock - EAFE		MSCI World Ex l	10.7%		
Stock - Global	12.2%	MSCI World Net	15.9%	21.6%	5.7%
Stock - Emerging	6.2%	MSCI Emerging I	18.3%	11.5%	-6.9%
Stock - ACWI x U.S.	2.2%	MSCI ACWI x/U!	10.7%	-28.2%	-38.9%
Fixed income - U.S.	26.0%	Barclays US Agg	7.5%	10.2%	2.7%
Fixed income - Emerging		50% JPM EMBI C	5.3%	1.1%	-4.2%
Fixed income - High yield		50%Bar U.S. Hig	5.1%	4.0%	-1.1%
Cash		BofA Merrill Lyn	0.7%	-0.5%	-1.2%
Infrastructure	3.0%	Dow Jones Broo	-7.0%	0.5%	7.4%
REITs		Your REIT bench	-8.0%	-1.3%	6.7%
Real estate ex-REITs	9.0%	NCREIF ODCE In	0.3%	0.4%	0.1%
Hedge funds		50% MSCI Work	11.9%	8.9%	-3.0%
Global TAA		50% MSCI Work	11.9%	-7.5%	-19.3%
Private credit	7.0%	S&P/LSTA + 150	2.6%	-0.4%	-3.0%
Private equity - Diversified	7.6%	Custom lagged s	0.3%	6.9%	6.6%
Total	100.0%				
Net Return (reported by you)					8.2%
Calculated policy return (sum: Policy weights x benchmarks)				11.3%	
Adjustment to reflect rebalancing and overlay impacts				-4.2%	
Policy return (reported by you)					<u>7.1%</u>
Net Value Added (Net Return - Policy Return)					1.1%

2018 Policy Return and Value Added

Asset class	Policy	Benchmark		Net return	Value added
	weight	Description	Return		
Stock - U.S. broad/all	16.4%	MSCI US IMI Ne	-5.7%	-7.9%	-2.2%
Stock - Global	17.7%	MSCI World Net	-8.7%	-9.0%	-0.3%
Stock - Emerging	6.3%	MSCI Emerging I	-14.6%	-16.6%	-2.1%
Stock - ACWI x U.S.	3.7%	MSCI ACWI x/U!	-14.2%	-18.6%	-4.4%
Fixed income - U.S.	13.0%	Barclays US Agg	0.0%	-0.4%	-0.4%
Fixed income - Emerging	4.0%	50% JPM EMBI C	-5.2%	-6.6%	-1.5%
Fixed income - High yield	5.2%	50%Bar U.S. Hig	-0.8%	0.5%	1.3%
Cash	1.0%	BofA Merrill Lyn	1.9%	1.2%	-0.7%
Infrastructure	3.0%	Dow Jones Broo	-7.9%	-6.7%	1.2%
REITs	3.1%	Your REIT bench	-4.6%	-5.2%	-0.6%
Real estate ex-REITs	5.9%	NCREIF ODCE In	8.4%	9.9%	1.5%
Hedge funds	1.0%	50% MSCI Work	-6.4%	2.5%	8.9%
Global TAA	7.0%	50% MSCI Work	-6.4%	-6.9%	-0.6%
Private credit	5.8%	S&P/LSTA + 150	6.7%	3.3%	-3.4%
Private equity - Diversified	7.0%	Custom lagged s	24.3%	6.6%	-17.7%
Total	100.0%				
Net Return (reported by you)					-4.2%
Calculated policy return (sum: Policy weights x benchmarks)				-2.5%	
Adjustment to reflect rebalancing and overlay impacts				0.0%	
Policy return (reported by you)					<u>-2.5%</u>
Net Value Added (Net Return - Policy Return)					-1.8%

Profit/Loss on overlay programs

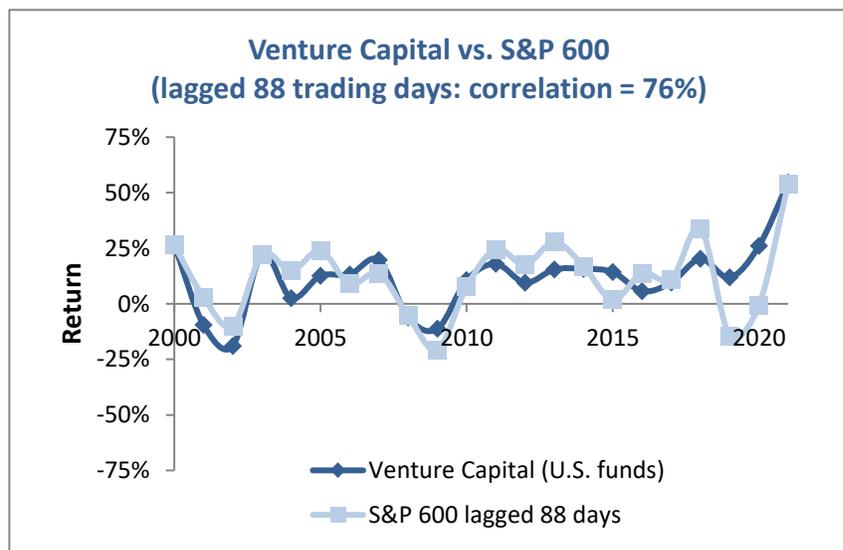
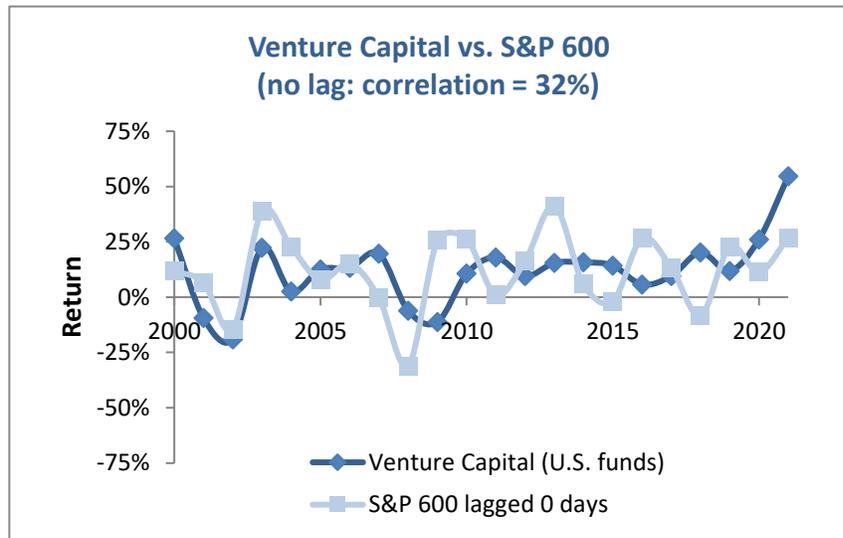
Overlay type	Your fund		Peer median				U.S. Public median			
	2022	2021	2022		2021		2022		2021	
	bps	bps	bps	#	bps	#	bps	#	bps	#
Int. Discretionary Currency							-15.2	1	-15.1	1
Ext. Discretionary Currency			-9.4	1	-4.8	1	-1.7	3	0.1	3
Internal Global TAA										
External Global TAA										
Internal PolicyTilt TAA										
External PolicyTilt TAA										
Internal Commodities										
External Commodities			4.2	2	3.6	1	46.5	2	3.6	1
Internal Long/Short										
External Long/Short										
Internal Other										
External Other							-24.0	1	-3.2	1

Profit/loss in basis points was calculated using total fund average holdings. This was done to measure the impact of the program at the total fund level.

Appendix - Private equity benchmarks used by most funds are flawed.

A high proportion of the benchmarks used for illiquid assets by participants in the CEM universe are flawed. Flaws include:

- Timing mismatches due to lagged reporting. For example, as the graphs on the right demonstrate, reported venture capital returns clearly lag the returns of stock indices. Yet most funds that use stock indices to benchmark their private equity do not use lagged benchmarks. The result is substantial noise when interpreting performance. For example, for 2008 the S&P 600 index return was -31.1% versus -5.4% if lagged 88 trading days. Thus if a fund earned the average reported venture capital return for 2008 of -6.1%, they would have mistakenly believed that their value added from venture capital was 25.0% using the un-lagged benchmarks versus -0.7% using the same benchmark lagged to match the average 88 day reporting lag of venture capital funds.



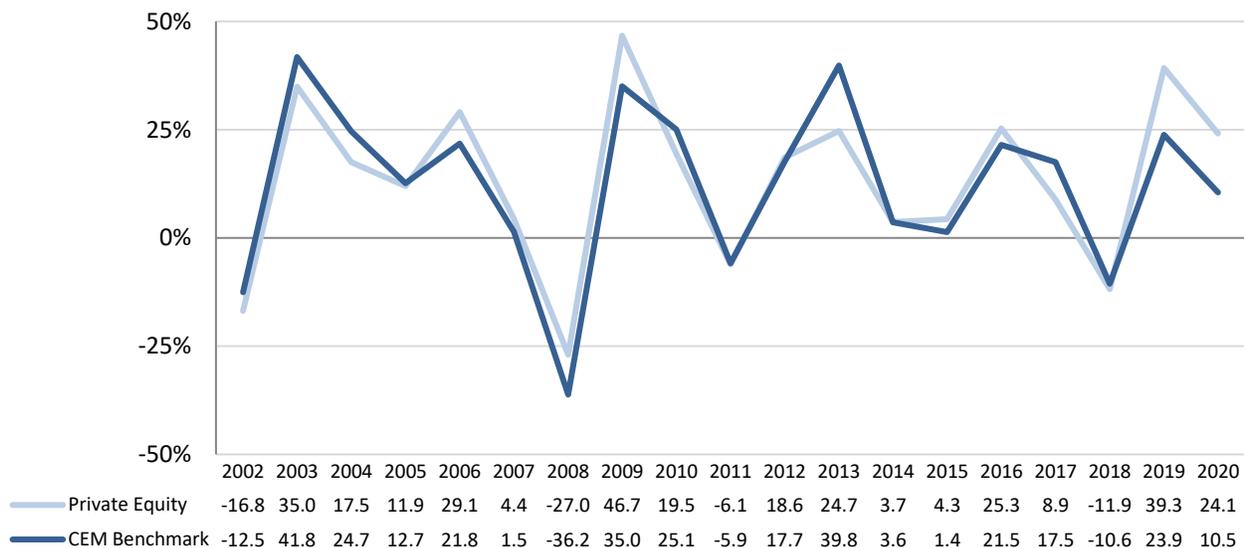
- Un-investable peer-based benchmarks. Peer based benchmarks reflect the reporting lags in peer portfolios so they have much better correlations than un-lagged investable benchmarks. But their relationship statistics are not as good as for lagged investable benchmarks.
- Aspirational premiums (i.e., benchmark + 2%). Premiums cannot be achieved passively, and evidence suggests that a fund has to be substantially better than average to attain them. More importantly, when comparing performance to other funds, they need to be excluded to ensure a level playing field.

To enable fairer comparisons, CEM uses default private equity benchmarks.

Benchmarks used for private equity by most participants in the CEM universe are flawed (see previous page). So to enable fairer comparisons, CEM replaced reported private equity benchmarks with defaults. The defaults are:

- Investable. They are comprised of a blend of small cap indices that are investable.
- Lagged. Your default benchmark had a lag of 85 trading days. CEM estimated the lag on private equity portfolios with multi-year histories by comparing annual private equity returns to public market proxies with 1 day of lag, 2 days of lag, 3 days of lag, etc. At 85 days (i.e., approximately 119 calendar days or 3.9 calendar months), the correlation between the two series is maximized for most plans.
- Regional mix adjusted based on the average estimated mix of regions in private equity portfolios for a given country. The region mix of your default benchmark was 20% Europe ex-UK, 10% Global, 70% U.S.
- The result is the default benchmarks are superior to most self-reported benchmarks. Correlations improve to a median of 82% for the default benchmarks versus 44% for self-reported benchmarks. Other statistics such as volatility were also much better.

Private equity returns versus default benchmark returns - Global median



1. To enable better comparison between lagged returns and lagged benchmarks, lags have been removed from both. See "Asset allocation and fund performance of defined benefit pension funds in the United States, 1998-2014" by Alexander D. Beath and Chris Flynn for details.

4

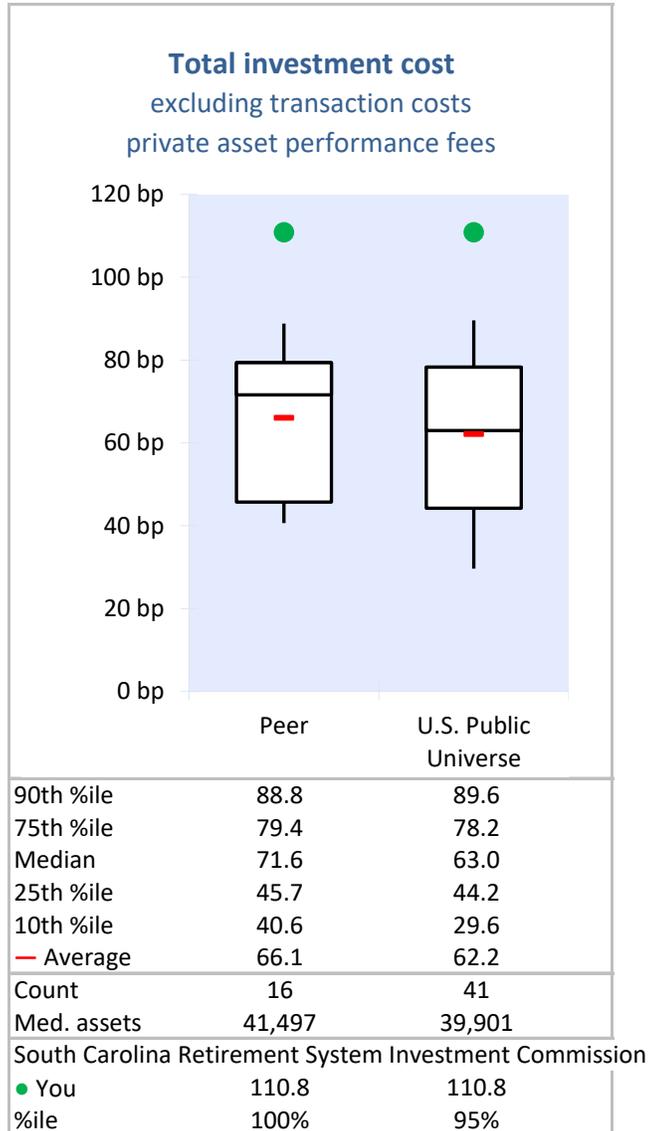
Cost: total, benchmark, trend

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Comparisons of total investment cost

Your total investment cost, excluding transaction costs and private asset performance fees, of 110.8 bps was above the peer median of 71.6 bps.

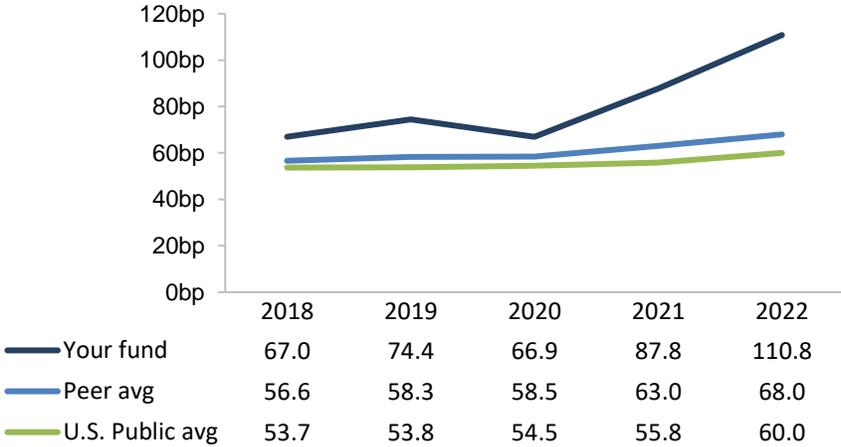
Differences in total investment cost are often caused by two factors that are usually outside of management's control: asset mix and fund size. Therefore, to assess whether your fund's total investment cost is high or low given your unique asset mix and size, CEM calculates a benchmark cost for your fund. Benchmark cost analysis begins on page 7 of this section.



Trend in total investment cost, you versus peers and universe

Your total investment cost, excluding transaction costs and private asset performance fees, increased from 67.0 bps in 2018 to 110.8 bps in 2022.

Trend in total investment cost
(excluding transaction costs and private asset performance fees)



Trend analysis is based on 36 U.S. Public funds and 15 peer funds with 5 or more consecutive years of data.

Types of costs included in your total investment cost

The table below outlines the types of costs included in your total investment cost.

Asset class	Internal		External			
	In-house total cost	Transaction costs	Manager base fees	Monitoring & other costs	Perform. fees (active only)	Transaction costs
<u>Public</u> (Stock, Fixed income, commodities, REITs)	✓	✗	✓	✓	✓	✗
Derivatives/Overlays	✓	✗	✓	✓	✓	✗
<u>Hedge funds & Global TAA</u>						
Hedge Funds	n/a	n/a	✓	✓	✓	✗
Global TAA	✓	✗	✓	✓	✓	✗
<u>Private real assets</u> (Infrastructure, natural resources, real estate ex-REITs, other real assets)	✓	✗	✓	✓	✗	✗
<u>Private equity</u> (Diversified private equity, venture capital, LBO, other private equity)	✓	✗	✓*	✓	✗	✗

*External manager base fees represent gross contractual management fees.

- ✓ indicates cost is included.
- ✗ indicates cost is excluded.
- CEM currently excludes performance fees for certain external assets and all transaction costs from your total cost because only a limited number of participants are currently able to provide complete data.

Detailed breakdown of your total investment cost

Your 2022 total investment cost, excluding transaction costs and private asset performance fees, was 110.8 bp or \$433.5 million.

	Internal		External passive		External active			Total ¹		
	Passive	Active	Fees	Monitoring & Other	Base Fees	Perform. Fees	Monitor. & Other	\$000s	bps	% of Total
Asset management										
Stock - U.S. broad/all										
Stock - U.S. small cap			583	243				826		0%
Stock - EAFE			243	161				404		0%
Stock - Emerging					154		52	206		0%
Stock - Global			2,332	2,979				5,311		1%
Stock - ACWI x U.S.										
Fixed income - U.S.		3			1,283	0	97	1,383		0%
Fixed income - Emerging					136	0	13	148		0%
Fixed income - High yield					5,197	0	288	5,486		1%
Cash		181			59	0	80	320		0%
REITs					1,200	0	86	1,286		0%
Real estate ex-REITs - LP ¹²					28,980	27,797	848	29,827		7%
Real estate ex-REITs - Co-invest. ¹					381	2,009	27	409		0%
Infrastructure ¹					3,073	2,465	86	3,159		1%
Infrastructure - LP ¹²					11,151	17,794	171	11,322		3%
Infrastructure - Co-invest. ¹					372	-491	48	420		0%
Hedge funds					50,756	115,308	542	166,606		38%
Hedge funds - FoFs					7,706	0	469	8,175		2%
Underlying FoF fees					18,725	21,699		40,424		9%
Global TAA					8,806	33,820	200	42,826		10%
Private equity - Diversified - LP ¹²					57,539	-2,609	679	58,219		13%
Private equity - Diversified - FoFs ¹					3,912	-8,325	200	4,112		1%
Underlying FoF fees ¹²					11,137	13,022		11,137		3%
Private equity - Diversified - Co-invest. ¹					4,462	18,321	518	4,980		1%
Private credit - LP ¹²					24,853	14,168	551	25,403		6%
Private credit - Co-invest. ¹					5,228	3,713	353	5,581		1%
Derivatives/Overlays			928	176				1,104		0%
Total asset management costs excluding private asset performance fees								429,072	109.7bp	99%
Oversight, custodial & other asset related costs										
Oversight of the fund								1,349		0%
Trustee & custodial								1,187		0%
Consulting and performance measurement								1,253		0%
Audit								278		0%
Other								357		0%
Total oversight, custodial & other costs								4,424	1.1bp	1%
Total investment costs excluding transaction costs and private asset performance fees								433,497	110.8bp	100%

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

2. Default costs added. Refer to Appendix A.

Changes in your investment costs

The table below shows how your investment costs have changed from year to year by asset class.

Change in your investment costs (2022 - 2018)

	Investment costs (\$000s)					Change (\$000s)				Change (%)			
	2022	2021	2020	2019	2018	2022	2021	2020	2019	2022	2021	2020	2019
Asset management													
Stock - U.S. broad/all		179	3,439	12,637	11,104	-3,260	-9,198	1,533		-95%	-73%	14%	
Stock - U.S. small cap	826	746	490			80	257			11%	52%		
Stock - EAFE	404	481	357			-77	124			-16%	35%		
Stock - Emerging	206	271	4,641	6,073	9,879	-65	-4,370	-1,432	-3,807	-24%	-94%	-24%	-39%
Stock - Global	5,311	5,162	5,577	7,480	7,572	148	-415	-1,903	-92	3%	-7%	-25%	-1%
Stock - ACWI x U.S.		0	1,468	4,181	4,697	-1,468	-2,713	-516		-100%	-65%	-11%	
Fixed income - U.S.	1,383	1,252	1,774	2,032	1,796	130	-522	-258	235	10%	-29%	-13%	13%
Fixed income - Emerging	148	242	3,630	5,404	6,107	-94	-3,388	-1,774	-703	-39%	-93%	-33%	-12%
Fixed income - High yield	5,486	5,163	5,965	6,158	5,847	323	-802	-193	311	6%	-13%	-3%	5%
Cash	320	288	781	621	1,358	32	-493	160	-737	11%	-63%	26%	-54%
REITs	1,286	1,021	1,651	2,002	1,996	265	-630	-350	6	26%	-38%	-18%	0%
Real estate ex-REITs - LP ¹²	29,827	28,228	23,640	27,651	19,845	1,599	4,588	-4,011	7,807	6%	19%	-15%	39%
Real estate ex-REITs - Co-invest. ¹	409	337	153	0	0	72	183	153	0	21%	119%	35588%	-7%
Infrastructure ¹	3,159	6,850	7,239	4,318	3,089	-3,691	-388	2,920	1,229	-54%	-5%	68%	40%
Infrastructure - LP ¹²	11,322												
Infrastructure - Co-invest. ¹	420	198	87			222	110			112%	126%		
Hedge funds	166,606	107,340	36,305	51,668	44,499	59,265	71,035	-15,363	7,169	55%	196%	-30%	16%
Hedge funds - FoFs	8,175	9,651	8,072	7,032	4,528	-1,476	1,579	1,040	2,504	-15%	20%	15%	55%
Underlying FoF fees	40,424	65,862	14,623	13,799	15,196	-25,438	51,239	824	-1,397	-39%	350%	6%	-9%
Global TAA	42,826	13,186	2,974	5,148	11,833	29,640	10,212	-2,174	-6,685	225%	343%	-42%	-56%
Private equity - Diversified - LP ¹²	58,219	55,044	39,545	33,675	27,896	3,174	15,499	5,870	5,779	6%	39%	17%	21%
Private equity - Diversified - FoFs ¹	4,112	3,534	4,663	3,109	1,518	579	-1,130	1,555	1,591	16%	-24%	50%	105%
Underlying FoF fees ¹²	11,137	8,128	7,951	3,847	3,500	3,009	176	4,104	347	37%	2%	107%	10%
Private equity - Diversified - Co-invest. ¹	4,980	2,395	1,190	3,103	3,384	2,585	1,206	-1,913	-281	108%	101%	-62%	-8%
Private credit - LP ¹²	25,403	20,353	27,494	30,307	19,324	5,050	-7,141	-2,813	10,984	25%	-26%	-9%	57%
Private credit - Co-invest. ¹	5,581	1,449	2,467	13	0	4,132	-1,018	2,454	13	285%	-41%	18672%	16325%
Derivatives/Overlays	1,104	768	237	800	958	336	530	-563	-158	44%	223%	-70%	-16%
Total excl. private asset perf. fees	429,072	338,130	206,413	231,057	205,926	90,942	131,717	-24,643	25,131	27%	64%	-11%	12%
Oversight, custodial & other asset related costs													
Oversight of the fund	1,349	1,238	1,198	1,237	1,251	111	39	-38	-14	9%	3%	-3%	-1%
Trustee & custodial	1,187	1,394	1,394	1,670	1,152	-207		-276	518	-15%	0%	-17%	45%
Consulting and performance measurement	1,253	835	786	825	764	418	49	-39	61	50%	6%	-5%	8%
Audit	278	238	409	120	102	40	-172	290	17	17%	-42%	242%	17%
Other	357	382	373	357	363	-25	9	16	-6	-6%	2%	4%	-2%
Total oversight, custodial & other	4,424	4,087	4,161	4,209	3,633	337	-74	-48	576	8%	-2%	-1%	16%
Total investment costs ¹	433,497	342,217	210,574	235,265	209,559	91,279	131,643	-24,691	25,707	27%	63%	-10%	12%
Total in basis points	110.8bp	87.8bp	66.9bp	74.4bp	67.0bp								

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

2. Default costs added. Refer to Appendix A.

Total cost versus benchmark cost

Your fund's total investment cost, excluding transaction costs and private asset performance fees, was 12.4 bps below your benchmark cost of 123.3 bps. This implies that your fund was low cost by 12.4 bps compared to the peer median, after adjusting for your fund's asset mix.

Your cost versus benchmark

	\$000s	bps
Your fund's total investment costs excluding transaction costs and private asset performance fees	433,497	110.8 bp
- Your fund's benchmark	482,194	123.3 bp
= Your fund's cost savings	-48,698	-12.4 bp

Your benchmark cost is an estimate of your total costs assuming that you paid the peer median cost for each of your investment mandates and fund oversight. The calculation of your benchmark cost is shown on the following page.

The reasons why your fund's total cost was below your benchmark are summarized in the table below. Details of each of the impacts below are provided on pages 9 to 11.

Reasons why your fund was low cost

	Cost/-Savings impact	
	\$000s	bps
<u>Differences in implementation style:</u>		
More passive	-22,972	-5.9 bp
Less int. pass, % of total passive	-845	-0.2 bp
Less int. active % of total active	2,445	0.6 bp
Less evergreen % of external	23,760	6.1 bp
Less fund of funds	-691	-0.2 bp
More co-investment	-28,171	-7.2 bp
Less overlays and unfunded strategies	-1,425	-0.4 bp
Total style impact	-27,898	-7.1 bp
<u>Paying more/-less for similar services:</u>		
External investment management	-18,333	-4.7 bp
Internal investment management	-1	0.0 bp
Oversight, custodial and other	-2,466	-0.6 bp
Total impact of paying more /-less	-20,800	-5.3 bp
Total savings	-48,698	-12.4 bp

Benchmark cost calculation

Your 2022 benchmark cost was 123.3 basis points or 482.2 million. It equals your holdings for each asset class multiplied by the peer median cost for the asset class. The peer median cost is the style weighted average for all implementation styles (i.e., internal passive, internal active, external passive, external active).

Asset class	Your average assets	Weighted peer median cost ¹	Benchmark \$000s
	(A)	(B)	(A X B)
Asset management costs			
Stock - U.S. small cap	1,059	32.4 bp	3,429
Stock - EAFE	694	33.7 bp	2,343
Stock - Emerging	228	33.4 bp	760
Stock - Global	13,733	17.7 bp	24,302
Fixed income - U.S.	572	7.9 bp	451
Fixed income - Emerging	58	33.5 bp	196
Fixed income - High yield	1,250	31.0 bp	3,873
Cash	1,030	3.1 bp	320
REITs	353	31.3 bp	1,103
Real estate ex-REITs	3,289	91.7 bp	30,170
Infrastructure	1,620	108.2 bp	17,530
Hedge funds	4,392	129.7 bp	56,960
Perf. fees *	4,392	335.7 bp	147,443
Global TAA *	665	642.3 bp	42,734
Private equity - Diversified	6,293	153.7 bp	96,725
Private credit	4,396	101.1 bp	44,437
Overlay Programs ²	39,118	0.6 bp	2,529
Benchmark for asset management	39,118	121.5 bp	475,304
Oversight, custody and other costs³			
Oversight	39,118	0.9 bp	
Trustee & custodial	39,118	0.2 bp	
Consulting	39,118	0.2 bp	
Audit	39,118	0.0 bp	
Other	39,118	0.1 bp	
Benchmark for oversight, custody, other	39,118	1.8 bp	6,890
Total benchmark cost		123.3 bp	482,194

1. The weighted peer median cost for asset management is the style-weighted average of the peer median costs for all implementation styles (i.e., internal passive, internal active, external passive, external active, fund of fund). It excludes performance fees on private assets. The style weights by asset class for your fund and the peers are shown on page 15 of this section.

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.

* The benchmark was adjusted to neutralize paying more/less impact of the styles where your costs were not reported on the same basis as the peers. See 'Cost impact of paying more/-less for similar services', page 11, for styles that were neutralized.

Cost impact of differences in implementation style

Differences in implementation style (passive vs. active, internal vs. external, etc.) relative to your peers saved you 7.1 bps.

Implementation choices	Assets by style	Peer benchmark cost			Style 1 %			Cost/ -Savings \$000s	bps
		Style 1	Style 2	Style 1 -Savings	Your	Peer average	More/ -Less		
	a	b	c	d = b - c	e	a x d x e			
<u>Passive vs active</u>	Total assets	Passive	Active		Passive % of total assets				
Stock - U.S. small cap	1,059	2 bp	51 bp	-49 bp	100%	38%	62%	-3,228	
Stock - EAFE	694	5 bp	47 bp	-42 bp	100%	31%	69%	-2,019	
Stock - Emerging	228	4 bp	52 bp	-48 bp	0%	39%	-39%	428	
Stock - Global	13,733	4 bp	36 bp	-31 bp	100%	57%	43%	-18,297	
Fixed income - U.S.	572	1 bp	9 bp	-8 bp	0%	13%	-13%	60	
Fixed income - Emerging	58	10 bp	36 bp	-25 bp	0%	8%	-8%	12	
REITs	353	2 bp	33 bp	-31 bp	0%	7%	-7%	73	
More passive								-22,972	-5.9 bp
<u>Internal passive vs external passive</u>	Passive assets	Internal passive	External passive		Internal passive % of passive				
Stock - U.S. small cap	1,059	2 bp	2 bp	0 bp	0%	23%	-23%	7	
Stock - Global	13,733	8 bp	4 bp	4 bp	0%	14%	-14%	-851	
Less int. pass, % of total passive								-845	-0.2 bp
<u>Internal active vs external active</u>	Active assets	Internal active	External active		Internal active % of active				
Stock - Emerging	228	13 bp	54 bp	-41 bp	0%	5%	-5%	47	
Fixed income - U.S.	572	3 bp	11 bp	-8 bp	2%	27%	-25%	115	
Fixed income - Emerging	58	11 bp	36 bp	-25 bp	0%	3%	-3%	4	
Fixed income - High yield	1,250	9 bp	32 bp	-23 bp	0%	4%	-4%	107	
REITs	353	7 bp	37 bp	-29 bp	0%	11%	-11%	117	
Real estate ex-REITs	3,289	31 bp	98 bp	-66 bp	0%	9%	-9%	1,962	
Global TAA	665	19 bp	61 bp	-42 bp	0%	3%	-3%	92	
Private equity - Diversified	6,293	41 bp	154 bp	-113 bp	0%	0%	0%	1	
Less int. active % of total active								2,445	0.6 bp
<u>Evergreen vs LP/Co & fund of funds</u>	External assets	Ever-green	LP/Co & FoF		Evergreen fund % of external				
Real estate ex-REITs	3,289	79 bp	129 bp	-50 bp	0%	62%	-62%	10,229	
Infrastructure	1,620	82 bp	118 bp	-37 bp	22%	28%	-6%	355	
Hedge funds	4,392	120 bp	179 bp	-59 bp	53%	84%	-32%	8,132	
Perf. fees	4,392	159 bp	147 bp	11 bp	53%	84%	-32%	-1,575	
Private credit	4,396	79 bp	116 bp	-37 bp	0%	40%	-40%	6,619	
Less evergreen % of external								23,760	6.1 bp
<u>LP/Co vs fund of funds</u>	LP/Co & Fund of F.	LP/Co	Fund of funds		LP/Co % of LP/Co & Fund of F.				
Real estate ex-REITs	3,289	128 bp	171 bp	-43 bp	100%	99%	1%	-173	
Infrastructure	1,270	116 bp	239 bp	-122 bp	100%	98%	2%	-282	
Private equity - Diversified	6,293	146 bp	211 bp	-65 bp	89%	88%	1%	-236	
Less fund of funds								-691	-0.2 bp
<u>Co-investment vs LP</u>	LP/Co	Co-invest	LP		Co-invest % of LP/Co				
Real estate ex-REITs	3,289	87 bp	129 bp	-42 bp	3%	2%	1%	-140	
Infrastructure	1,270	7 bp	126 bp	-119 bp	15%	8%	7%	-1,023	
Private equity - Diversified	5,570	12 bp	154 bp	-142 bp	35%	6%	29%	-23,126	
Private credit	4,396	22 bp	123 bp	-101 bp	16%	7%	9%	-3,881	
More co-investment								-28,171	-7.2 bp
Less overlays and unfunded strategies								-1,425	-0.4 bp
Total impact of differences in implementation style								-27,898	-7.1 bp

Cost impact of overlays

As summarized on the previous page, the style impact of overlays saved you 0.4 bps. If you use more overlays than your peers, or more expensive types of overlays, then it increases your relative cost.

	Your average total holdings (mils) (A)	Cost as % of total holdings		Cost/-Savings Impact (000s) A X (B - C)
		You (B)	Peer avg. (C)	
Internal Overlays				
Currency - Hedge	39,118	NA	0.00 bp	-6
Rebalancing / Passive beta - Hedge	39,118	NA	0.00 bp	-9
Duration management - Hedge	39,118	NA	0.00 bp	-2
Other overlay - Discretionary	39,118	NA	0.00 bp	-15
External Overlays				
Currency - Hedge	39,118	NA	0.01 bp	-33
Currency - Discretionary	39,118	NA	0.15 bp	-585
Rebalancing / Passive beta - Hedge	39,118	0.28 bp	0.06 bp	858
Commodity futures - Discretionary	39,118	NA	0.33 bp	-1,296
Other overlay - Discretionary	39,118	NA	0.09 bp	-337
Total impact in 000s				-1,425
Total impact in basis points				-0.4 bp

Cost impact of paying more/-less for similar services

Differences in what you paid relative to your peers for similar asset management and related oversight and support services saved you 5.3 bps.

	Style	Your avg holdings (mils) (A)	Cost in bps			Cost/-Savings	
			Your	Peer median	More/-less (B)	\$000s (A X B)	bps
External asset management							
Stock - U.S. small cap	passive	1,059	7.8	2.0	5.8	619	
Stock - EAFE	passive	694	5.8	4.7	1.2	80	
Stock - Emerging	active	228	9.0	54.2	-45.1	-1,029	
Stock - Global	passive	13,733	3.9	3.8	0.1	157	
Fixed income - U.S.	active	559	24.7	11.1	13.6	758	
Fixed income - Emerging	active	58	25.4	36.3	-10.8	-63	
Fixed income - High yield	active	1,250	43.9	31.8	12.0	1,506	
Cash ³	active	465	3.0	3.0	0.0	0	
REITs	active	353	36.4	36.6	-0.2	-7	
Real estate ex-REITs	CO	90	45.6	87.2	-41.6	-373	
Real estate ex-REITs	LP	3,199	93.2	129.0	-35.8	-11,438	
Infrastructure	active	350	90.3	81.7	8.6	301	
Infrastructure	CO	192	21.9	7.0	14.8	285	
Infrastructure	LP	1,078	105.0	126.0	-21.0	-2,264	
Hedge funds	active	2,317	221.4	120.5	101.0	23,390	
Top layer perf. fees	active	2,317	497.7	--	--	Excluded*	
Hedge funds	FoF	2,075	39.4	50.2	-10.8	-2,241	
Top layer perf. fees ²	FoF	2,075	0.0	10.0	-10.0	-2,074	
Underlying base fees	FoF	2,075	90.2	129.0	-38.8	-8,043	
Underlying perf. fees	FoF	2,075	104.6	137.3	-32.7	-6,788	
Global TAA ²	active	665	643.7	--	--	Excluded*	
Private equity - Diversified	CO	1,942	25.6	11.6	14.1	2,731	
Private equity - Diversified	LP	3,628	160.5	154.0	6.5	2,354	
Private equity - Diversified	FoF	723	56.9	56.9	0.0	0	
Underlying base fees ³	FoF	723	154.0	154.0	0.0	0	
Private credit ¹	CO	692	80.7	21.8	58.9	4,073	
Private credit	LP	3,705	68.6	123.3	-54.7	-20,265	
Total for external management						-18,333	-4.7 bp
Internal asset management							
Fixed income - U.S.	active	13	2.2	3.1	-0.9	-1	
Cash ³	active	565	3.2	3.2	0.0	0	
Total for internal management						-1	0.0 bp
Oversight, custody and other costs⁴							
Oversight			0.3	0.9	-0.6		
Trustee & custodial			0.3	0.2	0.1		
Consulting			0.3	0.2	0.1		
Audit			0.1	0.0	0.0		
Other			0.1	0.1	0.0		
Benchmark for oversight, custody, other						-2,466	-0.6 bp
Total						-20,800	-5.3 bp

1. Universe median used because peer data was insufficient.

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

3. The impact of this line is neutralized by setting the benchmark cost to You.

4. Benchmarks for oversight total and individual lines are based on peer medians. Sum of the lines may be different from the total.

* Paying more/less impact only is neutralized/excluded because your costs were not reported on the same basis as the peers.

Summary of why you are high or low cost by asset class

The table below summarizes where you are high and low cost by asset class. It also quantifies how much is due to differences in implementation style (i.e., differences in the mix of external active, external passive, internal active, internal passive and fund of fund usage) and how much is due to paying more or less for similar services (i.e., same asset class and style).

	Your cost	Benchmark = peer		Your average assets (or fee basis)	More/-less in \$000s		
		weighted median cost ¹	More/-less		Total More/-less	Due to Impl. style	Due to paying more/less
Asset management costs	(A)	(B)	(C = A - B)	(D)	(C X D)		
Stock - U.S. small cap	7.8 bp	32.4 bp	-24.6 bp	1,059	-2,603	-3,222	619
Stock - EAFE	5.8 bp	33.7 bp	-27.9 bp	694	-1,939	-2,019	80
Stock - Emerging	9.0 bp	33.4 bp	-24.3 bp	228	-555	475	-1,029
Stock - Global	3.9 bp	17.7 bp	-13.8 bp	13,733	-18,991	-19,148	157
Fixed income - U.S.	24.2 bp	7.9 bp	16.3 bp	572	932	175	757
Fixed income - Emerging	25.4 bp	33.5 bp	-8.1 bp	58	-47	16	-63
Fixed income - High yield	43.9 bp	31.0 bp	12.9 bp	1,250	1,613	107	1,506
Cash	3.1 bp	3.1 bp	0.0 bp	1,030	0	0	0
REITs	36.4 bp	31.3 bp	5.2 bp	353	183	190	-7
Real estate ex-REITs	91.9 bp	91.7 bp	0.2 bp	3,289	66	11,878	-11,812
Infrastructure	92.0 bp	108.2 bp	-16.2 bp	1,620	-2,629	-950	-1,678
Hedge funds	178.1 bp	129.7 bp	48.4 bp	4,392	21,238	8,132	13,106
Perf. fees *	312.0 bp	335.7 bp	-23.8 bp	4,392	-10,436	-1,575	-8,862
Global TAA *	643.7 bp	642.3 bp	1.4 bp	665	92	92	0
Private equity - Diversified	124.7 bp	153.7 bp	-29.0 bp	6,293	-18,277	-23,361	5,084
Private credit	70.5 bp	101.1 bp	-30.6 bp	4,396	-13,454	2,738	-16,192
Overlay Programs ²	0.3 bp	0.6 bp	-0.4 bp	39,118	-1,425	-1,425	0
Total asset management	109.7 bp	121.5 bp	-11.8 bp	39,118	-46,232	-27,898	-18,334
Oversight, custody and other costs³							
Oversight of the fund	0.3 bp	0.9 bp	-0.6 bp				
Trustee & custodial	0.3 bp	0.2 bp	0.1 bp				
Consulting	0.3 bp	0.2 bp	0.1 bp				
Audit	0.1 bp	0.0 bp	0.0 bp				
Other	0.1 bp	0.1 bp	0.0 bp				
Total oversight, custody & other	1.1 bp	1.8 bp	-0.6 bp	39,118	-2,466	n/a	-2,466
Total	110.8 bp	123.3 bp	-12.4 bp	39,118	-48,698	-27,898	-20,800

1. The weighted peer median cost for asset management is the style-weighted average of the peer median costs for all implementation styles (i.e., internal passive, internal active, external passive, external active, fund of fund). It excludes performance fees on private assets. The style weights by asset class for your fund and the peers are shown on page 15 of this section.

2. Total fund average holdings is used as the base when calculating the relative cost impact of the overlay programs.

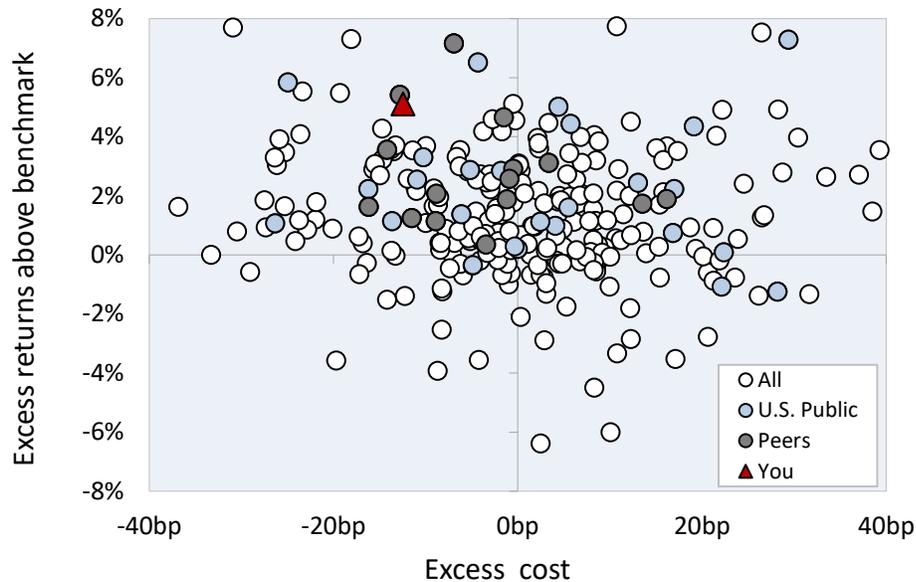
3. Benchmarks for oversight total and individual lines are based on peer medians. Sum of the lines may be different from the total.

* The benchmark was adjusted to neutralize paying more/less impact of the styles where your costs were not reported on the same basis as the peers. See 'Cost impact of paying more/-less for similar services', page 11, for styles that were neutralized.

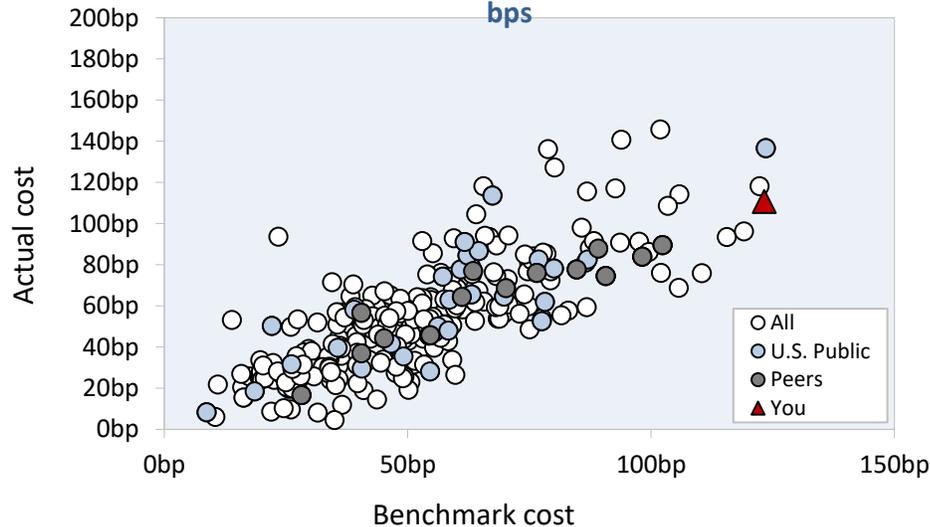
Your cost impact ranking

Being high or low cost is neither good nor bad. More important is whether you are receiving sufficient value for your excess cost. At the total fund level, we provide insight into this question by combining your excess return above benchmark and excess cost to create a snapshot of your cost impact performance relative to that of the global In 2022, your fund ranked in the positive excess return above benchmarked, low cost quadrant.

Your 2022 Excess returns 5.1%, Excess cost -12 bps



Your 2022 Actual cost 110.8 bps, Benchmark cost 123.3 bps



For all funds except your fund, benchmark cost equals the sum of group median costs x fund's average holdings by asset class plus group median cost of derivatives/overlays plus group median cost of oversight/support. Group peer if the fund is in the peer group, universe - if the fund is part of the universe, and global/database otherwise. Your fund's benchmark cost is calculated using peer-based methodology per page 14 of this section.

Benchmarking methodology formulas and data

a) Formulas

Example calculations for 'Stock - U.S. small cap'

Asset class peer cost = weighted average by peer average style of peer median costs

$$= (9\% \times 1.7 \text{ bp}) + (6\% \times 10.5 \text{ bp}) + (29\% \times 2.0 \text{ bp}) + (57\% \times 54.8 \text{ bp}) = 32.4 \text{ bp}$$

Your cost versus benchmark (-savings/+excess) = asset class your cost - asset class peer cost

$$= 7.8 \text{ bp} - 32.4 \text{ bp} = -24.6 \text{ bp}$$

Attribution of 'your cost versus benchmark' to impact of style mix and impact of cost/paying more

Cost impact of differences in implementation style (-savings/+excess)

= cost impacts of passive vs active (A), internal passive vs external passive (B), internal active vs external active (C)

$$= -30.5 \text{ bp} + 0.1 \text{ bp} + 0.0 \text{ bp} = -30.4 \text{ bp}$$

A) Impact of Passive vs Active management (-savings/+excess)

$$= (\text{peer average passive cost} - \text{peer average active cost}) \times (\text{passive \% of asset, you} - \text{passive \% of asset, peer average}) \\ = (1.9 \text{ bp} - 50.8 \text{ bp}) \times (100\% - 38\%) = -30.5 \text{ bp}$$

Peer average passive cost = weighted average by peer average style of peer median costs for internal passive and external passive management

$$= [(9\% \times 1.7 \text{ bp}) + (29\% \times 2.0 \text{ bp})] / (9\% + 29\%) = 1.9 \text{ bp}$$

Peer average active cost = weighted average by peer average style of peer median costs for internal active and external active management

$$= [(6\% \times 10.5 \text{ bp}) + (57\% \times 54.8 \text{ bp})] / (6\% + 57\%) = 50.8 \text{ bp}$$

B) Impact of Internal Passive vs External Passive management (-savings/+excess)

$$= (\text{peer average internal passive cost} - \text{peer average external passive cost}) \times (\text{internal passive \% of passive, you} - \text{internal passive \% of passive, peer average}) \times \text{passive \% of asset, you} \\ = (1.7 \text{ bp} - 2.0 \text{ bp}) \times (0\% - 23\%) \times 100\% = 0.1 \text{ bp}$$

C) Impact of Internal Active vs External Active management (-savings/+excess)

$$= (\text{peer average internal active cost} - \text{peer average external active cost}) \times (\text{internal active \% of active, you} - \text{internal active \% of active, peer avg}) \times \text{active \% of asset, you} \\ = (10.5 \text{ bp} - 54.8 \text{ bp}) \times (0\% - 0\%) \times 0\% = 0.0 \text{ bp}$$

Cost impact of paying more/-less

$$= (\text{cost internal passive, you} - \text{cost internal passive, peer}) \times \text{internal passive \% of asset, you} + (\text{cost internal active, you} - \text{cost internal active, peer}) \times \text{internal active \% of asset, you} + (\text{cost external passive, you} - \text{cost external passive, peer}) \times \text{external passive \% of asset, you} + (\text{cost external active, you} - \text{cost external active, peer}) \times \text{external active \% of asset, you} \\ = (0.0 \text{ bp} - 1.7 \text{ bp}) \times 0\% + (0.0 \text{ bp} - 10.5 \text{ bp}) \times 0\% + (7.8 \text{ bp} - 2.0 \text{ bp}) \times 100\% + (0.0 \text{ bp} - 54.8 \text{ bp}) \times 0\% = 5.8 \text{ bp}$$

Your cost versus benchmark (-savings/+excess)

$$= \text{cost impact of differences in implementation style} + \text{cost impact of paying more/-less} \\ = -30.4 \text{ bp} + 5.8 \text{ bp} = -24.6 \text{ bp}$$

Benchmarking methodology formulas and data

b) 2022 cost data used to calculate weighted peer median costs and impact of mix differences.

Asset Class	Your costs (basis points)							Peer median costs (basis points)							
	Internal Passive	Internal Active	External Passive	External Active	Co-invest	Limited Partner.	Fund of Funds	Internal Passive	Internal Active	External Passive	External Active	Co-invest	Limited Partner.	Fund of Funds	Weighted Median
Stock - U.S. small cap			7.8					1.7	10.5	2.0	54.8				32.4
Stock - EAFE			5.8						11.3	4.7	52.4				33.7
Stock - Emerging				9.0				4.8	13.4	4.1	54.2				33.4
Stock - Global			3.9					8.1	11.2	3.8	35.8				17.7
Fixed income - U.S.		2.2		24.7				1.6	3.1	0.8	11.1				7.9
Fixed income - Emerging				25.4					11.4	10.2	36.3				33.5
Fixed income - High yield				43.9					9.2		31.8				31.0
Cash		3.2		3.0					3.2		3.0				3.1
REITs				36.4				2.0	7.4		36.6				31.3
Real estate ex-REITs					45.6	93.2			31.3		78.7	87.2	129.0	41.9	91.2
Underlying base fees														129.0	0.6
Infrastructure				90.3	21.9	105.0					81.7	7.0	126.0	110.5	106.5
Underlying base fees														128.0	1.7
Hedge funds				221.4			39.4				120.5			50.2	109.4
Top layer perf. fees				497.7			0.0				158.7			10.0	135.3
Underlying base fees							90.2							129.0	20.3
Underlying perf. fees							104.6							137.3	21.6
Global TAA				643.7					19.4		60.9				59.6
Private equity - Diversified					25.6	160.5	56.9		40.5			11.6	154.0	56.9	135.1
Underlying base fees							154.0							154.0	18.6
Private credit					80.7	68.6					78.9	21.8	123.3		101.1
Underlying base fees															0.0

Benchmarking methodology formulas and data

c) 2022 Style weights used to calculate the weighted peer median costs and impact of mix differences.

Style Weights	You (%)							Peer average (%)						
	Internal Passive	Internal Active	External Passive	External Active	Co-invest	Limited Partner.	Fund of Funds	Internal Passive	Internal Active	External Passive	External Active	Co-invest	Limited Partner.	Fund of Funds
Stock - U.S. small cap	0.0%	0.0%	100.0%	0.0%				8.8%	5.5%	29.0%	56.7%			
Stock - EAFE	0.0%	0.0%	100.0%	0.0%				8.8%	8.8%	31.5%	59.7%			
Stock - Emerging	0.0%	0.0%	0.0%	100.0%				16.8%	3.1%	22.5%	57.6%			
Stock - Global	0.0%	0.0%	100.0%	0.0%				8.2%	0.3%	49.2%	42.3%			
Fixed income - U.S.	0.0%	2.2%	0.0%	97.8%				0.4%	23.9%	12.4%	63.2%			
Fixed income - Emerging		0.0%	0.0%	100.0%					2.6%	8.0%	89.4%			
Fixed income - High yield		0.0%		100.0%					3.8%		96.2%			
Cash		54.8%		45.2%					54.8%		45.2%			
REITs	0.0%	0.0%		100.0%				6.6%	10.6%		82.8%			
Real estate ex-REITs		0.0%		0.0%	2.7%	97.3%	0.0%		9.0%		56.5%	0.6%	33.5%	0.4%
Underlying base fees		0.0%		0.0%	2.7%	97.3%	0.0%		9.0%		56.5%	0.6%	33.5%	0.4%
Infrastructure				21.6%	11.9%	66.5%	0.0%				27.6%	5.9%	65.2%	1.3%
Underlying base fees				21.6%	11.9%	66.5%	0.0%				27.6%	5.9%	65.2%	1.3%
Hedge funds				52.8%			47.2%				84.3%			15.7%
Top layer perf. fees				52.8%			47.2%				84.3%			15.7%
Underlying base fees				52.8%			47.2%				84.3%			15.7%
Underlying perf. fees				52.8%			47.2%				84.3%			15.7%
Global TAA		0.0%		100.0%					3.3%		96.7%			
Private equity - Diversified		0.0%			30.9%	57.6%	11.5%		0.0%			5.0%	82.9%	12.1%
Underlying base fees		0.0%			30.9%	57.6%	11.5%		0.0%			5.0%	82.9%	12.1%
Private credit				0.0%	15.7%	84.3%					40.5%	4.2%	55.3%	
Underlying base fees				0.0%	15.7%	84.3%					40.5%	4.2%	55.3%	

The above data was adjusted when there were insufficient peers, or for other reasons where direct comparisons were inappropriate.

Methodology of the cost trend model

CEM cost trend model relies on four factors or reasons to explain the cost differences over time: asset value, asset mix, implementation style, and paying more/less for similar services.

Factors affecting the cost differences

Asset value. If we keep the last three factors constant, costs will normally follow changes in the asset holdings. For external implementations, among the reasons is the common practice of charging management fees based on the value of assets under management. For internal, more assets requires additional internal staff (front and back office) and other operating expenditures. In the current model, for simplicity, we assume that costs change proportionately to the plan average assets.

Change in asset value only affects the cost amounts and does not affect costs in basis points. These are determined by the changes in the last three factors.

Asset mix. These are the cost differences associated with increasing / decreasing allocations to one or more of the asset classes, while keeping other factors constant. Higher allocations to more expensive assets will increase the cost both in amounts and in basis points.

Implementation style. These are changes in costs associated with increasing / decreasing allocations to one or more of the management styles within the same asset class.

Paying more/less for similar services. These cost differences reflect changes in the fees / internal costs in basis points for the same implementation style within the same asset class or same oversight service.

Attribution of the cost differences and other assumptions

Change in the cost amount for one asset =

Sum of impacts of asset value, asset mix, implementation style, and paying more/less for similar services.

Change in the basis point costs for one asset =

Sum of basis point impacts of asset mix, implementation style, and paying more/less for similar services.

For overlays, we do not differentiate between implementation styles and use entire asset category.

Oversight costs are only affected by changes in asset value and paying more/less for similar services.

The base model attributes cost differences between any two years. Trends and cumulative results are built upon combinations of multiple two-year attributions. When an entire asset class is missing in one of the two years, the cost difference for that asset is attributed to the asset value and mix impacts only. Impacts of other factors is 0. When an implementation style within the same asset class is missing in one of the two years, the cost difference for that style is attributed to the effects of the implementation style, while impact of paying more/less for similar services is 0. Impacts of changes in the asset value and asset mix are still accounted for.

General simplified formula for attributing basis point cost differences for one asset class

Cost difference in bps = impact of asset mix + impacts of style & paying =

$$[\text{CostBpsL} \times (\text{HavgHpct} - \text{HavgLpct})] + [\text{HavgHpct} \times (\text{CostBpsH} - \text{CostBpsL})]$$

where L/H are lower and higher years; HavgPct is % of asset's average holdings in total nav holdings;

CostBps is the asset total cost in basis points for a particular year.

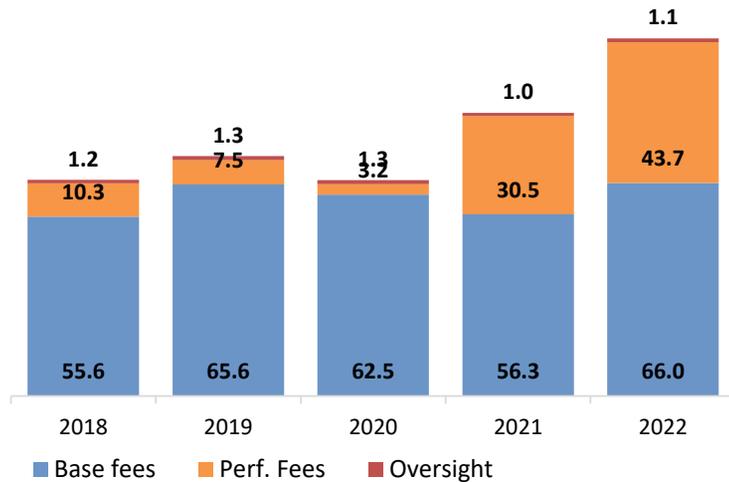
Further, cost difference for style & paying impacts (CostBpsH - CostBpsL) for one style =

$$\text{style impact} [\text{CostStyleBpsL} \times (\text{WgH} - \text{WgL})] + \text{paying impact} [\text{WgH} \times (\text{CostStyleBpsH} - \text{CostStyleBpsL})]$$

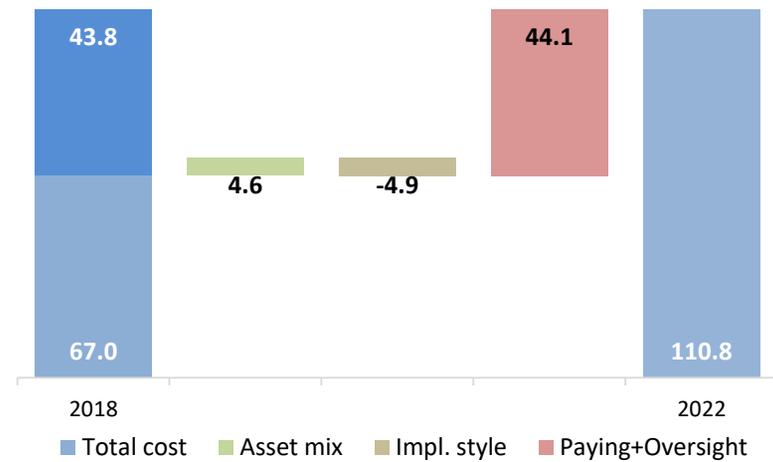
where CostStyleBps is the style cost in basis points; Wg is the weight for that style within the asset class.

Total plan cost and cost changes

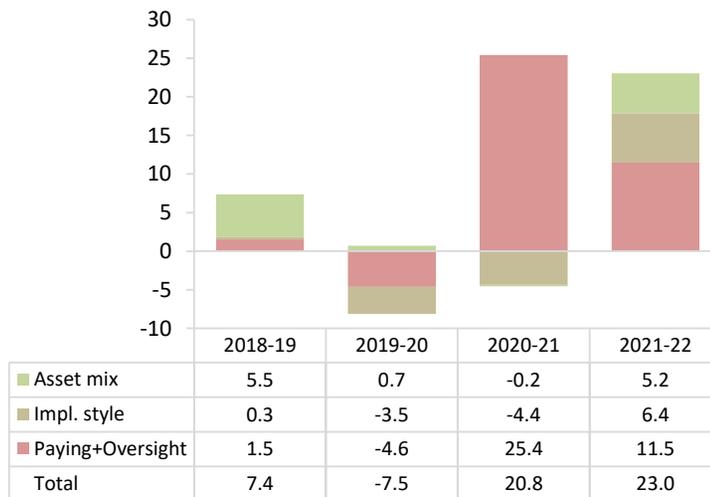
Total plan cost over time, bps



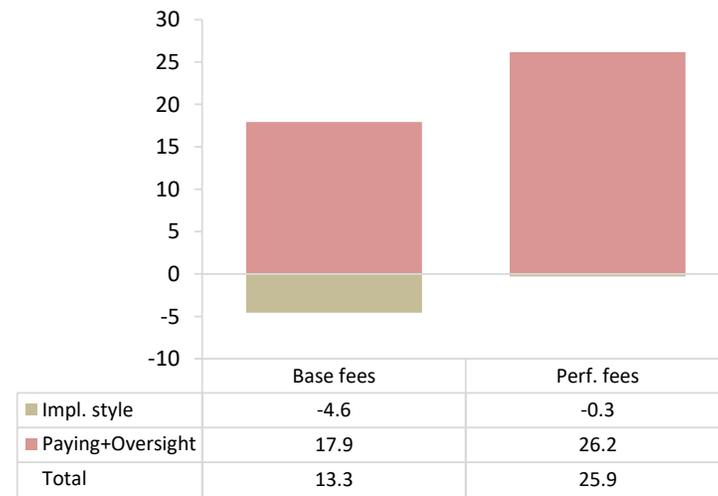
Cost differences, 2022 versus 2018, bps



Reasons for cost differences over time, bps



Impact of base and performance fees, 2022 vs. 2018, bps



Summary of cost differences, 2022 versus 2018

Your total cost increased by 43.8 bps between 2018 and 2022 because of changes in: asset mix (4.6 bps), implementation style (-4.9 bps), and paying more/less for similar services (44.1 bps).

	bps	\$000s
Starting total cost, 2018	67.0	209,559
Growth in asset value		52,696
Asset mix	<u>4.6</u>	<u>17,800</u>
Stock	-4.8	-18,801
Fixed income	-3.0	-11,917
Real estate ex-REITs	2.1	8,342
Real assets ex real estate	0.1	557
Hedge funds & multi-asset	-2.4	-9,512
Private equity	10.3	40,253
Private debt	2.3	8,877
Implementation style (less expensive vs. more)	<u>-4.9</u>	<u>-19,052</u>
More passive, less active	-3.4	-13,223
Less int. active % of total active	0.0	146
Less evergreen % of external	1.8	7,021
Mix of LP and fund of funds	0.1	292
Performance fees	-0.3	-1,134
More co-investment	-3.1	-12,154
Paying more/-less for	<u>44.1</u>	<u>172,616</u>
Stock	-0.7	-2,844
Fixed income	0.1	200
Real estate ex-REITs	-0.5	-2,089
Real assets ex real estate	0.6	2,247
Hedge funds & multi-asset	18.3	71,484
Performance fees	26.2	102,369
Private equity	-0.4	-1,556
Private debt	0.7	2,901
Overlays and unfunded strategies	0.0	-95
Oversight, custodial, other (pay more/-less)	<u>0.0</u>	<u>-122</u>
Total difference	43.8	223,938
Ending total cost, 2022	110.8	433,497

Summary of cost differences, year over year

	bps	\$000s	bps	\$000s	bps	\$000s	bps	\$000s	bps	\$000s
	2018		2019		2020		2021		2018	
Starting total cost	67.0	209,559	74.4	235,265	66.9	210,574	87.8	342,217	67.0	209,559
Growth in asset value		2,445		-1,249		50,413		1,167		52,696
Asset mix	5.5	17,433	0.7	2,161	-0.2	-803	5.2	20,173	4.6	17,800
Stock	0.4	1,370	-1.3	-4,176	-1.0	-4,011	-0.2	-901	-4.8	-18,801
Fixed income	-0.7	-2,247	-0.2	-773	-1.2	-4,560	-0.4	-1,668	-3.0	-11,917
Real estate ex-REITs	2.7	8,488	-1.1	-3,463	0.3	1,121	0.3	998	2.1	8,342
Real assets ex real estate	0.1	306	0.1	416	-0.5	-1,811	0.3	1,198	0.1	557
Hedge funds & multi-asset	-1.7	-5,374	-0.9	-2,887	0.2	719	3.2	12,441	-2.4	-9,512
Private equity	1.0	3,285	3.7	11,765	4.0	15,417	1.9	7,284	10.3	40,253
Private debt	3.7	11,604	0.4	1,278	-2.0	-7,678	0.2	821	2.3	8,877
Implementation style (less expensive vs. more)	0.3	986	-3.5	-11,046	-4.4	-16,965	6.4	25,062	-4.9	-19,052
Passive vs. active	0.0	-119	-3.0	-9,458	-0.8	-3,271	0.0	1	-3.4	-13,223
Internal active vs. external active	-0.1	-286	0.0	96	0.0	115	0.0	27	0.0	146
Evergreen vs. LP/Co & fund of funds	0.0	0	0.0	-50	0.0	-163	-0.9	-3,601	1.8	7,021
LP/Co vs. fund of funds	0.7	2,187	0.3	1,042	-1.5	-5,990	5.4	20,978	-0.2	-842
Co-investment vs. LP	-0.3	-796	-0.9	-2,676	-2.0	-7,655	2.0	7,658	-3.1	-12,154
Paying more/-less for	1.4	4,309	-4.6	-14,531	25.7	100,069	11.4	44,554	44.1	172,616
Stock	-1.4	-4,521	-0.2	-604	-1.5	-5,672	0.2	783	-0.7	-2,844
Fixed income	0.5	1,463	-0.4	-1,312	-0.9	-3,667	0.5	2,008	0.1	200
Real estate ex-REITs	-0.3	-929	0.0	-66	-0.5	-1,908	0.1	564	-0.5	-2,089
Real assets ex real estate	0.3	870	0.7	2,324	-0.3	-1,082	0.4	1,657	0.6	2,247
Hedge funds & multi-asset	1.4	4,403	-3.3	-10,515	31.2	121,494	7.5	29,412	44.4	173,853
Private equity	1.2	3,696	-1.3	-4,093	-0.4	-1,422	0.4	1,406	-0.4	-1,556
Private debt	-0.2	-503	0.1	292	-2.1	-8,147	2.1	8,391	0.7	2,901
Overlays and unfunded strategies	-0.1	-169	-0.2	-558	0.1	474	0.1	334	0.0	-95
Oversight, custodial, other (pay more/-less)	0.2	534	0.0	-25	-0.3	-1,070	0.1	323	0.0	-122
Total difference	7.4	25,707	-7.5	-24,691	20.8	131,643	23.0	91,279	43.8	223,938
Ending total cost	74.4	235,265	66.9	210,574	87.8	342,217	110.8	433,497	110.8	433,497
	2019		2020		2021		2022		2022	

Sum of all changes (except for the total) between adjacent years will differ from the changes between starting and ending years in the last two columns.

Reasons by asset class and cost type, \$000

Your total cost has increased by \$224 million in 2022 compared to 2018. An increase of \$53 million was due to the \$7.9 billion rise in plan total average nav holdings. The remaining increase of \$171 million is explained by the changes in the asset mix (\$18 million), implementation style (-\$19 million), and paying more/less for similar services (\$172 million).

Asset class ¹	2018 cost \$000s	Asset mix \$000s	Implement. style \$000s	Paying more/-less \$000s	Total ex asset gr. \$000s	Total difference \$000s	Growth in asset value \$000s	2022 cost \$000s
	A	B	C	D	E=B+C+D	F=G-A	F-E	G
Stock - U.S. broad/all	11,104	-13,896	0	0	-13,896	-11,104	2,792	n/a
Stock - U.S. small cap	n/a	826	0	0	826	826	0	826
Stock - EAFE	n/a	404	0	0	404	404	0	404
Stock - Emerging	9,879	-11,122	0	-1,036	-12,158	-9,673	2,484	206
Stock - Global	7,572	10,866	-13,223	-1,808	-4,166	-2,261	1,904	5,311
Stock - ACWI x U.S.	4,697	-5,878	0	0	-5,878	-4,697	1,181	n/a
Fixed income - U.S.	1,796	-1,068	14	188	-866	-414	452	1,383
Fixed income - Emerging	6,107	-7,398	0	-96	-7,495	-5,959	1,536	148
Fixed income - High yield	5,847	-2,420	0	589	-1,831	-361	1,470	5,486
Cash	1,358	-1,030	132	-481	-1,380	-1,038	342	320
REITs	1,996	-1,599	0	388	-1,211	-709	502	1,286
Real estate ex-REITs	19,845	8,342	-853	-2,089	5,401	10,391	4,990	30,236
Infrastructure	3,089	2,156	7,021	1,859	11,036	11,812	777	14,901
Hedge funds	26,052	1,059	-1,397	27,208	26,870	33,421	6,551	59,473
Top layer perf. fees	22,976	934	-1,600	87,220	86,554	92,332	5,778	115,308
Underlying base fees	10,487	426	1,038	4,136	5,600	8,237	2,637	18,725
Underlying perf. fees	4,709	191	466	15,149	15,806	16,990	1,184	21,699
Global TAA	11,833	-12,123	0	40,140	28,017	30,993	2,976	42,826
Private equity - Diversified	32,798	36,372	-3,323	-6,783	26,266	34,513	8,247	67,311
Underlying base fees	3,500	3,881	-2,350	5,227	6,757	7,637	880	11,137
Private credit	19,324	8,877	-4,977	2,901	6,801	11,660	4,859	30,984
Total for asset management	204,968	17,800	-19,052	172,711	171,459	223,001	51,542	427,968
Overlays and unfunded strategies ²	958	0		-95	-95	146	241	1,104
Oversight	1,251			-217	-217	97	315	1,349
Trustee & custodial	764			297	297	489	192	1,253
Consulting	1,152			-255	-255	35	290	1,187
Audit	102			150	150	176	26	278
Other	363			-97	-97	-6	91	357
Total for fund oversight³	3,633			-122	-122	791	913	4,424
Total	209,559	17,800	-19,052	172,494	171,242	223,938	52,696	433,497

1. Cost differences for asset classes are attributed to the effects of:

- Asset growth, asset mix, implementation style, and paying for similar services, when the asset class exists in both years.
- Asset growth and asset mix, when the asset class exists only in one of the years.

2. Cost differences for overlays are attributed to the effects of:

- Asset growth and paying more/less for similar services, when the fund has overlays in both years.
- Asset growth and asset mix, when the fund has overlays only in one of the years.

3. Cost differences for oversight are attributed to the effects of asset growth and paying more/less for similar services.

Reasons by asset class and cost type, basis points

Your total cost has increased by 43.8 bps in 2022 vs. 2018. It was driven by the changes in the asset mix (4.6 bps), implementation style (-4.9 bps), and paying more/less for similar services (44.1 bps).

Asset class	Asset mix bps	Implement. style bps	Paying more/-less bps	Total difference bps	Total ¹ ex asset gr. \$000s
	B	C	D	B+C+D	
Stock - U.S. broad/all	-3.6	0.0	0.0	-3.6	-13,896
Stock - U.S. small cap	0.2	0.0	0.0	0.2	826
Stock - EAFE	0.1	0.0	0.0	0.1	404
Stock - Emerging	-2.8	0.0	-0.3	-3.1	-12,158
Stock - Global	2.8	-3.4	-0.5	-1.1	-4,166
Stock - ACWI x U.S.	-1.5	0.0	0.0	-1.5	-5,878
Fixed income - U.S.	-0.3	0.0	0.0	-0.2	-866
Fixed income - Emerging	-1.9	0.0	0.0	-1.9	-7,495
Fixed income - High yield	-0.6	0.0	0.2	-0.5	-1,831
Cash	-0.3	0.0	-0.1	-0.4	-1,380
REITs	-0.4	0.0	0.1	-0.3	-1,211
Real estate ex-REITs	2.1	-0.2	-0.5	1.4	5,401
Infrastructure	0.6	1.8	0.5	2.8	11,036
Hedge funds	0.3	-0.4	7.0	6.9	26,870
Top layer perf. fees	0.2	-0.4	22.3	22.1	86,554
Underlying base fees	0.1	0.3	1.1	1.4	5,600
Underlying perf. fees	0.0	0.1	3.9	4.0	15,806
Global TAA	-3.1	0.0	10.3	7.2	28,017
Private equity - Diversified	9.3	-0.8	-1.7	6.7	26,266
Underlying base fees	1.0	-0.6	1.3	1.7	6,757
Private credit	2.3	-1.3	0.7	1.7	6,801
Total for asset management	4.6	-4.9	44.2	43.8	171,459
Overlays and unfunded strategies	0.00		-0.02	-0.02	-95
Oversight			-0.1	-0.1	-217
Trustee & custodial			0.1	0.1	297
Consulting			-0.1	-0.1	-255
Audit			0.0	0.0	150
Other			0.0	0.0	-97
Total for fund oversight			0.0	0.0	-122
Total	4.6	-4.9	44.1	43.8	171,242
Total basis point costs in years 2022 and 2018		110.8	67.0	43.8	

1. Calculated by multiplying total difference in bps by plan total nav average holdings for year 2022, \$39 billion. Similarly, basis point costs on this page are converted from the amounts on the previous page using the same total nav holdings as the fee basis.

Impact of changes in asset mix

Changes in the asset mix increased your total cost by \$18 million or 4.6 bps.

Asset class	2018 Cost bps	2022 Cost bps	2018 asset ¹ weight %	2022 asset ¹ weight %	Change in asset weight	Asset mix changes ² bps	Asset mix changes ³ \$000s
	A	B	C	D	E=D-C	A (or B) x E	
Stock - U.S. broad/all	40.8	n/a	9%	0%	-9%	-3.6	-13,896
Stock - U.S. small cap	n/a	7.8	0%	3%	3%	0.2	826
Stock - EAFE	n/a	5.8	0%	2%	2%	0.1	404
Stock - Emerging	54.5	9.0	6%	1%	-5%	-2.8	-11,122
Stock - Global	14.8	3.9	16%	35%	19%	2.8	10,866
Stock - ACWI x U.S.	44.4	n/a	3%	0%	-3%	-1.5	-5,878
Fixed income - U.S.	20.6	24.2	3%	1%	-1%	-0.3	-1,068
Fixed income - Emerging	41.9	25.4	5%	0%	-5%	-1.9	-7,398
Fixed income - High yield	39.2	43.9	5%	3%	-2%	-0.6	-2,420
Cash	6.5	3.1	7%	3%	-4%	-0.3	-1,030
REITs	25.5	36.4	3%	1%	-2%	-0.4	-1,599
Real estate ex-REITs	100.9	91.9	6%	8%	2%	2.1	8,342
Infrastructure	37.2	92.0	3%	4%	1%	0.6	2,156
Hedge funds	76.6	135.4	11%	11%	0%	0.3	1,059
Top layer perf. fees	67.6	262.5	11%	11%	0%	0.2	934
Underlying base fees	30.9	42.6	11%	11%	0%	0.1	426
Underlying perf. fees	13.9	49.4	11%	11%	0%	0.0	191
Global TAA	40.4	643.7	9%	2%	-8%	-3.1	-12,123
Private equity - Diversified	123.0	107.0	9%	16%	8%	9.3	36,372
Underlying base fees	13.1	17.7	9%	16%	8%	1.0	3,881
Private credit	75.2	70.5	8%	11%	3%	2.3	8,877
Total for asset management						4.6	17,800

1. Weight % = asset's average (NAV for performance lines) holdings / plan total nav average holdings.

2. If asset is not available in one of the years, the entire weighted cost difference in bps is attributed to the asset mix.

3. Calculated by multiplying asset mix changes in bps by plan total nav average holdings for year 2022, \$39 billion.

Impact of changes in implementation style

Changes in implementation style (passive vs. active, internal vs. external, etc.) in 2022 vs. 2018 saved you \$19 million.

Implementation choices	2022	Cost, 2018			Style 1 %			Cost/ \$000s
	avg. assets \$mils	Style 1	Style 2	Style 1 -Savings	2022	2018	More/ -Less	
	A	B	C	D = B - C	E			A x D x E
<u>Passive vs active</u>	Total assets	Passive	Active		Passive % of total assets			
Stock - Global	13,733	5 bp	23 bp	-18 bp	100%	45%	55%	-13,223
More passive, less active								-13,223
<u>Internal active vs external active</u>	Active assets	Internal active	External active		Internal active % of active			
Fixed income - U.S.	572	3 bp	21 bp	-18 bp	2%	4%	-1%	14
Cash	1,030	3 bp	13 bp	-10 bp	55%	67%	-13%	132
Less int. active % of total active								146
<u>Evergreen vs LP/Co & fund of funds</u>	External assets	Ever-green	LP/Co & FoF		Evergreen fund % of external			
Infrastructure	1,620	37 bp	92 bp	-55 bp	22%	100%	-78%	7,021
Less evergreen % of external								7,021
<u>LP/Co-investment vs fund of funds</u>	LP/Co & FoFs	LP/Co	Fund of funds		LP/Co % of LP/Co + FoFs			
Hedge funds	4,392	118 bp	94 bp	24 bp	53%	56%	-3%	-358
Perf. fees	4,392	115 bp	38 bp	77 bp	53%	56%	-3%	-1,134
Private equity - Diversified	6,293	140 bp	117 bp	23 bp	89%	84%	5%	650
Mix of LP and fund of funds								-842
<u>Co-investment vs LP</u>	LP/Co	Co-invest	LP		Co-invest % of LP/Co			
Real estate ex-REITs	3,289	3 bp	101 bp	-98 bp	3%	0%	3%	-853
Private equity - Diversified	5,570	85 bp	152 bp	-66 bp	35%	18%	17%	-6,324
Private credit	4,396	3 bp	75 bp	-72 bp	16%	0%	16%	-4,977
More co-investment								-12,154
Total								-19,052

Cost differences are attributed exclusively to the effects of implementation style when the style existed in one of the years only.

Impact of paying more/-less for similar services

In 2022, you paid \$172 million more for similar asset management and oversight / support services vs. 2018.

Asset class styles where you had assets in both 2022 and 2018 ¹	Style	2022	Cost in bps		More/ -less	Cost/ -Savings \$000s
		avg. assets \$mils	2022	2018		
<u>External asset management</u>		A			B	A x B
Stock - Emerging	active	228	9.0	54.5	-45.4	-1,036
Stock - Global	passive	13,733	3.9	5.2	-1.3	-1,808
Fixed income - U.S.	active	559	24.7	21.3	3.4	189
Fixed income - Emerging	active	58	25.4	41.9	-16.5	-96
Fixed income - High yield	active	1,250	43.9	39.2	4.7	589
Cash	active	465	3.0	13.4	-10.4	-483
REITs	active	353	36.4	25.5	11.0	388
Real estate ex-REITs	CO	90	45.6	3.0	42.5	381
Real estate ex-REITs	LP	3,199	93.2	101.0	-7.7	-2,470
Infrastructure	active	350	90.3	37.2	53.1	1,859
Hedge funds	active	2,317	221.4	118.2	103.3	23,923
Top layer perf. fees	active	2,317	497.7	115.1	382.5	88,629
Hedge funds	FoF	2,075	39.4	23.6	15.8	3,285
Top layer perf. fees	FoF	2,075	0.0	6.8	-6.8	-1,409
Underlying base fees	FoF	2,075	90.2	70.3	19.9	4,136
Underlying perf. fees	FoF	2,075	104.6	31.6	73.0	15,149
Global TAA	active	665	643.7	40.4	603.3	40,140
Private equity - Diversified	CO	1,942	25.6	85.3	-59.6	-11,585
Private equity - Diversified	LP	3,628	160.5	151.5	9.0	3,253
Private equity - Diversified	FoF	723	56.9	35.4	21.4	1,549
Underlying base fees	FoF	723	154.0	81.7	72.3	5,227
Private credit	CO	692	80.7	3.2	77.5	5,359
Private credit	LP	3,705	68.6	75.2	-6.6	-2,459
Total for external management						172,711
<u>Internal asset management</u>		A			B	A x B
Fixed income - U.S.	active	13	2.2	3.2	-1.0	-1
Cash	active	565	3.2	3.2	0.0	2
Total for internal management						1
Overlays and unfunded strategies		39,118	0.3	0.3	0.0	-95
Oversight		39,118	0.3	0.4	-0.1	-217.2
Trustee & custodial		39,118	0.3	0.2	0.1	297
Consulting		39,118	0.3	0.4	-0.1	-255
Audit		39,118	0.1	0.0	0.0	150
Other		39,118	0.1	0.1	0.0	-97
Total for fund oversight						-122
Total						172,494

1. Cost differences are attributed to paying more/less for similar services only if the asset-class style existed in both years.

5

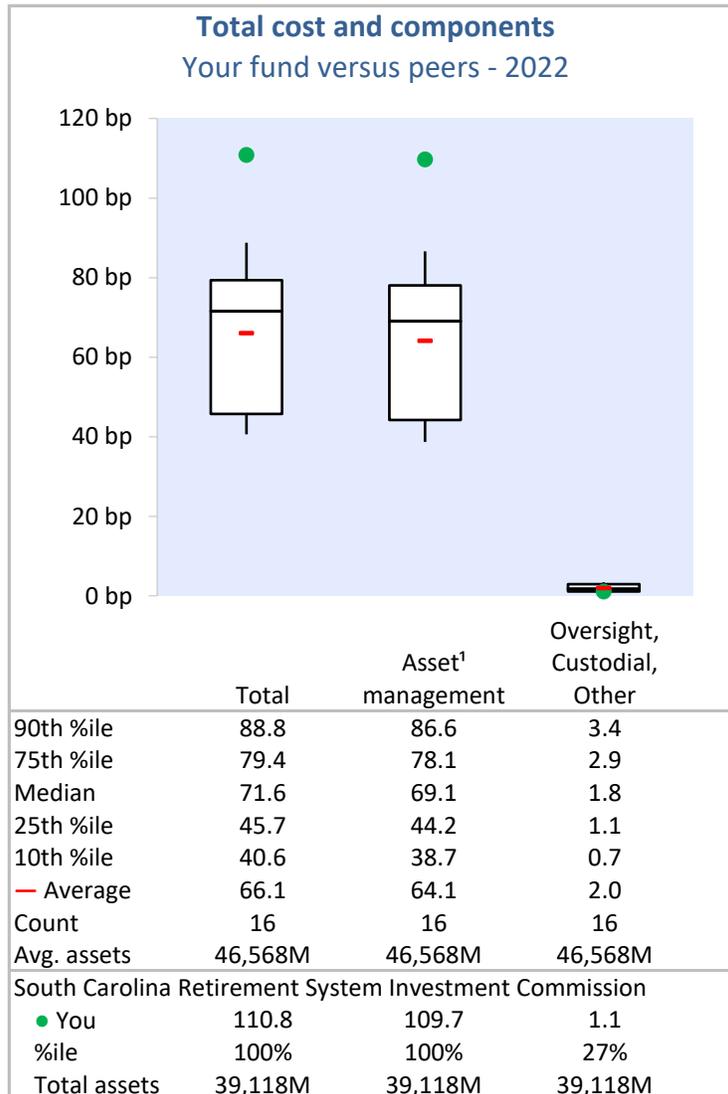
Cost comparisons

Total fund cost	2
Governance, operations & support	3
Public asset classes	
- Stock	4
- Fixed Income	13
- Commodities	27
- REITs	28
Real asset classes	
- Real estate ex-REITs	30
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Private equity	
- Diversified private equity	35
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- Venture capital	37
- Private credit	38
- Mortgages	39
- Other private equity	40
Global TAA	41
RiskParity	42
Hedge Funds	43
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Total fund cost

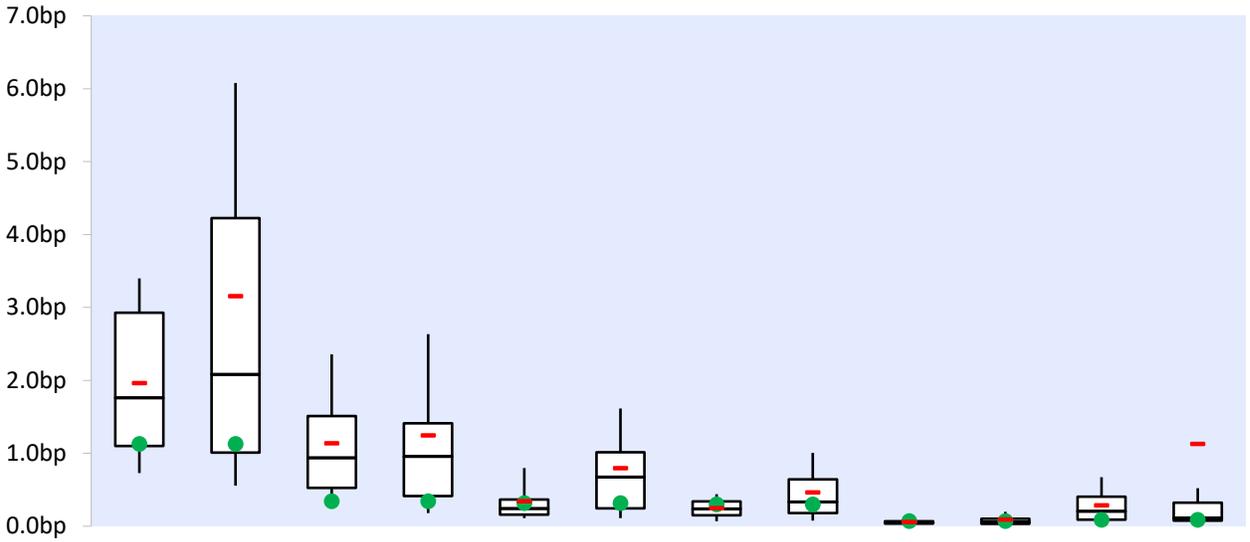
Total costs are benchmarked in the previous section. In this section, your fund's costs are compared on a line-item basis to your peers. This enables you to understand better why you may be a high or low cost fund and it also identifies and quantifies major cost differences that may warrant further investigation.

The 25th to 75th percentile range is the most relevant since higher and lower values may include outliers caused by unusual circumstances, such as performance-based fees. Count refers to the number of funds in your peer group that have costs in this category. It enables you to gauge the statistical significance.



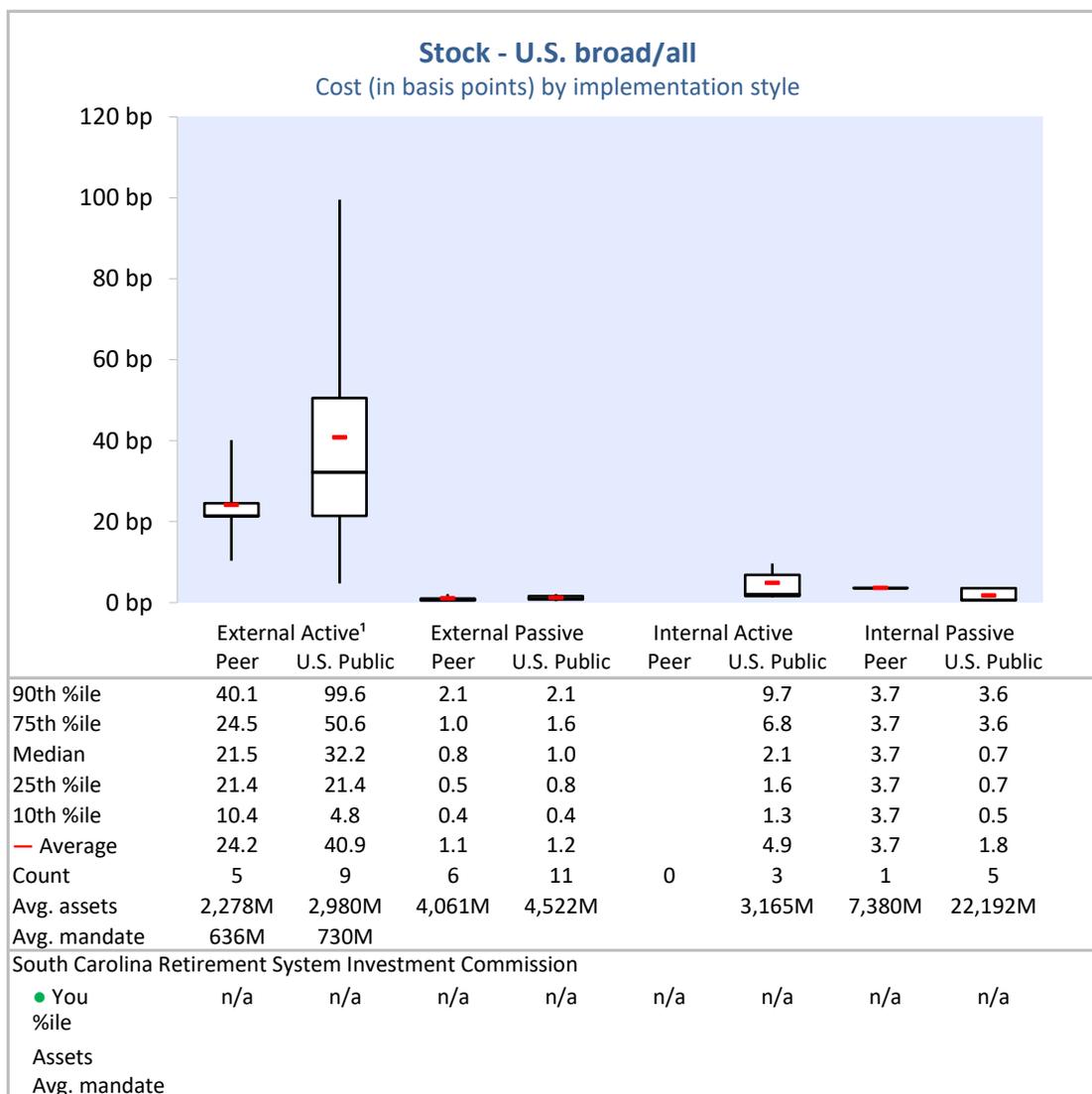
Governance, operations & support

Cost as a % of total plan assets



	<u>Total</u>		<u>Oversight¹</u>		<u>Consulting & Perf. Meas.</u>		<u>Custody</u>		<u>Audit</u>		<u>Other</u>	
	Peer	U.S. Public	Peer	U.S. Public	Peer	U.S. Public	Peer	U.S. Public	Peer	U.S. Public	Peer	U.S. Public
90th %ile	3.4	6.1	2.4	2.6	0.8	1.6	0.4	1.0	0.1	0.2	0.7	0.5
75th %ile	2.9	4.2	1.5	1.4	0.4	1.0	0.3	0.6	0.1	0.1	0.4	0.3
Median	1.8	2.1	0.9	1.0	0.2	0.7	0.2	0.3	0.0	0.1	0.2	0.1
25th %ile	1.1	1.0	0.5	0.4	0.2	0.2	0.2	0.2	0.0	0.0	0.1	0.1
10th %ile	0.7	0.6	0.3	0.2	0.1	0.1	0.1	0.1	0.0	0.0	0.1	0.0
— Average	2.0	3.2	1.1	1.2	0.3	0.8	0.3	0.5	0.1	0.1	0.3	1.1
Count	16	41	16	41	14	31	15	40	14	36	13	28
Avg. assets	46,568M	72,835M	46,568M	72,835M	46,568M	72,835M	46,568M	72,835M	46,568M	72,835M	46,568M	72,835M
South Carolina Retirement System Investment Commission												
● You	1.1	1.1	0.3	0.3	0.3	0.3	0.3	0.3	0.1	0.1	0.1	0.1
%ile	27%	28%	13%	23%	62%	33%	64%	44%	77%	60%	25%	41%
Plan assets	39,118M	39,118M	39,118M	39,118M	39,118M	39,118M	39,118M	39,118M	39,118M	39,118M	39,118M	39,118M

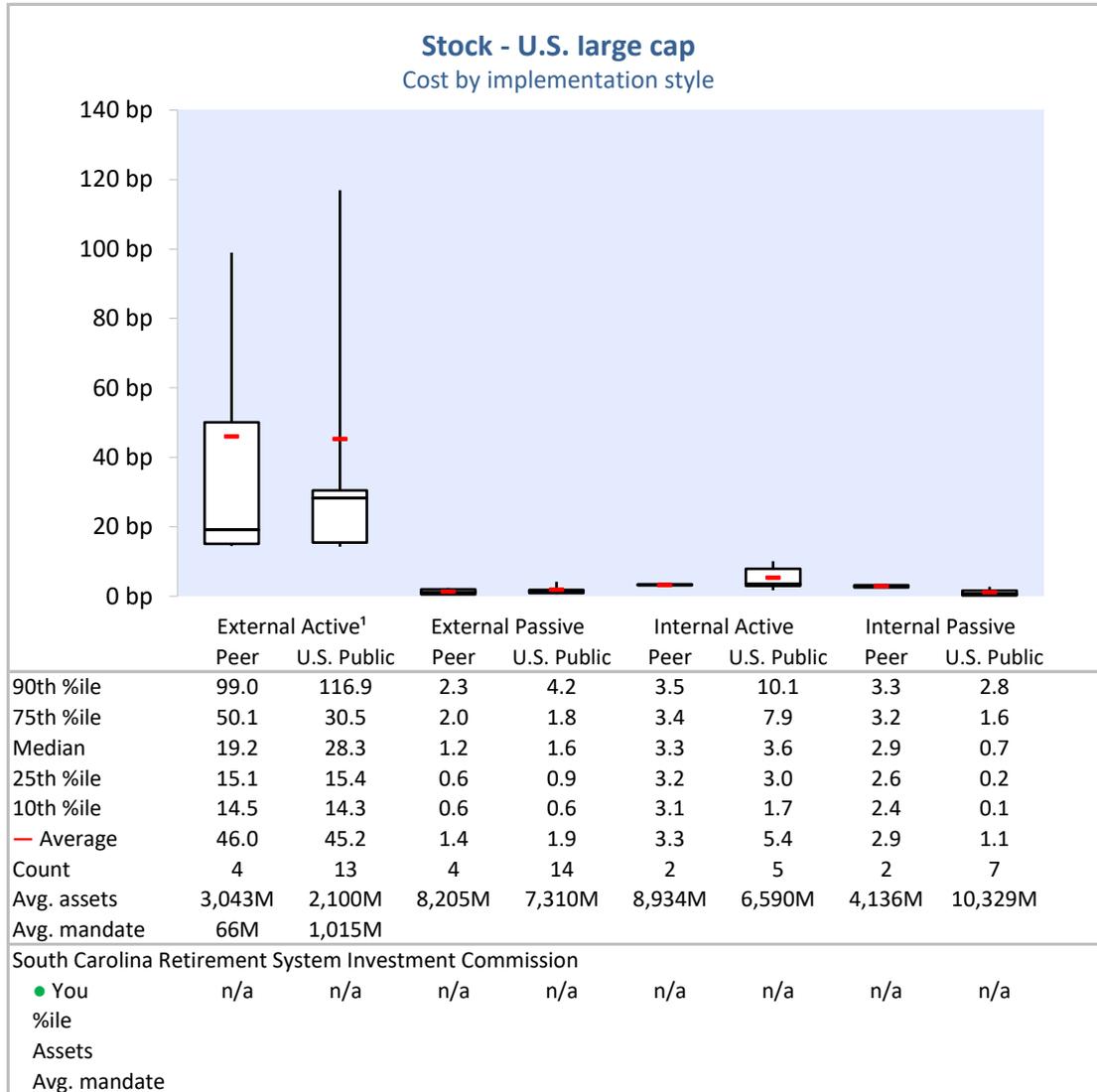
1. Oversight costs include the salaries and benefits of executives and their staff responsible for overseeing the entire fund or multiple asset classes and the fees/salaries of the Board or Investment Committee. All costs associated with the above including fees/salaries, travel, director's insurance and attributed overhead are included. Given fiduciary obligations, having the lowest oversight costs is not necessarily optimal. Some sponsors with lower-than-average executive and administration costs compensate by having higher-than average consulting costs.



1. Breakdown of external active fees

	You	Peer Average	U.S. Public Average
Base fees	n/a	21.6	24.6
Performance fees*	n/a	1.9	15.1
Internal and other	<u>n/a</u>	<u>0.7</u>	<u>1.2</u>
Total	n/a	24.2	40.9

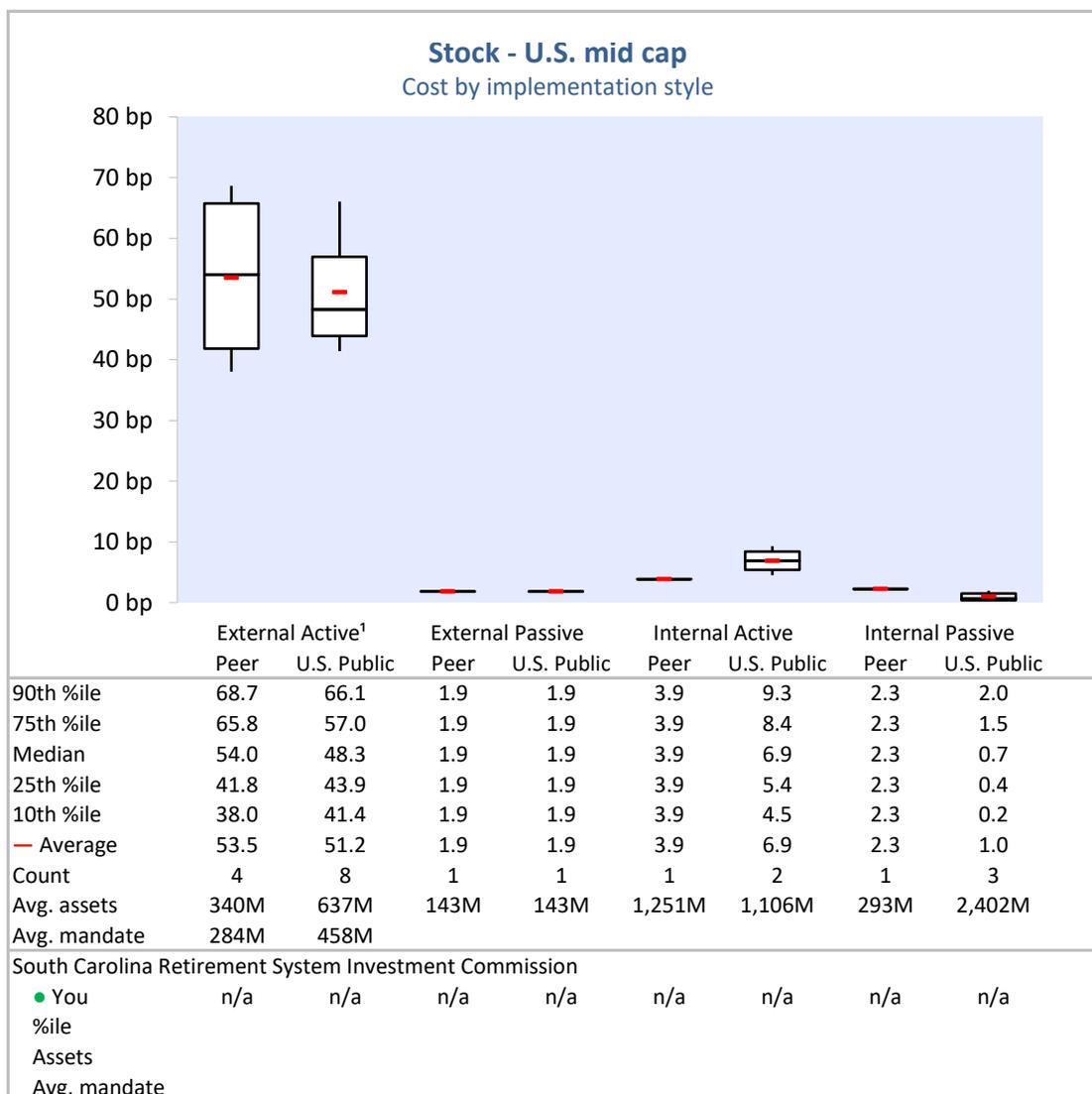
* For funds that did not report a performance fee, a value of 'zero' was used. The average performance fee for those funds that reported a performance fee is 3.2 bps for peers (3 funds) and 27.1 bps for U.S. Public participants (5 funds).



1. Breakdown of external active fees

	You	Peer Average	U.S. Public Average
Base fees	n/a	45.8	34.4
Performance fees*	n/a	0.0	10.4
Internal and other	<u>n/a</u>	<u>0.2</u>	<u>0.5</u>
Total	n/a	46.0	45.2

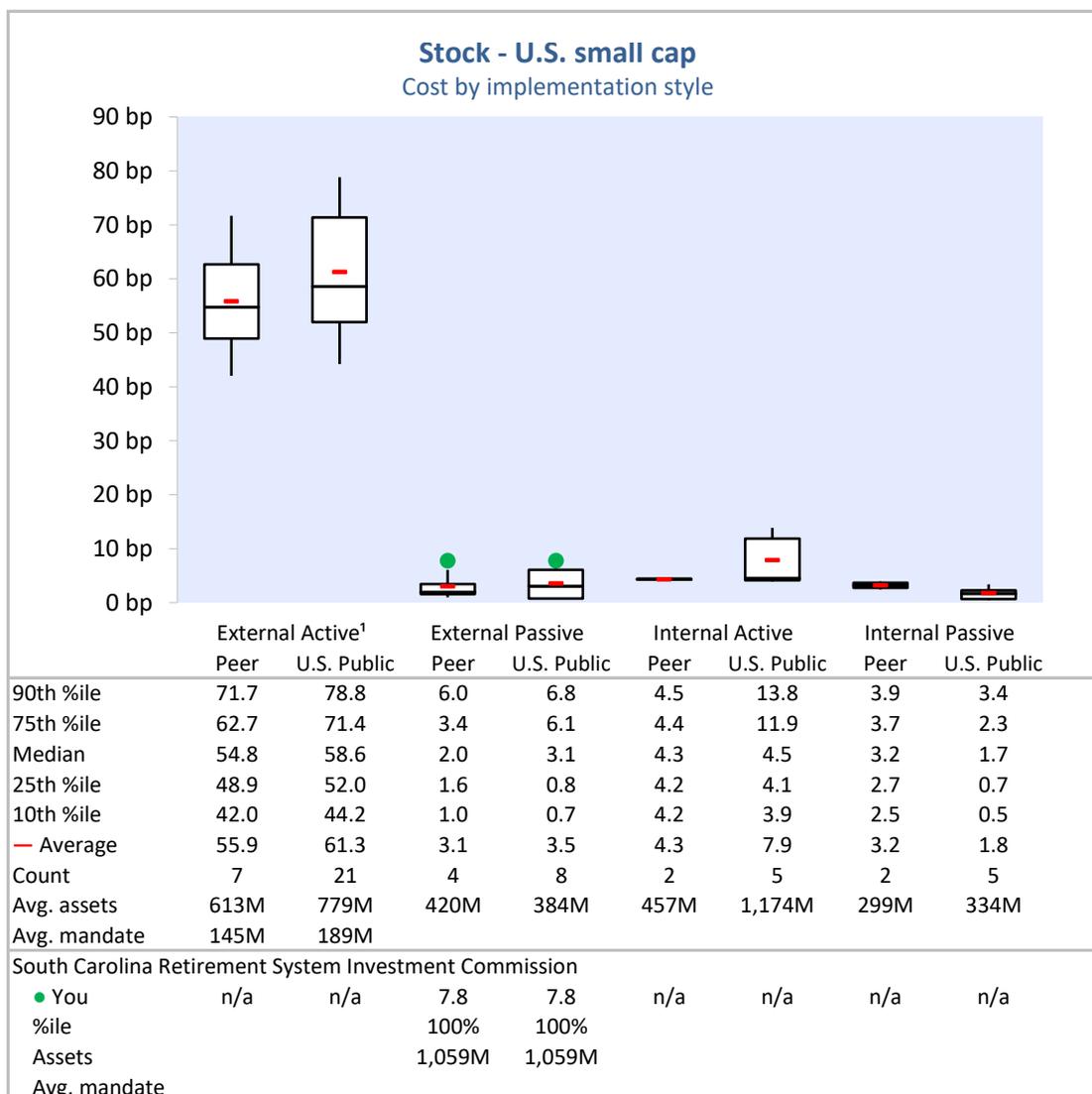
* For funds that did not report a performance fee, a value of 'zero' was used. The average performance fee for those funds that reported a performance fee is 0.0 bps for peers (1 fund) and 33.8 bps for U.S. Public participants (4 funds).



1. Breakdown of external active fees

	You	Peer Average	U.S. Public Average
Base fees	n/a	53.4	50.9
Performance fees*	n/a	0.0	0.0
Internal and other	<u>n/a</u>	<u>0.2</u>	<u>0.2</u>
Total	n/a	53.5	51.2

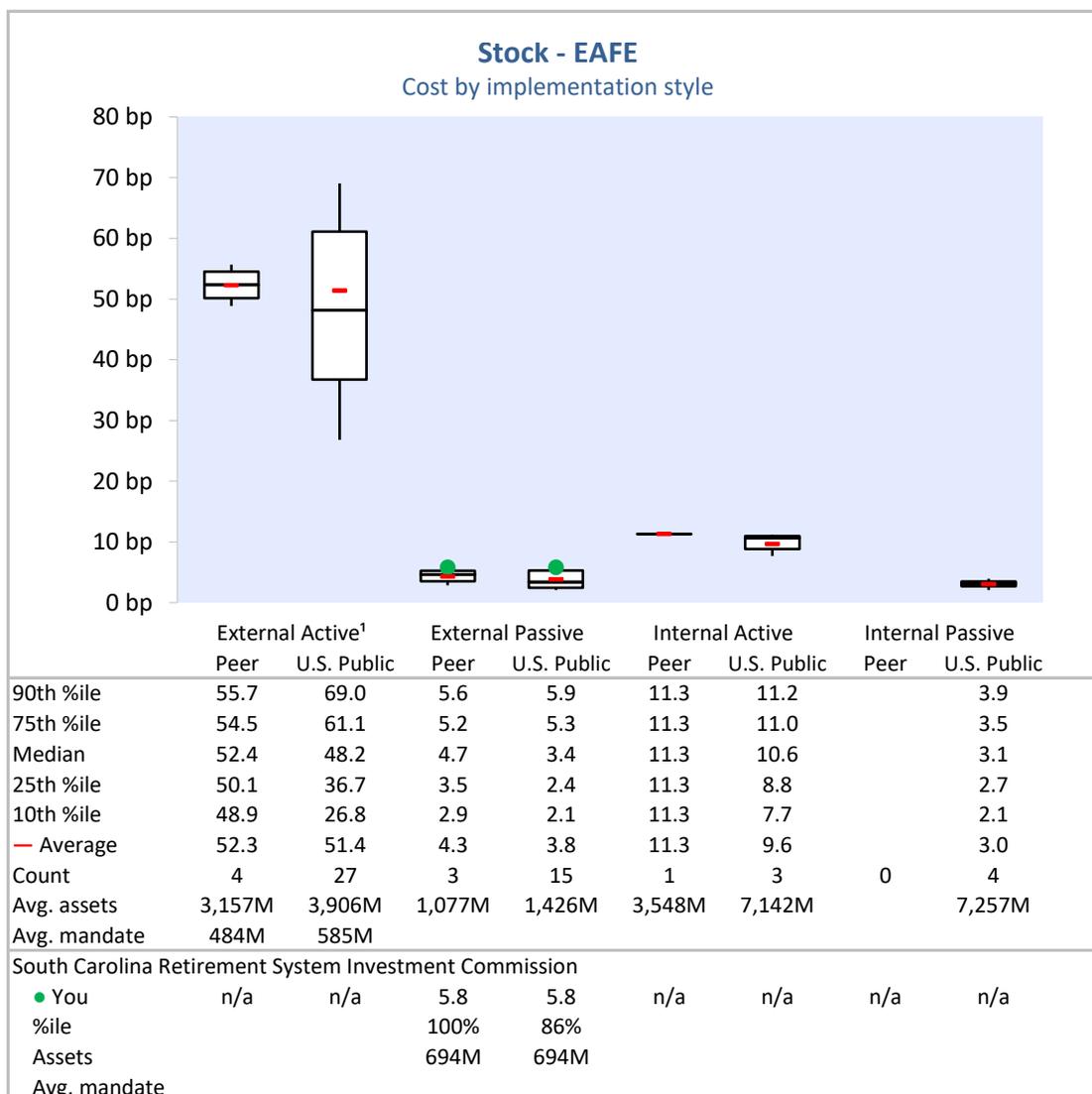
* For funds that did not report a performance fee, a value of 'zero' was used. The average performance fee for those funds that reported a performance fee is 0.0 bps for peers (1 fund) and 0.0 bps for U.S. Public participants (2 funds).



1. Breakdown of external active fees

	You	Peer Average	U.S. Public Average
Base fees	n/a	52.3	56.7
Performance fees*	n/a	3.3	4.2
Internal and other	<u>n/a</u>	<u>0.2</u>	<u>0.4</u>
Total	n/a	55.9	61.3

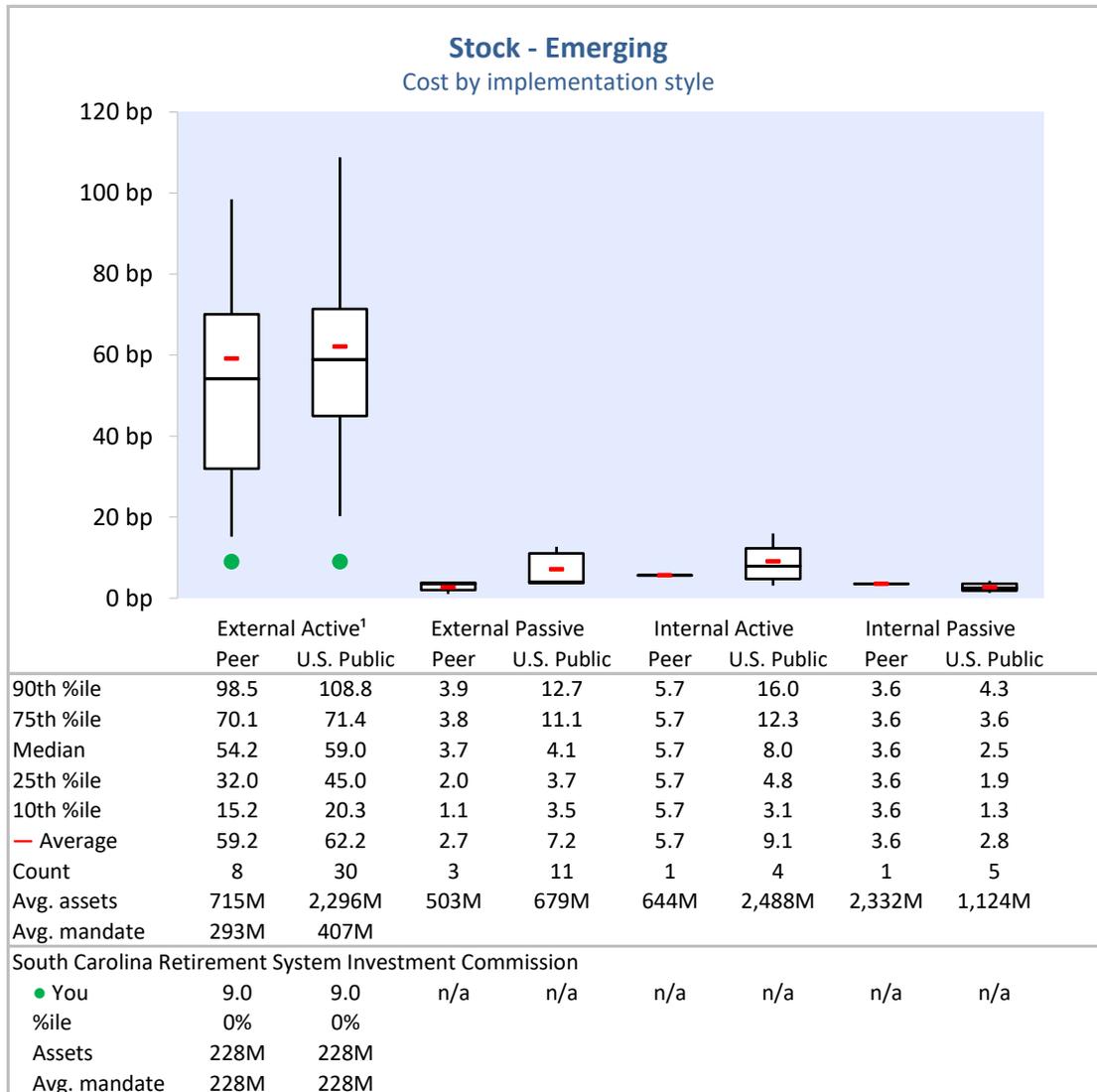
* For funds that did not report a performance fee, a value of 'zero' was used. The average performance fee for those funds that reported a performance fee is 7.8 bps for peers (3 funds) and 11.1 bps for U.S. Public participants (8 funds).



1. Breakdown of external active fees

	You	Peer Average	U.S. Public Average
Base fees	n/a	50.9	43.7
Performance fees*	n/a	1.1	7.3
Internal and other	<u>n/a</u>	<u>0.3</u>	<u>0.5</u>
Total	n/a	52.3	51.4

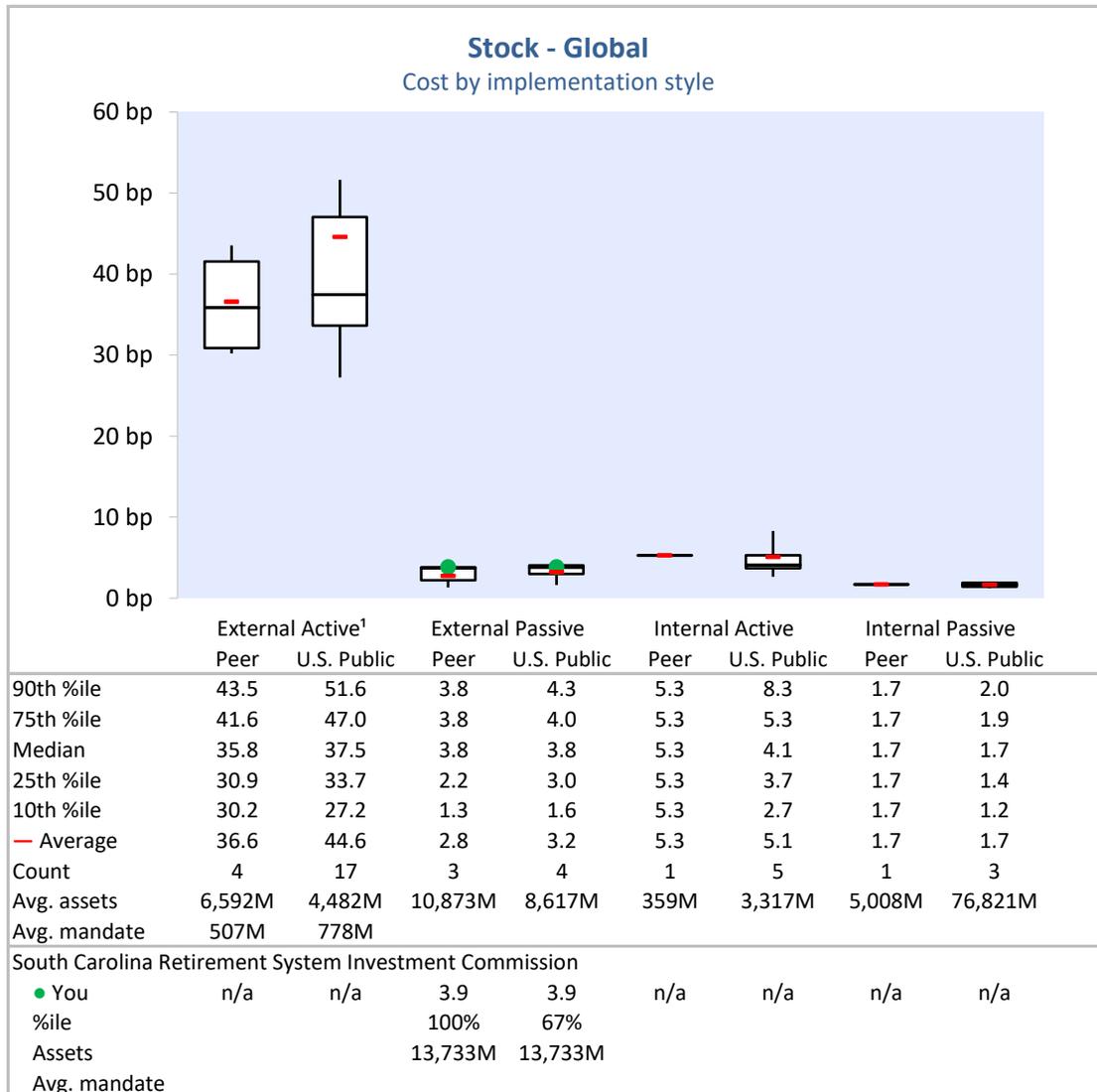
* For funds that did not report a performance fee, a value of 'zero' was used. The average performance fee for those funds that reported a performance fee is 4.4 bps for peers (1 fund) and 19.6 bps for U.S. Public participants (10 funds).



1. Breakdown of external active fees

	You	Peer Average	U.S. Public Average
Base fees	6.7	57.5	53.5
Performance fees*	n/a	0.7	8.0
Internal and other	<u>2.3</u>	<u>1.0</u>	<u>0.8</u>
Total	9.0	59.2	62.2

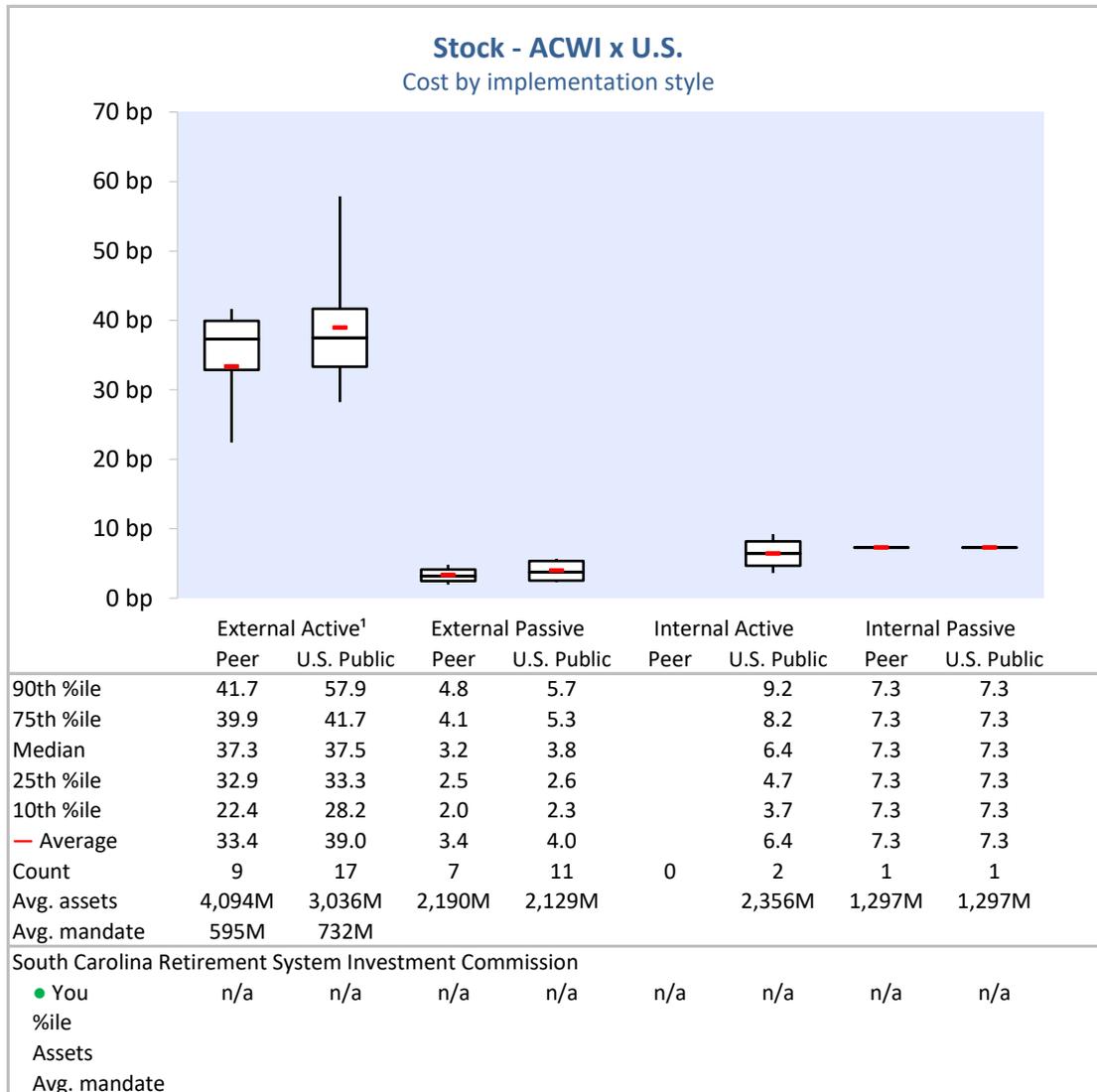
* For funds that did not report a performance fee, a value of 'zero' was used. The average performance fee for those funds that reported a performance fee is 2.9 bps for peers (2 funds) and 21.7 bps for U.S. Public participants (11 funds).



1. Breakdown of external active fees

	You	Peer Average	U.S. Public Average
Base fees	n/a	29.7	34.2
Performance fees*	n/a	5.4	9.6
Internal and other	<u>n/a</u>	<u>1.5</u>	<u>0.8</u>
Total	n/a	36.6	44.6

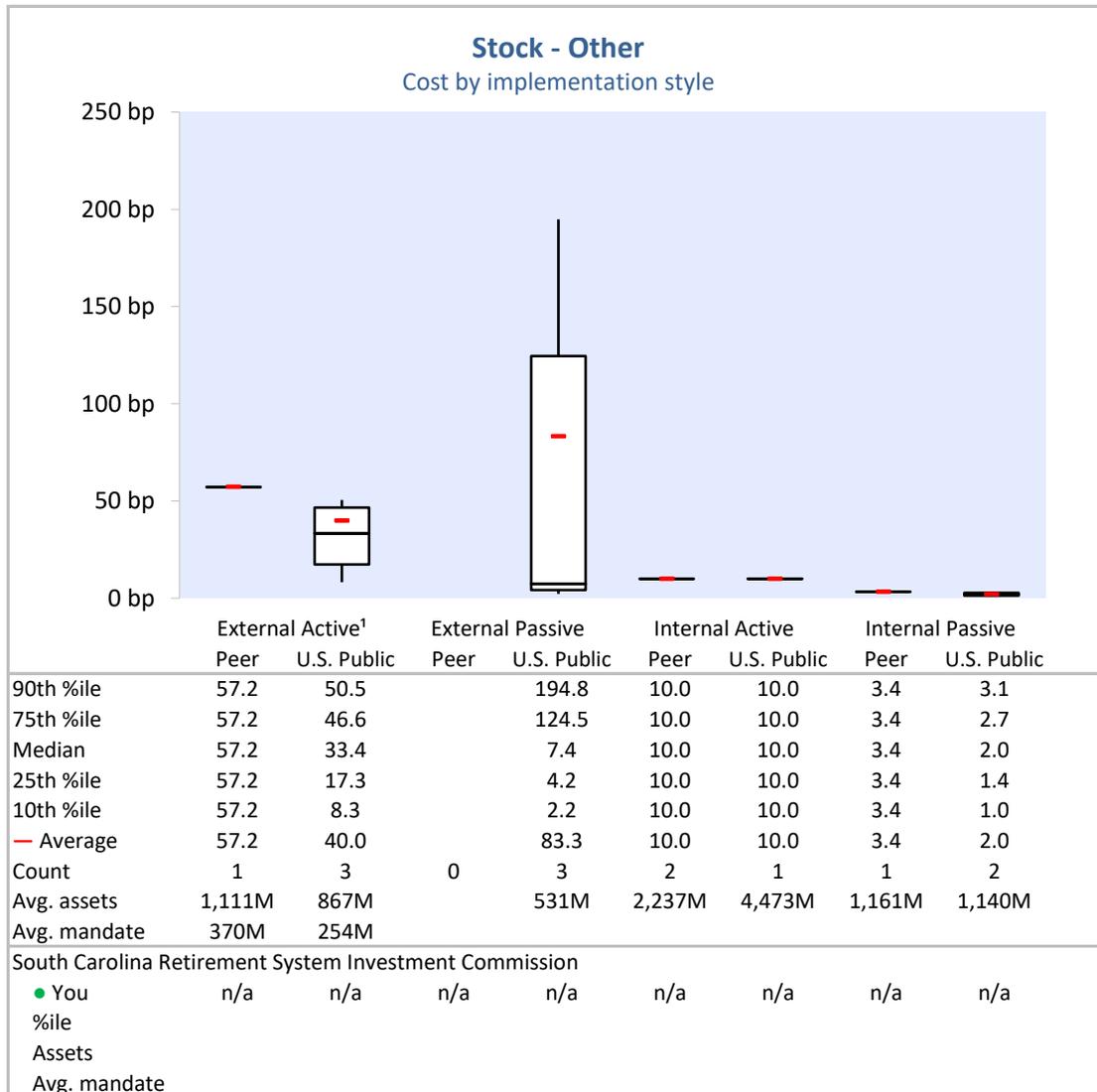
* For funds that did not report a performance fee, a value of 'zero' was used. The average performance fee for those funds that reported a performance fee is 21.6 bps for peers (1 fund) and 27.2 bps for U.S. Public participants (6 funds).



1. Breakdown of external active fees

	You	Peer Average	U.S. Public Average
Base fees	n/a	29.4	37.9
Performance fees*	n/a	3.7	0.8
Internal and other	<u>n/a</u>	<u>0.2</u>	<u>0.3</u>
Total	n/a	33.4	39.0

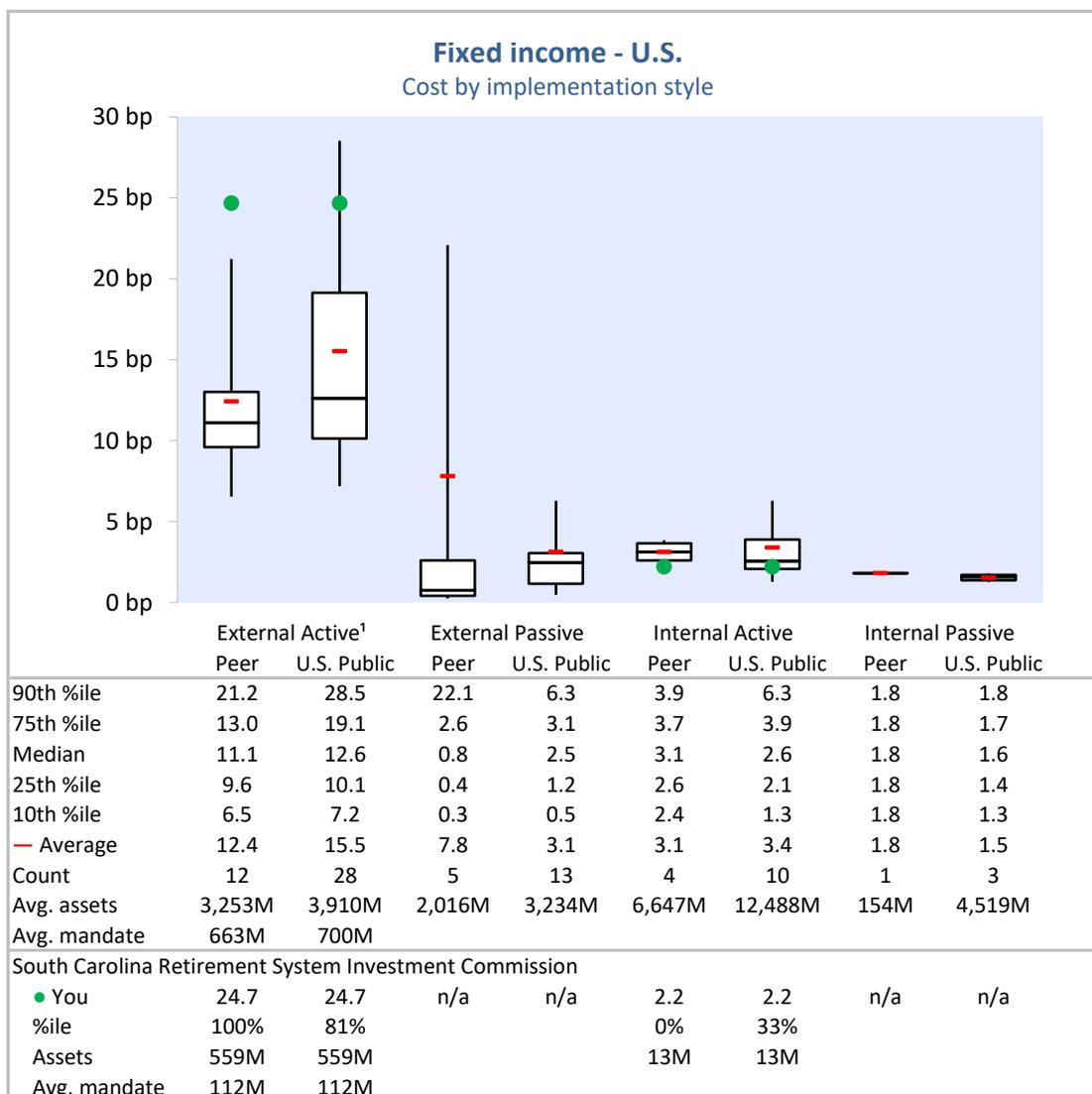
* For funds that did not report a performance fee, a value of 'zero' was used. The average performance fee for those funds that reported a performance fee is 5.6 bps for peers (6 funds) and 1.9 bps for U.S. Public participants (7 funds).



1. Breakdown of external active fees

	You	Peer Average	U.S. Public Average
Base fees	n/a	49.0	39.9
Performance fees*	n/a	8.3	0.0
Internal and other	<u>n/a</u>	<u>n/a</u>	<u>0.9</u>
Total	n/a	57.2	40.0

* For funds that did not report a performance fee, a value of 'zero' was used. The average performance fee for those funds that reported a performance fee is 8.3 bps for peers (1 fund) and 0.0 bps for U.S. Public participants (1 fund).

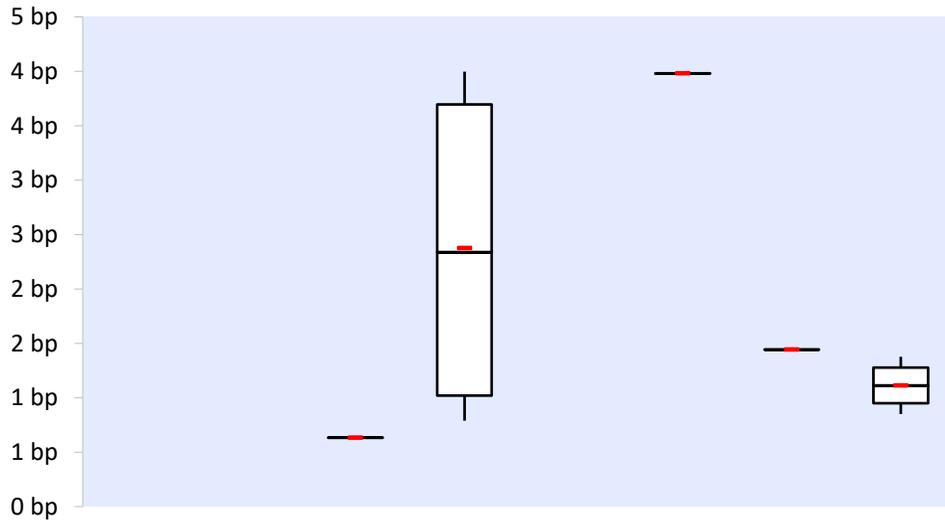


1. Breakdown of external active fees

	You	Peer Average	U.S. Public Average
Base fees	22.9	11.6	15.0
Performance fees*	0.0	0.3	0.2
Internal and other	1.7	0.5	0.4
Total	24.7	12.4	15.5

* For funds that did not report a performance fee, a value of 'zero' was used. The average performance fee for those funds that reported a performance fee is 1.0 bps for peers (4 funds) and 0.8 bps for U.S. Public participants (7 funds).

Fixed income - U.S. gov't
Cost by implementation style



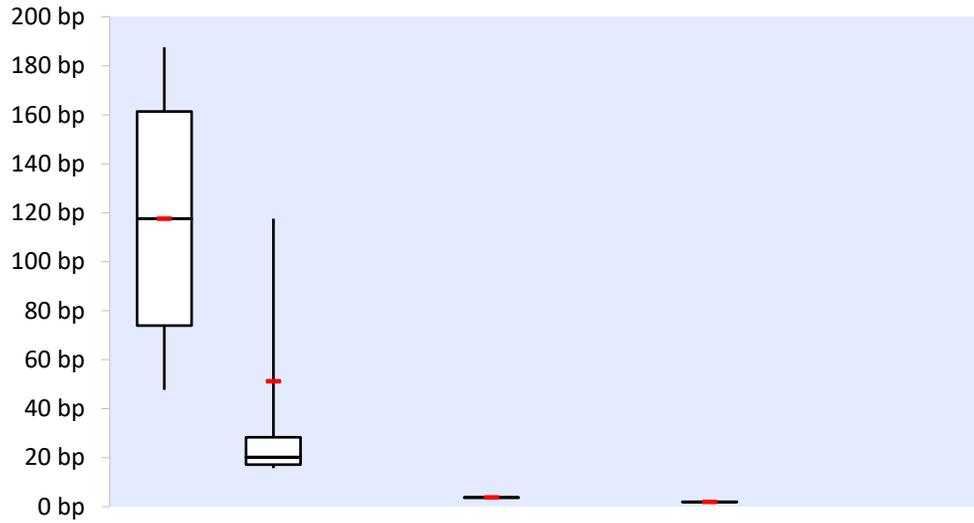
	External Active ¹		External Passive		Internal Active		Internal Passive	
	Peer	U.S. Public	Peer	U.S. Public	Peer	U.S. Public	Peer	U.S. Public
90th %ile			0.6	4.0		4.0	1.4	1.4
75th %ile			0.6	3.7		4.0	1.4	1.3
Median			0.6	2.3		4.0	1.4	1.1
25th %ile			0.6	1.0		4.0	1.4	1.0
10th %ile			0.6	0.8		4.0	1.4	0.9
— Average			0.6	2.4		4.0	1.4	1.1
Count	0	0	1	4	0	1	1	2
Avg. assets			15,322M	3,957M		2,257M	6,854M	21,403M
Avg. mandate								
South Carolina Retirement System Investment Commission								
● You	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
%ile								
Assets								
Avg. mandate								

1. Breakdown of external active fees

	You	Peer Average	U.S. Public Average
Base fees	n/a	n/a	n/a
Performance fees*	n/a	n/a	n/a
Internal and other	<u>n/a</u>	<u>n/a</u>	<u>n/a</u>
Total	n/a	n/a	n/a

No funds reported a performance fee.

Fixed income - U.S. credits Cost by implementation style

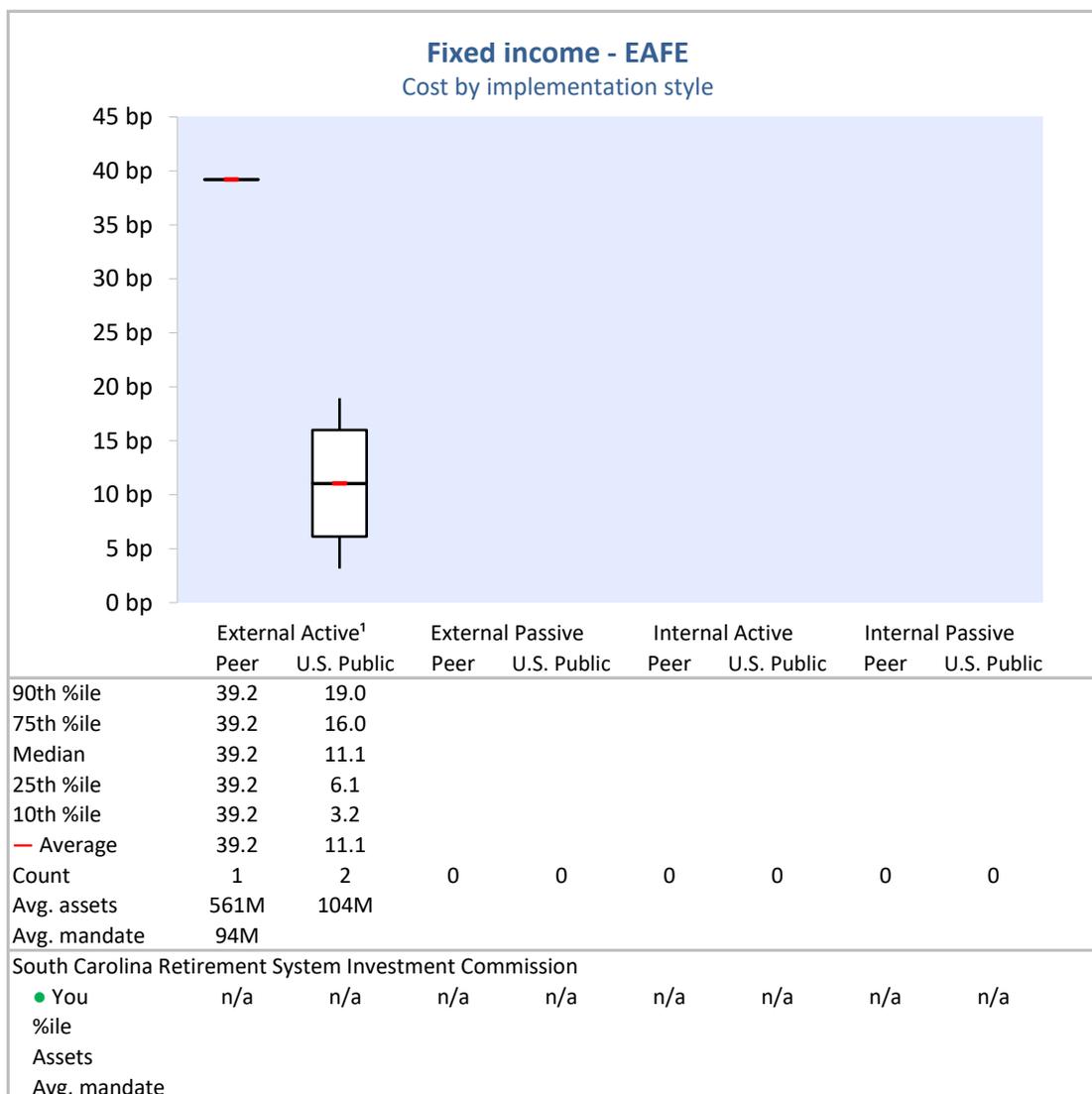


	External Active ¹		External Passive		Internal Active		Internal Passive	
	Peer	U.S. Public	Peer	U.S. Public	Peer	U.S. Public	Peer	U.S. Public
90th %ile	187.6	117.6		3.7		2.0		
75th %ile	161.4	28.3		3.7		2.0		
Median	117.6	20.2		3.7		2.0		
25th %ile	73.9	17.2		3.7		2.0		
10th %ile	47.7	15.8		3.7		2.0		
— Average	117.6	51.2		3.7		2.0		
Count	2	6	0	1	0	1	0	0
Avg. assets	2,025M	836M		110M		72,955M		
Avg. mandate	272M	304M						
South Carolina Retirement System Investment Commission								
● You	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
%ile								
Assets								
Avg. mandate								

1. Breakdown of external active fees

	You	Peer Average	U.S. Public Average
Base fees	n/a	52.6	29.4
Performance fees*	n/a	64.5	21.5
Internal and other	<u>n/a</u>	<u>0.6</u>	<u>0.3</u>
Total	n/a	117.6	51.2

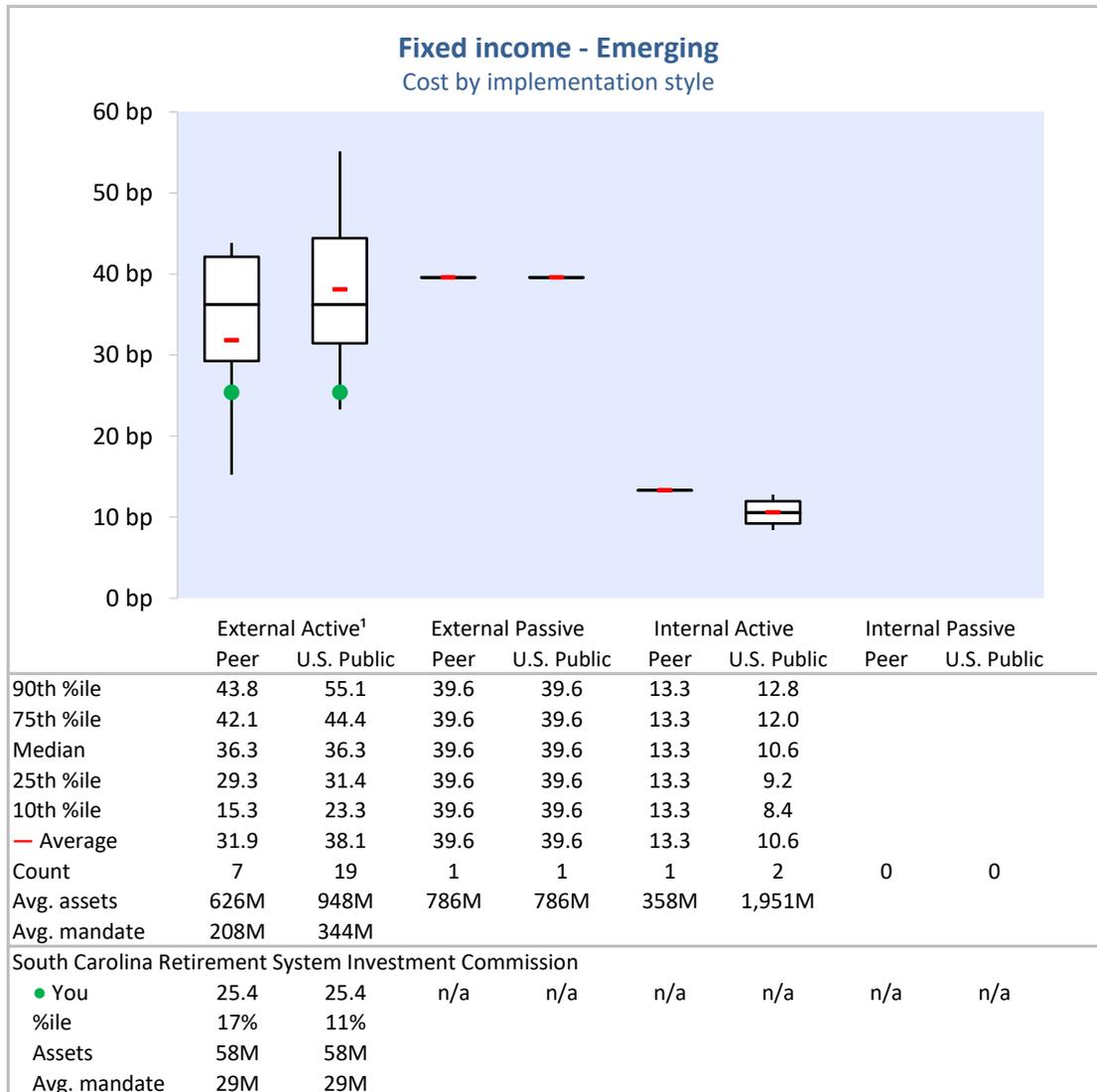
* For funds that did not report a performance fee, a value of 'zero' was used. The average performance fee for those funds that reported a performance fee is 129.0 bps for peers (1 fund) and 129.0 bps for U.S. Public participants (1 fund).



1. Breakdown of external active fees

	You	Peer Average	U.S. Public Average
Base fees	n/a	34.6	11.1
Performance fees*	n/a	4.6	0.0
Internal and other	<u>n/a</u>	<u>n/a</u>	<u>n/a</u>
Total	n/a	39.2	11.1

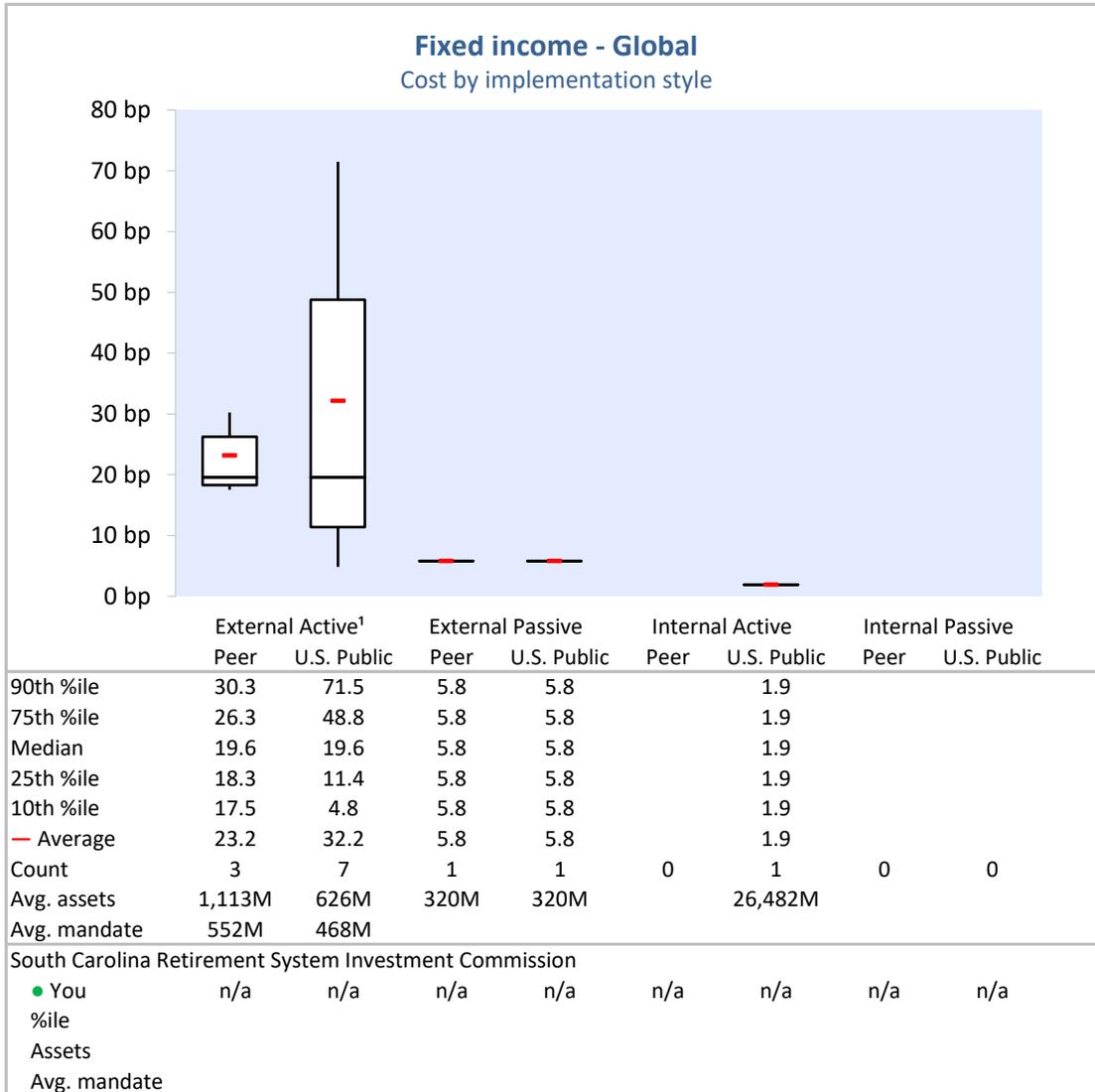
* For funds that did not report a performance fee, a value of 'zero' was used. The average performance fee for those funds that reported a performance fee is 4.6 bps for peers (1 fund) and 0.0 bps for U.S. Public participants (1 fund).



1. Breakdown of external active fees

	You	Peer Average	U.S. Public Average
Base fees	23.3	30.3	36.1
Performance fees*	0.0	0.0	1.1
Internal and other	<u>2.2</u>	<u>1.6</u>	<u>0.9</u>
Total	25.4	31.9	38.1

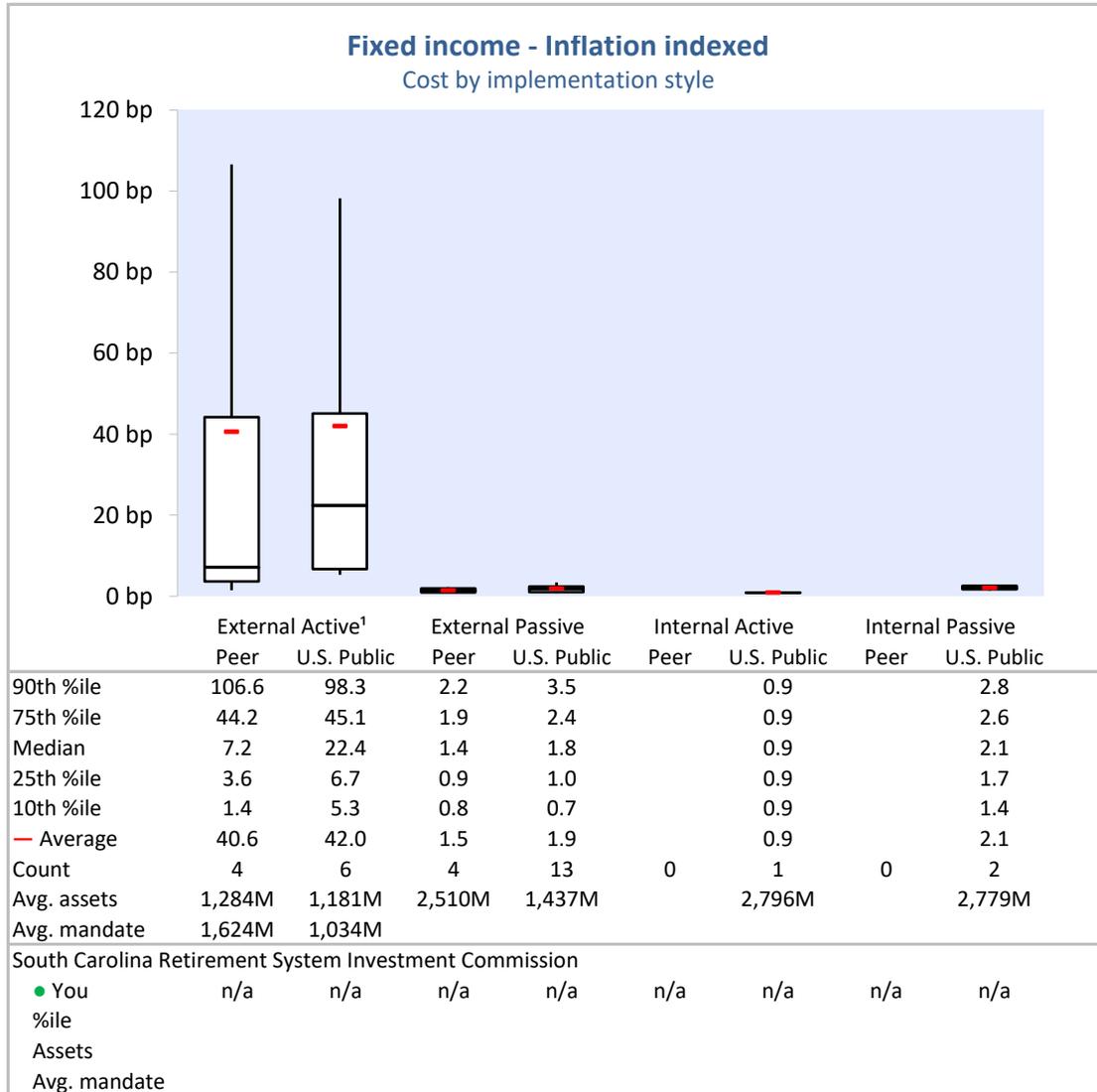
* For funds that did not report a performance fee, a value of 'zero' was used. The average performance fee for those funds that reported a performance fee is 0.0 bps for peers (3 funds) and 2.9 bps for U.S. Public participants (7 funds).



1. Breakdown of external active fees

	You	Peer Average	U.S. Public Average
Base fees	n/a	20.5	30.3
Performance fees*	n/a	n/a	0.0
Internal and other	<u>n/a</u>	<u>2.7</u>	<u>1.9</u>
Total	n/a	23.2	32.2

* For funds that did not report a performance fee, a value of 'zero' was used. The average performance fee for those funds that reported a performance fee is 0.0 bps for U.S. Public participants (1 fund).

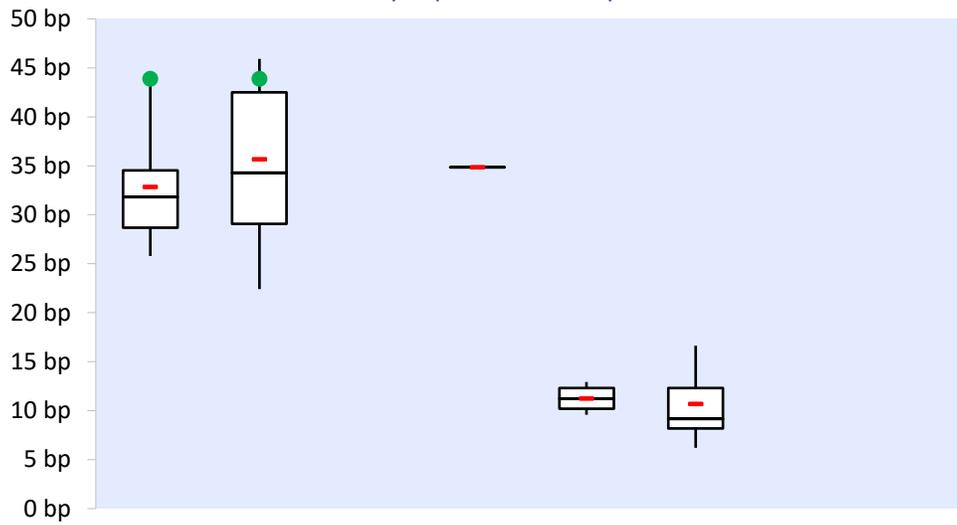


1. Breakdown of external active fees

	You	Peer Average	U.S. Public Average
Base fees	n/a	13.3	23.6
Performance fees*	n/a	27.2	18.2
Internal and other	<u>n/a</u>	<u>0.1</u>	<u>0.3</u>
Total	n/a	40.6	42.0

* For funds that did not report a performance fee, a value of 'zero' was used. The average performance fee for those funds that reported a performance fee is 54.5 bps for peers (2 funds) and 36.3 bps for U.S. Public participants (3 funds).

Fixed income - High yield
Cost by implementation style



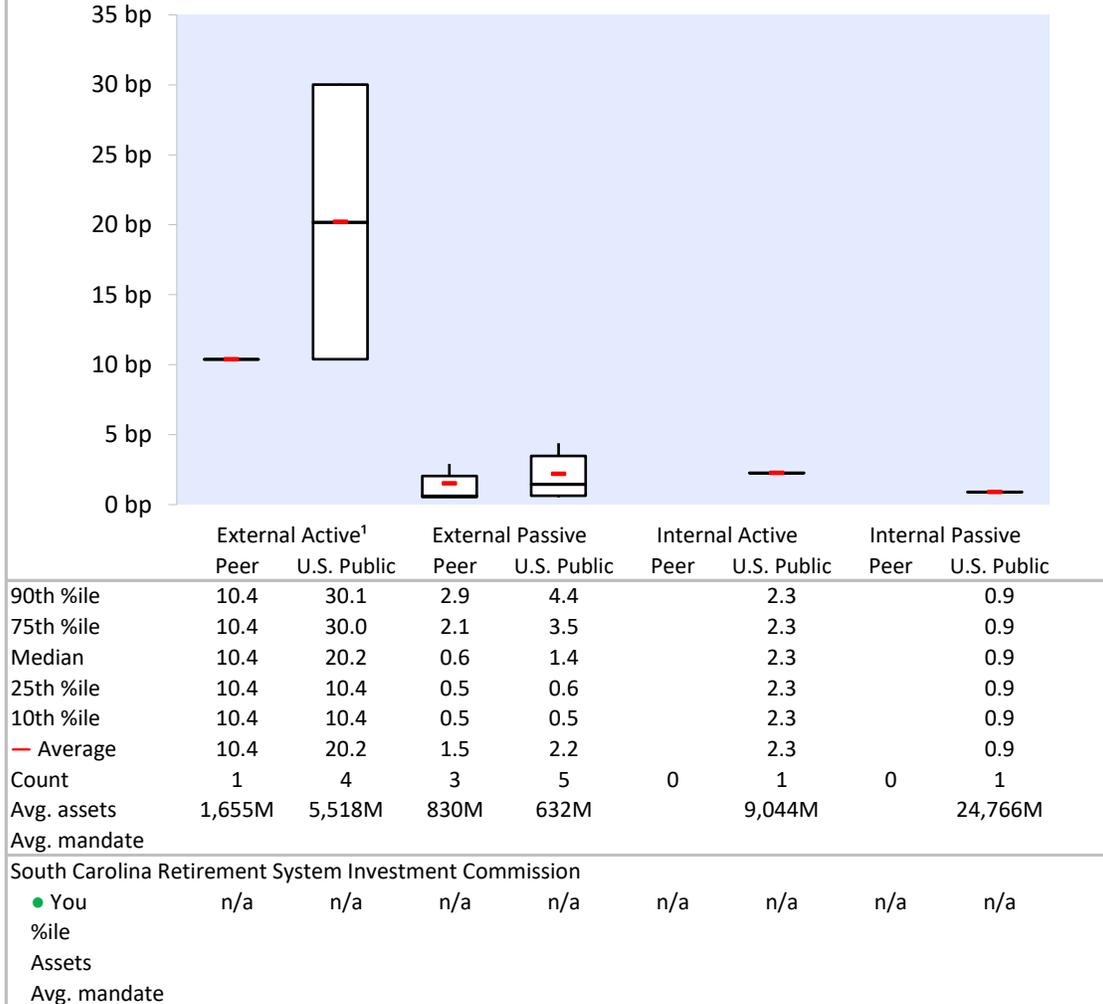
	External Active ¹		External Passive		Internal Active		Internal Passive	
	Peer	U.S. Public	Peer	U.S. Public	Peer	U.S. Public	Peer	U.S. Public
90th %ile	43.1	45.9		34.9	12.9	16.6		
75th %ile	34.5	42.5		34.9	12.3	12.3		
Median	31.8	34.3		34.9	11.3	9.2		
25th %ile	28.7	29.1		34.9	10.2	8.2		
10th %ile	25.8	22.4		34.9	9.6	6.2		
— Average	32.8	35.7		34.9	11.3	10.7		
Count	9	22	0	1	2	6	0	0
Avg. assets	1,209M	1,721M		106M	256M	3,327M		
Avg. mandate	520M	393M						
South Carolina Retirement System Investment Commission								
● You	43.9	43.9	n/a	n/a	n/a	n/a	n/a	n/a
%ile	100%	86%						
Assets	1,250M	1,250M						
Avg. mandate	625M	625M						

1. Breakdown of external active fees

	You	Peer Average	U.S. Public Average
Base fees	41.6	30.6	30.1
Performance fees*	0.0	1.8	4.8
Internal and other	<u>2.3</u>	<u>0.4</u>	<u>0.7</u>
Total	43.9	32.8	35.7

* For funds that did not report a performance fee, a value of 'zero' was used. The average performance fee for those funds that reported a performance fee is 5.4 bps for peers (3 funds) and 17.6 bps for U.S. Public participants (6 funds).

Fixed income - Long bonds Cost by implementation style



1. Breakdown of external active fees

	You	Peer Average	U.S. Public Average
Base fees	n/a	10.0	15.9
Performance fees*	n/a	n/a	4.1
Internal and other	<u>n/a</u>	<u>0.4</u>	<u>0.3</u>
Total	n/a	10.4	20.2

* For funds that did not report a performance fee, a value of 'zero' was used. The average performance fee for those funds that reported a performance fee is 16.4 bps for U.S. Public participants (1 fund).

Fixed income - Absolute return bonds
 Cost by implementation style

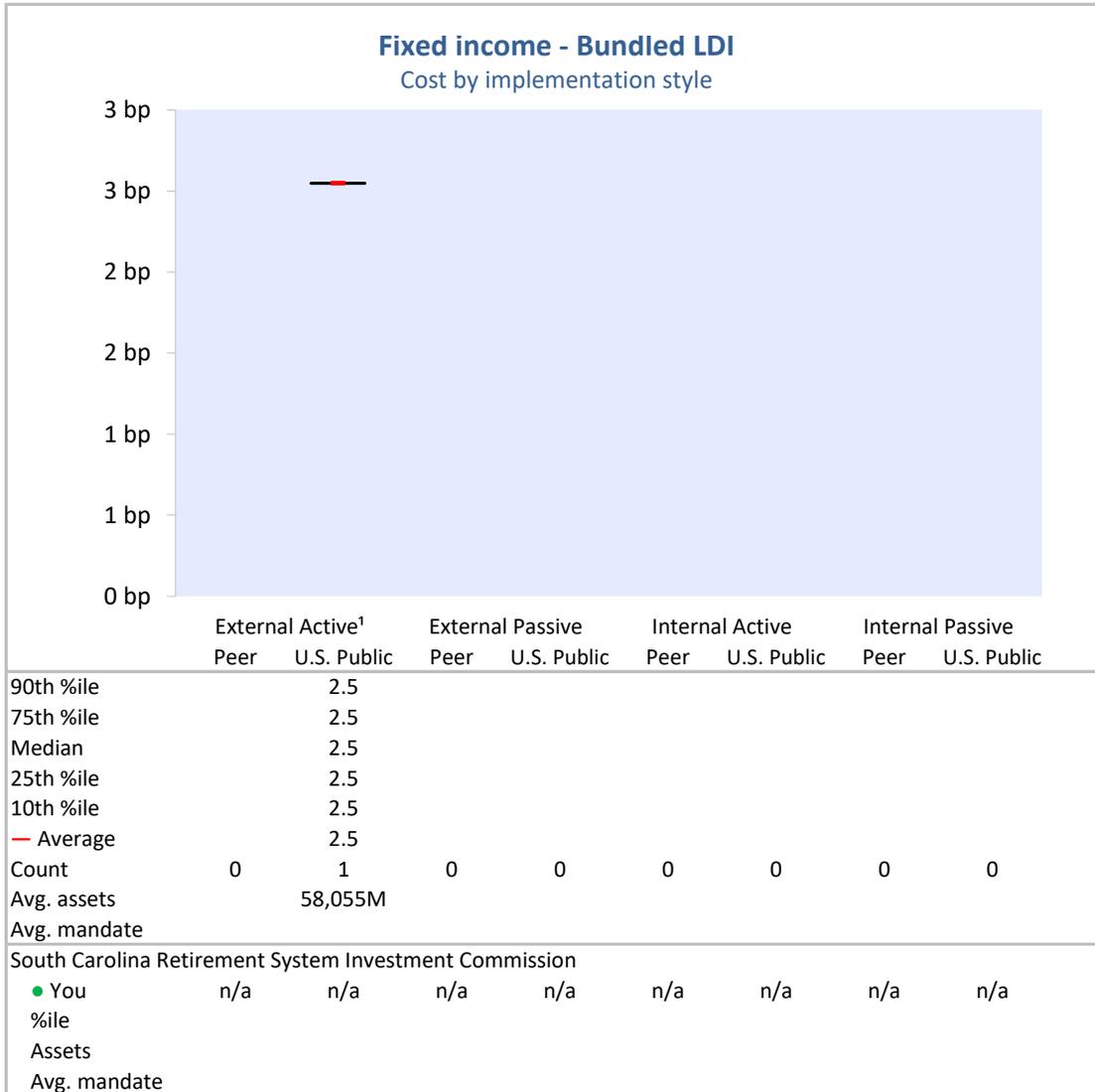


90th %ile								
75th %ile								
Median								
25th %ile								
10th %ile								
— Average								
Count	0	0	0	0	0	0	0	0
Avg. assets								
Avg. mandate								
South Carolina Retirement System Investment Commission								
● You	n/a							
%ile								
Assets								
Avg. mandate								

1. Breakdown of external active fees

	You	Peer Average	U.S. Public Average
Base fees	n/a	n/a	n/a
Performance fees*	n/a	n/a	n/a
Internal and other	<u>n/a</u>	<u>n/a</u>	<u>n/a</u>
Total	n/a	n/a	n/a

No funds reported a performance fee.

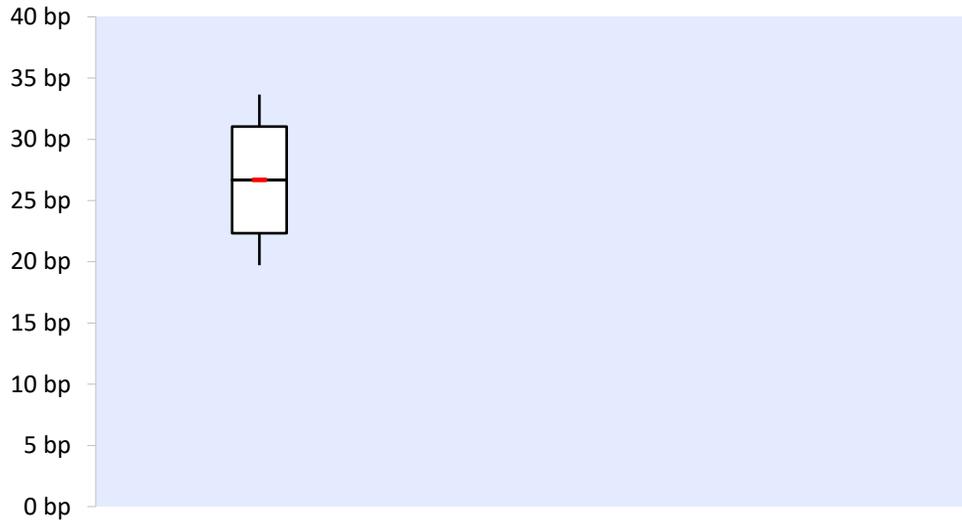


1. Breakdown of external active fees

	You	Peer Average	U.S. Public Average
Base fees	n/a	n/a	2.5
Performance fees*	n/a	n/a	n/a
Internal and other	<u>n/a</u>	<u>n/a</u>	<u>n/a</u>
Total	n/a	n/a	2.5

No funds reported a performance fee.

Fixed income - Convertibles
Cost by implementation style

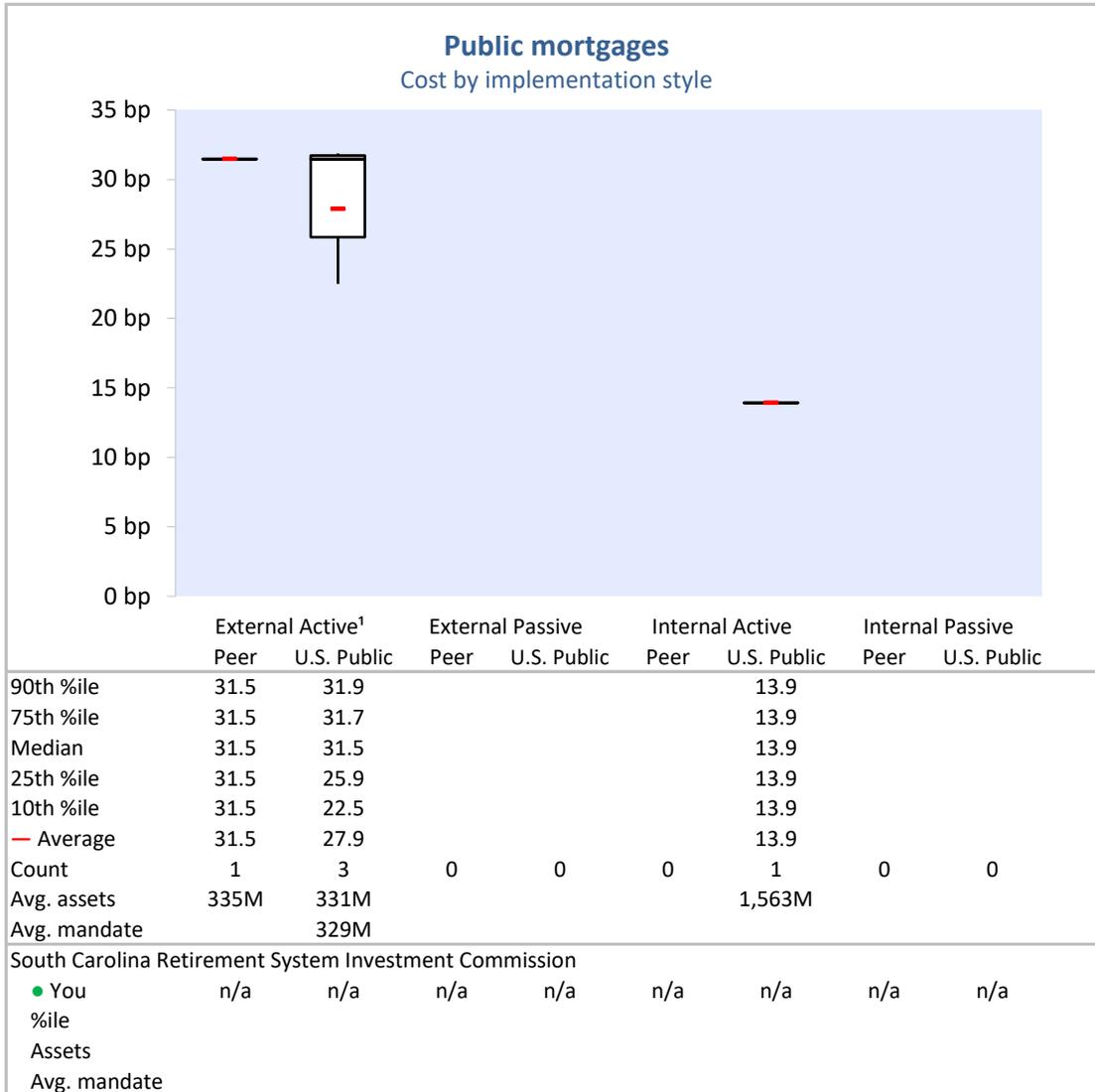


	External Active ¹		External Passive		Internal Active		Internal Passive	
	Peer	U.S. Public	Peer	U.S. Public	Peer	U.S. Public	Peer	U.S. Public
90th %ile		33.7						
75th %ile		31.0						
Median		26.7						
25th %ile		22.3						
10th %ile		19.7						
— Average		26.7						
Count	0	2	0	0	0	0	0	0
Avg. assets		1,244M						
Avg. mandate								
South Carolina Retirement System Investment Commission								
● You	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
%ile								
Assets								
Avg. mandate								

1. Breakdown of external active fees

	You	Peer Average	U.S. Public Average
Base fees	n/a	n/a	26.5
Performance fees*	n/a	n/a	n/a
Internal and other	<u>n/a</u>	<u>n/a</u>	<u>0.2</u>
Total	n/a	n/a	26.7

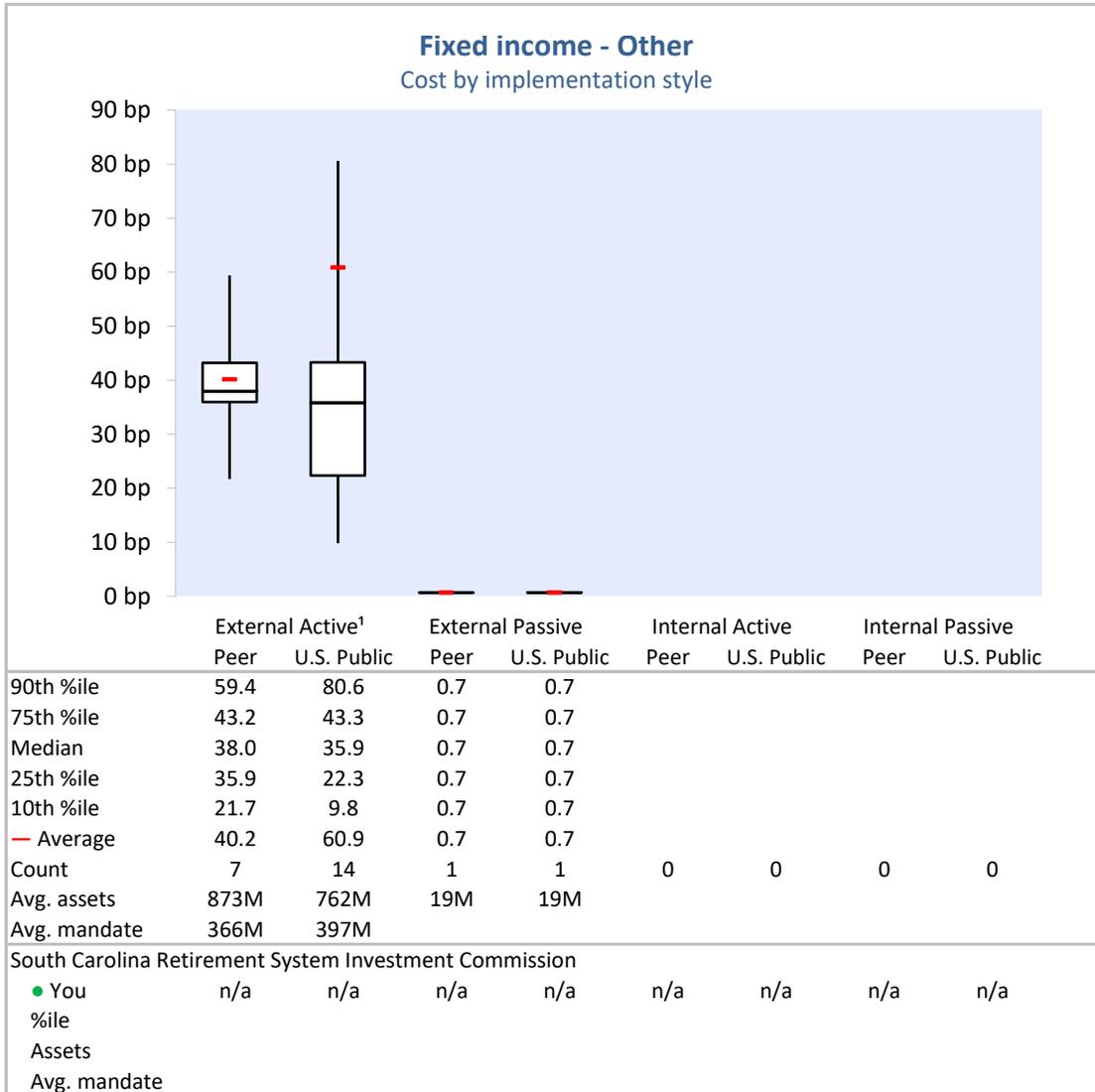
No funds reported a performance fee.



1. Breakdown of external active fees

	You	Peer Average	U.S. Public Average
Base fees	n/a	31.0	27.4
Performance fees*	n/a	n/a	n/a
Internal and other	<u>n/a</u>	<u>0.5</u>	<u>0.5</u>
Total	n/a	31.5	27.9

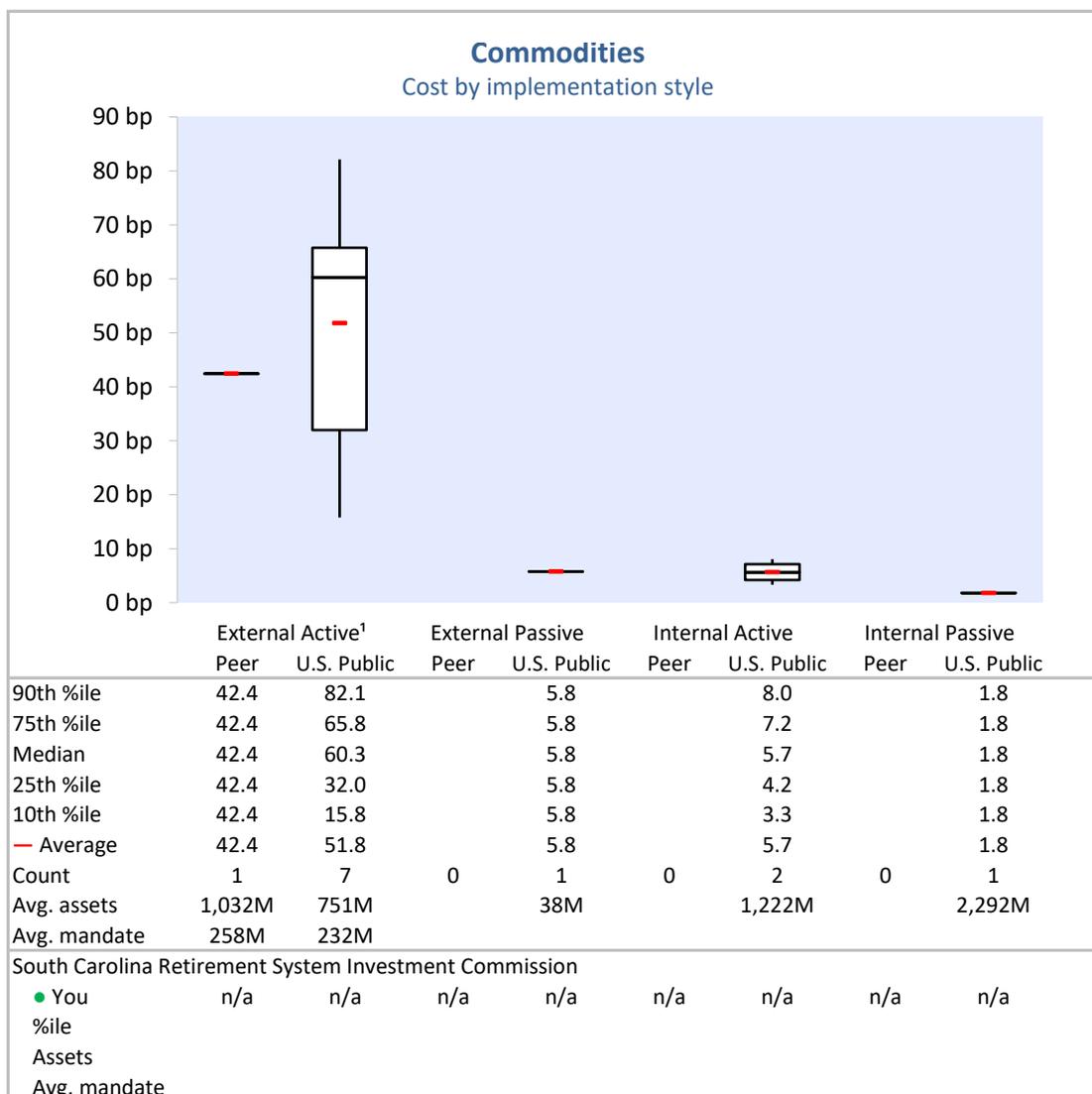
No funds reported a performance fee.



1. Breakdown of external active fees

	You	Peer Average	U.S. Public Average
Base fees	n/a	38.8	43.5
Performance fees*	n/a	0.7	16.9
Internal and other	<u>n/a</u>	<u>0.7</u>	<u>0.5</u>
Total	n/a	40.2	60.9

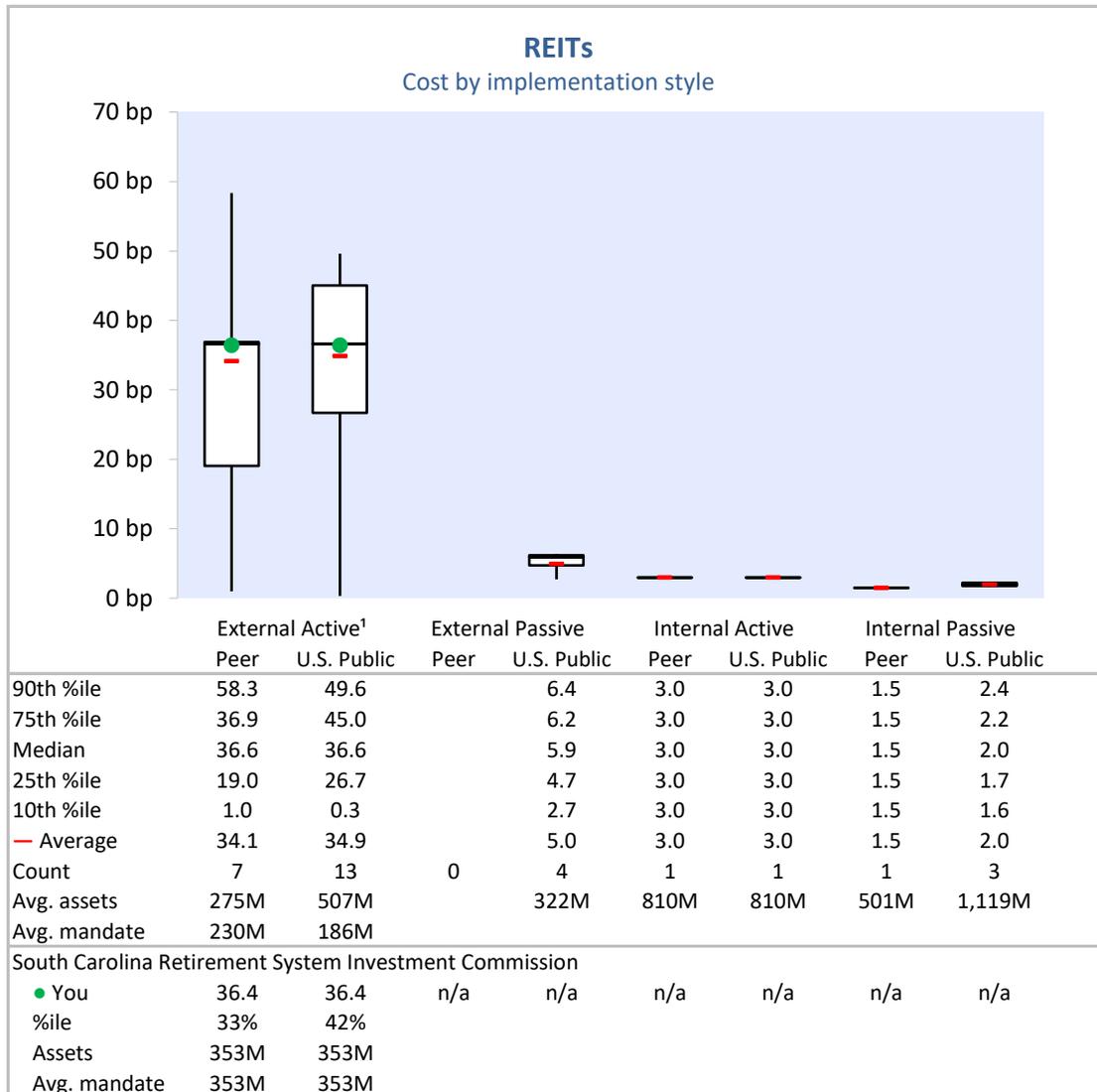
* For funds that did not report a performance fee, a value of 'zero' was used. The average performance fee for those funds that reported a performance fee is 5.1 bps for peers (1 fund) and 78.8 bps for U.S. Public participants (3 funds).



1. Breakdown of external active fees

	You	Peer Average	U.S. Public Average
Base fees	n/a	42.4	46.1
Performance fees*	n/a	n/a	4.6
Internal and other	<u>n/a</u>	<u>n/a</u>	<u>1.1</u>
Total	n/a	42.4	51.8

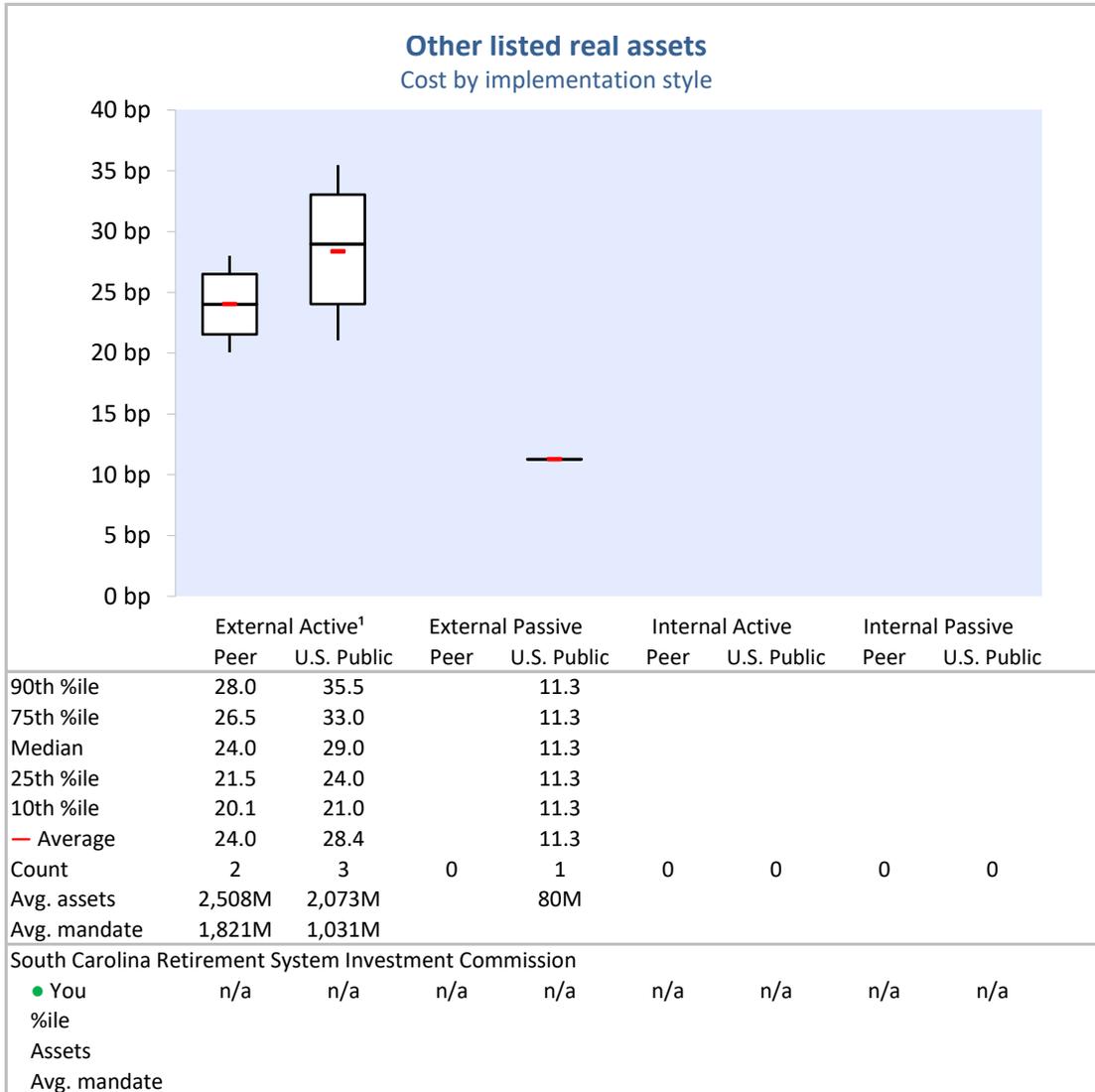
* For funds that did not report a performance fee, a value of 'zero' was used. The average performance fee for those funds that reported a performance fee is 8.0 bps for U.S. Public participants (4 funds).



1. Breakdown of external active fees

	You	Peer Average	U.S. Public Average
Base fees	34.0	22.0	25.4
Performance fees*	0.0	11.1	8.4
Internal and other	<u>2.4</u>	<u>1.0</u>	<u>1.0</u>
Total	36.4	34.1	34.9

* For funds that did not report a performance fee, a value of 'zero' was used. The average performance fee for those funds that reported a performance fee is 38.9 bps for peers (2 funds) and 21.8 bps for U.S. Public participants (5 funds).



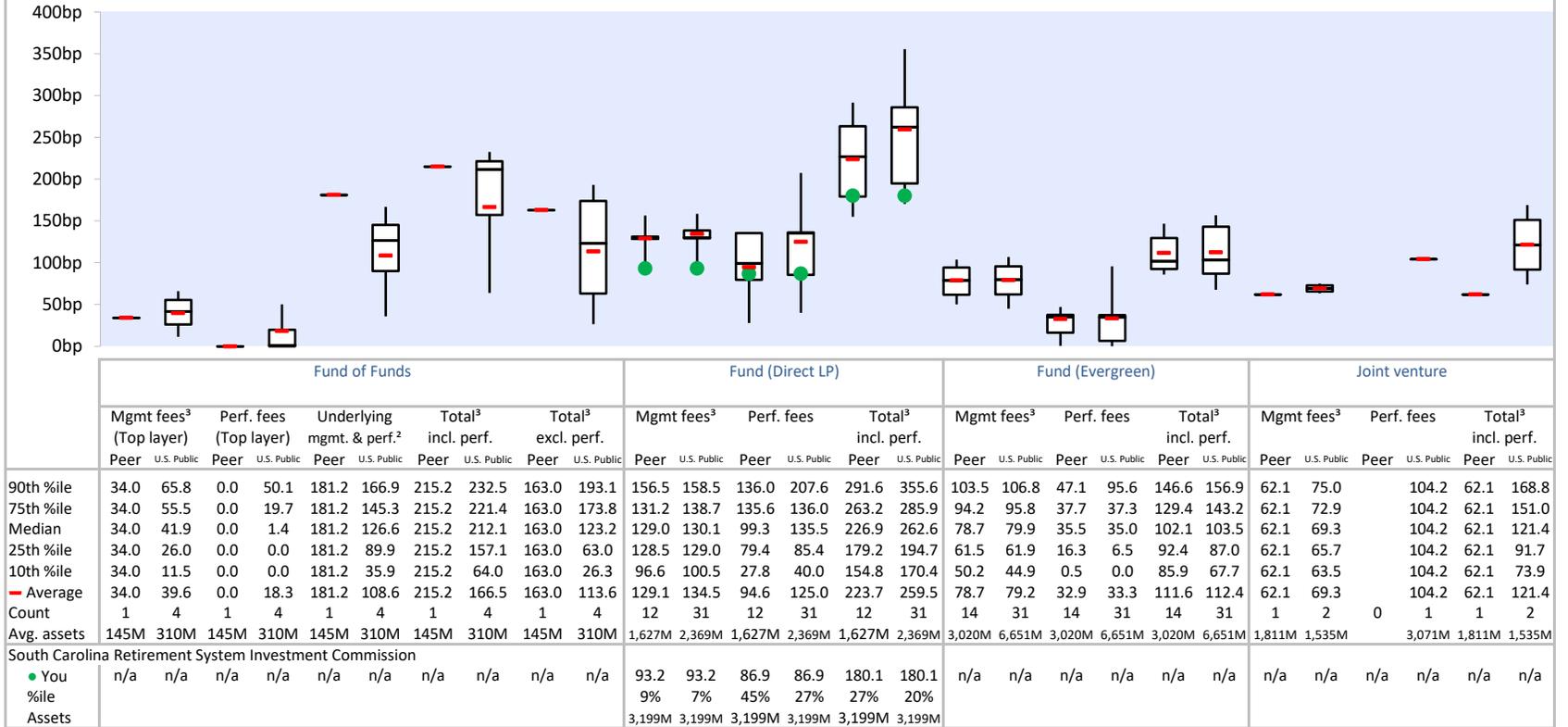
1. Breakdown of external active fees

	You	Peer Average	U.S. Public Average
Base fees	n/a	24.0	28.4
Performance fees*	n/a	0.0	0.0
Internal and other	<u>n/a</u>	<u>n/a</u>	<u>n/a</u>
Total	n/a	24.0	28.4

* For funds that did not report a performance fee, a value of 'zero' was used. The average performance fee for those funds that reported a performance fee is 0.0 bps for peers (1 fund) and 0.0 bps for U.S. Public participants (2 funds).

Real estate ex-REITs

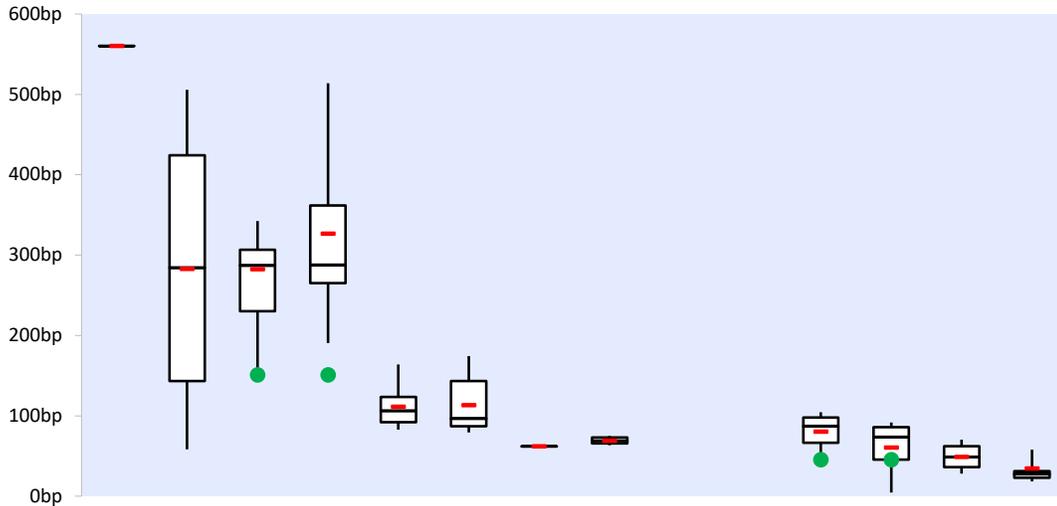
Cost as a % of the amount fees are based on¹



- The base for fees is usually the committed amount during the commitment period, and unreturned invested capital afterwards.
 - The fees of fund of funds include both the top layer fees paid to the fund of funds manager and the underlying fees paid to the 'underlying partnerships' held by the fund of funds. Most funds were unable to provide the underlying fees so defaults of 129 bps (on amount fees are based on) for underlying management fees and 52 bps (on NAV) for underlying performance fees were used.
 - The management fees and total cost also include the internal cost of monitoring and selecting real estate investments. Your cost of monitoring and selecting was 2.6 bps for LPs. The peer average cost of monitoring and selecting was 4.7 bps for LPs and 2.6 bps for external (not LPs).
- LP base fee is the weighted average management fee of 91 bps per the partnership level detail provided by you. This replaces the cost on the main survey of 115 bps (36.7 million).

Real estate ex-REITs - contd.

Cost as a % of NAV



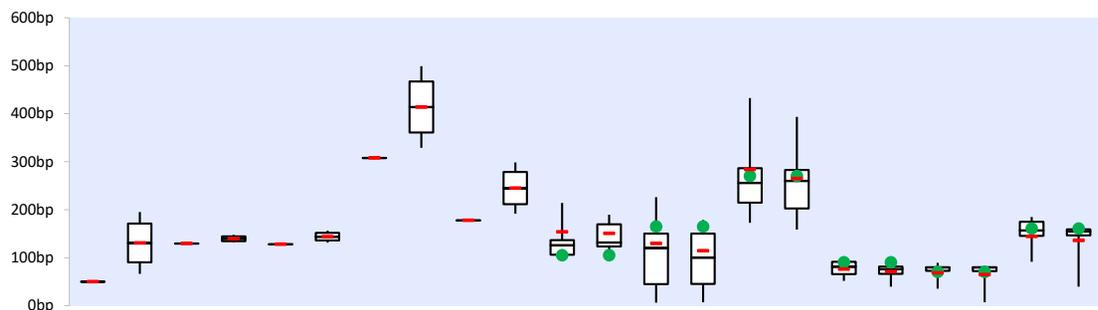
	Fund of Funds		Fund (Direct LP)		Fund (Evergreen)		Joint venture		Oper. Sub.		Co-Inv.		Internal	
	Total ¹ incl. perf.		Total ¹ incl. perf.		Total ¹ incl. perf.		Total ¹ incl. perf.		Total ¹ incl. perf.		Total ¹ incl. perf.		Total	
	Peer	U.S. Public	Peer	U.S. Public										
90th %ile	560.3	505.8	342.5	513.9	163.7	174.2	62.1	75.0			104.6	91.6	70.2	57.8
75th %ile	560.3	424.0	306.7	361.9	123.4	143.2	62.1	72.9			98.1	85.7	62.3	31.3
Median	560.3	284.6	287.4	288.1	106.3	96.6	62.1	69.3			87.2	73.9	49.2	27.6
25th %ile	560.3	143.4	230.3	265.0	91.9	87.0	62.1	65.7			66.4	45.6	36.0	22.9
10th %ile	560.3	58.5	156.3	190.5	82.6	79.3	62.1	63.5			53.9	4.5	28.2	18.5
— Average	560.3	282.8	282.6	326.9	111.5	113.5	62.1	69.3			80.6	60.7	49.2	34.5
Count	1	4	12	31	14	31	1	2	0	0	3	9	2	5
Avg. assets	56M	251M	1,514M	2,020M	2,984M	5,836M	1,811M	1,535M			176M	2,166M	2,430M	5,280M
South Carolina Retirement System Investment Commission														
● You	n/a	n/a	150.9	150.9	n/a	n/a	n/a	n/a	n/a	n/a	45.6	45.6	n/a	n/a
%ile			0%	0%							0%	25%		
Assets			3,820M	3,820M							100M	100M		

1. The total cost also includes the internal cost of monitoring and selecting real estate investments.
2. Co-investment is included with direct LPs because it can only be done alongside direct LPs. Co-investment is done by 3 of your peers and 9 of the U.S. Public funds.
3. The total cost also includes the internal cost of monitoring and selecting real estate investments. Internal and other - FoFs The peer average cost of monitoring and selecting was 4.7 bps for LPs and 2.6 bps for external (not LPs).

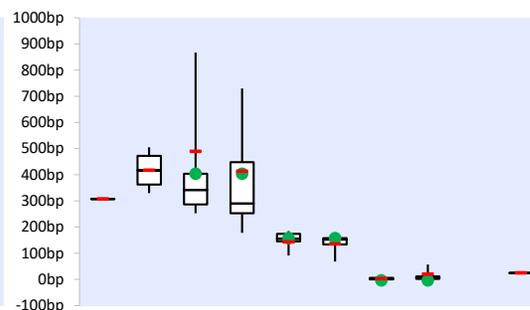
LP base fee is the weighted average management fee of 91 bps per the partnership level detail provided by you. This replaces the cost on the main survey of 115 bps (36.7 million).

Infrastructure

Cost as a % of the amount fees are based on¹



Cost as a % of NAV

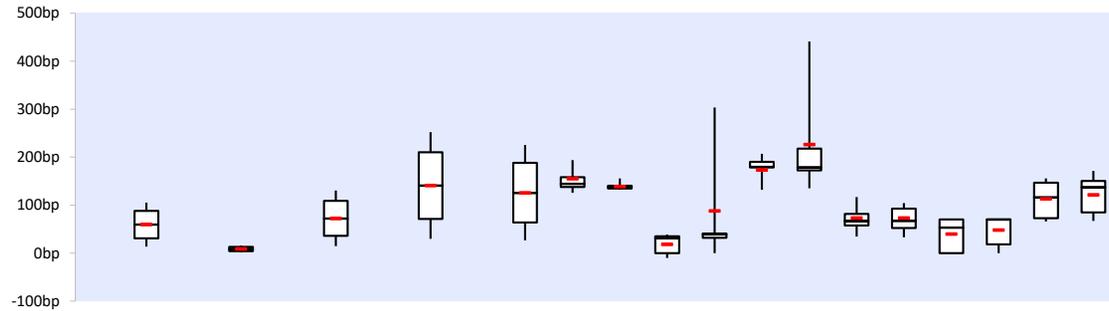


	Fund of Funds										Fund (Direct LP)						Fund (Evergreen)						Co-Inv.		Internal	
	Mgmt fees ³ (Top layer)		Perf. fees (Top layer)		Underlying mgmt. & perf. ²		Total ³ incl. perf.		Total ³ excl. perf.		Mgmt fees ³		Perf. fees		Total ³ incl. perf.		Mgmt fees ³		Perf. fees		Total ³ incl. perf.		Total		Total	
	Peer	U.S. Public	Peer	U.S. Public	Peer	U.S. Public	Peer	U.S. Public	Peer	U.S. Public	Peer	U.S. Public	Peer	U.S. Public	Peer	U.S. Public	Peer	U.S. Public	Peer	U.S. Public	Peer	U.S. Public	Peer	U.S. Public	Peer	U.S. Public
90th %ile	50.2	195.3	129.6	147.5	128.0	156.2	307.8	499.1	178.2	298.8	214.1	189.3	226.0	178.5	432.5	393.3	95.4	90.3	89.5	80.0	184.9	163.4	10.1	57.1	25.7	25.7
75th %ile	50.2	171.2	129.6	144.5	128.0	151.5	307.8	467.2	178.2	278.7	136.6	169.7	150.0	150.0	286.6	282.6	91.2	81.5	80.0	80.0	174.7	159.0	6.1	11.7	25.7	25.7
Median	50.2	130.8	129.6	139.6	128.0	143.7	307.8	414.1	178.2	245.2	126.0	131.9	120.2	100.2	256.0	260.5	81.7	76.0	79.8	79.7	156.7	154.7	2.8	6.1	25.7	25.7
25th %ile	50.2	90.5	129.6	134.6	128.0	135.8	307.8	360.9	178.2	211.7	106.0	123.6	44.9	45.5	214.7	202.8	65.7	66.5	72.7	72.2	145.6	146.4	0.4	2.3	25.7	25.7
10th %ile	50.2	66.3	129.6	131.6	128.0	131.1	307.8	329.1	178.2	191.6	105.5	106.0	6.3	7.0	172.5	158.4	51.5	39.7	35.2	7.1	91.5	39.7	-2.2	-1.0	25.7	25.7
Average	50.2	130.8	129.6	139.6	128.0	143.7	307.8	414.1	178.2	245.2	153.8	150.6	129.9	114.6	283.7	265.2	76.2	71.0	68.2	64.8	144.4	135.8	3.6	20.7	25.7	25.7
Count	1	2	1	2	1	2	1	2	1	2	9	20	9	20	9	20	6	11	6	11	6	11	4	6	0	1
Avg. assets	301M	154M	301M	154M	301M	154M	301M	154M	301M	154M	1,043M	1,521M	1,043M	1,521M	1,043M	1,521M	402M	1,042M	402M	1,042M	402M	1,042M	212M	541M	1,182M	1,182M
South Carolina Retirement System Investment Commission																										
● You	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	105.0	105.0	165.0	165.0	270.1	270.1	90.3	90.3	70.4	70.4	160.7	160.7	-3.9	-3.9	n/a	n/a
%ile											88%	84%	63%	63%			60%	90%	20%	20%	60%	80%	0%	0%	0M	0M
Assets											1,078M	1,078M	1,078M	1,078M	1,078M	1,078M	350M	350M	350M	350M	350M	350M	182M	182M	0M	0M

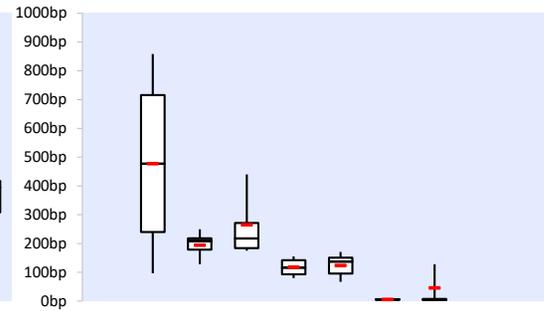
- The base for fees is usually the committed amount during the commitment period, and unreturned invested capital afterwards.
- The fees of fund of funds include both the top layer fees paid to the fund of funds manager and the underlying fees paid to the 'underlying partnerships' held by the fund of funds. Most funds were unable to provide the underlying fees so defaults of 128 bps (on amount fees are based on) for underlying management fees and 0 bps (on NAV) for underlying performance fees were used.
- The management fees and total cost also include the internal cost of monitoring and selecting infrastructure investments. Your cost of monitoring and selecting was 1.6 bps for LPs and 2.3 bps for external (not LPs). The peer average cost of monitoring and selecting was 1.6 bps for fund of funds, 8.5 bps for LPs and 2.3 bps for external (not LPs). Some averages on the right chart may be off the chart where there is outlier data resulting from large base or performance fees divided by small NAV. LP base fee is the weighted average management fee of 103 bps per the partnership level detail provided by you. This replaces the cost on the main survey of 59 bps (6.4 million).

Natural resources

Cost as a % of the amount fees are based on¹



Cost as a % of NAV

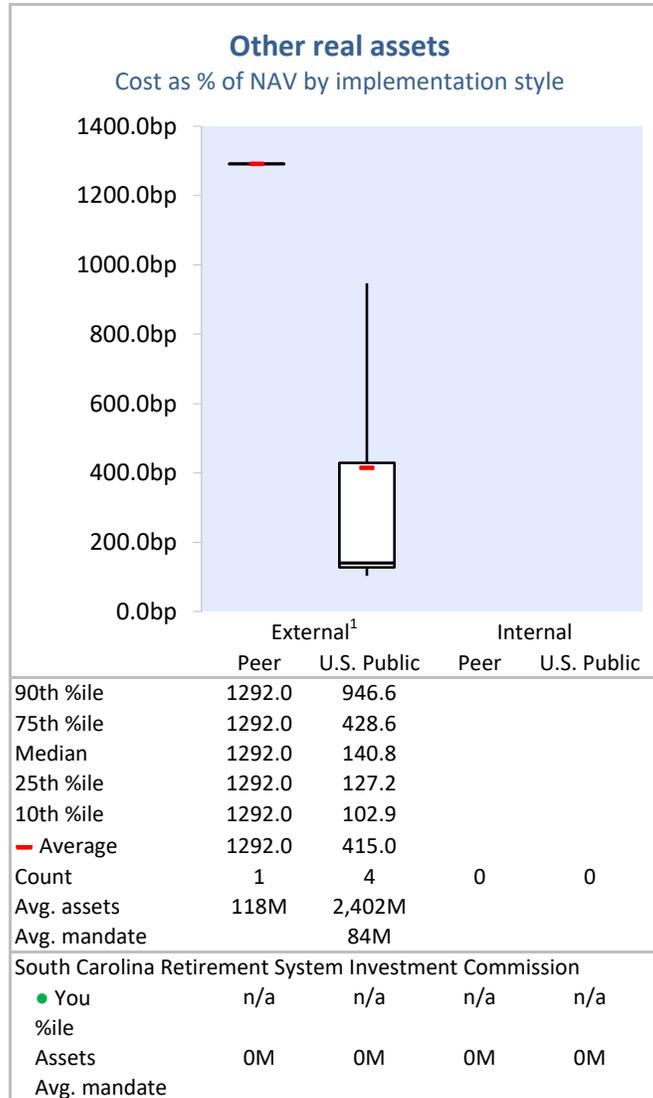


	Fund of Funds										Fund (Direct LP)					Fund (Evergreen)					Co-Inv.		Internal				
	Mgmt fees (Top layer)		Perf. fees (Top layer)		Underlying mgmt. & perf. ²		Total ³ incl. perf.		Total ³ excl. perf.		Mgmt fees		Perf. fees		Total ³ incl. perf.		Mgmt fees		Perf. fees		Total ³ incl. perf.		Total incl. perf.		Total		
	Peer	U.S. Public	Peer	U.S. Public	Peer	U.S. Public	Peer	U.S. Public	Peer	U.S. Public	Peer	U.S. Public	Peer	U.S. Public	Peer	U.S. Public	Peer	U.S. Public	Peer	U.S. Public	Peer	U.S. Public	Peer	U.S. Public	Peer	U.S. Public	Peer
90th %ile	105.5	15.8	130.5	251.9	225.2	194.0	155.7	38.7	303.4	206.8	441.1	116.8	104.0	71.1	70.0	155.6	171.3	858.4	249.4	439.8	154.8	171.3	6.9	128.3			
75th %ile	88.3	13.2	108.8	210.2	188.0	158.4	140.3	35.3	41.0	190.3	217.8	81.6	92.9	70.0	70.0	146.9	150.7	715.6	217.8	271.6	142.0	151.0	6.5	7.2			
Median	59.5	8.8	72.5	140.8	126.0	144.7	137.6	31.9	39.2	180.0	178.9	67.2	67.4	53.3	70.0	116.4	137.4	477.7	209.2	217.8	116.8	137.4	5.8	5.3			
25th %ile	30.7	4.4	36.3	71.4	64.0	137.9	134.9	0.0	31.9	178.9	172.4	57.5	52.5	0.0	18.3	72.7	85.0	239.9	178.9	184.3	93.1	95.8	5.1	4.4			
10th %ile	13.5	1.8	14.5	29.7	26.8	125.5	133.2	-10.1	0.0	131.8	135.4	34.3	32.9	0.0	0.0	66.0	66.9	97.1	128.5	175.0	80.5	66.9	4.7	3.5			
Average	59.5	8.8	72.5	140.8	126.0	155.2	138.8	18.3	87.8	173.5	226.6	73.3	73.5	40.0	48.1	113.3	121.6	477.7	194.2	265.1	117.9	123.4	5.8	45.8			
Count	0	2	0	2	0	2	2	0	2	0	2	5	13	5	13	5	13	8	11	8	11	8	11	0	0		
Avg. assets	46M	46M	46M	46M	46M	1,286M	1,397M	1,286M	1,397M	1,286M	1,397M	503M	439M	503M	439M	503M	439M	37M	1,054M	1,258M	471M	416M	211M	980M			
South Carolina Retirement System Investment Commission																											
You %ile Assets	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a

1. The base for fees is usually the committed amount during the commitment period, and unreturned invested capital afterwards.

2. The fees of fund of funds include both the top layer fees paid to the fund of funds manager and the underlying fees paid to the 'underlying partnerships' held by the fund of funds. Most funds were unable to provide the underlying fees so defaults of n/a bps (on amount fees are based on) for underlying management fees and n/a bps (on NAV) for underlying performance fees were used.

3. The management fees and total cost also include the internal cost of monitoring and selecting natural resource investments. The peer average cost of monitoring and selecting was 12.3 bps for LPs and 1.9 bps for external (not LPs).



1. Breakdown of external fees

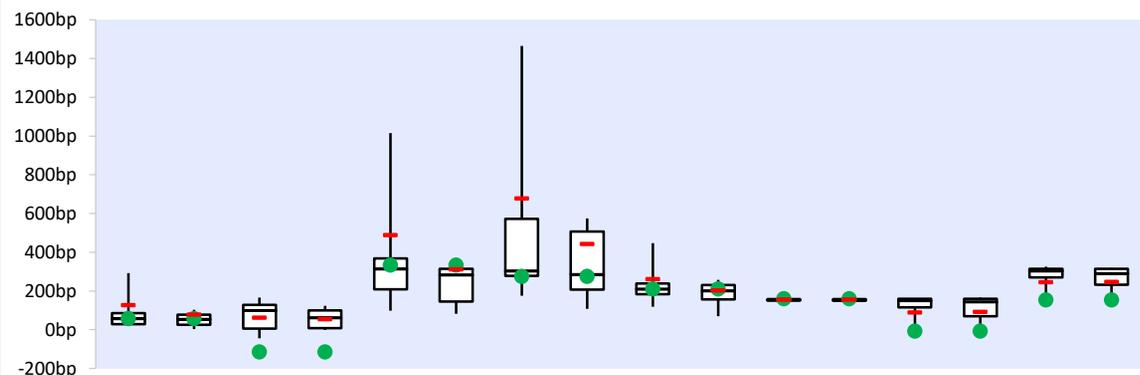
	Your Plan	Peer Average	U.S. Public Average
Base fees	n/a	1,292.0	413.5
Internal and other	<u>n/a</u>	<u>n/a</u>	<u>1.6</u>
Total*	n/a	1,292.0	415.0
Performance fees**	n/a	0.0	16.0

* Total cost excludes performance fees because most participants did not provide performance fees for other real assets.

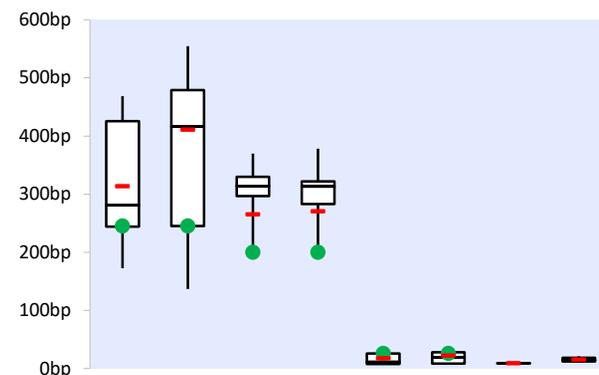
** For funds that did not report a performance fee, a default value of 32 bps was applied. The average performance fee for only those funds that reported a performance fee is 0.0 bps for peers (1 funds) and 0.0 bps for U.S. Public participants (2 funds).

Private equity - Diversified

Cost as a % of the amount fees are based on¹



Cost as a % of NAV

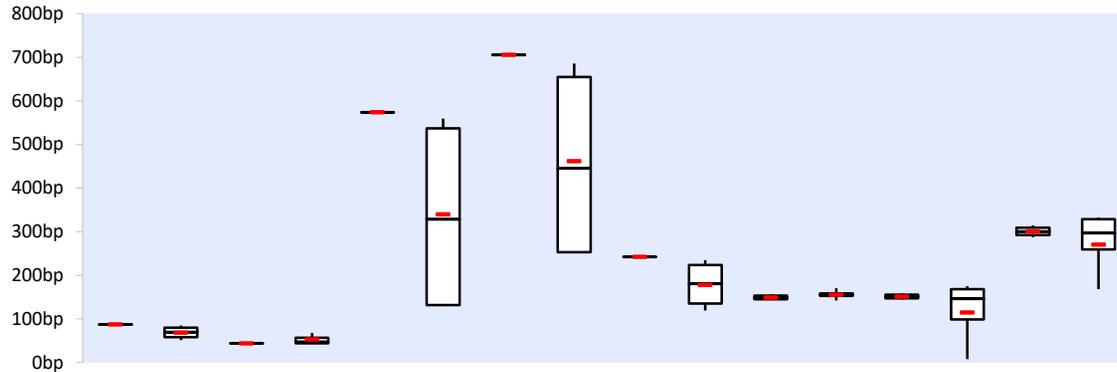


	Fund of Funds										Direct LP						Fund of Funds		Direct LP		Co-Investment		Internal	
	Mgmt fees ³ (Top layer)		Perf. fees (Top layer)		Underlying mgmt. & perf. ²		Total ³ incl. perf.		Total ³ excl. perf.		Mgmt fees ³		Perf. fees		Total ³ incl. perf.		Total ³ incl. perf.		Total incl. perf.		Total			
	Peer	U.S. Public	Peer	U.S. Public	Peer	U.S. Public	Peer	U.S. Public	Peer	U.S. Public	Peer	U.S. Public	Peer	U.S. Public	Peer	U.S. Public	Peer	U.S. Public	Peer	U.S. Public	Peer	U.S. Public	Peer	U.S. Public
	Peer	U.S. Public	Peer	U.S. Public	Peer	U.S. Public	Peer	U.S. Public	Peer	U.S. Public	Peer	U.S. Public	Peer	U.S. Public	Peer	U.S. Public	Peer	U.S. Public	Peer	U.S. Public	Peer	U.S. Public	Peer	U.S. Public
90th %ile	293.0	103.2	166.6	123.2	1014.9	351.1	1465.0	575.1	447.0	257.2	170.0	166.9	162.6	165.7	326.4	318.7	468.4	554.6	369.8	378.2	31.8	35.2	9.3	20.9
75th %ile	85.5	77.5	128.1	100.0	369.0	314.0	572.5	507.4	239.5	231.5	158.5	157.8	160.0	160.0	314.0	314.0	425.3	479.0	330.0	322.0	25.6	28.2	9.3	18.6
Median	56.9	55.1	100.0	61.8	314.0	282.8	303.8	285.4	210.9	201.0	154.0	154.0	150.0	144.7	304.0	290.4	281.7	416.9	314.0	313.8	11.6	19.7	9.3	14.7
25th %ile	29.4	25.7	6.2	8.8	208.9	145.1	278.7	207.4	183.4	156.9	151.4	150.6	115.9	69.4	271.2	232.8	244.3	245.1	296.6	283.2	7.8	8.3	9.3	12.0
10th %ile	20.4	3.4	-43.9	-1.0	97.8	82.5	176.1	107.2	118.2	70.5	147.2	141.7	-4.3	-8.0	157.9	161.0	172.4	136.7	207.2	194.0	7.3	7.0	9.3	10.4
— Average	126.9	77.4	62.2	53.6	487.8	311.5	677.0	442.5	260.9	202.7	155.9	154.6	88.8	92.6	244.7	247.1	313.4	410.7	265.2	270.6	17.6	22.0	9.3	15.5
Count	7	21	7	21	7	21	7	21	7	21	15	30	15	30	15	30	7	21	15	30	5	12	1	3
Avg. assets	1,577M	1,176M	1,577M	1,176M	1,577M	1,176M	1,577M	1,176M	1,577M	1,176M	6,579M	7,828M	6,579M	7,828M	6,579M	7,828M	1,435M	996M	6,292M	7,525M	1,557M	2,300M	3M	107M
South Carolina Retirement System Investment Commission																								
● You	56.9	56.9	-115.1	-115.1	334.1	334.1	275.8	275.8	210.9	210.9	160.5	160.5	-7.2	-7.2	153.3	153.3	245.1	245.1	199.8	199.8	25.6	25.6	n/a	n/a
%ile	50%	60%	0%	0%	67%	85%	17%	40%	50%	60%	79%	83%	7%	10%	7%	7%	33%	25%	7%	10%	75%	64%		
Assets	723M	723M	723M	723M	723M	723M	723M	723M	723M	723M	3,628M	3,628M	3,628M	3,628M	3,628M	3,628M	814M	814M	2,783M	2,783M	2,003M	2,003M	0M	0M

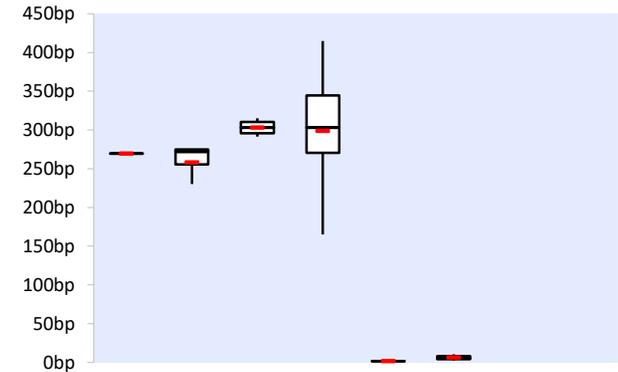
1. The base for fees is usually the committed amount during the commitment period, and unreturned invested capital afterwards.
2. The fees of fund of funds include both the top layer fees paid to the fund of funds manager and the underlying fees paid to the 'underlying partnerships' held by the fund of funds. Most funds were unable to provide the underlying fees so defaults of 154 bps (on amount fees are based on) for underlying management fees and 160 bps (on NAV) for underlying performance fees were used.
3. The management fees and total cost also includes the internal cost of monitoring and selecting private equity investments. Your cost of monitoring and selecting was 2.8 bps for fund of funds and 1.9 bps for LPs. The peer average cost of monitoring and selecting was 12.1 bps for fund of funds, 7.1 bps for LPs and 5.0 bps for co-investments.

LBO

Cost as a % of the amount fees are based on¹



Cost as a % of NAV



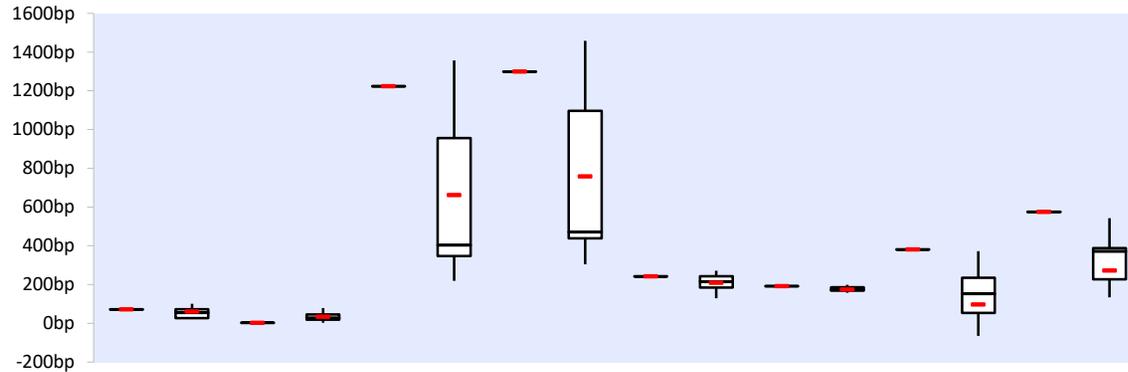
	Fund of Funds										Direct LP					
	Mgmt fees ³ (Top layer)		Perf. fees (Top layer)		Underlying mgmt. & perf. ²		Total ³ incl. perf.		Total ³ excl. perf.		Mgmt fees ³		Perf. fees		Total ³ incl. perf.	
	Peer	U.S. Public	Peer	U.S. Public	Peer	U.S. Public	Peer	U.S. Public	Peer	U.S. Public	Peer	U.S. Public	Peer	U.S. Public	Peer	U.S. Public
	Peer	U.S. Public	Peer	U.S. Public	Peer	U.S. Public	Peer	U.S. Public	Peer	U.S. Public	Peer	U.S. Public	Peer	U.S. Public	Peer	U.S. Public
90th %ile	87.7	84.6	44.1	67.7	574.0	559.3	705.8	685.5	242.7	235.1	156.1	170.3	158.3	175.0	314.4	332.1
75th %ile	87.7	79.9	44.1	56.9	574.0	537.2	705.8	654.9	242.7	223.6	153.6	158.0	155.7	168.4	309.3	328.8
Median	87.7	69.8	44.1	47.5	574.0	328.8	705.8	445.9	242.7	180.9	149.3	156.5	151.4	146.3	300.7	297.4
25th %ile	87.7	58.2	44.1	44.0	574.0	131.6	705.8	252.8	242.7	135.4	145.1	152.7	147.1	98.4	292.2	259.4
10th %ile	87.7	51.1	44.1	43.8	574.0	129.8	705.8	250.9	242.7	118.9	142.5	141.8	144.5	7.6	287.1	167.8
Average	87.7	68.4	44.1	53.4	574.0	340.0	705.8	461.8	242.7	178.1	149.3	155.5	151.4	114.9	300.7	270.4
Count	1	4	1	4	1	4	1	4	1	4	2	12	2	12	2	12
Avg. assets	43M	1,004M	43M	1,004M	43M	1,004M	43M	1,004M	43M	1,004M	2,792M	7,277M	2,792M	7,277M	2,792M	7,277M
South Carolina Retirement System Investment Commission																
● You	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
%ile																
Assets	0M	0M	0M	0M	0M	0M	0M	0M	0M	0M	0M	0M	0M	0M	0M	0M

Fund of Funds		Direct LP		Co-Investment		Internal	
Total ³ incl. perf.		Total ³ incl. perf.		Total incl. perf.		Total	
Peer	U.S. Public	Peer	U.S. Public	Peer	U.S. Public	Peer	U.S. Public
269.5	275.4	314.9	414.7	1.8	10.4		
269.5	274.6	310.5	344.5	1.8	8.2		
269.5	271.9	303.1	303.1	1.8	6.0		
269.5	255.5	295.8	270.4	1.8	4.2		
269.5	230.2	291.4	165.2	1.8	2.8		
269.5	258.3	303.1	299.0	1.8	6.4		
1	4	2	12	1	4	0	0
113M	1,172M	2,766M	7,227M	279M	2,603M		
n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
0M	0M	0M	0M	0M	0M	0M	0M

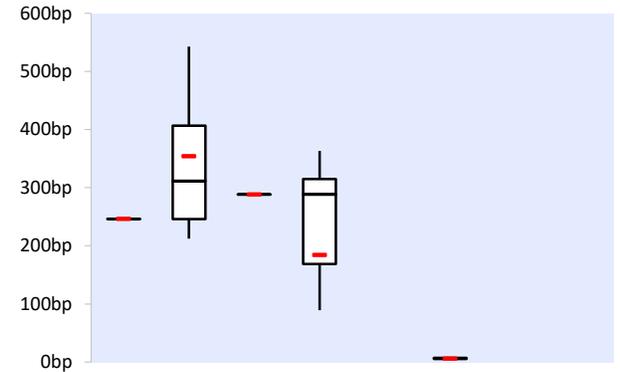
1. The base for fees is usually the committed amount during the commitment period, and unreturned invested capital afterwards.
2. The fees of fund of funds include both the top layer fees paid to the fund of funds manager and the underlying fees paid to the 'underlying partnerships' held by the fund of funds. Most funds were unable to provide the underlying fees so defaults of 155 bps (on amount fees are based on) for underlying management fees and 160 bps (on NAV) for underlying performance fees were used.
3. The management fees and total cost also include the internal cost of monitoring and selecting private equity investments. The peer average cost of monitoring and selecting was 5.2 bps for fund of funds , 2.4 bps for LPs and 1.0

Venture capital

Cost as a % of the amount fees are based on¹



Cost as a % of NAV



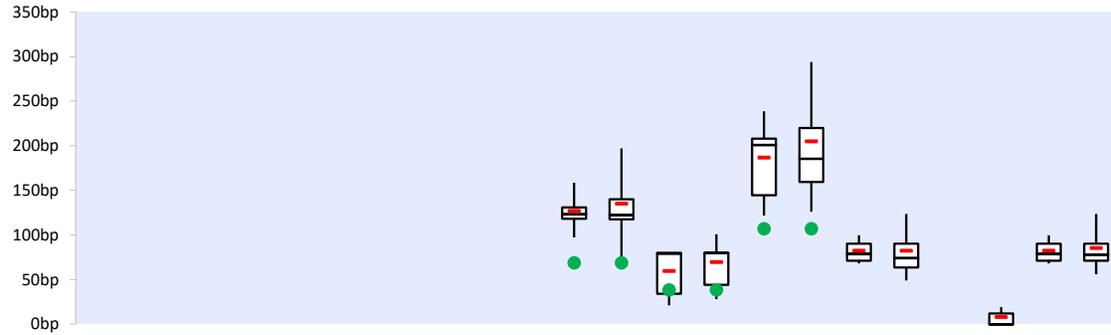
	Fund of Funds										Direct LP					
	Mgmt fees ³ (Top layer)		Perf. fees (Top layer)		Underlying mgmt. & perf. ²		Total ³ incl. perf.		Total ³ excl. perf.		Mgmt fees ³		Perf. fees		Total ³ incl. perf.	
	Peer	U.S. Public	Peer	U.S. Public	Peer	U.S. Public	Peer	U.S. Public	Peer	U.S. Public	Peer	U.S. Public	Peer	U.S. Public	Peer	U.S. Public
90th %ile	71.9	100.4	3.5	78.3	1224.3	1357.5	1299.7	1458.1	242.9	271.4	193.0	198.9	382.6	372.5	575.6	543.5
75th %ile	71.9	72.6	3.5	46.0	1224.3	956.8	1299.7	1097.2	242.9	243.6	193.0	186.1	382.6	234.7	575.6	387.6
Median	71.9	55.2	3.5	28.6	1224.3	403.2	1299.7	471.4	242.9	216.8	193.0	173.2	382.6	153.0	575.6	372.5
25th %ile	71.9	26.3	3.5	19.6	1224.3	346.5	1299.7	439.2	242.9	184.2	193.0	168.8	382.6	53.5	575.6	226.5
10th %ile	71.9	22.7	3.5	2.4	1224.3	219.8	1299.7	304.7	242.9	129.5	193.0	158.5	382.6	-64.6	575.6	134.3
— Average	71.9	60.9	3.5	35.5	1224.3	663.3	1299.7	759.6	242.9	209.9	193.0	175.9	382.6	97.9	575.6	273.7
Count	1	8	1	8	1	8	1	8	1	8	1	11	1	11	1	11
Avg. assets	33M	499M	33M	499M	33M	499M	33M	499M	33M	499M	34M	910M	34M	910M	34M	910M
South Carolina Retirement System Investment Commission																
● You %ile	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Assets	0M	0M	0M	0M	0M	0M	0M	0M	0M	0M	0M	0M	0M	0M	0M	0M

Fund of Funds		Direct LP		Co-Investment		Internal	
Total ³ incl. perf.		Total ³ incl. perf.		Total incl. perf.		Total	
Peer	U.S. Public	Peer	U.S. Public	Peer	U.S. Public	Peer	U.S. Public
246.8	542.7	288.5	363.3				7.5
246.8	406.7	288.5	315.1				7.2
246.8	311.9	288.5	288.5				6.6
246.8	246.1	288.5	168.9				5.4
246.8	212.2	288.5	89.3				4.0
246.8	354.4	288.5	184.5				6.0
1	8	1	11	0	4	0	0
33M	499M	67M	1,219M		231M		
n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
0M	0M	0M	0M	0M	0M	0M	0M

1. The base for fees is usually the committed amount during the commitment period, and unreturned invested capital afterwards.
2. The fees of fund of funds include both the top layer fees paid to the fund of funds manager and the underlying fees paid to the 'underlying partnerships' held by the fund of funds. Most funds were unable to provide the underlying fees so defaults of 171 bps (on amount fees are based on) for underlying management fees and 200 bps (on NAV) for underlying performance fees were used.
3. The management fees and total cost also include the internal cost of monitoring and selecting private equity investments. The peer average cost of monitoring and selecting was 16.9 bps for fund of funds, 6.8 bps for LPs and 0.0

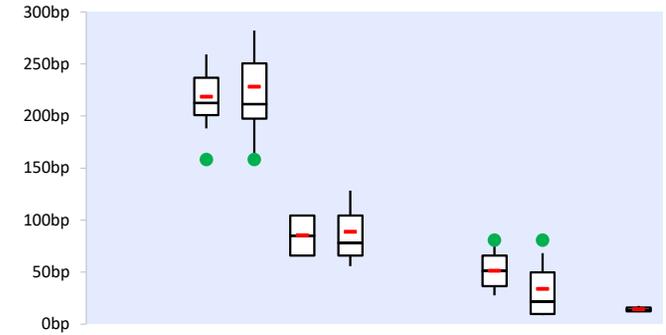
Private credit

Cost as a % of the amount fees are based on¹



	Fund of Funds						Direct LP						Evergreen										
	Mgmt fees ³ (Top layer)		Perf. fees (Top layer)		Underlying mgmt. & perf. ²		Total ³ incl. perf.		Total ³ excl. perf.		Mgmt fees ³		Perf. fees		Total ³ incl. perf.		Mgmt fees ³		Perf. fees		Total ³ incl. perf.		
	Peer	U.S. Public	Peer	U.S. Public	Peer	U.S. Public	Peer	U.S. Public	Peer	U.S. Public	Peer	U.S. Public	Peer	U.S. Public	Peer	U.S. Public	Peer	U.S. Public	Peer	U.S. Public	Peer	U.S. Public	
	90th %ile	75th %ile	Median	25th %ile	10th %ile	Average	Count	Avg. assets	Peer	U.S. Public	Peer	U.S. Public	Peer	U.S. Public	Peer	U.S. Public	Peer	U.S. Public	Peer	U.S. Public	Peer	U.S. Public	Peer
90th %ile								158.7	197.0	80.0	100.8	238.7	293.9	99.6	123.7	19.4	99.6	123.7					
75th %ile								131.0	139.9	80.0	80.0	208.0	219.9	90.4	90.4	12.1	90.4	90.4					
Median								123.3	122.3	79.2	80.0	201.0	185.5	78.9	74.3	0.0	78.9	78.1					
25th %ile								118.1	117.6	34.2	44.1	144.7	159.3	71.0	63.6	0.0	71.0	71.0					
10th %ile								97.1	70.8	21.2	28.1	121.7	125.9	68.1	48.9	0.0	68.1	55.9					
Average								126.9	135.2	59.7	69.7	186.6	204.9	82.4	82.5	8.1	82.4	85.5					
Count	0	0	0	0	0	0	0	8	20	8	20	8	20	4	8	0	3	4	8	8			
Avg. assets								1,618M	1,819M	1,618M	1,819M	1,618M	1,819M	4,040M	3,497M	9,325M	4,040M	3,497M					
South Carolina Retirement System Investment Commission																							
You %ile	n/a	n/a	n/a	n/a	n/a	n/a	n/a	68.6	68.6	38.2	38.2	106.8	106.8	n/a	n/a	n/a	n/a	n/a	n/a	n/a			
Assets								3,705M	3,705M	3,705M	3,705M	3,705M	3,705M										

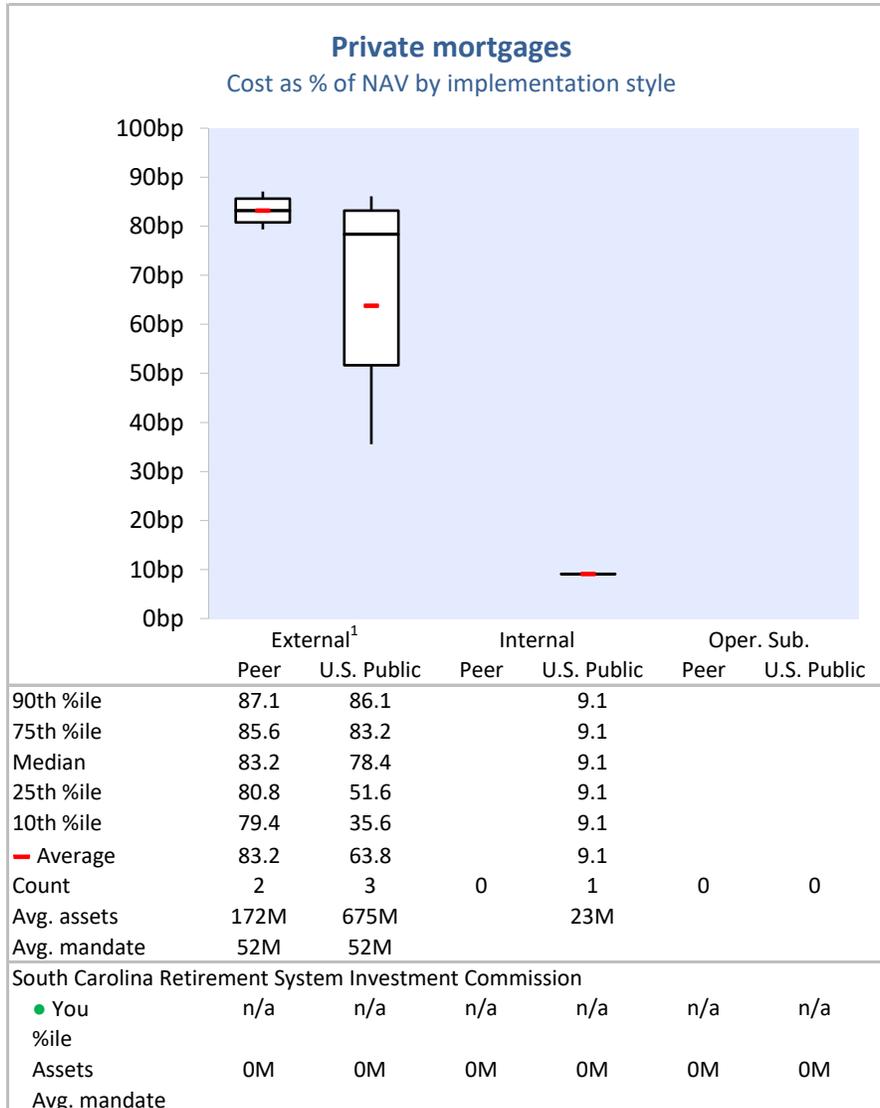
Cost as a % of NAV



	Fund of Funds		Direct LP		Evergreen		Oper. Sub.		Co-Inv.		Internal									
	Total ³ incl. perf.		Total ³ incl. perf.		Total ³ incl. perf.		Total		Total incl. perf.		Total									
	Peer	U.S. Public	Peer	U.S. Public	Peer	U.S. Public	Peer	U.S. Public	Peer	U.S. Public	Peer	U.S. Public								
	90th %ile	75th %ile	Median	25th %ile	10th %ile	Average	Count	Avg. assets	Peer	U.S. Public	Peer	U.S. Public	Peer	U.S. Public						
90th %ile								259.1	282.1	105.2	128.2			74.8	68.3	17.6				
75th %ile								236.8	250.6	104.5	104.5			66.0	49.7	16.1				
Median								212.6	211.5	85.1	78.1			51.2	21.8	13.6				
25th %ile								201.0	197.4	66.0	66.0			36.5	9.8	12.3				
10th %ile								188.1	157.4	65.9	55.7			27.7	8.7	11.6				
Average								218.7	228.2	85.4	88.9			51.2	34.0	14.4				
Count	0	0							4	8	0	0	2	5	0	3				
Avg. assets									1,309M	1,562M	3,735M	3,343M			911M	618M	357M			
You %ile													n/a	n/a			80.7	80.7	n/a	n/a
Assets													2,502M	2,502M			1,275M	1,275M		

- The base for fees is usually the committed amount during the commitment period, and unreturned invested capital afterwards.
- The fees of fund of funds include both the top layer fees paid to the fund of funds manager and the underlying fees paid to the 'underlying partnerships' held by the fund of funds. Most funds were unable to provide the underlying fees so defaults of n/a bps (on amount fees are based on) for underlying management fees and n/a bps (on NAV) for underlying performance fees were used.
- The management fees and total cost also include the internal cost of monitoring and selecting real estate investments. Your cost of monitoring and selecting was 1.5 bps for LPs. The peer average cost of monitoring and selecting was 3.0 bps for LPs and 1.9 bps for external (not LPs).

LP base fee is the weighted average management fee of 67 bps per the partnership level detail provided by you. This replaces the cost on the main survey of 71 bps (26.4 million).



1. Breakdown of external fees

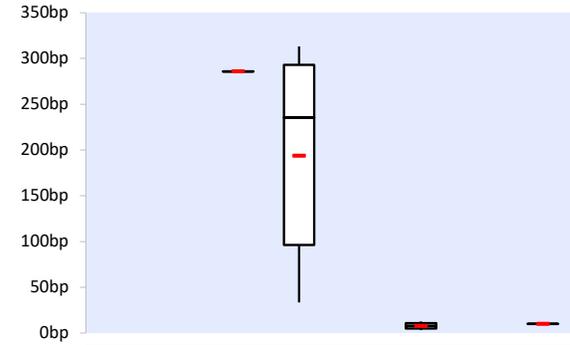
	Your Plan	Peer Average	U.S. Public Average
Base fees	n/a	82.7	63.3
Internal and other	<u>n/a</u>	<u>0.5</u>	<u>0.5</u>
Total	n/a	83.2	63.8
Performance fees	n/a	n/a	n/a

Private equity - Other

Cost as a % of the amount fees are based on¹



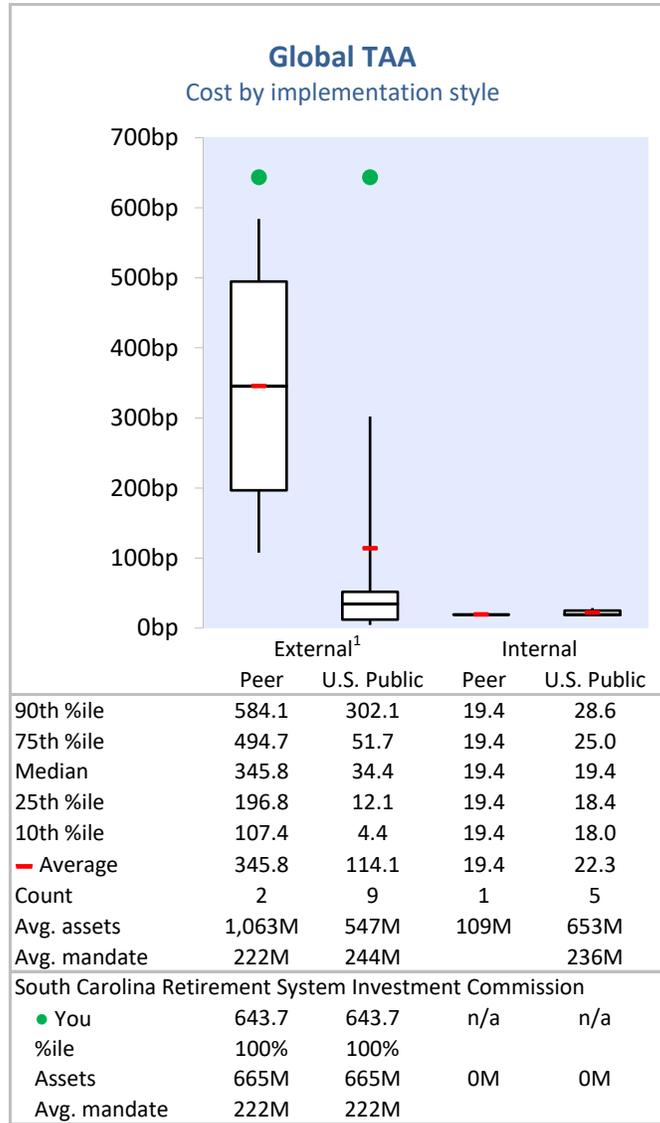
Cost as a % of NAV



	Fund of Funds										Direct LP						Fund of Funds		Direct LP		Co-Investment		Internal	
	Mgmt fees ³ (Top layer)		Perf. fees (Top layer)		Underlying mgmt. & perf. ²		Total ³ incl. perf.		Total ³ excl. perf.		Mgmt fees ³		Perf. fees		Total ³ incl. perf.		Total ³ incl. perf.		Total incl. perf.		Total incl. perf.		Total	
	Peer	U.S. Public	Peer	U.S. Public	Peer	U.S. Public	Peer	U.S. Public	Peer	U.S. Public	Peer	U.S. Public	Peer	U.S. Public	Peer	U.S. Public	Peer	U.S. Public	Peer	U.S. Public	Peer	U.S. Public	Peer	U.S. Public
	90th %ile	75th %ile	Median	25th %ile	10th %ile	Average	Count	Avg. assets	Peer	U.S. Public	Peer	U.S. Public	Peer	U.S. Public	Peer	U.S. Public	Peer	U.S. Public	Peer	U.S. Public	Peer	U.S. Public	Peer	U.S. Public
90th %ile								109.2	125.7	138.7	145.1	247.9	263.7			286.0	313.2			12.7	10.3			
75th %ile								109.2	119.8	138.7	128.8	247.9	237.2			286.0	293.0			10.9	10.3			
Median								109.2	107.5	138.7	67.4	247.9	181.9			286.0	235.6			7.9	10.3			
25th %ile								109.2	64.8	138.7	11.6	247.9	80.8			286.0	96.1			5.0	10.3			
10th %ile								109.2	25.8	138.7	1.8	247.9	27.6			286.0	33.4			3.2	10.3			
Average								109.2	86.3	138.7	71.4	247.9	157.7			286.0	194.1			7.9	10.3			
Count	0	0	0	0	0	0	0	0	0	0	1	6	1	6	0	0	1	6	0	2	0	1	0	1
Avg. assets								2,811M	1,874M	2,811M	1,874M	2,811M	1,874M			2,437M	1,540M			284M			9M	
South Carolina Retirement System Investment Commission																								
You %ile Assets	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a

1. The base for fees is usually the committed amount during the commitment period, and unreturned invested capital afterwards.

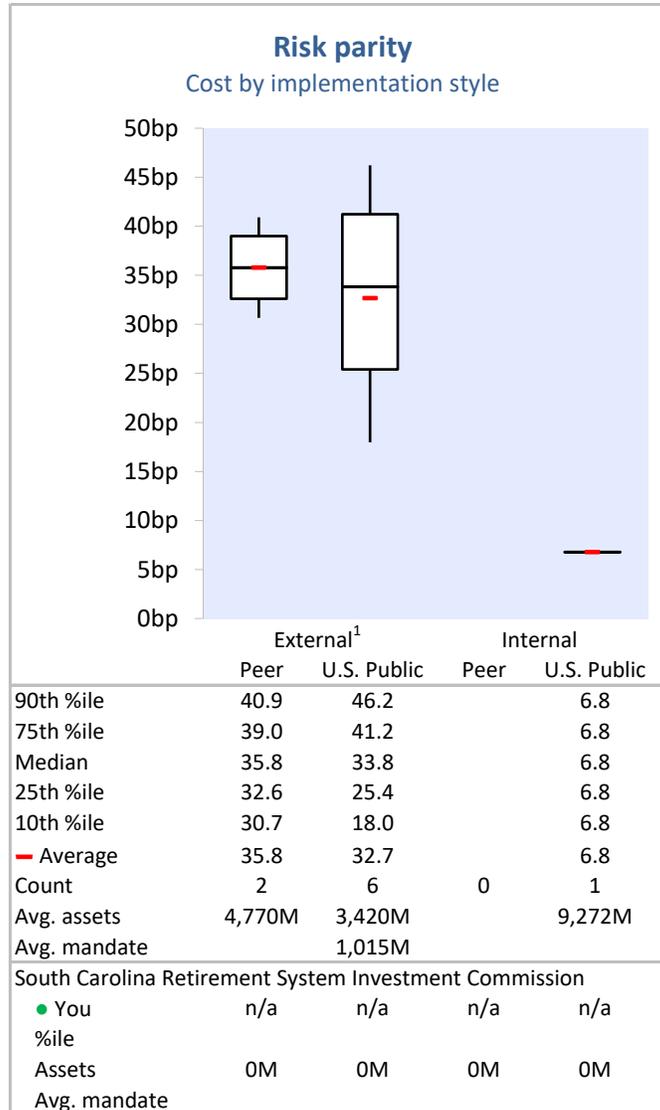
2. The fees of fund of funds include both the top layer fees paid to the fund of funds manager and the underlying fees paid to the 'underlying partnerships' held by the fund of funds. Most funds were unable to provide the underlying fees so defaults of n/a bps (on amount fees are based on) for underlying management fees and n/a bps (on NAV) for underlying performance fees were used.



1. Breakdown of external fees

	Your Plan	Peer Average	U.S. Public Average
Base fees	132.4	87.6	55.0
Internal and other	3.0	4.0	2.8
Performance fees	<u>508.3</u>	<u>508.3</u>	<u>171.7</u>
Total*	643.7	345.8	114.1

* For funds that did not report a performance fee, a value of 'zero' was used. The average performance fee for those funds that reported a performance fee is 508.3 bps for peers (1 fund) and 171.7 bps for U.S. Public participants (3 funds).



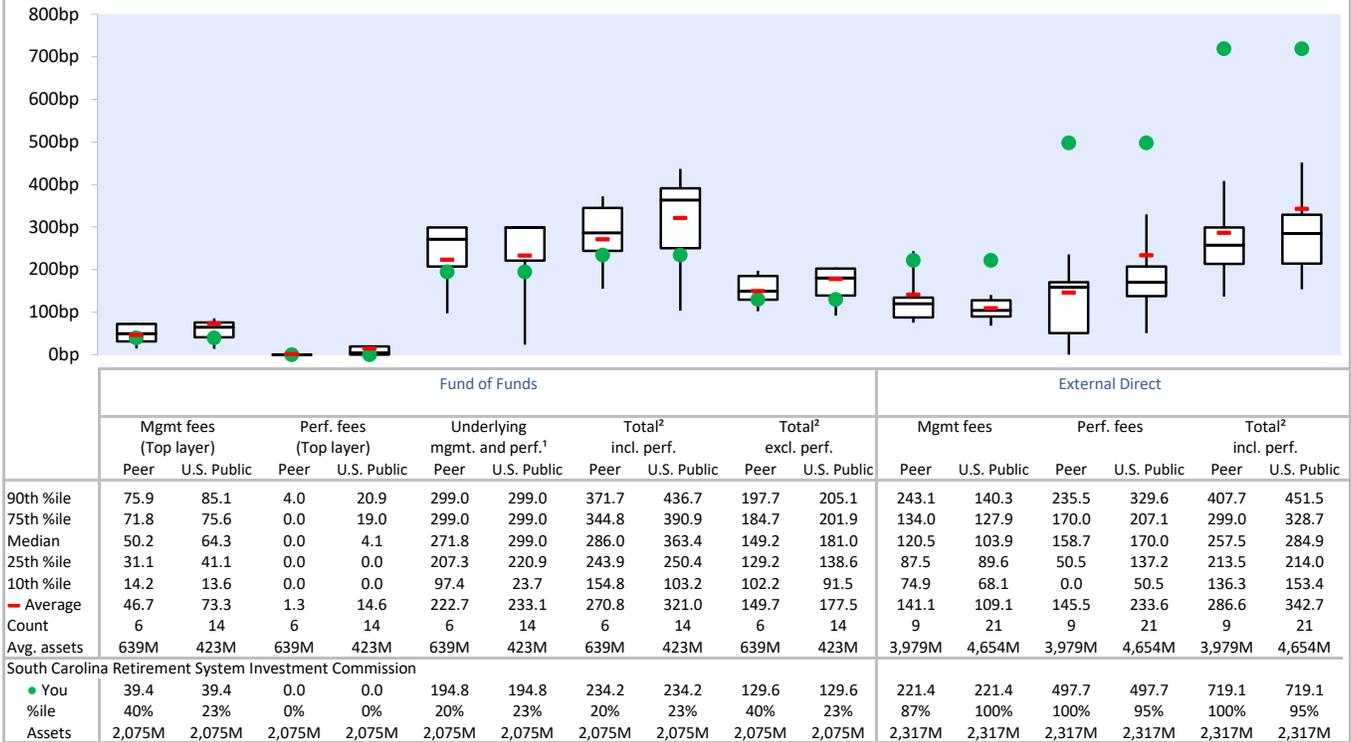
1. Breakdown of external fees

	Your Plan	Peer Average	U.S. Public Average
Base fees	n/a	34.8	31.9
Internal and other	n/a	1.0	0.9
Performance fees	<u>n/a</u>	<u>0.0</u>	<u>0.1</u>
Total*	n/a	35.8	32.7

* For funds that did not report a performance fee, a value of 'zero' was used. The average performance fee for those funds that reported a performance fee is 0.0 bps for peers (1 fund) and 0.1 bps for U.S. Public participants (3 funds).

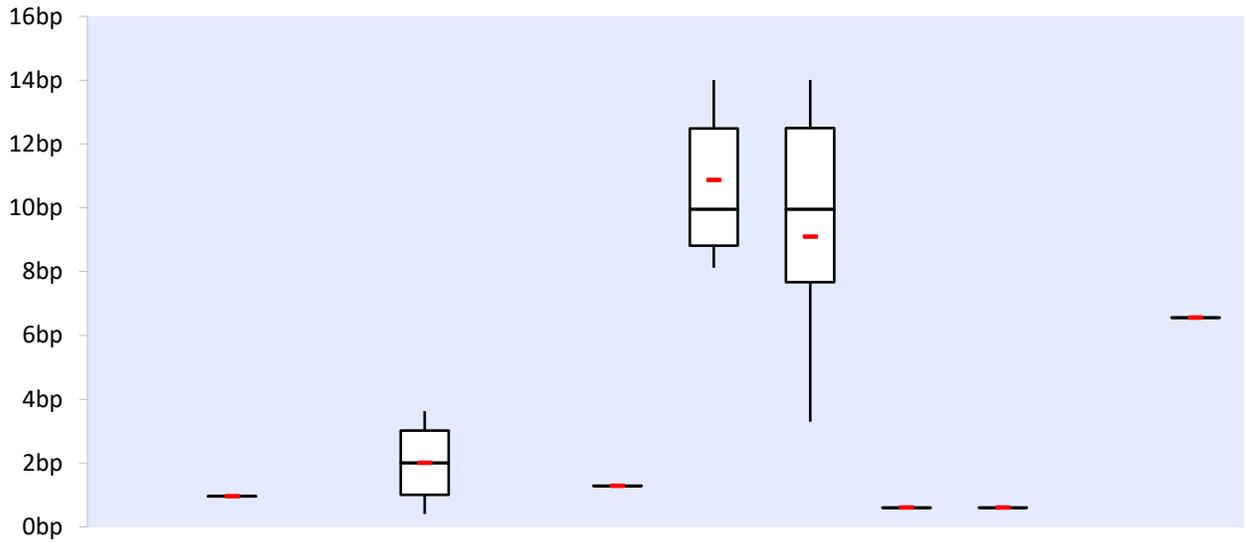
Hedge funds

Cost by implementation style



- The fees of fund of funds include both the top layer fees paid to the fund of funds manager and the underlying fees paid to the 'underlying partnerships' held by the fund of funds. Most funds were unable to provide the underlying fees so defaults of 129 bps (on NAV) for underlying management fees and 137 bps (on NAV) for underlying performance fees were used.
- The total cost also includes the internal cost of monitoring and selecting real estate investments. The peer average cost of monitoring and selecting was 1.4 bps for fund of funds and 2.9 bps for LPs.

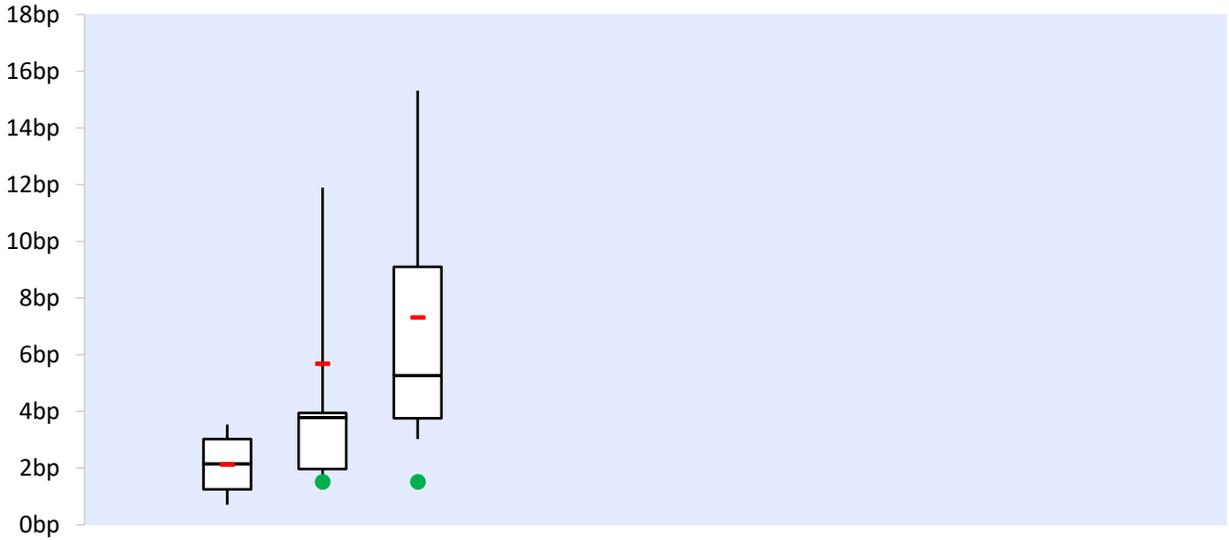
Overlays: currency, duration Cost by implementation style



	Currency Hedge				Discretionary Currency				Duration Management			
	Internal		External		Internal		External		Internal		External	
	% of notional	% of notional	% of notional	% of notional	% of notional	% of notional	% of notional	% of notional	% of notional	% of notional	% of notional	
	Peer	U.S. Public	Peer	U.S. Public	Peer	U.S. Public	Peer	U.S. Public	Peer	U.S. Public	Peer	U.S. Public
90th %ile		1.0		3.6		1.3		14.0		14.0		6.6
75th %ile		1.0		3.0		1.3		12.5		12.5		6.6
Median		1.0		2.0		1.3		10.0		10.0		6.6
25th %ile		1.0		1.0		1.3		8.8		7.7		6.6
10th %ile		1.0		0.4		1.3		8.1		3.3		6.6
— Average		1.0		2.0		1.3		10.9		9.1		6.6
Count	0	1	0	2	0	1	3	5	1	1	0	1
Avg. notional		4,182M		6,491M		31,100M		3,858M		3,410M		791M
South Carolina Retirement System Investment Commission												
● You	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
%ile												
Avg. notional												

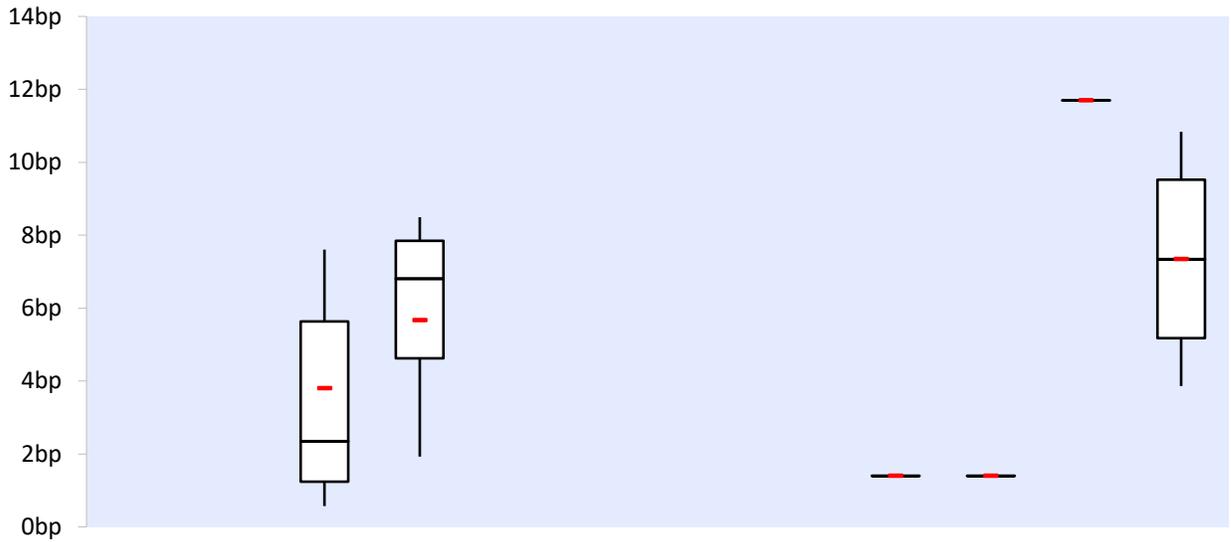
Overlays: passive beta/rebalancing, global TAA, policy tilt TAA

Cost by implementation style



	Passive Beta/Rebalancing				Global TAA				Policy Tilt TAA			
	Internal % of notional		External % of notional		Internal % of notional		External % of notional		Internal % of notional		External % of notional	
	Peer	U.S. Public										
90th %ile		3.5	11.9	15.3								
75th %ile		3.0	4.0	9.1								
Median		2.2	3.8	5.3								
25th %ile		1.3	2.0	3.8								
10th %ile		0.7	1.7	3.0								
— Average		2.1	5.7	7.3								
Count	0	3	5	8	0	0	0	0	0	0	0	0
Avg. notional		9,933M	2,534M	4,681M								
South Carolina Retirement System Investment Commission												
● You	n/a	n/a	1.5	1.5	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
%ile			0%	0%								
Avg. notional			6,142M	6,142M								

Overlays: commodity, long/short, other Cost by implementation style



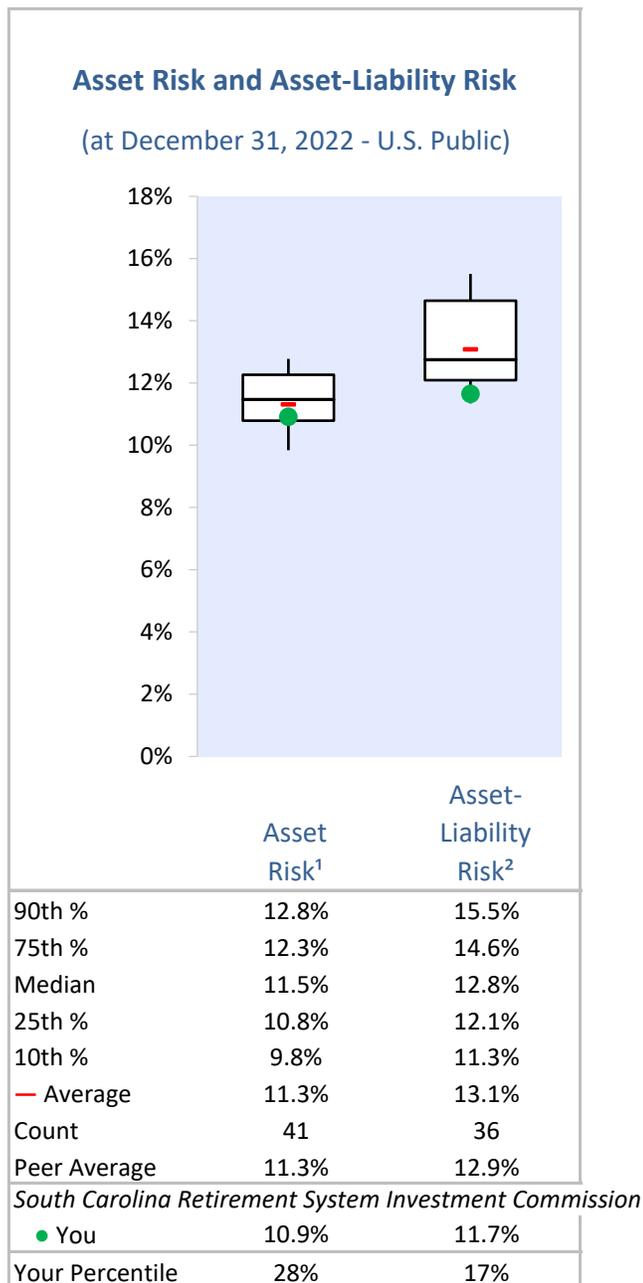
	Commodity				Long/ Short				Other			
	Internal		External		Internal		External		Internal		External	
	% of notional		% of notional		% of notional		% of notional		% of notional		% of notional	
	Peer	U.S. Public										
90th %ile			7.6	8.5					1.4	1.4	11.7	10.8
75th %ile			5.6	7.8					1.4	1.4	11.7	9.5
Median			2.4	6.8					1.4	1.4	11.7	7.3
25th %ile			1.2	4.6					1.4	1.4	11.7	5.2
10th %ile			0.6	1.9					1.4	1.4	11.7	3.9
— Average			3.8	5.7					1.4	1.4	11.7	7.3
Count	0	0	3	4	0	0	0	0	1	1	1	2
Avg. notional			1,717M	1,185M					2,881M	2,881M	2,471M	2,763M
South Carolina Retirement System Investment Commission												
● You	n/a	n/a										
%ile												
Avg. notional												

6

Risk

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Comparison of your risk levels to the U.S. Public universe



1. Asset risk is the expected volatility of your policy return. It is based on the historical variance of, and covariance between, the asset classes in your asset mix policy. It is expressed as an annual standard deviation.
2. Asset-liability risk is the expected volatility of surplus returns. Surplus returns are the changes in a plan's marked-to-market funded status caused by market factors. Asset liability risk is a function of the volatility of policy returns (asset risk), the volatility of surplus returns (surplus risk) and the correlation between policy returns and surplus returns.

Calculation of asset risk

Before considering the benefit of diversification, the weighted average risk of the asset classes in your asset mix policy was 13.0%.

Calculation of your weighted asset class risk

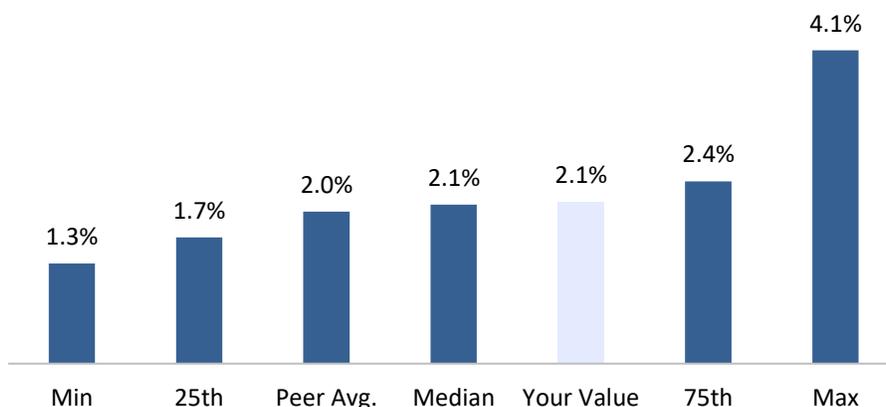
Asset Class	Policy weight	Risk ¹	Weighted risk
	(A)	(B)	(A X B)
Stock: U.S. small cap	6.1%	20%	1.2%
Stock: EAFE	3.8%	17%	0.6%
Stock: Emerging	1.5%	22%	0.3%
Stock: Global	34.6%	15%	5.3%
Bonds: U.S.	24.0%	5%	1.3%
Bonds: Emerging	1.0%	11%	0.1%
Bonds: High yield	1.0%	8%	0.1%
REITs	1.0%	20%	0.2%
Real estate ex-REITs	8.0%	10%	0.8%
Infrastructure	3.0%	14%	0.4%
Private equity - Diversified	9.0%	25%	2.2%
Private credit	7.0%	6%	0.4%
Weighted Total			13.0%

1. Risk is the standard deviation of returns for the asset class based on standard benchmarks used by CEM.

Reduction in asset risk due to diversification

Your asset risk is less than your weighted asset risk because of the benefit of diversification. Diversification reduces risk because when one asset class has a negative return, it might be offset by another asset class with a positive return. The lower the correlation between your policy asset classes, the greater the diversification benefit. The correlation between your policy asset classes is shown on page 15 of this section.

Diversification benefit: U.S. Public universe



The benefit of diversification equals weighted asset risk minus asset risk.

Components of asset risk

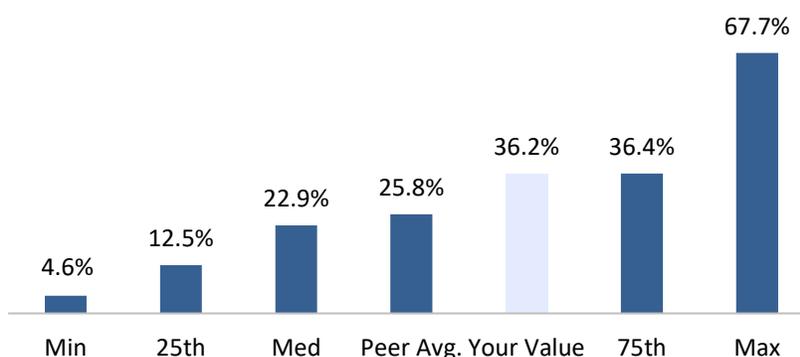
	You	Peer median*	Peer average	U.S. Public median*	U.S. Public average
Weighted asset risk	13.0%	13.3%	13.3%	13.3%	13.4%
Benefit of diversification	2.1%	2.1%	2.0%	2.1%	2.1%
Asset risk	10.9%	11.5%	11.3%	11.5%	11.3%

* Comparisons of components of asset risk should be interpreted with caution because it is not always possible to separate the diversification benefit from the weighted asset risk. For example, global stock as an asset class includes the diversification benefit of its geographic components within its asset risk.

Asset-liability risk

Your plan would not have any asset-liability risk if your assets perfectly matched your liabilities. If they matched, then the correlation between asset returns and liability returns would be 100%. If liabilities increased, assets would increase by a like amount (and vice versa). Thus higher correlation between your asset returns and liability returns reduces your asset-liability risk.

Correlation between policy returns and liability returns: U.S. Public universe



In addition to the correlation between asset returns and liability returns, asset-liability risk is also a function of the volatility of asset returns (asset risk) and the volatility of liability returns¹ (liability risk = $\sqrt{R_A^2 + R_L^2 - 2\rho_{AL}R_AR_L}$).

Components of asset-liability risk

	You	Peer median	Peer average	U.S. Public median	U.S. Public average
Asset risk (R_A)	10.9%	11.5%	11.3%	11.5%	11.3%
Liability risk (R_L)	9.7%	9.8%	9.8%	10.0%	10.0%
Correlation between policy returns and liability returns (ρ_{AL})	36.2%	34.6%	25.8%	22.9%	25.2%
Asset-liability risk	11.7%	12.3%	12.9%	12.8%	13.1%

1. Liability returns equal the changes in your marked-to-market liabilities caused by market factors. These are assumed to equal the return on your liability proxy portfolio (see next page).

Liability proxy portfolio

Your liability proxy portfolio is the portfolio of nominal and inflation-indexed bonds that best matches the sensitivity of your liabilities to changes in real and nominal interest rates.

Comparisons of liability proxy portfolio

	Your fund		Peer average		U.S. Public	
	Duration	% of Assets	Duration	% of Assets	Duration	% of Assets
Inflation Indexed Bonds	14.0	94%	12.1	69%	11.8	62%
Nominal Bonds	10.0	6%	13.2	31%	13.4	38%
Total		100%		100%		100%

Your liability proxy portfolio is a tool that:

- Helps you understand how the unsmoothed market value of your liabilities responds to changes in real and nominal interest rates.
- Helps you make better asset mix policy decisions by providing an understanding of which assets will decrease your asset-liability risk (i.e., assets that behave similarly to the neutral asset mix) and which assets will increase your risk.
- Helps you understand how your liabilities are different from your peers. Differences in liabilities mean that the same asset will have different risk / reward characteristics for different funds. For example, the risk of a nominal bond for a fund with 100% inflation sensitivity is much higher than it is for a fund with less than 100% inflation sensitivity.

Asset-liability risk could theoretically be eliminated if your actual asset mix matched the liability proxy portfolio. However, we recognize that this is neither an option nor a goal for most funds because:

- The supply of inflation-indexed assets is limited. These assets are required to match the obligations of pension liabilities.
- This low-risk strategy also has a lower expected return, implying either higher future funding costs or lower future benefits.

The methodology and formula used to determine your liability proxy portfolio are provided on pages 11-13 of this section.

Liability risk

Differences in liability risk are due to differences in inflation sensitivity and member demographics.

A plan's inflation sensitivity depends on:

a) The type of plan

Final and highest average plans have more inflation sensitivity than career average plans. Conversely, career average plans have more inflation sensitivity than flat benefit plans. Your plan type is final average.

Plan type	# of plans	% of Total
Flat Benefit	1	2%
Career Average	1	2%
Final/Highest/Best Avg	38	84%
Other	5	11%
Total	45	100%

b) Contractual inflation protection for retired members

Your retired members get 100% contractual inflation protection. Your retiree inflation protection is subject to a cap of For SCRS and PORS, eligible retirees and surviving annuitants will receive an annual increase in their pension benefit equal to the lesser of 1% of their retirement allowance or

Retiree inflation protection	# of plans		
	Corporate	Public	Other
0%	0	21	0
>0% and <50%	0	0	0
50%	0	0	0
>50% and <100%	0	3	0
100%	0	15	0
Total	0	39	0

c) Member demographics

Member demographics impacts both inflation sensitivity and the duration of plan liabilities. The survey asks for your plan's percentage of liabilities that relate to retired members from your actuarial reports. If you did not provide this number, then it is estimated (see page 12 of this section). Your percentage of liabilities that relate to retired members was 60%.

	Your fund	Peer Average	U.S. Public Average
Active Members	57%	50%	54%
Retired Members	43%	50%	46%
Total	100%	100%	100%

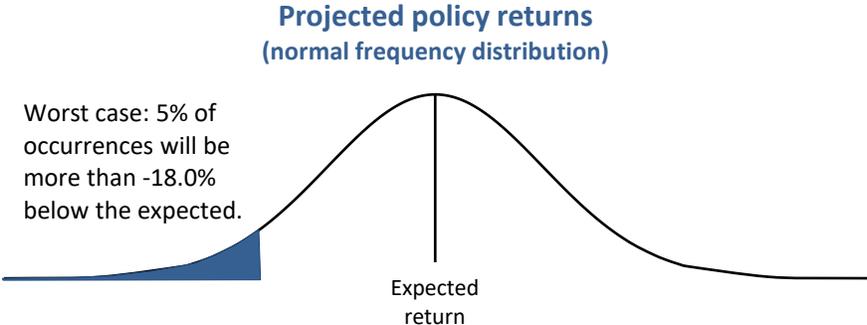
Projected worst case scenarios

We can convert your asset risk and asset-liability risk into worst case outcomes for policy returns and funded status if we make the following simplifying assumptions:

- a) Returns are normally distributed.
- b) Historic return volatility and correlations will continue in the future.
- c) No change in your policy asset mix or liabilities.

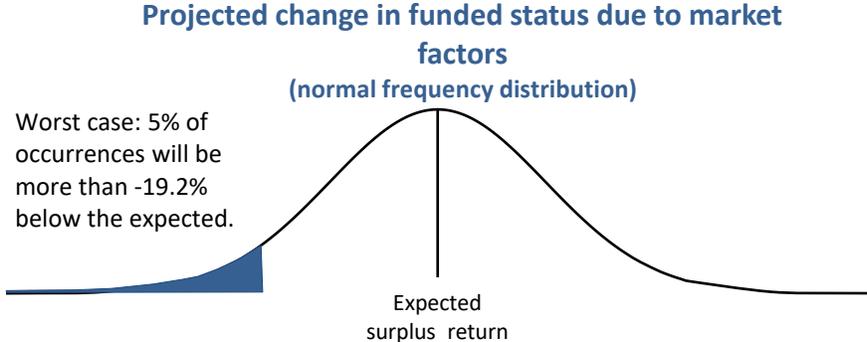
a) Worst case policy returns

Every year there is a 5% probability that your policy return will be worse than your expected policy return by more than -18.0% (-18.0% equals -1.65 X your asset risk of 10.9%). -18.0% is the starting point of worst case outcomes. They could be much worse.



b) Worst case impact on funded status

Every year, there is a 5% probability that changes in your mark-to-market funded status caused by market factors ("Surplus Returns") will be worse than expected by more than -19.2%. (-19.2% equals -1.65 X your asset-liability risk of 11.7%). -19.2% is the starting point of worst case outcomes. They could be much worse.



Historic worst case scenarios during the past 5 years

a) Historic worst case policy returns

During the past 5 years, your lowest policy return was -12.4% in 2022.

Historic policy returns - U.S. Public universe

	2022	2021	2020	2019	2018
90th %	-9.1%	18.2%	13.0%	18.7%	0.2%
75th %	-11.1%	17.2%	12.0%	16.7%	-1.0%
Median	-12.8%	15.7%	10.4%	14.9%	-2.3%
25th %	-13.7%	13.7%	9.1%	13.5%	-3.2%
10th %	-15.8%	11.6%	7.9%	10.9%	-5.1%
Average	-12.8%	15.2%	10.5%	15.1%	-2.2%
Count	41	45	52	50	57
Peer Avg	-12.1%	16.3%	10.6%	15.4%	-1.8%
Your Value	-12.4%	15.2%	7.1%	15.9%	-2.5%

b) Historic worst case changes in funded status

During the past 5 years, your worst change in marked-to-market funded status caused by market factors ("Surplus Returns") was -7.1% in 2020.

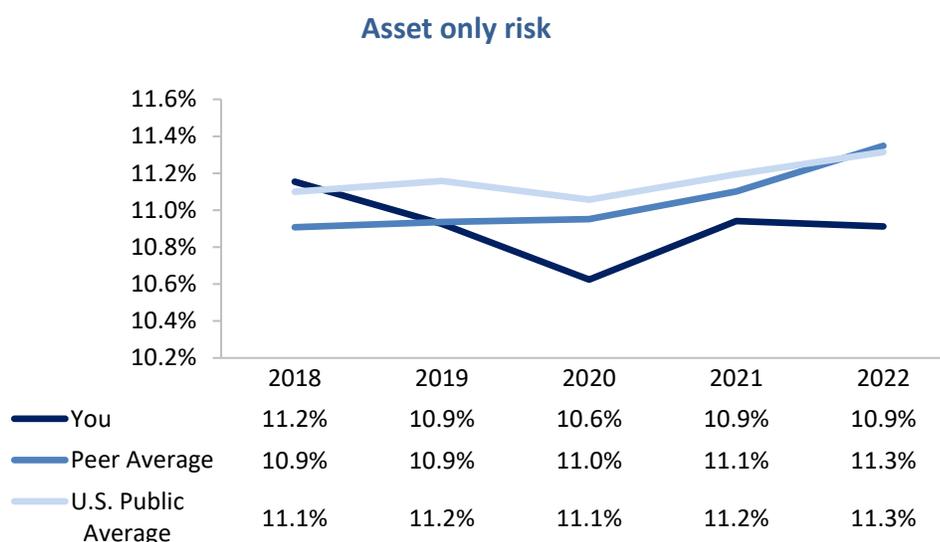
Historic changes in funded status caused by market factors - U.S. Public universe

	2022	2021	2020	2019	2018
90th %	20.0%	21.3%	0.4%	7.9%	2.3%
75th %	17.0%	18.6%	-1.8%	7.0%	0.8%
Median	13.4%	15.1%	-3.5%	5.3%	-0.4%
25th %	11.3%	12.5%	-4.8%	3.2%	-1.9%
10th %	9.7%	9.6%	-7.1%	1.8%	-3.5%
Average	13.9%	15.3%	-3.3%	5.1%	-0.5%
Count	36	40	47	46	52
Peer Avg	14.8%	16.5%	-3.3%	5.3%	-0.2%
Your Value	15.4%	14.3%	-7.1%	5.3%	-0.9%

Risk Trends - 2018 to 2022

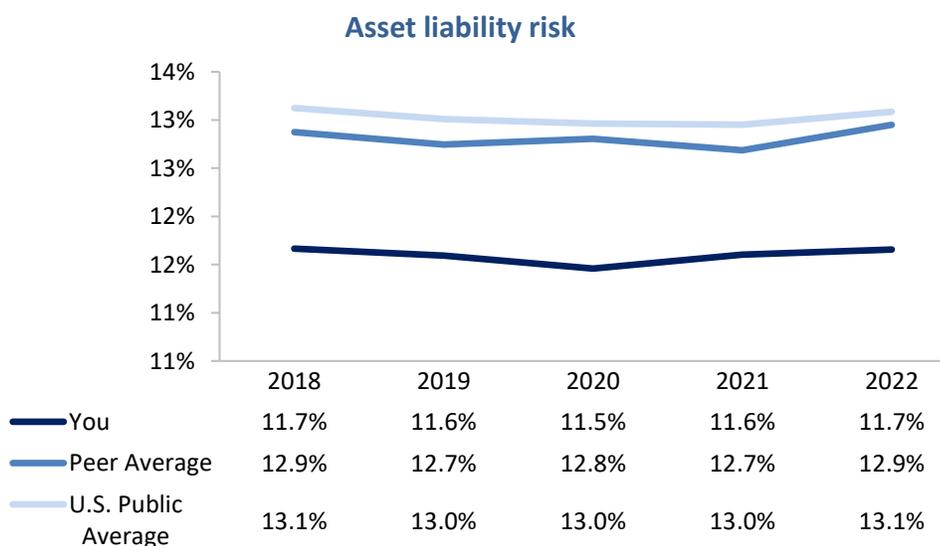
a) Asset risk trends

Asset risk will only change if policy asset mix changes. Between 2018 and 2022 the asset risk for your fund decreased from 11.2% to 10.9%.

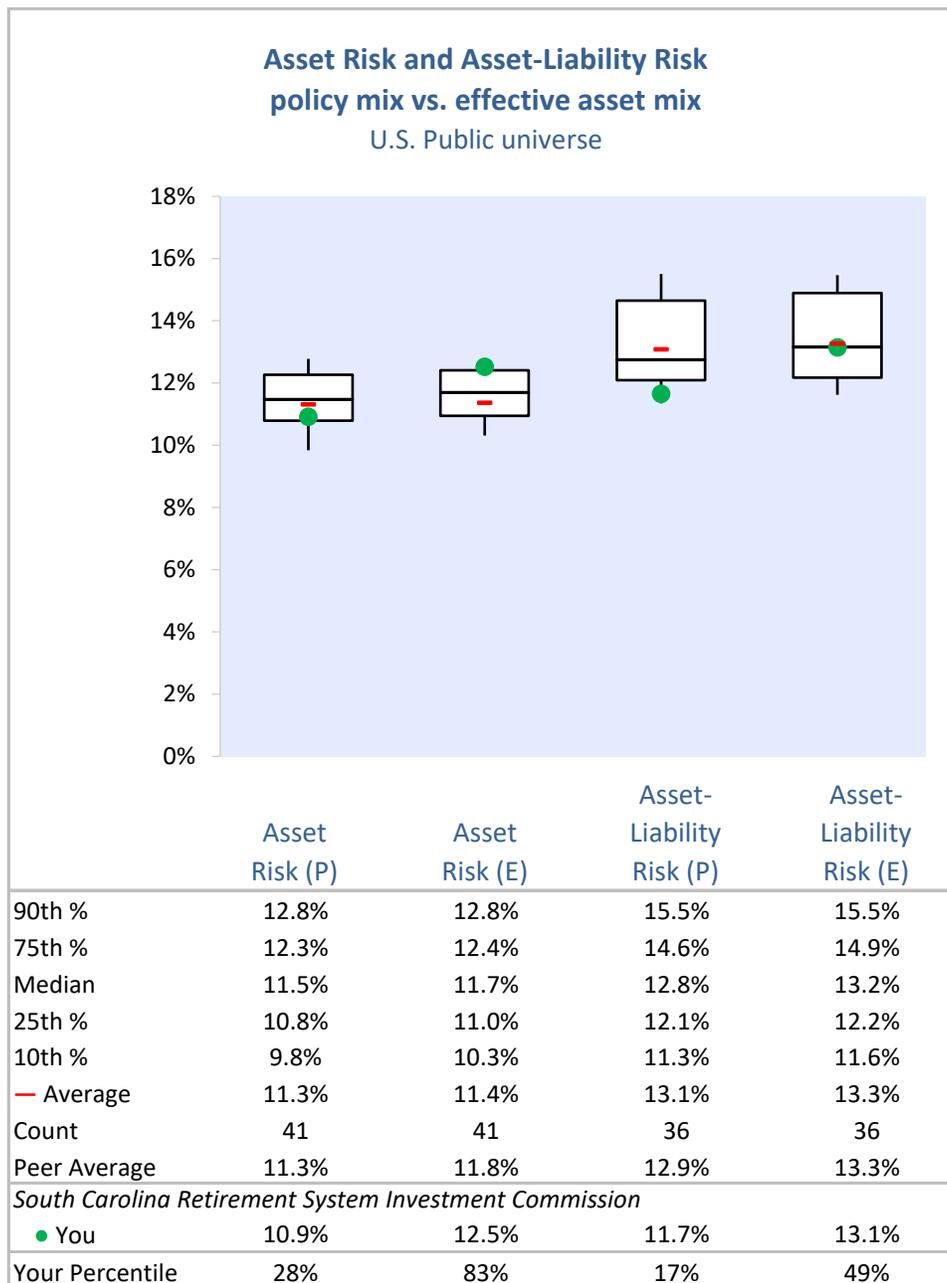


b) Asset-liability risk trends

Asset-liability risk will change if policy asset mix changes, or if the nature of your liabilities changes. Between 2018 and 2022 the asset-liability risk for your fund remained the same at 11.7%.



Risk levels based on the policy mix and the effective asset mix



P - calculated using your policy mix, same as the risk figures shown on page 2.

E - based on the effective asset mix (if a valid effective mix was provided, or the actual asset mix otherwise).

Appendix A - Methodology and formula used to calculate liability return and liability proxy portfolio

Risk calculation descriptions

CEM would like to recognize and thank Malcolm Hamilton previously of Mercer for providing the key formulas used to calculate liability returns. We would also like to thank Stijn Oude Brunink previously of ORTEC Consultants in the Netherlands who provided the proofs and made adjustments to Mr. Hamilton's formulas. These formulas and this section use several simplifying assumptions that could cause your fund's individual results to differ from actual. We encourage you to pursue more precise calculations of your liability returns.

Step 1 - Inflation sensitivity

The first step in estimating your liability return is to determine your liabilities' inflation sensitivity. The degree of total inflation sensitivity determines the proportion of inflation-indexed bonds versus nominal bonds that belong in your liability proxy portfolio.

Total inflation sensitivity

- = Inflation protection retirees X % liabilities relating to retirees
- + Inflation protection for active members X (1 - % liabilities relating to retirees)

Inflation protection for retirees

On the survey we asked for the amount of contractual inflation protection provided to retirees.

Ad hoc inflation protection is not considered because it is not a contractual liability. However, many funds are managed to maintain historic levels of ad hoc increases. If this is the case with your fund, then your inflation protection may have been understated. Please ask for CEM to make that adjustment for you.

Inflation protection for active members

We inferred inflation protection for your active members to be 86% based on your plan type of Final Average.

Final and highest average plans have less than 100% inflation protection because during the averaging period, inflation protection is only 50%, not 100%. This is a natural function of taking an average of more than one year's earnings. Thus the weighted average inflation protection for active members in a 5-year final average plan is around 86% and in a 3-year average plan, 93%. These weighted averages are lower than intuition might suggest because the active members associated with the largest liabilities (i.e., the highest weights) are the ones closest to retirement.

Flat Benefit and Career Average plans are assumed to have 77% inflation protection. Contractually, flat benefit plans have zero inflation protection but negotiated increases tend to closely track inflation. However, just as with Final Average plans, inflation protection between negotiated increases is less than full inflation.

Step 2 - Proportion of liabilities relating to retirees

The second step is to determine how much of your liabilities relate to your retirees versus your active members. This number is used to weight the liability proxy portfolio's obligations to retirees and active members.

This ratio depends on several factors including the ratio of retired and active members, member demographics and the inflation sensitivity of the promise made to these two member groups. Deferred (also known as inactive) members are ignored because even if they are large in number they tend to represent only a very small fraction of the future liability.

Equivalency Table	
Retirees as a % of Active + Retirees	Relating to Retirees
0%	0%
10%	22%
20%	35%
30%	45%
40%	55%
50%	63%
60%	71%
70%	79%
80%	86%
90%	93%
100%	100%

Most funds have provided the actual ratio from their actuarial reports (as requested on the survey). If the ratio is not provided, it is estimated based on the "Equivalency" table above.

Your percentage of liabilities that relates to retirees was 60%. The percentage of liability that relates to retirees is higher than the retirees as a percentage of active and retired members because retirees have accrued a higher benefit.

Step 3 - Determining your duration relative to real and nominal yields

Duration enables you to determine the change in value of a cash flow, such as your pension liabilities, caused by a change in interest rates. The relationship between duration and cost of your pension liability is as follows.

$$\begin{aligned} &\text{Percentage change in pension liability cost} \\ &= (- \text{Modified duration relative to change in real yields} \times \text{change in real yields}) \\ &+ (- \text{Modified duration relative to change in nominal yields} \times \text{change in nominal yields}) \end{aligned}$$

The modified duration of your liabilities with respect to changes in real and nominal yields is determined by the following two formulas.

$$\begin{aligned} &\text{Modified duration relative to changes in real yields} \\ &= 10 \times [\text{Inflation protection for active members} \times (1 - \% \text{ of liabilities relating to retirees}) \\ &+ \text{Inflation protection for retirees} \times (1 - \% \text{ of liabilities relating to retirees}/4) \\ &+ (\text{Inflation protection for retirees}/10) \times (1.5 - 0.5 \times \% \text{ liabilities relating to retirees})] \end{aligned}$$

$$\begin{aligned} &\text{Modified duration relative to changes in nominal yields} \\ &= 10 \times [(2 - 5 \times \% \text{ Liabilities relating to retirees}/4 - \text{inflation protection for actives} \times \\ &\quad (1 - \% \text{ liabilities relating to retirees}) \\ &- (\text{Inflation protection for retirees}/10) \times (8.5 - 2 \times \% \text{ liabilities relating to retirees}) \\ &- (\text{Inflation protection for retirees}/10) \times (1.5 - 0.5 \times \% \text{ liabilities relating to retirees})] \end{aligned}$$

Step 4 - Determining the liability proxy portfolio

Knowing the sensitivity of your pension liabilities to real and nominal interest rates enables you to construct a liability proxy portfolio using a combination of nominal bonds and inflation-indexed bonds.

Duration of inflation-indexed bonds in your liability proxy portfolio =
 Modified Duration Relative to Change in Real yields ÷ Proportion of inflation-indexed bonds in your liability proxy portfolio (this is the total inflation sensitivity)

Duration of nominal bonds in your liability proxy portfolio =
 Modified Duration Relative to Change in Nominal Yields ÷ Proportion of nominal bonds in your liability proxy portfolio (this is 1 minus the total inflation sensitivity)

Proportion of inflation-indexed bonds in your liability proxy portfolio = total inflation sensitivity

Proportion of nominal bonds in your liability proxy portfolio = 1 - total inflation sensitivity

Step 5 - Liability returns

The return earned on your liability proxy portfolio is the liability return and matches the change in your plan's liabilities in response to changes in market factors. It uses a true market valuation rather than a smoothed actuarial valuation. See page 15 for benchmark details.

Liability Return

- = Proportion indexed bonds in liability proxy portfolio X (CPI + average real yield)
- + Proportion nominal bonds in liability proxy portfolio X average long bond yield
- Modified duration relative to change in real yields X change in real yields
- Modified duration relative to change in nominal yields X change long yields

	Long Nominal Bonds		Inflation Indexed Bonds		CPI
	Year end yield	Change in yield	Year end yield	Change in yield	
2022	3.83	2.33	1.76	2.25	8.00
2021	1.50	0.59	-0.49	-0.05	4.70
2020	0.91	-1.00	-0.44	-1.01	1.23
2019	1.91	-0.78	0.57	-0.64	1.81
2018	2.69	0.28	1.21	0.51	2.44

Appendix B - Methodology used to calculate asset and asset-liability risk

Asset mix

Your asset only mix is a function of your policy asset mix, your currency hedging policy and the presence of any duration overlays.

CEM does not use your specific policy benchmarks. Standard asset class proxies (shown on the next page) are used for each given asset class. Monthly, historical data is used to construct an asset class variance/covariance table. Your specific policy weights are then used to calculate an expected monthly volatility for your policy mix using the following formula, which takes current asset class variances and covariances as expected future variances and covariances.

$$\begin{aligned}\text{Expected monthly variance of policy mix} &= \sum \sum w_X w_Y \text{Cov}(X, Y) \\ &= \sum \sum w_X w_Y \sigma_X \sigma_Y \rho_{X,Y}\end{aligned}$$

where

w_X = policy weight of asset class X

σ_X = standard deviation of monthly returns for asset class X

w_Y = policy weight of asset class Y

σ_Y = standard deviation of monthly returns for asset class Y

$\text{Cov}(X, Y)$ = covariance of X and Y

$\rho_{X,Y}$ = Pearson's correlation of the returns for X and Y

Each sum is over all asset classes. Assuming normal distribution of returns, we then solve for expected annual standard deviation as:

$$\begin{aligned}\text{Expected annual standard deviation of policy mix} &= \\ &(\text{Expected monthly variance of policy mix})^{1/2} \times (12)^{1/2}\end{aligned}$$

Hedged and unhedged asset classes are treated as separate asset classes in the model. Funds with hedging policies between 0% and 100% have their policy weight allocated between the hedged and unhedged asset classes according to the proportion hedged.

Duration overlays are also treated as a separate asset class. Their weight is taken as notional value divided by total plan assets. For funds with duration overlays, the sum of weights will be greater than 100%. Rather than calculating a return for every possible duration, CEM's total variance/covariance matrix includes bonds with a continual duration of each whole number. A given fund's duration overlay is then represented by the two constant duration bonds closest to the duration of the overlay, with the total weight divided proportionately between them.

Asset-liability risk

Asset-liability risk is calculated in exactly the same way as asset risk with the addition of a short position in the liability proxy portfolio. This portfolio will typically be represented by up to four bonds with continual duration whose summed weights will equal -100%, and whose real and nominal duration match the liability proxy portfolio.

Appendix C - Correlation Matrix

	Stock: U.S. small cap	Stock: EAFE	Stock: Emerging	Stock: Global	Bonds: U.S.	Bonds: Emerging	Bonds: High yield	Real Assets: REITs	Real Assets: Real estate ex-REITs	Real Assets: Infrastructure	Private equity - Diversified	Private credit	Nominal Bond: Duration 10	Nominal Bond: Duration 11	Real Return Bond: Duration 13	Real Return Bond: Duration 14
Stock: U.S. small cap	1.00	0.63	0.66	0.78	0.12	0.50	0.63	0.65	0.60	0.49	0.86	0.51	-0.10	-0.09	0.15	0.15
Stock: EAFE	0.63	1.00	0.71	0.95	0.18	0.56	0.55	0.58	0.56	0.59	0.87	0.51	0.00	0.00	0.26	0.25
Stock: Emerging	0.66	0.71	1.00	0.77	0.10	0.70	0.58	0.50	0.46	0.50	0.75	0.46	-0.08	-0.09	0.28	0.27
Stock: Global	0.78	0.95	0.77	1.00	0.17	0.60	0.64	0.62	0.60	0.66	0.90	0.53	-0.03	-0.04	0.28	0.28
Bonds: U.S.	0.12	0.18	0.10	0.17	1.00	0.39	0.30	0.24	0.44	0.15	0.18	0.05	0.92	0.91	0.82	0.82
Bonds: Emerging	0.50	0.56	0.70	0.60	0.39	1.00	0.61	0.47	0.51	0.45	0.61	0.42	0.23	0.22	0.58	0.57
Bonds: High yield	0.63	0.55	0.58	0.64	0.30	0.61	1.00	0.60	0.60	0.47	0.75	0.74	0.06	0.05	0.35	0.34
Real Assets: REITs	0.65	0.58	0.50	0.62	0.24	0.47	0.60	1.00	0.95	0.48	0.77	0.51	0.05	0.05	0.35	0.34
Real Assets: Real estate ex-REITs	0.60	0.56	0.46	0.60	0.44	0.51	0.60	0.95	1.00	0.50	0.73	0.50	0.25	0.25	0.49	0.49
Real Assets: Infrastructure	0.49	0.59	0.50	0.66	0.15	0.45	0.47	0.48	0.50	1.00	0.57	0.35	0.00	0.01	0.33	0.32
Private equity - Diversified	0.86	0.87	0.75	0.90	0.18	0.61	0.75	0.77	0.73	0.57	1.00	0.68	-0.11	-0.12	0.25	0.25
Private credit	0.51	0.51	0.46	0.53	0.05	0.42	0.74	0.51	0.50	0.35	0.68	1.00	-0.22	-0.23	0.15	0.14
Nominal Bond: Duration 10	-0.10	0.00	-0.08	-0.03	0.92	0.23	0.06	0.05	0.25	0.00	-0.11	-0.22	1.00	1.00	0.76	0.76
Nominal Bond: Duration 11	-0.09	0.00	-0.09	-0.04	0.91	0.22	0.05	0.05	0.25	0.01	-0.12	-0.23	1.00	1.00	0.75	0.76
Real Return Bond: Duration 13	0.15	0.26	0.28	0.28	0.82	0.58	0.35	0.35	0.49	0.33	0.25	0.15	0.76	0.75	1.00	1.00
Real Return Bond: Duration 14	0.15	0.25	0.27	0.28	0.82	0.57	0.34	0.34	0.49	0.32	0.25	0.14	0.76	0.76	1.00	1.00

Correlation Matrix of Common Asset Classes in U.S. Public universe

	Stock: U.S. broad/all	Stock: U.S. large cap	Stock: U.S. small cap	Stock: EAFE	Stock: Emerging	Stock: Global	Stock: ACWI x U.S.	Bonds: Emerging	Bonds: High yield	Bonds: Long bonds	Bonds: Other	Bonds: Cash	Real Assets: Real estate ex-REITs	Hedge funds	Private equity - Diversified	Private credit	Nominal Bond: Duration 10	Nominal Bond: Duration 11	Real Return Bond: Duration 10	Real Return Bond: Duration 11
Stock: U.S. broad/all	1.00	0.99	0.89	0.70	0.68	0.91	0.77	0.55	0.63	0.21	0.21	0.02	0.61	0.81	0.89	0.51	0.01	0.01	0.17	0.17
Stock: U.S. large cap	0.99	1.00	0.82	0.76	0.66	0.91	0.77	0.54	0.62	0.17	0.19	0.01	0.60	0.80	0.88	0.48	0.00	-0.01	0.17	0.17
Stock: U.S. small cap	0.89	0.82	1.00	0.63	0.66	0.78	0.69	0.50	0.63	0.11	0.12	0.00	0.60	0.72	0.86	0.51	-0.10	-0.09	0.09	0.10
Stock: EAFE	0.70	0.76	0.63	1.00	0.71	0.95	0.99	0.56	0.55	0.18	0.18	0.03	0.56	0.88	0.87	0.51	0.00	0.00	0.21	0.21
Stock: Emerging	0.68	0.66	0.66	0.71	1.00	0.77	0.78	0.70	0.58	0.09	0.10	0.01	0.46	0.78	0.75	0.46	-0.08	-0.09	0.23	0.23
Stock: Global	0.91	0.91	0.78	0.95	0.77	1.00	0.96	0.60	0.64	0.15	0.17	-0.02	0.60	0.88	0.90	0.53	-0.03	-0.04	0.21	0.21
Stock: ACWI x U.S.	0.77	0.77	0.69	0.99	0.78	0.96	1.00	0.61	0.60	0.14	0.15	-0.03	0.56	0.89	0.87	0.53	-0.04	-0.05	0.23	0.22
Bonds: Emerging	0.55	0.54	0.50	0.56	0.70	0.60	0.61	1.00	0.61	0.38	0.39	0.03	0.51	0.65	0.61	0.42	0.23	0.22	0.54	0.54
Bonds: High yield	0.63	0.62	0.63	0.55	0.58	0.64	0.60	0.61	1.00	0.28	0.30	0.01	0.60	0.70	0.75	0.74	0.06	0.05	0.31	0.30
Bonds: Long bonds	0.21	0.17	0.11	0.18	0.09	0.15	0.14	0.38	0.28	1.00	0.93	0.16	0.45	0.28	0.14	0.04	0.91	0.91	0.78	0.79
Bonds: Other	0.21	0.19	0.12	0.18	0.10	0.17	0.15	0.39	0.30	0.93	1.00	0.29	0.44	0.31	0.18	0.05	0.92	0.91	0.81	0.82
Bonds: Cash	0.02	0.01	0.00	0.03	0.01	-0.02	-0.03	0.03	0.01	0.16	0.29	1.00	0.00	-0.04	-0.09	-0.10	0.18	0.18	0.06	0.06
Real Assets: Real estate ex-REITs	0.61	0.60	0.60	0.56	0.46	0.60	0.56	0.51	0.60	0.45	0.44	0.00	1.00	0.63	0.73	0.50	0.25	0.25	0.49	0.50
Hedge funds	0.81	0.80	0.72	0.88	0.78	0.88	0.89	0.65	0.70	0.28	0.31	-0.04	0.63	1.00	0.82	0.58	0.05	0.05	0.43	0.43
Private equity - Diversified	0.89	0.88	0.86	0.87	0.75	0.90	0.87	0.61	0.75	0.14	0.18	-0.09	0.73	0.82	1.00	0.68	-0.11	-0.12	0.29	0.28
Private credit	0.51	0.48	0.51	0.51	0.46	0.53	0.53	0.42	0.74	0.04	0.05	-0.10	0.50	0.58	0.68	1.00	-0.22	-0.23	0.17	0.16
Nominal Bond: Duration 10	0.01	0.00	-0.10	0.00	-0.08	-0.03	-0.04	0.23	0.06	0.91	0.92	0.18	0.25	0.05	-0.11	-0.22	1.00	1.00	0.76	0.77
Nominal Bond: Duration 11	0.01	-0.01	-0.09	0.00	-0.09	-0.04	-0.05	0.22	0.05	0.91	0.91	0.18	0.25	0.05	-0.12	-0.23	1.00	1.00	0.75	0.76
Real Return Bond: Duration 10	0.17	0.17	0.09	0.21	0.23	0.21	0.23	0.54	0.31	0.78	0.81	0.06	0.49	0.43	0.29	0.17	0.76	0.75	1.00	1.00
Real Return Bond: Duration 11	0.17	0.17	0.10	0.21	0.23	0.21	0.22	0.54	0.30	0.79	0.82	0.06	0.50	0.43	0.28	0.16	0.77	0.76	1.00	1.00

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Appendices

Appendix A - Data Summary

Appendix B - Data quality

Appendix C - Glossary of terms

Appendix A - Data Summary

South Carolina Retirement System Investment Commission

Plan Info	2022	2021	2020	2019	2018
Survey Preparer	Jon Rychener	Kevin Reinhard	Kevin Reinhard	Kevin Reinhard	Kevin Reinhard
Additional Contact	Andrew Chernick	Jon Rychener	Jon Rychener	Jon Rychener	Jon Rychener
Type of fund (corporate, public, other)	Public	Public	Public	Public	Public
Total fund size (\$mils) as at December 31	38,158.0	41,654.2	35,611.8	33,502.8	29,259.8
Asset-class level holdings provided on survey are: year end or average?	Average	Average	Average	Average	Average
Total return for year ended	-7.23%	18.68%	8.19%	16.81%	-4.20%
Is the return net or gross?	Net of manager fees				
Total fund policy or benchmark return	-11.22%	15.07%	8.35%	17.05%	-2.94%

Ancillary Data	2022	2021	2020	2019	2018
What is your hedging policy for: Foreign Holdings					
What were your actuarial fees in 000s?	206	260	271	405	382
How many plan members/beneficiaries do you have:					
Active?	239,874	238,096	241,285	240,009	235,390
Active (no-accrual)?					
Retired?	177,339	173,770	171,280	168,851	166,126
Other?	239,252	229,607	219,515	210,922	202,146
What type of plan(s) do you have?	Final Average				
To what extent are your retired members' benefits indexed to inflation?					
Contractual %	100%	100%	100%	100%	100%
If the indexation is subject to a cap, describe the cap	For SCRS and PORS,				
What % of the plan's liabilities pertain to retired members?	60%	60%	59%	61%	62%
Actuarial valuation assumptions for funding purposes:					
Liability discount rate	7.0%	7.0%	7.3%	7.3%	7.3%
Salary progression rate	3.0%	3.0%	3.0%	3.0%	3.0%
What was your actuarial assumption for expected rate of return?	7.0%	7.0%	7.3%	7.3%	7.3%

Appendix A - Data Summary: Policy Weights and Benchmarks

South Carolina Retirement System Investment Commission

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Asset Class	Year	Policy Weight	Benchmark	
			Description	Return
Stock - U.S. broad/all	2022			
	2021		MSCI US IMI Net	
	2020	23.9	MSCI US IMI Net	20.7
	2019	16.3	MSCI US IMI Net	26.6
	2018	16.4	MSCI US IMI Net	-5.7
Stock - U.S. small cap	2022	6.1	MSCI US Small Cap Net Index	-17.6
	2021	3.0	MSCI US Small Cap Net Index	19.1
	2020	2.9	MSCI US Small Cap Net Index	35.8
Stock - EAFE	2022	3.8	MSCI World Ex US Net Index	-14.3
	2021	2.0	MSCI World Ex US Net Index	11.1
	2020		MSCI World Ex US Net Index	10.7
Stock - Emerging	2022	1.5	MSCI Emerging Market IMI Net	-19.8
	2021	5.2	MSCI Emerging Market IMI Net	18.8
	2020	6.2	MSCI Emerging Market IMI Net	18.3
	2019	6.6	MSCI Emerging Market IMI Net	18.9
	2018	6.3	MSCI Emerging Market IMI Net	-14.6
Stock - Global	2022	34.6	MSCI World Net Dividend	-18.1
	2021	35.8	MSCI World Net Dividend	18.5
	2020	12.2	MSCI World Net Dividend	15.9
	2019	18.3	MSCI World Net Dividend	27.7
	2018	17.7	MSCI World Net Dividend	-8.7
Stock - ACWI x U.S.	2022			
	2021		MSCI ACWI x/US Net	11.1
	2020	2.2	MSCI ACWI x/US Net	10.7
	2019	3.6	MSCI ACWI x/US Net	21.5
	2018	3.7	MSCI ACWI x/US Net	-14.2
Fixed income - U.S.	2022	24.0	Barclays US Aggregate	-13.0
	2021	24.0	Barclays US Aggregate	-1.5
	2020	26.0	Barclays US Aggregate	7.5
	2019	11.0	Barclays US Aggregate	8.7
	2018	13.0	Barclays US Aggregate	0.0
Fixed income - Emerging	2022	1.0	JP Morgan EMBI GD	-6.9
	2021	1.0	JP Morgan EMBI GD	-1.8
	2020		50% JPM EMBI Global Diversified/50% JPM-GBI-EM Global	5.3
	2019	4.0	50% JPM EMBI Global Diversified/50% JPM-GBI-EM Global	14.3
	2018	4.0	50% JPM EMBI Global Diversified/50% JPM-GBI-EM Global	-5.2
Fixed income - High yield	2022	1.0	50%Bar U.S. High Yield 2% / 50%S&P LSTA Leveraged Loan	-6.0
	2021	1.0	50%Bar U.S. High Yield 2% / 50%S&P LSTA Leveraged Loan	5.2
	2020		50%Bar U.S. High Yield 2% / 50%S&P LSTA Leveraged Loan	5.1
	2019	4.4	50%Bar U.S. High Yield 2% / 50%S&P LSTA Leveraged Loan	11.5
	2018	5.2	50%Bar U.S. High Yield 2% / 50%S&P LSTA Leveraged Loan	-0.8
Cash	2022		ICE LIBOR USD 3 Month Index	4.9
	2021		ICE LIBOR USD 3 Month Index	0.2
	2020		BofA Merrill Lynch 3 Month US Treasury Bill G001	0.7
	2019	3.0	BofA Merrill Lynch 3 Month US Treasury Bill G001	2.3
	2018	1.0	BofA Merrill Lynch 3 Month US Treasury Bill G001	1.9
REITs	2022	1.0	Your REIT benchmark	-24.4
	2021	1.0	Your REIT benchmark	43.2
	2020		Your REIT benchmark	-8.0
	2019	1.5	Your REIT benchmark	26.0
	2018	3.1	Your REIT benchmark	-4.6
Real estate ex-REITs	2022	8.0	NCREIF ODCE Index	6.5
	2021	8.0	NCREIF ODCE Index	21.1
	2020	9.0	NCREIF ODCE Index	0.3
	2019	7.5	NCREIF ODCE Index + 100 bps	5.4
	2018	5.9	NCREIF ODCE Index + 100 bps	8.4
Infrastructure	2022	3.0	Dow Jones Brookfield Global Infrastructure Net Index	-6.6
	2021	3.0	Dow Jones Brookfield Global Infrastructure Net Index	19.9
	2020	3.0	Dow Jones Brookfield Global Infrastructure Net Index	-7.0
	2019	3.0	Dow Jones Brookfield Global Infrastructure Net Index	28.7
	2018	3.0	Dow Jones Brookfield Global Infrastructure Net Index	-7.9
Hedge funds	2022		50% MSCI World Net/50% Barclays US Aggregate	-15.3
	2021		50% MSCI World Net/50% Barclays US Aggregate	8.5
	2020		50% MSCI World Net/50% Barclays US Aggregate	11.9
	2019	1.0	50% MSCI World Net/50% Barclays US Aggregate	18.2
	2018	1.0	50% MSCI World Net/50% Barclays US Aggregate	-6.4
Global TAA	2022		50% MSCI World Net/50% Barclays US Aggregate	-15.3

Appendix A - Data Summary: Policy Weights and Benchmarks

South Carolina Retirement System Investment Commission

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Asset Class	Year	Policy Weight	Benchmark	
			Description	Return
	2021		50% MSCI World Net/50% Barclays US Aggregate	8.5
	2020		50% MSCI World Net/50% Barclays US Aggregate	11.9
	2019	7.0	50% MSCI World Net/50% Barclays US Aggregate	18.2
	2018	7.0	50% MSCI World Net/50% Barclays US Aggregate	-6.4
Private equity - Diversified	2022	9.0	Burgiss ALL PE Universe	-3.4
	2021	9.0	Burgiss ALL PE Universe	50.5
	2020	7.6	Burgiss ALL PE Universe	17.1
	2019	6.2	80% Russell 3000 / 20% MSCI EAFE Lagged + 300 Bps	5.1
	2018	7.0	80% Russell 3000 / 20% MSCI EAFE Lagged + 300 Bps	17.5
Private credit	2022	7.0	S&P/LSTA + 150 Bps 3 Month Lag	-1.0
	2021	7.0	S&P/LSTA + 150 Bps 3 Month Lag	9.9
	2020	7.0	S&P/LSTA + 150 Bps 3 Month Lag	2.6
	2019	6.6	S&P/LSTA + 150 Bps 3 Month Lag	4.6
	2018	5.8	S&P/LSTA + 150 Bps 3 Month Lag	6.7

Appendix A Data Summary - Assets, Returns and Costs: Public Market

South Carolina Retirement System Investment Commission

Asset Class/Style	Year	Asset (\$millions)	Net Return %	Cost (\$000)				Cost (bps)				
				Internal & Other	Base Fees	Perf Fees	Total	Internal & Other	Base Fees	Perf Fees	Total	
Stock - U.S. broad/all	External passive	2022										
		2021										
	External active	2020	803.9		211.5	87.6		299.1	2.6	1.1		3.7
		2022										
		2021	835.3		179.0	-	-	179.0	2.1	-	-	2.1
		2020	956.6	-11.66	251.7	2,887.9	-	3,139.6	2.6	30.2	-	32.8
2019	2,792.7	19.62	779.2	11,857.7		12,636.9	2.8	42.5		45.2		
2018	2,724.9	-7.90	822.9	10,281.2		11,104.1	3.0	37.7		40.8		
Stock - U.S. small cap	External passive	2022	1,059.4	-17.14	243.2	582.5		825.7	2.3	5.5		7.8
		2021	1,192.8	19.39	255.7	490.5		746.2	2.1	4.1		6.3
	2020	618.0		162.6	327.0		489.6	2.6	5.3		7.9	
Stock - EAFE	External passive	2022	694.4	-20.00	161.0	242.9		403.9	2.3	3.5		5.8
		2021	1,228.6	11.45	263.3	217.8		481.1	2.1	1.8		3.9
	2020	629.6		165.7	191.5		357.2	2.6	3.0		5.7	
Stock - Emerging	External passive	2022										
		2021										
	External active	2020	551.4		145.1	148.2		293.3	2.6	2.7		5.3
		2022										
		2021	228.0	-18.00	52.1	153.8		205.9	2.3	6.7		9.0
		2020	650.7	17.99	139.5	131.7		271.2	2.1	2.0		4.2
2020	1,401.2	11.45	368.7	3,978.8	-	4,347.4	2.6	28.4	-	31.0		
2019	1,973.6	18.75	518.7	5,554.0		6,072.7	2.6	28.1		30.8		
2018	1,813.7	-16.64	547.7	9,331.5		9,879.2	3.0	51.4		54.5		
Stock - Global	External passive	2022	13,733.3	-18.10	2,978.7	2,332.1		5,310.8	2.2	1.7		3.9
		2021	14,365.6	18.89	3,078.9	2,082.0		5,160.9	2.1	1.4		3.6
		2020	6,209.9	16.43	1,634.0	994.8		2,628.8	2.6	1.6		4.2
		2019	2,549.9	27.84	664.8	533.5		1,198.3	2.6	2.1		4.7
		2018	2,324.8	-7.93	702.0	503.1		1,205.1	3.0	2.2		5.2
	External active	2022										
		2021	6.7	-7.36	1.4	-	-	1.4	2.1	-	-	2.1
		2020	1,108.4	50.73	291.7	2,656.7	-	2,948.4	2.6	24.0	-	26.6
		2019	2,908.7	25.74	797.1	5,484.9		6,281.9	2.7	18.9		21.6
2018	2,787.4	-9.95	841.7	5,525.4		6,367.1	3.0	19.8		22.8		
Stock - ACWI x U.S.	External active	2022										
		2021	2.3	-9.49	0.5	-	-	0.5	2.1	-	-	2.1
		2020	305.8	-28.21	80.5	1,387.8	-	1,468.3	2.6	45.4	-	48.0
		2019	1,079.8	23.36	302.5	3,878.3		4,180.8	2.8	35.9		38.7
		2018	1,057.7	-18.55		4,696.7		4,696.7		44.4		44.4
Fixed income - U.S.	Internal active	2022	12.6	-0.20	2.8			2.8	2.2			2.2
		2021	15.6	3.47	5.2			5.2	3.3			3.3
		2020	19.9	5.53	5.8			5.8	2.9			2.9
		2019	24.1	7.34	9.5			9.5	3.9			3.9
		2018	31.3	3.81	9.9			9.9	3.2			3.2
	External active	2022	559.1	-12.37	96.7	1,283.0	-	1,379.7	1.7	22.9	-	24.7
		2021	867.7	4.06	286.9	960.3	-	1,247.2	3.3	11.1	-	14.4
		2020	722.5	10.33	190.1	1,578.4	-	1,768.5	2.6	21.8	-	24.5
		2019	741.2	8.66	240.0	1,782.5		2,022.4	3.2	24.0		27.3
2018	839.1	-0.56	253.4	1,533.1		1,786.5	3.0	18.3		21.3		
Fixed income - Emerging	External active	2022	58.3	-9.60	12.6	135.6	-	148.2	2.2	23.3	-	25.4
		2021	327.9	-3.82	70.3	172.0	-	242.3	2.1	5.2	-	7.4
		2020	908.0	1.10	238.9	3,391.0	-	3,630.0	2.6	37.3	-	40.0
		2019	1,158.4	13.23	416.6	4,987.5		5,404.0	3.6	43.1		46.7
		2018	1,456.7	-6.63	439.9	5,667.3		6,107.2	3.0	38.9		41.9
Fixed income - High yield	External active	2022	1,250.0	-4.40	288.4	5,197.4	-	5,485.8	2.3	41.6	-	43.9
		2021	1,547.1	5.28	331.6	4,831.4	-	5,163.0	2.1	31.2	-	33.4
		2020	1,381.0	4.00	363.4	5,601.2	-	5,964.6	2.6	40.6	-	43.2
		2019	1,286.8	7.27	426.8	5,730.9		6,157.7	3.3	44.5		47.9
		2018	1,492.5	0.48	450.7	5,395.8		5,846.5	3.0	36.2		39.2

Appendix A Data Summary - Assets, Returns and Costs: Public Market

South Carolina Retirement System Investment Commission

Asset Class/Style	Year	Asset (\$millions)	Net Return %	Cost (\$000)				Cost (bps)				
				Internal & Other	Base Fees	Perf Fees	Total	Internal & Other	Base Fees	Perf Fees	Total	
Cash	Internal active	2022	564.7	2.10	181.2			181.2	3.2			3.2
		2021	1,162.4	0.09	339.9			339.9	2.9			2.9
	External active	2020	1,904.0	3.06	426.1			426.1	2.2			2.2
		2019	1,407.4	1.71	447.1			447.1	3.2			3.2
		2022	465.1	-0.70	79.7	59.1	-	138.8	1.7	1.3	-	3.0
		2021	1,075.0	-0.11	230.4	57.6	-	288.0	2.1	0.5	-	2.7
		2020	963.5	-1.25	253.5	187.4	-	441.0	2.6	1.9	-	4.6
		2019	496.8	1.56	194.9	-		194.9	3.9	-		3.9
	2018	681.5	0.11	205.8	705.4		911.2	3.0	10.4		13.4	
	REITs	External active	2022	352.9	-22.50	86.1	1,200.2	-	1,286.3	2.4	34.0	-
2021			409.8	44.09	87.8	933.4	-	1,021.2	2.1	22.8	-	24.9
2020			461.3	-1.28	121.4	1,529.9	-	1,651.3	2.6	33.2	-	35.8
2019			520.3	27.01	224.2	1,777.4	-	2,001.6	4.3	34.2	-	38.5
2018			784.0	-5.20	236.8	1,758.8	-	1,995.5	3.0	22.4	-	25.5
Global TAA	External active	2022	665.3	12.30	199.8	8,806.4	33,819.8	42,826.0	3.0	132.4	508.3	643.7
		2021	628.4	1.18	134.7	6,326.6	6,725.1	13,186.4	2.1	100.7	107.0	209.8
		2020	1,276.9	-7.46	336.0	2,638.1	-	2,974.1	2.6	20.7	-	23.3
		2019	2,663.6	20.28	758.2	4,389.9	-	5,148.1	2.8	16.5	-	19.3
		2018	2,931.3	-6.93	885.2	6,444.9	4,503.4	11,833.4	3.0	22.0	15.4	40.4

Appendix A Data Summary - Assets, Returns and Costs: Hedge Funds and Private Market

South Carolina Retirement System Investment Commission
(Default costs are highlighted with blue shading. See page 10 for more details)

Asset Class/Style	Year	Asset (\$millions)	Fee basis (\$millions)	Net Return %	Cost (\$000)							
					Internal & Other	Base Fees	Perf Fees	Underlying fees		Total		
								Base	Perf	excl. perf	incl. perf	
Hedge funds	External active	2022	2,316.9		11.90	541.9	50,756.2	115,307.6			51,298.1	166,605.7
		2021	1,644.7		15.41	352.5	36,125.1	70,862.8			36,477.6	107,340.4
		2020	1,759.4		2.90	462.9	32,516.3	3,325.9			32,979.2	36,305.1
		2019	1,971.9		2.74	561.3	34,167.6	16,939.2			34,728.9	51,668.1
		2018	1,907.4		6.56	576.0	21,960.4	21,962.8			22,536.4	44,499.2
	Fund of funds	2022	2,075.0		8.90	469.2	7,705.9	-	18,724.7	21,698.8	26,899.9	48,598.7
		2021	2,469.7		10.99	529.3	9,122.0	-	24,699.0	41,162.9	34,350.3	75,513.2
		2020	1,431.9		16.18	376.8	7,695.3	-	8,003.9	6,619.3	16,076.0	22,695.2
		2019	1,246.9		7.08	426.5	6,605.4	-	7,015.7	6,783.0	14,047.7	20,830.6
		2018	1,491.6		-2.70	450.4	3,065.0	1,012.9	10,487.3	4,708.5	14,002.7	19,724.2
Real estate ex-REITs	Co-investment	2022	100.0	89.6	23.80	27.4	381.1	2,008.9			408.5	2,417.4
		2021	62.3	88.4	16.48	13.4	323.1	527.8			336.5	864.3
		2020	20.6	20.6	-0.03	5.4	148.0	364.5			153.5	518.0
		2019	0.6	0.6	28.63	0.4	-	-			0.4	0.4
		2018	1.5	1.5	-59.67	0.5	-	-			0.5	0.5
	LP	2022	3,819.8	3,198.9	15.30	847.7	28,979.6	27,796.6			29,827.3	57,623.9
		2021	2,942.1	3,078.7	24.42	630.6	27,597.6	111,619.5			28,228.2	139,847.7
		2020	2,313.8	2,441.1	0.42	608.8	23,031.4	12,173.9			23,640.2	35,814.1
		2019	2,358.7	2,830.7	5.64	547.5	27,103.6	15,690.9			27,651.1	43,342.0
		2018	1,914.6	1,965.5	9.93	578.2	19,266.4	16,742.4			19,844.5	36,586.9
Infrastructure	External active	2022	356.0	350.0	7.96	86.2	3,073.1	2,465.0			3,159.3	5,624.3
		2021	1,024.0	1,271.3	12.75	219.5	6,631.0	5,891.0			6,850.5	12,741.5
		2020	916.1	1,231.5	0.37	241.0	6,997.5	1,377.0			7,238.5	8,615.5
		2019	830.0	1,110.1	26.51	236.3	4,081.9	-			4,318.2	4,318.2
		2018	631.2	831.2	-6.65	190.6	2,898.4	-			3,089.0	3,089.0
	Co-investment	2022	182.3	192.3	2.00	48.2	372.1	(490.6)			420.3	(70.3)
		2021	83.2	85.8	9.41	17.8	180.0	488.0			197.8	685.8
		2020	35.2	35.2	3.19	9.3	78.1	2.3			87.4	89.7
	LP	2022	720.1	1,078.1	0.75	171.1	11,150.7	17,794.3			11,321.8	29,116.0
	Private equity - Diversified	Co-investment	2022	2,002.8	1,942.2	8.20	518.0	4,462.4	18,321.2			4,980.4
2021			1,292.8	1,726.7	39.01	277.1	2,118.0	15,383.2			2,395.1	17,778.3
2020			727.0	727.0	8.22	229.3	960.3	892.5			1,189.5	2,082.0
2019			550.2	550.2	12.89	156.6	2,945.9	3,620.1			3,102.5	6,722.6
2018			396.7	396.7	-29.24	119.8	3,263.9				3,383.7	3,383.7
LP		2022	2,783.2	3,627.6	5.80	679.4	57,539.4	(2,608.8)			58,218.8	55,610.0
		2021	2,133.3	3,420.9	47.37	457.2	54,587.1	101,809.3			55,044.3	156,853.6
		2020	1,047.0	2,479.9	2.36	277.7	39,267.3	18,736.3			39,544.9	58,281.3
		2019	1,344.7	2,143.2	6.32	382.8	33,292.1	55,870.5			33,674.8	89,545.3
		2018	1,474.3	1,841.1	13.35	445.2	27,451.1	19,305.3			27,896.3	47,201.6
Fund of funds		2022	813.9	723.2	0.50	199.7	3,912.4	(8,325.4)	11,136.8	13,022.4	15,248.9	19,945.9
		2021	482.1	527.8	82.95	103.3	3,430.2	23,019.2	8,127.5	12,052.0	11,661.0	46,732.2
		2020	329.9	506.5	18.62	84.6	4,578.8	9,723.6	7,951.3	6,334.8	12,614.7	28,673.1
		2019	401.0	245.0	5.37	114.2	2,994.6	1,084.5	3,846.8	7,418.7	6,955.6	15,458.7
		2018	473.3	428.2	15.66	142.9	1,374.8	-	3,499.5	4,158.9	5,017.3	9,176.2
Private credit	Co-investment	2022	1,275.0	691.7	3.80	352.9	5,227.7	3,713.3			5,580.6	9,293.9
		2021	548.6	634.9	20.97	117.6	1,331.0	(1,335.7)			1,448.6	112.9
		2020	296.7	296.7	1.78	40.1	2,426.6	485.6			2,466.7	2,952.3
		2019	46.2	46.2	-1.66	13.1	-	-			13.1	13.1
		2018	0.3	0.3	18.65	0.1	0.0				0.1	0.1
	LP	2022	2,502.1	3,704.8	4.21	550.6	24,852.5	14,167.8			25,403.1	39,570.9

Appendix A Data Summary - Assets, Returns and Costs: Hedge Funds and Private Market

South Carolina Retirement System Investment Commission
(Default costs are highlighted with blue shading. See page 10 for more details)

Asset Class/Style	Year	Asset (\$millions)	Fee basis (\$millions)	Net Return %	Cost (\$000)						
					Internal & Other	Base Fees	Perf Fees	Underlying fees		Total	
								Base	Perf	excl. perf	incl. perf
LP (cont'd)	2021	2,634.5	3,588.2	19.31	564.7	19,788.4	28,099.9			20,353.1	48,452.9
	2020	2,199.1	3,998.9	-0.72	578.6	26,915.1	909.2			27,493.7	28,402.9
	2019	1,963.2	4,096.7	6.60	558.8	29,748.3	9,198.2			30,307.2	39,505.3
	2018	1,836.9	2,569.5	3.29	554.7	18,768.9	12,110.3			19,323.6	31,433.9

1. External Active' style is alternatively named 'Fund (Evergreen, Core)' on the survey. This category typically includes core funds having perpetual or undefined lifetimes and operated by an external manager who invests in opportunities where a large part of expected return is income or yield. They are often described as core or core+ investments. Include funds-of-one and separately managed accounts (SMAs) if they are operated by an external manager.

2. LP' style is alternatively named 'Fund (LP, Value Add)' on the survey. This category typically includes value-add or opportunistic funds having a pre-defined term and a GP/LP structure. Typically, the investment period is less than 12 years. They are operated by an external manager who invests in opportunities where a large part of the expected return is capital gains due to repositioning or redevelopment.

Appendix A Data Summary - Costs in bps: Hedge Funds and Private Market

South Carolina Retirement System Investment Commission
(Default costs are highlighted with blue shading. See page 10 for more details)

Asset Class/Style	Year	Cost on NAV (bps)							Cost on fee basis (bps)								
		Internal & Other	Base Fees	Perf Fees	Underlying fees		Total		Internal & Other	Base Fees	Perf Fees	Underlying fees		Total			
					Base	Perf	excl. perf	incl. perf				Base	Perf	excl. perf	incl. perf		
Hedge funds	External active	2022	2.3	219.1	497.7				221.4	719.1	2.3	219.1	497.7			221.4	719.1
		2021	2.1	219.6	430.9				221.8	652.6	2.1	219.6	430.9			221.8	652.6
		2020	2.6	184.8	18.9				187.5	206.4	2.6	184.8	18.9			187.5	206.4
		2019	2.8	173.3	85.9				176.1	262.0	2.8	173.3	85.9			176.1	262.0
		2018	3.0	115.1	115.1				118.2	233.3	3.0	115.1	115.1			118.2	233.3
	Fund of funds	2022	2.3	37.1	-	90.2	104.6	129.6	234.2	2.3	37.1	-	90.2	104.6	129.6	234.2	
		2021	2.1	36.9	-	100.0	166.7	139.1	305.8	2.1	36.9	-	100.0	166.7	139.1	305.8	
		2020	2.6	53.7	-	55.9	46.2	112.3	158.5	2.6	53.7	-	55.9	46.2	112.3	158.5	
		2019	3.4	53.0	-	56.3	54.4	112.7	167.1	3.4	53.0	-	56.3	54.4	112.7	167.1	
		2018	3.0	20.5	6.8	70.3	31.6	93.9	132.2	3.0	20.5	6.8	70.3	31.6	93.9	132.2	
Real estate ex-REITs	Co-investment	2022	2.7	38.1	200.9			40.9	241.7	3.1	42.5	224.1			45.6	269.7	
		2021	2.1	51.8	84.7			54.0	138.7	1.5	36.5	59.7			38.1	97.7	
		2020	2.6	71.8	176.7			74.4	251.1	2.6	71.8	176.7			74.4	251.1	
		2019	7.3	-	-			7.3	7.3	7.3	-	-			7.3	7.3	
		2018	3.0	-	-			3.0	3.0	3.0	-	-			3.0	3.0	
	LP	2022	2.2	75.9	72.8			78.1	150.9	2.6	90.6	86.9			93.2	180.1	
		2021	2.1	93.8	379.4			95.9	475.3	2.0	89.6	362.6			91.7	454.3	
		2020	2.6	99.5	52.6			102.2	154.8	2.5	94.3	49.9			96.8	146.7	
		2019	2.3	114.9	66.5			117.2	183.8	1.9	95.7	55.4			97.7	153.1	
		2018	3.0	100.6	87.4			103.7	191.1	2.9	98.0	85.2			101.0	186.1	
Infrastructure	External active	2022	2.4	86.3	69.2			88.8	158.0	2.5	87.8	70.4			90.3	160.7	
		2021	2.1	64.8	57.5			66.9	124.4	1.7	52.2	46.3			53.9	100.2	
		2020	2.6	76.4	15.0			79.0	94.0	2.0	56.8	11.2			58.8	70.0	
		2019	2.8	49.2	-			52.0	52.0	2.1	36.8	-			38.9	38.9	
		2018	3.0	45.9	-			48.9	48.9	2.3	34.9	-			37.2	37.2	
	Co-investment	2022	2.6	20.4	(26.9)			23.1	(3.9)	2.5	19.4	(25.5)			21.9	(3.7)	
		2021	2.1	21.6	58.7			23.8	82.5	2.1	21.0	56.9			23.1	79.9	
		2020	2.6	22.2	0.7			24.8	25.5	2.6	22.2	0.7			24.8	25.5	
	LP	2022	2.4	154.9	247.1			157.2	404.4	1.6	103.4	165.0			105.0	270.1	
	Private equity - Diversified	Co-investment	2022	2.6	22.3	91.5			24.9	116.3	2.7	23.0	94.3			25.6	120.0
2021			2.1	16.4	119.0			18.5	137.5	1.6	12.3	89.1			13.9	103.0	
2020			3.2	13.2	12.3			16.4	28.6	3.2	13.2	12.3			16.4	28.6	
2019			2.8	53.5	65.8			56.4	122.2	2.8	53.5	65.8			56.4	122.2	
2018			3.0	82.3				85.3	85.3	3.0	82.3				85.3	85.3	
LP		2022	2.4	206.7	(9.4)			209.2	199.8	1.9	158.6	(7.2)			160.5	153.3	
		2021	2.1	255.9	477.2			258.0	735.3	1.3	159.6	297.6			160.9	458.5	
		2020	2.7	375.1	179.0			377.7	556.7	1.1	158.3	75.6			159.5	235.0	
		2019	2.8	247.6	415.5			250.4	665.9	1.8	155.3	260.7			157.1	417.8	
		2018	3.0	186.2	130.9			189.2	320.2	2.4	149.1	104.9			151.5	256.4	
Fund of funds		2022	2.5	48.1	(102.3)	136.8	160.0	187.4	245.1	2.8	54.1	(115.1)	154.0	180.1	210.9	275.8	
		2021	2.1	71.2	477.5	168.6	250.0	241.9	969.4	2.0	65.0	436.2	154.0	228.4	221.0	885.5	
		2020	2.6	138.8	294.7	241.0	192.0	382.3	869.0	1.7	90.4	192.0	157.0	125.1	249.1	566.2	
		2019	2.8	74.7	27.0	95.9	185.0	173.5	385.5	4.7	122.2	44.3	157.0	302.8	283.9	630.9	
		2018	3.0	29.0	-	73.9	87.9	106.0	193.9	3.3	32.1	-	81.7	97.1	117.2	214.3	
Private credit	Co-investment	2022	2.8	41.0	29.1			43.8	72.9	5.1	75.6	53.7			80.7	134.4	
		2021	2.1	24.3	(24.3)			26.4	2.1	1.9	21.0	(21.0)			22.8	1.8	
		2020	1.4	81.8	16.4			83.2	99.5	1.4	81.8	16.4			83.2	99.5	
		2019	2.8	-	-			2.8	2.8	2.8	-	-			2.8	2.8	
		2018	2.8	0.4				3.2	3.2	2.8	0.4				3.2	3.2	
	LP	2022	2.2	99.3	56.6			101.5	158.2	1.5	67.1	38.2			68.6	106.8	

Appendix A Data Summary - Costs in bps: Hedge Funds and Private Market

South Carolina Retirement System Investment Commission
 (Default costs are highlighted with blue shading. See page 10 for more details)

Asset Class/Style	Year	Cost on NAV (bps)						Cost on fee basis (bps)					
		Internal & Other	Base Fees	Perf Fees	Underlying fees Base	Perf	Total excl. perf incl. perf	Internal & Other	Base Fees	Perf Fees	Underlying fees Base	Perf	Total excl. perf incl. perf
LP (cont'd)	2021	2.1	75.1	106.7			77.3 183.9	1.6	55.1	78.3			56.7 135.0
	2020	2.6	122.4	4.1			125.0 129.2	1.4	67.3	2.3			68.8 71.0
	2019	2.8	151.5	46.9			154.4 201.2	1.4	72.6	22.5			74.0 96.4
	2018	3.0	102.2	65.9			105.2 171.1	2.2	73.0	47.1			75.2 122.3

Appendix A - Data Summary: Oversight, Custodial and Other Costs

South Carolina Retirement System Investment Commission

Oversight, Custodial and Other Costs			
		000s	bps
Oversight of the fund assets ¹	2022	1,348.5	0.3bp
	2021	1,237.9	0.3bp
	2020	1,198.5	0.4bp
	2019	1,236.7	0.4bp
	2018	1,251.1	0.4bp
Custodial total	2022	1,187.4	0.3bp
	2021	1,394.3	0.4bp
	2020	1,394.3	0.4bp
	2019	1,670.0	0.5bp
	2018	1,152.4	0.4bp
Custodial foreign (if available)	2018	692.4	0.2bp
Custodial domestic (if available)	2018	460.0	0.1bp
Consulting / performance measurement	2022	1,252.9	0.3bp
	2021	835.0	0.2bp
	2020	785.7	0.2bp
	2019	825.1	0.3bp
	2018	763.7	0.2bp
Audit	2022	278.1	0.1bp
	2021	237.7	0.1bp
	2020	409.3	0.1bp
	2019	119.7	0.0bp
	2018	102.4	0.0bp
Other (legal etc)	2022	357.4	0.1bp
	2021	382.2	0.1bp
	2020	373.3	0.1bp
	2019	357.3	0.1bp
	2018	363.2	0.1bp
Total	2022	4,424.2	1.1bp
	2021	4,087.1	1.0bp
	2020	4,161.1	1.3bp
	2019	4,208.9	1.3bp
	2018	3,632.7	1.2bp

Summary of All Asset Management Costs			
		000s	bps
Investment Management Costs	2022	429,072.4	109.7bp
	2021	338,130.0	86.7bp
	2020	206,413.4	65.6bp
	2019	231,056.6	73.1bp
	2018	205,925.8	65.9bp
Oversight, Custodial & Other Costs	2022	4,424.2	1.1bp
	2021	4,087.1	1.0bp
	2020	4,161.1	1.3bp
	2019	4,208.9	1.3bp
	2018	3,632.7	1.2bp
Total	2022	433,496.6	110.8bp
	2021	342,217.1	87.8bp
	2020	210,574.4	66.9bp
	2019	235,265.5	74.4bp
	2018	209,558.6	67.0bp

1. Oversight includes the salaries and benefits of executives and their staff responsible for overseeing the entire fund or multiple asset classes and the fees / salaries of the board or investment committee. All costs associated with the above including fees / salaries, travel, director's insurance and attributed overhead should be included.

Appendix A - Data Summary: Overlays

South Carolina Retirement System Investment Commission

Overlays		Internal					External								
		Notional amount (mils)	Market value (mils)	Profit/Loss (000s)	Cost (000s)	% of Notion. (bps)	Duration (years)	Notional amount (mils)	Market value (mils)	Profit/Loss (000s)	Base fees (000s)	Perf. fees (000s)	Over-sight (000s)	Total (000s)	% of Notion. (bps)
Rebalancing/	2022						6,142.5	527.9		928.0			175.9	1,103.9	1.8
Passive Beta	2021						6,010.4	514.5		657.5			110.3	767.8	1.3

Appendix A - Data Summary: Comments and defaults

As discussed with you during the data confirmation process, the following defaults and footnotes are applicable to your data:

- 2022 - Real estate ex-REITs - LP: LP base fee is the weighted average management fee of 91 bps per the partnership level detail provided by you. This replaces the cost on the main survey of 115 bps (36.7 million).
- 2022 - Infrastructure - LP: LP base fee is the weighted average management fee of 103 bps per the partnership level detail provided by you. This replaces the cost on the main survey of 59 bps (6.4 million).
- 2022 - Private equity - Diversified - LP: LP base fee is the weighted average management fee of 159 bps per the partnership level detail provided by you. This replaces the cost on the main survey of 101 bps (36.6 million).
- 2022 - Private equity - Diversified - FoFs: A default of 154 bps (on amount fees are based on) was applied to the fund of funds underlying base fee to enable comparisons of the total cost of different implementation styles.
- 2022 - Private equity - Diversified - FoFs: A default of 160 bps (on NAV) was applied to the fund of funds underlying performance fee to enable comparisons of the total cost of different implementation styles. This default is not included in your total fund cost or in benchmark analysis.
- 2022 - Private credit - LP: LP base fee is the weighted average management fee of 67 bps per the partnership level detail provided by you. This replaces the cost on the main survey of 71 bps (26.4 million).
- 2021 - Real estate ex-REITs - LP: LP base fee is the weighted average management fee of 90 bps per the partnership level detail provided by you. This replaces the cost on the main survey of 104 bps (32.1 million).
- 2021 - Private equity - Diversified - LP: LP base fee is the weighted average management fee of 160 bps per the partnership level detail provided by you. This replaces the cost on the main survey of 93 bps (31.9 million).
- 2021 - Private equity - Diversified - FoFs: A default of 154 bps (on amount fees are based on) was applied to the fund of funds underlying base fee to enable comparisons of the total cost of different implementation styles.
- 2021 - Private equity - Diversified - FoFs: A default of 250 bps (on NAV) was applied to the fund of funds underlying performance fee to enable comparisons of the total cost of different implementation styles. This default is not included in your total fund cost or in benchmark analysis.
- 2021 - Private credit - LP: LP base fee is the weighted average management fee of 55 bps per the partnership level detail provided by you. This replaces the cost on the main survey of 64 bps (23 million).
- 2020 - Real estate ex-REITs - LP: LP base fee is the weighted average management fee of 94 bps per the partnership level detail provided by you. This replaces the cost on the main survey of 106 bps (25.8 million).
- 2020 - Private equity - Diversified - LP: LP base fee is the weighted average management fee of 158 bps per the partnership level detail provided by you. This replaces the cost on the main survey of 102 bps (25.2 million).
- 2020 - Private equity - Diversified - FoFs: A default of 157 bps (on amount fees are based on) was applied to the fund of funds underlying base fee to enable comparisons of the total cost of different implementation styles.
- 2020 - Private equity - Diversified - FoFs: A default of 192 bps (on NAV) was applied to the fund of funds underlying performance fee to enable comparisons of the total cost of different implementation styles. This default is not included in your total fund cost or in benchmark analysis.
- 2020 - Private credit - LP: LP base fee is the weighted average management fee of 67 bps per the partnership level detail provided by you. This replaces the cost on the main survey of 55 bps (22.2 million).
- 2019 - Real estate ex-REITs - LP: LP base fee is the weighted average management fee of 96 bps per the partnership level detail provided by you. This replaces the cost on the main survey of 84 bps (23.8 million).
- 2019 - Private equity - Diversified - LP: LP base fee is the weighted average management fee of 155 bps per the partnership level detail provided by you. This replaces the cost on the main survey of 88 bps (18.9 million).
- 2019 - Private equity - Diversified - FoFs: A default of 157 bps (on amount fees are based on) was applied to the fund of funds underlying base fee to enable comparisons of the total cost of different implementation styles.

- 2019 - Private equity - Diversified - FoFs: A default of 185 bps (on NAV) was applied to the fund of funds underlying performance fee to enable comparisons of the total cost of different implementation styles. This default is not included in your total fund cost or in benchmark analysis.
- 2019 - Private credit - LP: LP base fee is the weighted average management fee of 73 bps per the partnership level detail provided by you. This replaces the cost on the main survey of 41 bps (16.9 million).
- 2018 - Real estate ex-REITs - LP: LP base fee is the weighted average management fee of 98 bps per the partnership level detail provided by you. This replaces the cost on the main survey of 87 bps (17.2 million).
- 2018 - Private equity - Diversified - LP: LP base fee is the weighted average management fee of 149 bps per the partnership level detail provided by you. This replaces the cost on the main survey of 102 bps (18.8 million).
- 2018 - Private credit - LP: LP base fee is the weighted average management fee of 73 bps per the partnership level detail provided by you. This replaces the cost on the main survey of 72 bps (18.5 million).

Appendix B - Data quality

The value of the information contained in these reports is only as good as the quality of the data received. CEM's procedures for checking and improving the data include the following.

Improved survey clarity

Twenty years of feedback from survey participants has led to improved definitions and survey clarity. In addition to immediate feedback from participants, CEM has hosted user workshops to solicit additional feedback and to resolve issues, such as trade-offs between more information and effort on the part of participants.

Computer and desktop verification

Survey responses are compared to norms for the survey universe and to each sponsor's prior year data when available. This typically results in questions generated by our online survey engine as well as additional follow-up to clarify responses or with additional questions.

In addition to these procedures, data quality continues to improve for the following reasons:

Learning curve

This is CEM's 32nd year of gathering this data and experience is teaching the firm and the participants how to do a better job.

Growing universe

As our universe of respondents continues to increase in size, so does our confidence in the results as unbiased errors tend to average themselves out.

Any suggestions on how to further improve data quality are welcome.

Currency Conversions

For reports where either the peer group or report universe includes funds from multiple countries, we have converted the returns back to the base currency of the fund we prepared the report for. For example, for a Euro zone fund with peers from the U.S. we converted U.S. returns to Euro based on the currency return for the year using December 31 spot rates.

Appendix C - Glossary of terms

Average cost

- Calculated by dividing actual annual costs by the average of beginning and end-of-year holdings. If beginning-of-year holdings are not available, they are estimated using end-of-year holdings before the effect of this year's return on investment.

Benchmark return

- Rate of return on a portfolio of investable assets (such as the S&P500) designated as the benchmark portfolio against which the fund measures its own performance for that asset class.

F statistics

- Measure of the statistical significance of the regression coefficients taken as a group. Generally, regression equations with 5 coefficients and sample sizes greater than 20 are statistically significant if its F statistic is greater than 3.

Global TAA

- Fully funded segregated asset pool dedicated to active asset allocation.

Impact coefficient

- Estimate of the impact on the dependent variable in a regression of a change in the value of a given explanatory variable

Level of significance

- Degree to which sample data explains the universe from which they are extracted.

N-year peers

- Subset of peer group that have participated in our study for at least the consecutive n years.

Oversight of the fund

- Resources devoted to the oversight of the fund.

Overlay

- Derivative based program (unfunded other than margin requirements), designed to enhance total portfolio return (such as a tactical asset allocation program) or to achieve some specific mandate such as currency hedging.

Passive proportion

- Proportion of assets managed passively, i.e., indexed to broad capital market benchmarks or dedicated to replicate market benchmarks.

Policy mix

- Reflects long-term policy or target asset weights. Policy asset mix is often established by a fund's investment committee or board and is determined by such long term considerations as liability structure, risk tolerance and long term capital markets prospects.

Policy return

- The return you would have earned if you had passively implemented your policy mix decision through your benchmark portfolios. Your policy return equals the sum of your policy weights multiplied by your asset class benchmarks for each asset class.

R squared (coefficient of determination)

- The percentage of the differences in the dependent variable explained by the regression equation. For example, an R squared of 1 means 100% of the differences are explained and an R squared of 0 means that none of the differences are explained.

Value added

- the difference between your total actual return and your policy return. It is a measure of actual value produced over what could have been earned passively.