

**Investment**  
**Cost Effectiveness Analysis**  
(for the 10-year period ending December 31, 2018)

**Norwegian Government Pension Fund**  
**Global**



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Prepared January 24, 2020. Although the information in this report has been based upon and obtained from sources we believe to be reliable, CEM Benchmarking Inc. ("CEM") does not guarantee its accuracy or completeness. The information contained herein is proprietary and confidential and may not be disclosed to third parties without the express written mutual consent of both CEM and Norwegian Government Pension Fund Global.

# Key takeaways

## Returns

- All returns have been converted using the GPFG currency basket. However, differences in total returns reflect in large part home-market biases and the relative performance of currencies. So they are not the primary focus of this report.
- Your 10-year net total return was 8.3%. This was below the Global median of 9.1% and below the peer median of 8.9%.
- Your 10-year policy return was 7.7%. This was below the Global median of 8.9% and below the peer median of 9.2%.

## Value added

- Your 10-year net value added was 0.5%. This was above the Global median of 0.3% and above the peer median of 0.1%.

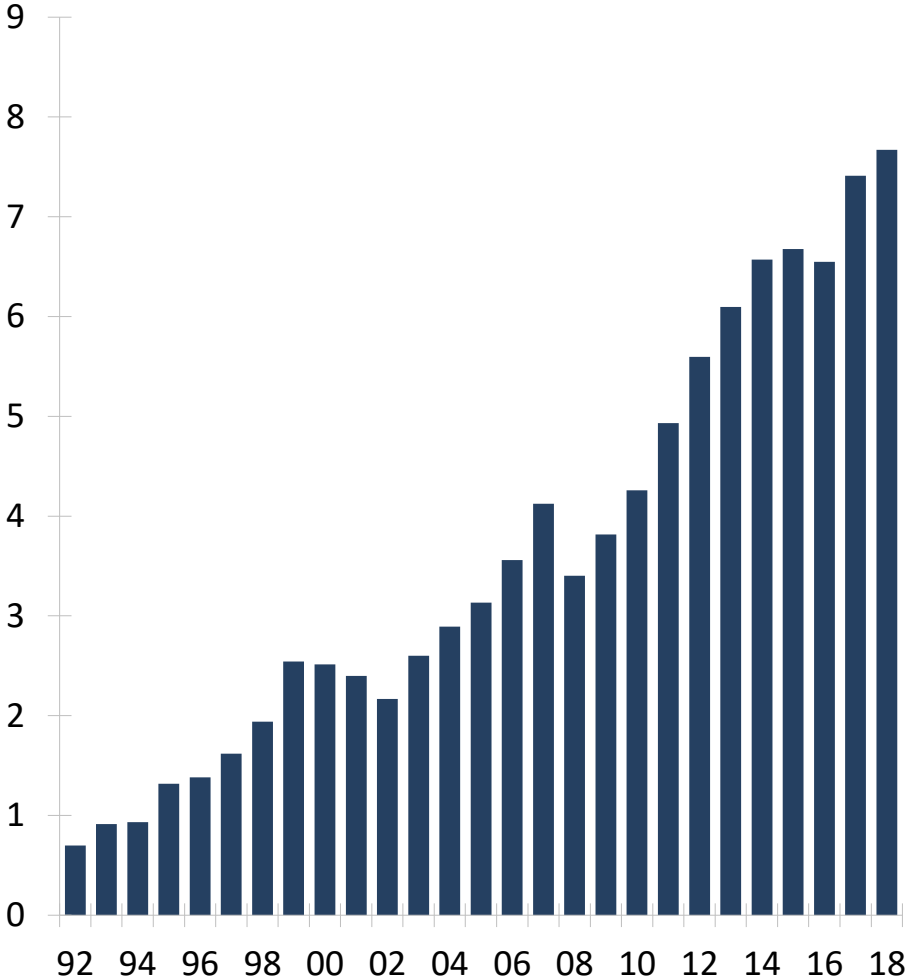
## Cost

- Your investment cost in 2018 of 5.6 bps was below your benchmark cost of 19.7 bps. This suggests that your fund was low cost compared to your peers.
- Your fund was low cost because you had a lower cost implementation style and you paid less than peers for similar services.
- Your 10-year performance placed in the positive value added, low cost quadrant of the cost effectiveness chart.

# This benchmarking report compares your cost and return performance to the 332 funds in CEM's extensive pension database.

- 167 U.S. pension funds participate. The median U.S. fund had assets of €6.2 billion and the average U.S. fund had assets of €17.4 billion. Total participating U.S. assets were €2.9 trillion.
- 78 Canadian funds participate with assets totaling €1.1 trillion.
- 78 European funds participate with aggregate assets of €2.5 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 €738.9 billion. Included are funds from Australia, New Zealand, China and South Korea.
- 2 Gulf region funds participate.

Participating assets (€ trillions)





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

### Peer group for Norwegian Government Pension Fund Global

- 10 largest Global sponsors from €109.2 billion to €425.3 billion
  - Median size of €189.9 billion versus your €872.0 billion
- 2 Canadian funds, 2 European funds, 2 Asia-Pacific funds and 4 U.S. funds make up the Global peer group.
- In the report there are also comparisons to CEM's Global database of participants.

## Your 10-year net total return of 8.3% was below the peer median of 8.9%.

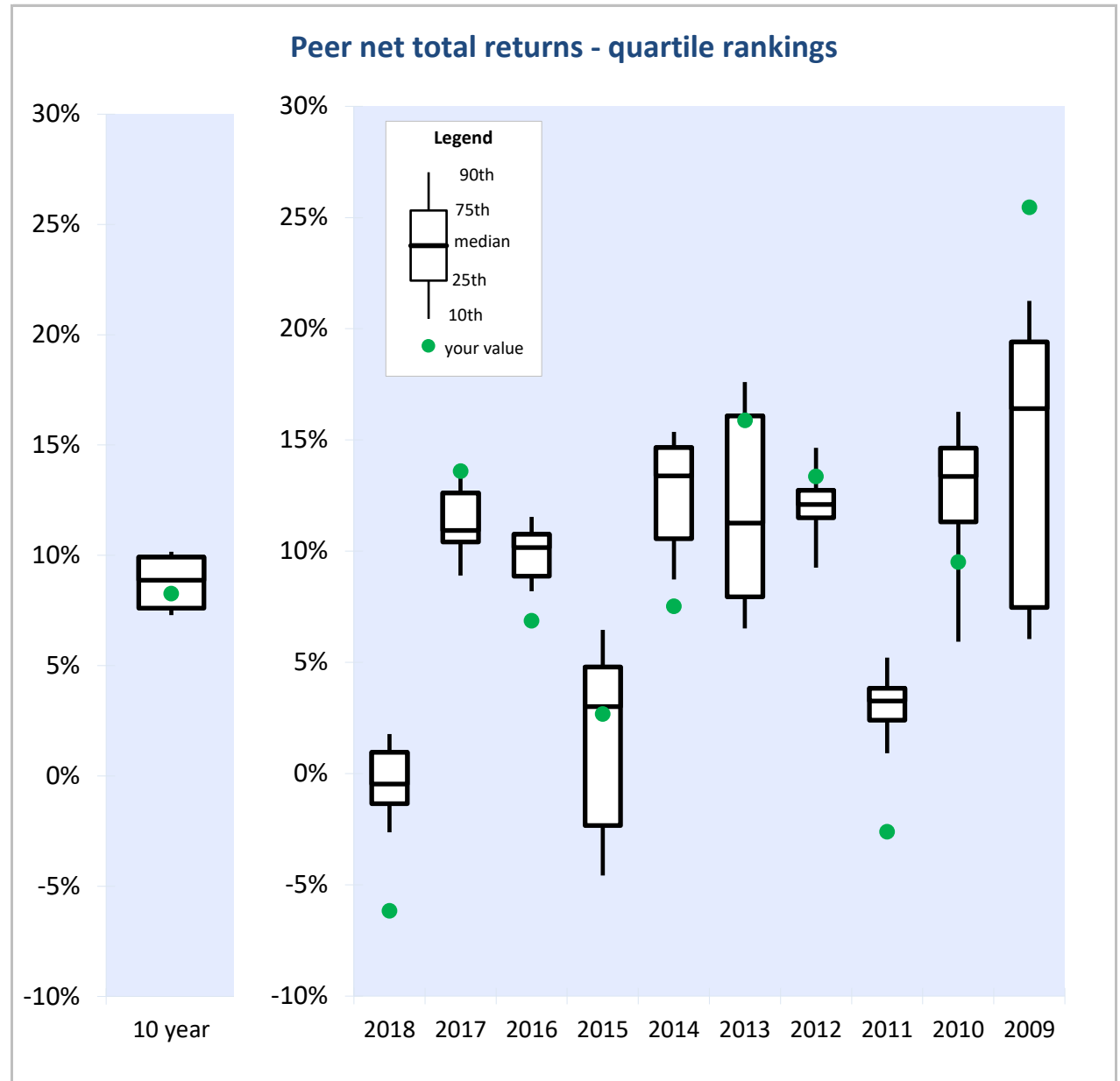
Total returns, by themselves, provide little insight into the reasons behind relative performance. Therefore, we separate total return into its more meaningful components: policy return and value

	Your 10-year
Net total fund return	8.3%
- Policy return	7.7%
= Net value added	0.5%

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

Actual and policy returns have been converted to your currency using unhedged currency returns.

The fund return consists of Equity, Fixed Income and Real Estate. The fund benchmark is the weighted benchmark of Equity and Fixed Income. The benchmark for Real Estate used in the report prior to 2017 was the actual portfolio return, and thereafter the financing cost for the real estate investments.



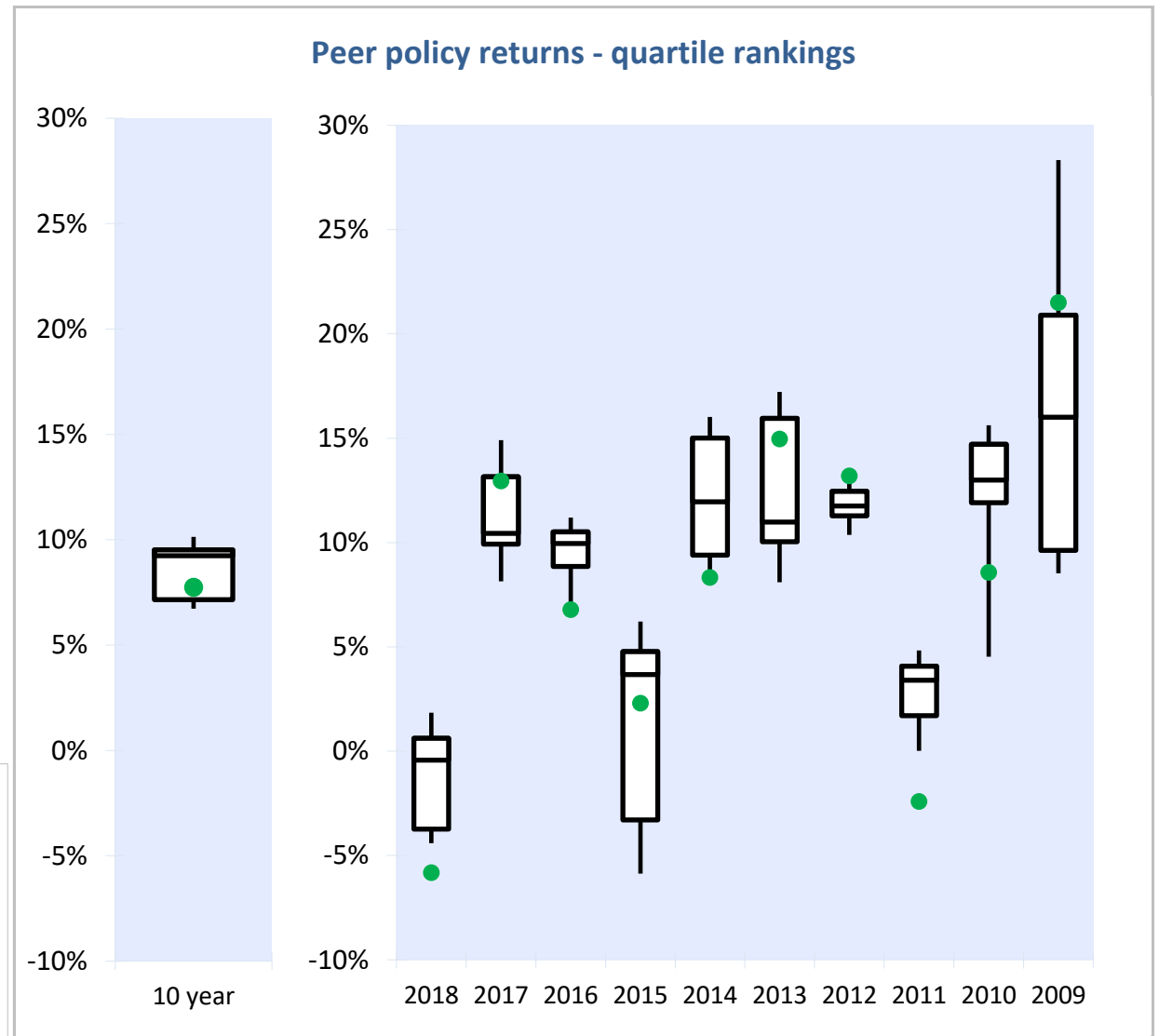
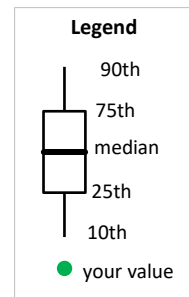
## Your 10-year policy return of 7.7% was below the peer median of 9.2%.

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 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.



## Your 10-year average policy asset mix compares to the Peer and Global funds as follows.

- Your fund has no allocation to real assets, hedge funds or private equity whereas the peer funds had average allocations of 12%, 3%, and 7% respectively. The Global funds' average allocations were 9%, 4% and 5%. The manager however can invest up to 7% in unlisted real estate.
- Your policy asset mix is more globally diversified than the average Peer or Global fund.

### 10-year average policy mix<sup>1</sup>

	Your Fund	Peer Avg.	Global Avg.
Stock	62%	46%	46%
Fixed Income	37%	33%	36%
Hedge Funds	0%	3%	4%
Real Assets	1%	12%	9%
Private Equity	0%	7%	5%
Total	100%	100%	100%

Regional allocations can significantly influence the policy return. GPFG's overweight in European securities and the peer group's overweight in North American securities would cause a difference in the policy returns. Variations in the fixed income portfolios, such as duration, credit quality and country allocation within regions would have an impact as well. Not being invested in asset classes like private equity and having a lower allocation to real estate also had an impact on GPFG's policy return.

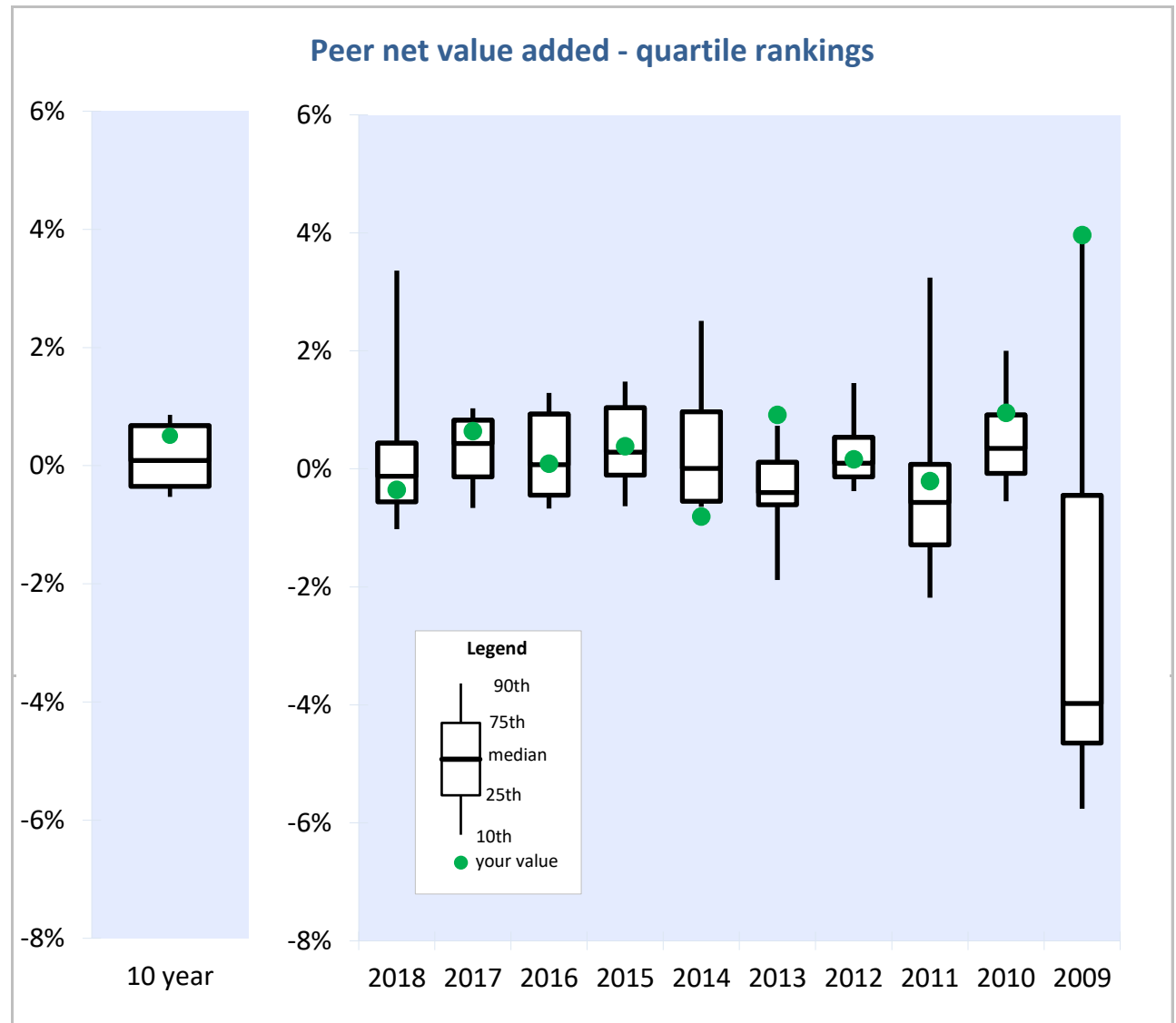
## Net value added is the component of total return from active management. Your 10-year net value added was 0.5%.

Net value added equals total net return minus policy return.

### Value added for Norwegian Government Pension Fund Global

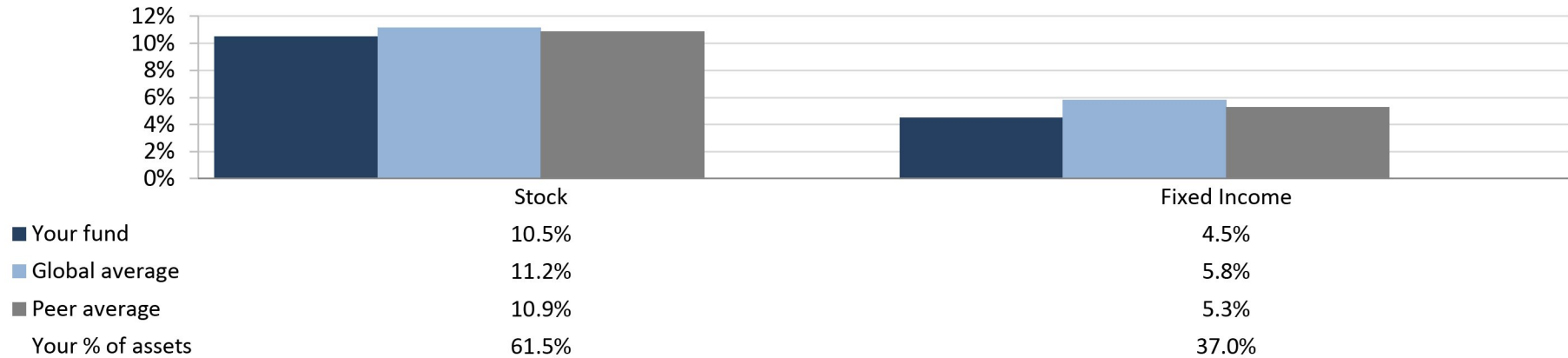
Year	Net Return	Policy Return	Net value Added
2018	-6.2%	-5.8%	-0.4%
2017	13.6%	13.0%	0.6%
2016	6.9%	6.8%	0.1%
2015	2.7%	2.3%	0.4%
2014	7.5%	8.3%	-0.8%
2013	15.9%	15.0%	0.9%
2012	13.4%	13.2%	0.2%
2011	-2.6%	-2.4%	-0.2%
2010	9.5%	8.6%	0.9%
2009	25.5%	21.5%	4.0%
10-Year	8.3%	7.7%	0.5%

Your 10-year net value added of 0.5% compares to a median of 0.1% for your peers and 0.3% for the Global universe.

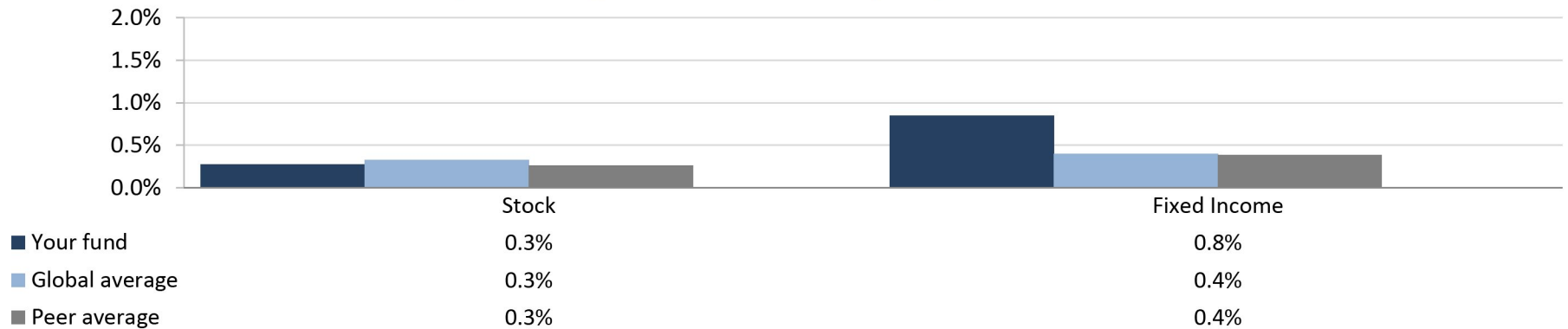


# Comparisons of your 10-year net return and net value added by major asset class:

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



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



## Your investment costs were €484.4 million or 5.6 basis points in 2018.

Asset management costs by asset class and style (€000s)	Internal Mgmt		External Mgmt		Total	
	Active	Overseeing of external	Active base fees	Perform. fees <sup>1</sup>		
Stock - U.S.		39	816		855	
Stock - EAFE		1,203	18,307	8,043	27,553	
Stock - Emerging		4,030	56,220	62,008	122,257	
Stock - Global	104,260				104,260	
Fixed Income - Global	42,087				42,087	
REITs	2,013				2,013	
Real Estate <sup>1</sup>	50,360				50,360	
Total excluding private asset performance fees					349,386	4.0bp
<b>Oversight, custodial and other costs <sup>2</sup></b>						
Oversight of the fund					76,723	
Trustee & custodial					39,045	
Consulting and performance measurement					14,930	
Audit					4,358	
Other					0	
Total oversight, custodial & other costs					135,056	1.5bp
Total investment costs (excl. transaction costs & private asset performance fees)					484,442	5.6bp

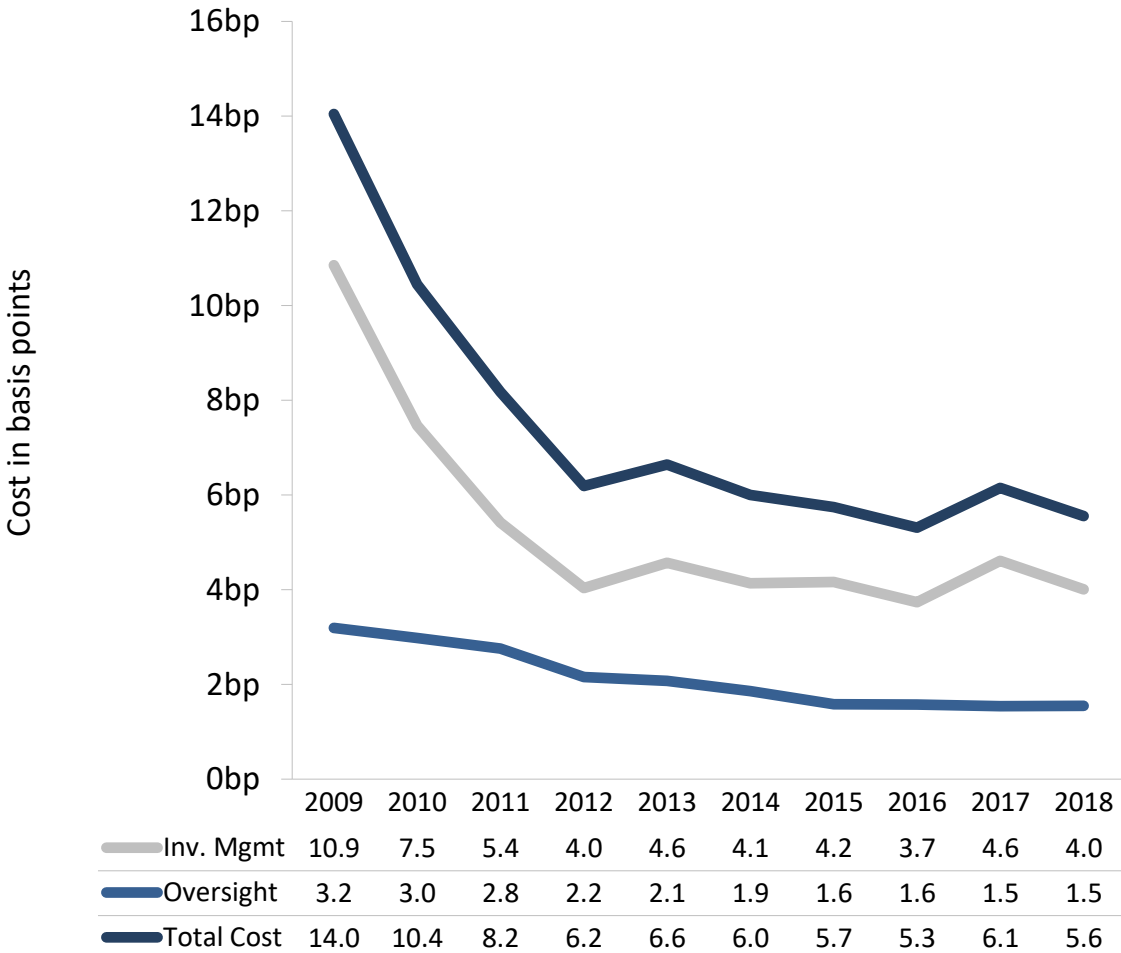
### Footnotes

1. Total cost excludes carry/performance fees for real estate. Performance fees are included for the public market asset classes.
2. Excludes non-investment costs, such as benefit insurance premiums and preparing cheques for retirees.

# Your costs decreased between 2009 and 2018.

Your costs decreased primarily because you increased your use of lower cost internal management from 86% to 96% in 2018.

Trend in your investment costs



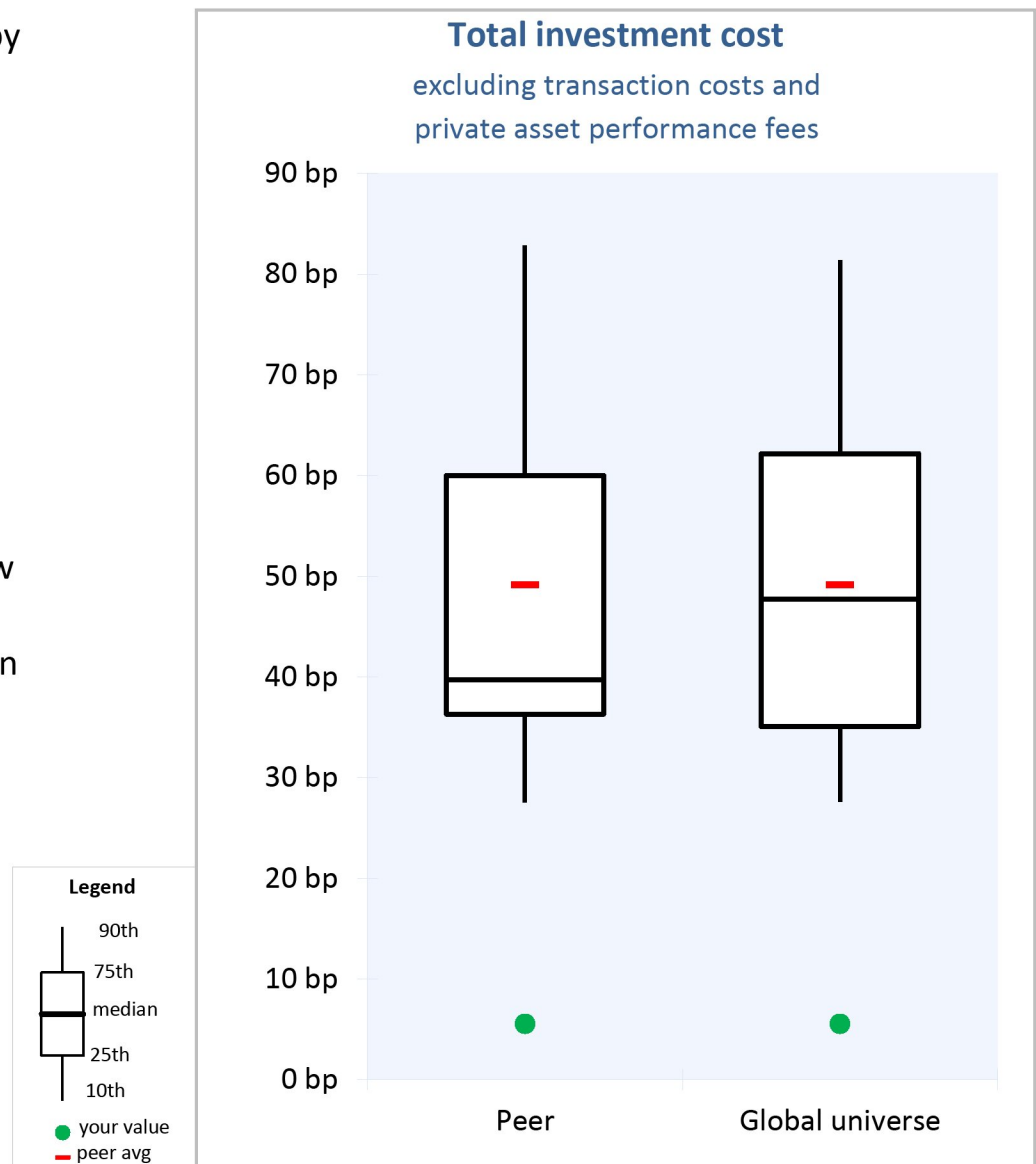


## Your total investment cost in 2018 of 5.6 bps was the lowest of the peers and was substantially below the peer median of 39.7 bps.

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

- Asset mix, particularly holdings of the highest cost asset classes: real estate (excl. REITS), infrastructure, hedge funds and private equity. These high cost assets equaled 3% of your funds assets at the end of 2018 versus a peer average of 26%.
- 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 14.1 basis points in 2018.

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 5.6 bp was below your benchmark cost of 19.7 bp. Thus, your cost savings were 14.1 bp.

### Your cost versus benchmark

	€000s	basis points
Your total investment cost	484,442	5.6 bp
Your benchmark cost	1,715,475	19.7 bp
Your excess cost	(1,231,033)	(14.1) bp

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

### Reasons for your low cost status

	Excess Cost/ (Savings)	
	€000s	bps
1. Lower cost implementation style	(814,845)	(9.3)
2. Paying less than peers for similar services		
• External investment management costs	(30,486)	(0.3)
• Internal investment management costs	(346,683)	(4.0)
• Oversight, custodial & other costs	(39,019)	(0.4)
	<u>(416,188)</u>	<u>(4.8)</u>
<b>Total savings</b>	<b>(1,231,033)</b>	<b>(14.1)</b>

## Alternative benchmark cost

	Average holdings in €mils	GPFG cost in bps	Cost comparison with median peer across all management styles (bps)			Cost comparison with median peer with similar management style (bps)		
			Benchmark cost	Difference to benchmark cost	Contribution to total cost difference	Benchmark cost	Difference to benchmark cost	Contribution to total cost difference
<b>External asset management</b>								
Stock - U.S.	283	30.2	8.9	(21.3)	(0.0)	29.7	(0.5)	(0.0)
Stock - EAFE	8,758	31.5	22.0	(9.5)	(0.1)	38.0	6.6	0.1
Stock - Emerging	29,349	41.7	32.1	(9.6)	(0.3)	50.1	8.4	0.3
<b>Internal asset management</b>								
Stock - Global	538,129	1.9	17.2	15.3	9.4	7.1	5.1	3.2
Fixed Income - Global	264,501	1.6	8.8	7.2	2.2	3.7	2.1	0.6
REITs	7,937	2.5	10.0	7.5	0.1	5.9	3.4	0.0
Real Estate ex-REITs	23,008	21.9	81.6	59.7	1.6	27.1	5.2	0.1
<b>Total, excl. Overlays and overhead</b>		<b>4.0</b>	<b>16.8</b>		<b>12.8</b>	<b>8.3</b>		<b>4.3</b>
Overlay programs	871,966	0.0	0.8	0.8	0.8	0.8	0.8	0.8
Overhead	871,966	1.5	2.0	0.4	0.4	2.0	0.4	0.4
<b>Total</b>	<b>871,966</b>	<b>5.6</b>	<b>19.7</b>		<b>14.1</b>	<b>11.2</b>		<b>5.6</b>

Notes:

Internal Global stock uses All stock as the benchmark.

Internal Global fixed income uses All fixed income as the benchmark.

## High-level estimate of management costs incurred if GPFG were managed passively

	Average holdings in €mils	Current cost in bps	Benchmark target cost in bps
<b><i>External asset management</i></b>			
Stock - U.S.	283	30.2	0.8
Stock - EAFE	8,758	31.5	1.7
Stock - Emerging	29,349	41.7	3.7
<b><i>Internal asset management</i></b>			
Stock - Global	538,129	1.9	1.5
Fixed Income - Global	264,501	1.6	1.1
<b>Total, excl. Overlays and overhead</b>		<b>4.0</b>	<b>1.4</b>
REITs	7,937	2.5	1.4
Real Estate ex-REITs	23,008	21.9	1.4
Overhead	871,966	1.5	1.5
<b>Total</b>	<b>871,966</b>	<b>5.6</b>	<b>2.9</b>

### Notes:

Internal passive asset class costs at the first quartile are used for the benchmark proxies for the externally managed assets.

Internal Global stock uses All stock as the benchmark.

Internal Global fixed income uses All fixed income as the benchmark.

Real estate and REITs use the weighted average benchmark for stock and fixed income.

The benchmark result needs to be interpreted with caution since the value is very low and based on a limited number of observations.

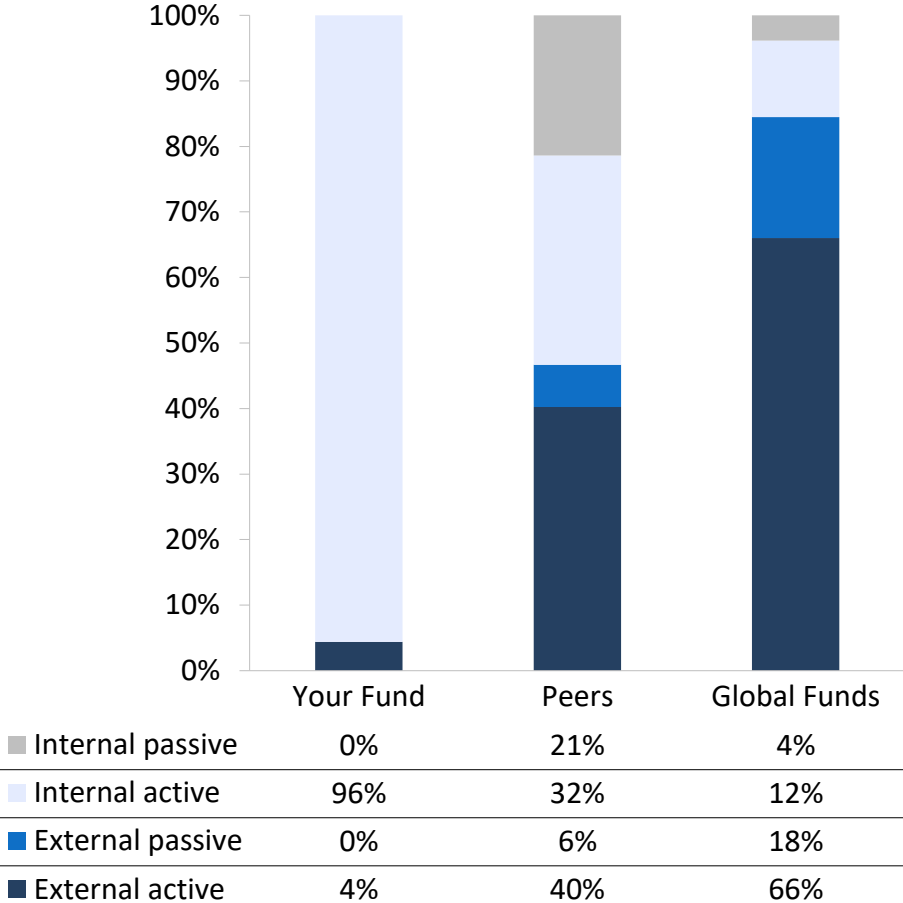
# Differences in cost performance are often caused by differences in implementation style.

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

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

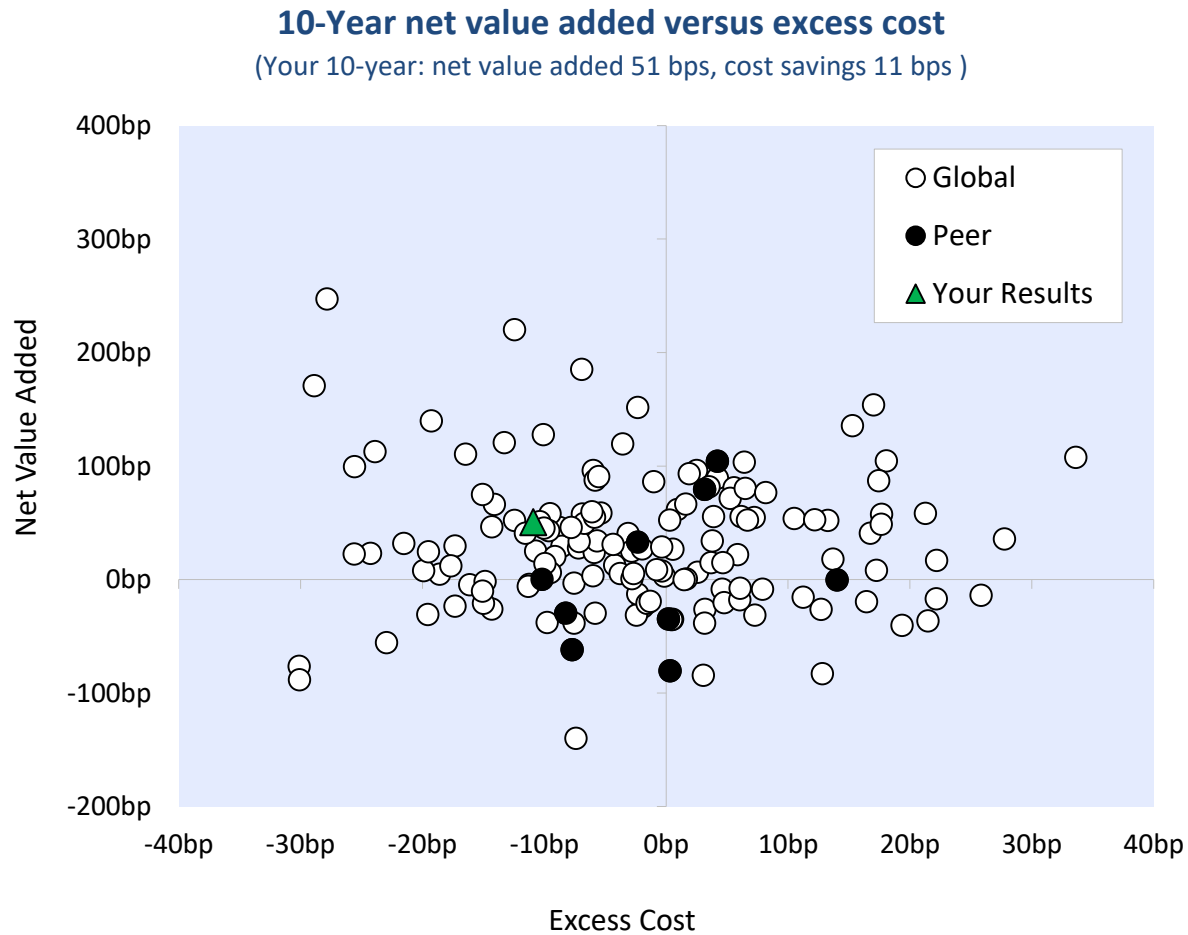
- External active management because it tends to be much more expensive than internal or passive management. You used less external active management than your peers (your 4% versus 40% for your peers).
- Within external active holdings, fund of funds usage because it is more expensive than direct fund investment. You had less in fund of funds. Your 0% of hedge funds, real estate and private equity in fund of funds compared to 8% for your peers.

Implementation style<sup>1</sup>



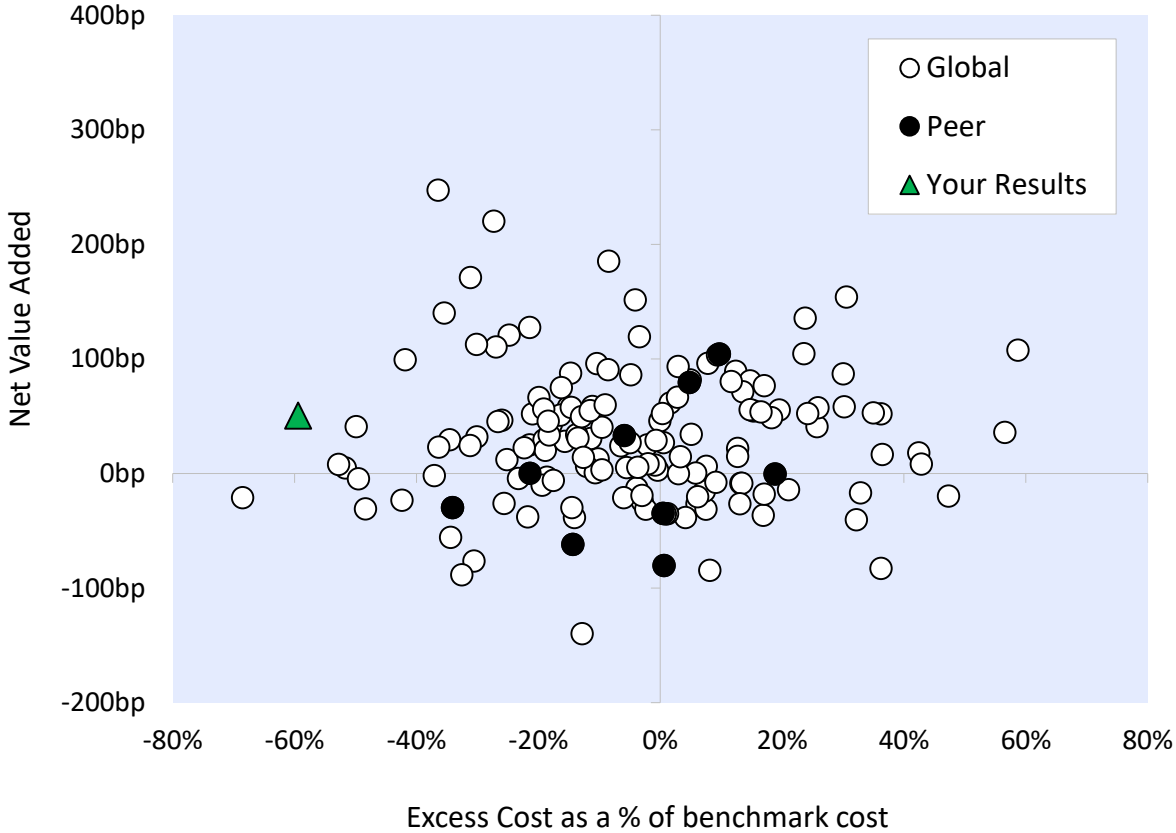
1. The graph above does not take into consideration the impact of derivatives. The values in the graph above are calculated using average holdings.

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



# 10-year Excess cost as a % of benchmark cost versus Net value added

10-year excess cost as a % of BM cost vs. net value added





# 2

## Description of peer group and universe

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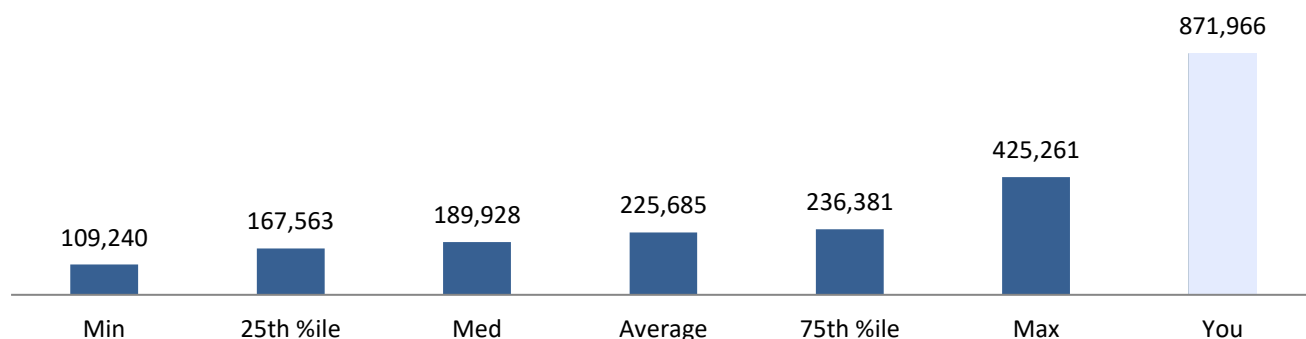
## Peer group

Your peer group is comprised of 10 Global funds, with assets ranging from €109.2 billion to €425.3 billion versus your €872.0 billion. The median size is €189.9 billion.

### Peer Group Characteristics - 2018

	Your Plan	Peers	Global average
<u>Plan Assets (\$ billions)</u>			
Range	872.0	109.2 - 425.3	0.0 - 872.0
Median		189.9	5.2
<u># of Plans</u>			
Corporate		0	145
Public	1	8	140
Other		2	47
Total		10	332
<u>Implementation style</u>			
% External active	4.4	40.2	66.0
% External passive	0.0	6.4	18.5
% Internal active	95.6	31.9	11.7
% Internal passive	0.0	21.4	3.8
<u>Asset mix</u>			
% Stock	66.1	40.5	39.5
% Fixed Income	30.3	27.2	38.7
% Real Assets	3.5	15.3	9.9
% Private Equity	0.0	9.4	4.7
% Hedge Funds & Other	0.0	5.2	5.4

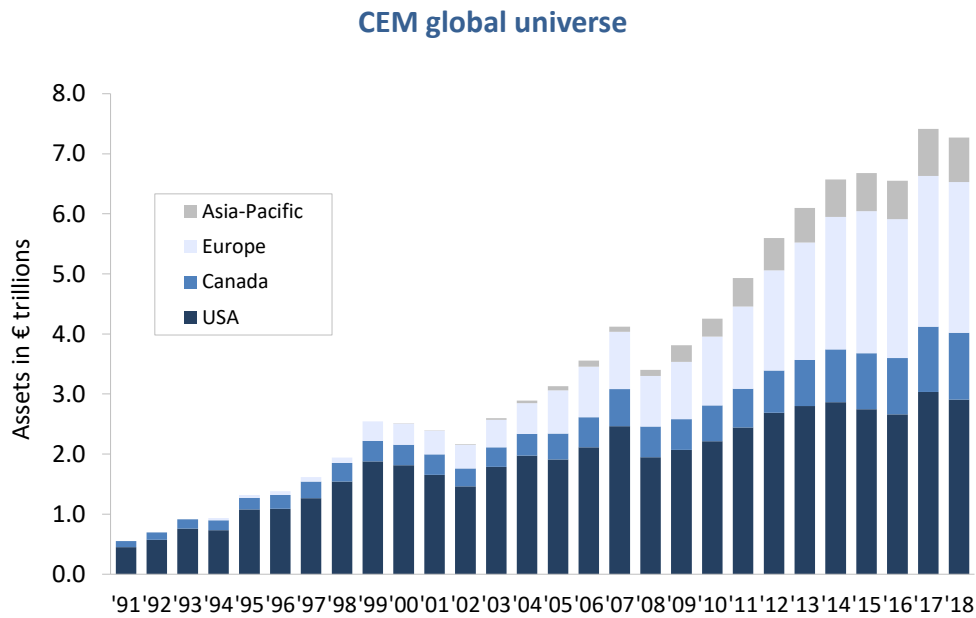
### Total fund assets (€ millions) - you versus peers



## CEM global universe

CEM has been providing investment benchmarking solutions since 1991. The 2018 survey universe is comprised of 332 funds representing €7.3 trillion in assets. The breakdown by region is as follows:

- 167 U.S. pension funds with aggregate assets of €2.9 trillion.
- 78 Canadian pension funds with aggregate assets of €1.1 trillion.
- 78 European pension funds with aggregate assets of €2.5 trillion. Included are funds from the Netherlands, Norway, Sweden, Finland, Denmark, UK, and Ireland.
- 7 Asia-Pacific pension funds with aggregate assets of €0.7 trillion.



## Universe subsets

CEM's global survey universe is comprised of 332 funds with total assets of €7.3 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 10 Global funds ranging in size from €109.2 - €425.3 billion. The peer median of €189.9 billion compares to your €872.0 billion.
- Global - The global universe is comprised of 332 funds ranging in size from €0.0 - €872.0 billion. The median fund is €5.2 billion.

### Universe subsets by number of funds and assets

	Peer group <sup>1</sup>	Global by type				Global by Country				
		Corp.	Public	Other	Total	U.S.	Canada	Europe	Asia-Pacific	Total
<b># of funds</b>										
2018	10	145	140	47	332	167	78	78	9	332
2017	10	151	152	48	351	168	79	91	13	351
2016	10	154	143	48	345	170	80	83	12	345
2015	10	161	146	55	362	176	80	93	13	362
2014	10	164	206	55	425	178	89	145	13	425
2013	10	185	200	63	448	193	90	153	12	448
2012	10	188	204	58	450	203	89	144	14	450
2011	10	195	115	67	377	204	89	70	14	377
2010	9	180	120	48	348	206	95	38	9	348
2009	9	177	115	45	337	208	93	27	9	337
<b># of funds with uninterrupted data for:</b>										
1 yr	10	145	140	47	332	167	78	78	9	332
2 yrs	10	132	132	40	304	152	69	75	8	304
3 yrs	10	120	125	38	283	141	64	71	7	283
4 yrs	10	109	118	35	262	132	55	68	7	262
5 yrs	10	101	118	34	253	128	53	65	7	253
6 yrs	10	95	114	32	241	119	51	64	7	241
7 yrs	10	87	109	28	224	114	49	55	6	224
8 yrs	10	83	73	27	183	111	45	21	6	183
9 yrs	9	77	68	22	167	102	45	16	4	167
10 yrs	9	74	63	21	158	96	44	14	4	158
<b>Total assets (€ billions)</b>										
2018	2,257	1,091	4,834	1,364	7,289	2,908	1,110	2,513	757	7,289
2017	2,256	1,138	5,009	1,500	7,648	3,037	1,082	2,512	1,016	7,648
2016	1,954	1,078	4,279	1,380	6,737	2,661	939	2,314	823	6,737
2015	1,935	1,100	4,455	1,404	6,958	2,746	935	2,364	914	6,958
2014	1,872	1,162	4,373	1,286	6,822	2,866	879	2,203	873	6,822
2013	1,705	1,104	4,051	1,156	6,311	2,802	765	1,956	788	6,311
2012	1,573	1,094	3,795	854	5,744	2,687	707	1,665	685	5,744
2011	1,366	1,074	3,223	763	5,060	2,442	644	1,368	605	5,060
2010	1,202	939	2,723	627	4,290	2,215	598	1,142	335	4,290
2009	1,083	858	2,342	616	3,815	2,071	512	952	281	3,815
<b>2018 asset distribution (€ billions)</b>										
Avg	225.7	7.5	34.5	29.0	22.0	17.4	14.2	32.2	84.2	22.0
Max	425.3	50.8	872.0	425.3	872.0	243.6	214.7	872.0	411.5	872.0
75th %ile	236.4	9.7	27.9	26.0	16.4	17.6	7.4	22.8	69.2	16.4
Median	189.9	3.3	7.5	6.4	5.2	6.2	3.0	6.3	23.0	5.2
25th %ile	167.6	1.4	2.5	1.6	1.8	1.8	1.1	2.7	11.4	1.8
Min	109.2	0.2	0.1	0.0	0.0	0.2	0.0	0.4	2.2	0.0

1. Peer group statistics are for your 2018 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 - 2018 (as a % of year-end assets)

	Your fund <sup>1</sup>	Peer group	Global by type				Global by Country				
			Corp.	Public	Other	Total	U.S.	Canada	Europe	Asia-Pacific	Total
<b>Implementation style</b>											
External Active	4.4	38.5	69.3	57.3	62.7	63.3	70.0	64.7	49.7	45.2	63.3
Fund of funds	0.0	1.7	2.5	2.9	2.8	2.7	2.7	1.8	3.8	2.1	2.7
External passive	0.0	6.4	18.6	18.3	18.3	18.5	18.8	10.5	25.3	21.0	18.5
Internal Active	95.6	31.9	7.2	16.3	11.8	11.7	5.1	18.3	18.3	19.2	11.7
Internal Passive	<u>0.0</u>	<u>21.4</u>	<u>2.4</u>	<u>5.2</u>	<u>4.4</u>	<u>3.8</u>	<u>3.5</u>	<u>4.6</u>	<u>2.8</u>	<u>12.5</u>	<u>3.8</u>
Total	100	100	100	100	100	100	100	100	100	100	100
<b>Actual asset mix</b>											
Stock	66.1	40.5	31.7	46.6	42.5	39.5	37.1	40.4	43.1	46.6	39.5
Fixed Income	30.3	27.3	51.7	27.0	34.7	38.9	42.3	35.9	35.8	28.1	38.9
Global TAA	0.0	0.3	0.8	1.5	0.1	1.0	1.1	0.6	1.2	0.3	1.0
Real Assets	3.5	15.3	6.5	12.5	12.6	9.9	7.2	14.8	10.3	13.3	9.9
Hedge Funds	0.0	3.8	3.7	3.2	2.2	3.3	4.4	2.2	1.9	3.8	3.3
Balanced Funds	0.0	0.0	0.0	0.9	0.0	0.4	0.0	0.0	1.6	0.0	0.4
Risk Parity	0.0	1.0	0.4	0.5	0.6	0.5	0.8	0.2	0.1	0.9	0.5
Private Credit	0.0	2.4	1.4	1.7	3.5	1.8	1.2	2.3	2.6	1.3	1.8
Private Equity	<u>0.0</u>	<u>9.4</u>	<u>3.7</u>	<u>6.1</u>	<u>3.7</u>	<u>4.7</u>	<u>5.9</u>	<u>3.5</u>	<u>3.3</u>	<u>5.6</u>	<u>4.7</u>
Total	100	100	100	100	100	100	100	100	100	100	100
<b>Policy asset mix</b>											
Stock	67.3	44.7	32.3	47.7	43.2	40.3	38.4	40.5	43.0	51.6	40.3
Fixed Income	32.7	28.6	51.3	26.7	34.3	38.5	41.2	36.7	36.0	27.1	38.5
Global TAA	0.0	0.1	0.8	1.6	0.1	1.0	1.0	0.9	1.2	0.2	1.0
Real Assets	0.0	14.0	6.6	12.9	12.5	10.1	7.5	14.7	10.8	12.2	10.1
Hedge funds	0.0	3.0	3.5	2.8	2.5	3.0	4.2	1.9	1.9	2.7	3.0
Balanced Funds	0.0	0.0	0.0	0.4	0.0	0.2	0.0	0.0	0.7	0.0	0.2
Risk Parity	0.0	1.0	0.3	0.4	0.7	0.4	0.6	0.2	0.2	1.0	0.4
Private Credit	0.0	1.0	1.3	1.8	3.1	1.8	1.1	2.2	2.7	1.1	1.8
Private Equity	<u>0.0</u>	<u>7.5</u>	<u>3.9</u>	<u>5.8</u>	<u>3.6</u>	<u>4.7</u>	<u>6.0</u>	<u>3.1</u>	<u>3.5</u>	<u>4.1</u>	<u>4.7</u>
Total	100	100	100	100	100	100	100	100	100	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.

## Implementation style, actual mix and policy mix trends

### Implementation style, actual mix and policy mix - 2014 to 2018 (as a % of year-end assets)

	Your fund <sup>1</sup>					Peer average <sup>2</sup>					Global average <sup>2</sup>				
	2018	2017	2016	2015	2014	2018	2017	2016	2015	2014	2018	2017	2016	2015	2014
<b>Implementation style</b>															
External active	4.4	4.8	4.3	4.1	4.1	37.3	36.4	36.5	36.1	34.3	63.3	62.5	62.1	62.3	62.1
Fund of funds	0.0	0.0	0.0	0.0	0.0	1.6	2.0	2.1	2.0	2.4	2.3	2.3	2.5	2.6	2.5
External passive	0.0	0.0	0.0	0.0	0.0	5.6	5.6	5.0	5.8	6.9	15.9	16.6	16.9	17.0	17.3
Internal active	95.6	95.2	95.7	95.9	95.9	33.1	33.5	34.5	33.7	34.0	13.7	13.7	13.5	13.0	12.9
Internal passive	<u>0.0</u>	<u>0.0</u>	<u>0.0</u>	<u>0.0</u>	<u>0.0</u>	<u>22.3</u>	<u>22.6</u>	<u>21.8</u>	<u>22.3</u>	<u>22.5</u>	<u>4.9</u>	<u>4.8</u>	<u>5.0</u>	<u>5.0</u>	<u>5.3</u>
Total	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
<b>Actual asset mix</b>															
Stock	66.1	65.0	60.3	61.9	61.2	40.0	42.0	40.1	41.0	41.7	37.7	41.4	41.4	42.5	43.7
Fixed income	30.3	32.5	36.6	35.4	37.4	28.7	29.2	30.5	30.6	32.1	38.9	37.0	36.9	36.4	36.9
Global TAA	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	1.0	0.8	1.2	1.4	1.4
Real assets	3.5	2.5	3.1	2.7	1.4	15.5	14.6	14.9	13.9	12.8	10.6	9.8	9.8	9.1	8.3
Hedge funds	0.0	0.0	0.0	0.0	0.0	3.5	3.5	3.2	3.6	2.5	3.7	3.7	4.0	4.1	3.7
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	0.6	0.5	0.5	0.2	0.1	0.4	0.5	0.2	0.2	0.3
Private credit	0.0	0.0	0.0	0.0	0.0	2.4	1.6	2.1	2.1	2.0	1.6	1.3	1.1	0.8	0.8
Private equity	<u>0.0</u>	<u>0.0</u>	<u>0.0</u>	<u>0.0</u>	<u>0.0</u>	<u>9.3</u>	<u>8.6</u>	<u>8.7</u>	<u>8.5</u>	<u>8.8</u>	<u>6.0</u>	<u>5.4</u>	<u>5.5</u>	<u>5.3</u>	<u>5.0</u>
Total	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
<b>Policy asset mix</b>															
Stock	67.3	67.1	62.2	61.6	61.1	45.4	45.5	45.5	43.8	43.2	39.1	41.6	42.1	43.1	43.5
Fixed income	32.7	33.0	35.3	35.3	36.7	29.8	30.4	30.8	32.0	33.0	38.9	37.2	36.9	36.6	36.7
Global TAA	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.1	1.0	1.2	1.3	1.3
Real assets	0.0	0.0	2.5	3.1	2.2	13.7	13.5	13.0	12.8	12.5	10.4	9.9	9.6	9.1	8.8
Hedge funds	0.0	0.0	0.0	0.0	0.0	2.6	2.3	1.8	2.6	2.6	3.2	3.3	3.4	3.5	3.4
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	0.6	0.6	0.6	0.6	0.6	0.4	0.4	0.3	0.3	0.3
Private credit	0.0	0.0	0.0	0.0	0.0	0.9	0.8	1.4	0.6	0.6	1.3	1.0	0.9	0.7	0.5
Private equity	<u>0.0</u>	<u>0.0</u>	<u>0.0</u>	<u>0.0</u>	<u>0.0</u>	<u>7.0</u>	<u>6.9</u>	<u>6.9</u>	<u>7.6</u>	<u>7.5</u>	<u>5.6</u>	<u>5.5</u>	<u>5.6</u>	<u>5.5</u>	<u>5.4</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 158 Global and 9 peer funds with 10 or more consecutive years of data ending 2018.

## 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 - 2018 (as a % of average assets)

	Your fund %					Peer average %					Global average %				
	External			Internal		External			Internal		External			Internal	
	Active	FOFs	Index	Active	Index	Active	FOFs	Index	Active	Index	Active	FOFs	Index	Active	Index
Stock - U.S.	100.0		0.0	0.0	0.0	23.9		37.7	7.2	31.2	41.0		44.6	6.7	7.7
Stock - EAFE	100.0		0.0	0.0	0.0	51.6		20.5	12.6	15.2	52.3		29.0	16.0	2.7
Stock - Global	0.0		0.0	100.0	0.0	27.9		0.4	36.5	35.1	64.0		22.0	11.5	2.5
Stock - Other						30.4		0.0	45.4	24.3	70.6		9.7	13.4	6.2
Stock - Emerging	100.0		0.0	0.0	0.0	56.9		5.3	12.9	24.9	78.3		13.4	5.1	3.2
Stock - ACWI x U.S.						0.0		0.0	0.0	0.0	66.7		31.4	0.6	1.3
Stock - Aggregate	6.7		0.0	93.3	0.0	34.3		12.6	23.8	29.3	57.4		28.3	10.0	4.3
Fixed Income - U.S.						35.8		3.8	56.3	4.2	57.5		23.5	13.6	5.4
Fixed Income - EAFE						0.0		0.0	100.0	0.0	40.6		31.7	22.6	5.2
Fixed Income - Global	0.0		0.0	100.0	0.0	15.4		0.0	64.4	20.2	60.0		9.4	26.1	4.4
Fixed Income - Other						15.9		0.0	6.0	78.1	61.2		12.9	20.6	5.3
Fixed Income - Long Bonds						7.9		0.0	0.0	92.1	79.2		10.8	5.7	4.2
Fixed Income - Emerging						28.1		36.9	28.5	6.6	82.1		5.5	11.2	1.3
Fixed Income - Inflation Indexed						7.7		15.1	49.5	27.7	9.1		51.3	16.9	22.7
Fixed Income - High Yield						77.2		0.0	22.8	0.0	89.5		2.5	7.9	0.1
Fixed Income - Bundled LDI						0.0		0.0	0.0	0.0	44.4		35.5	11.8	8.3
Fixed Income - Convertibles						100.0		0.0	0.0	0.0	100.0		0.0	0.0	0.0
Cash						0.0			100.0		54.4			45.6	
Fixed Income - Aggregate	0.0		0.0	100.0	0.0	19.9		3.5	43.9	32.7	62.6		17.4	14.7	5.4
Commodities						3.5		0.0	96.1	0.4	62.1		9.4	17.9	10.6
Infrastructure						28.1	0.0		67.3		71.8	5.3		16.2	
Natural Resources						45.6	0.2		35.8		78.4	1.2		17.9	
REITs	0.0		0.0	100.0	0.0	9.6		0.0	90.4	0.0	71.5		18.3	8.1	2.1
Real Estate	0.0	0.0		100.0		57.5	0.3		34.5		76.4	6.8		15.5	
Other Real Assets						36.8			63.2		96.1			3.9	
Real Assets	0.0	0.0	0.0	100.0	0.0	42.8	0.2	0.0	50.4	0.0	75.2	5.5	1.5	15.1	0.4
Hedge Funds						82.0	18.0				68.1	31.9			
Global TAA						85.4			14.6		82.2			17.8	
Balanced Funds						0.0		0.0			75.2		24.8		
Risk Parity						53.5			46.5		94.2			5.8	
Private Credit						52.8	0.5		43.5		89.8	0.2		9.2	
Mortgages						31.8			68.2		87.0			13.0	
Diversified Private Equity						57.5	14.5		17.8		64.9	27.4		4.8	
Venture Capital						96.1	3.2		0.0		63.7	34.2		1.8	
LBO						66.9	3.1		20.6		86.5	4.1		3.0	
Other Private Equity						93.6			6.4		78.7			18.0	
Private Equity						61.6	10.8		17.9		67.9	24.0		4.8	
Total Fund - Avg. Holdings	4.4	0.0	0.0	95.6	0.0	36.6	1.7	6.4	31.9	21.4	62.9	2.7	18.5	11.7	3.8

## Actual mix

### Actual asset mix - 2014 to 2018 (as a % of total average assets)

	Your fund <sup>1</sup>					Peer average %					Global average %				
	2018	2017	2016	2015	2014	2018	2017	2016	2015	2014	2018	2017	2016	2015	2014
Stock - U.S.	0.0	0.1	0.1			9.5	12.3	12.2	13.0	13.6	11.0	12.2	13.5	13.6	13.0
Stock - EAFE	1.0	1.2	1.0			5.6	7.7	5.5	6.1	6.4	7.0	8.1	8.4	8.3	10.1
Stock - Global	61.7	60.3	56.3	61.9	61.2	16.9	12.8	14.2	12.9	12.3	12.8	13.0	11.6	11.5	13.1
Stock - Other						3.0	4.0	4.0	4.6	4.9	3.5	3.9	4.3	4.2	4.4
Stock - Emerging	3.4	3.5	2.8			5.4	5.7	5.2	5.4	5.4	3.1	3.4	3.0	2.9	3.0
Stock - ACWI x U.S.											2.2	2.5	2.6	2.7	2.3
Stock - Aggregate	66.1	65.0	60.3	61.9	61.2	40.5	42.5	41.0	42.0	42.7	39.5	43.1	43.4	43.2	45.9
Fixed Income - U.S.						4.8	4.6	4.8	5.0	4.7	7.0	5.7	6.2	6.8	5.6
Fixed Income - EAFE						3.5	3.5	3.7	3.6	3.3	3.1	3.8	3.8	4.4	4.7
Fixed Income - Global	30.3	32.4	36.3	35.4	37.4	6.5	6.5	3.4	3.1	2.4	2.6	2.8	2.7	2.9	3.2
Fixed Income - Other						6.8	6.6	9.8	10.1	11.0	5.0	5.4	6.0	6.1	5.8
Fixed Income - Long Bonds						1.6	1.5	1.4	1.4	1.3	12.7	10.8	10.1	9.7	8.6
Fixed Income - Emerging		0.1	0.3			1.2	1.1	1.0	1.0	1.0	1.1	1.1	1.0	1.1	1.1
Fixed Income - Inflation Indexed						2.1	2.5	2.8	2.5	2.5	1.8	2.0	2.4	2.0	2.0
Fixed Income - High Yield						1.2	1.0	0.9	0.9	1.0	1.3	1.2	1.4	1.3	1.1
Fixed Income - Bundled LDI											2.2	1.2	0.2	0.1	0.1
Fixed Income - Convertibles						0.1	0.1				0.0	0.1	0.0	0.0	0.0
Cash						-0.5	-0.4	0.4	0.5	1.8	1.7	2.1	2.0	1.8	2.0
Fixed Income - Aggregate	30.3	32.5	36.6	35.4	37.4	27.2	27.1	28.3	28.2	29.0	38.7	36.2	35.8	36.3	34.3
Commodities						1.0	1.0	1.0	1.0	1.2	0.2	0.3	0.3	0.3	0.4
Infrastructure						3.2	2.9	2.6	2.3	1.9	2.1	1.8	1.7	1.4	1.1
Natural Resources						1.0	0.9	0.9	0.7	0.7	0.4	0.5	0.4	0.3	0.3
REITs	0.9					1.3	1.2	1.4	1.4	1.3	0.7	0.7	0.6	0.6	0.5
Real Estate	2.6	2.5	3.1	2.7	1.4	8.7	8.0	8.3	7.9	7.2	6.3	5.6	5.8	5.5	5.3
Other Real Assets						0.2	0.2	0.2	0.2	0.3	0.2	0.2	0.2	0.3	0.3
Real Assets	3.5	2.5	3.1	2.7	1.4	15.3	14.3	14.4	13.5	12.6	9.9	9.1	9.0	8.5	7.8
Hedge Funds						3.8	3.8	3.6	4.0	2.9	3.3	3.4	3.8	3.8	3.6
Global TAA						0.3	0.1	0.6	0.6	0.6	1.0	1.0	1.2	1.6	2.7
Balanced Funds											0.4	0.4	0.4	0.4	0.4
Risk Parity						1.0	1.0	0.4	0.2	0.1	0.5	0.4	0.3	0.2	0.2
Mortgages						1.4	0.8	1.3	1.3	1.3	0.6	0.4	0.4	0.4	0.3
Private Credit						1.0	0.9	0.6	0.6	0.5	1.2	1.0	0.8	0.7	0.5
Diversified Private Equity						6.4	6.1	6.3	5.8	5.6	3.7	3.3	3.5	3.4	3.1
Venture Capital						0.4	0.2	0.1	0.1	0.1	0.2	0.2	0.2	0.3	0.2
LBO						2.6	2.3	2.1	2.2	2.5	0.6	0.5	0.5	0.5	0.4
Other Private Equity						0.0	0.0	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.1
Private Equity						9.4	8.5	8.8	8.5	8.6	4.7	4.3	4.5	4.3	3.9
Derivatives/Overlays Mkt Value						0.0	1.0	1.0	1.2	1.8	0.3	0.6	0.4	0.6	0.5
Total Fund	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
Count	1	1	1	1	1	10	10	10	10	10	332	351	345	362	425
Median Assets (€ billions)	872.0	844.4	776.1	783.2	655.7	189.9	180.3	161.8	163.2	152.9	5.2	5.2	4.8	4.4	3.4

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



## Policy mix

### Policy asset mix - 2014 to 2018 (as a % of total assets)

	Your fund %					Peer average %					Global average %				
	2018	2017	2016	2015	2014	2018	2017	2016	2015	2014	2018	2017	2016	2015	2014
Stock - U.S.						9.2	9.4	9.9	9.8	10.2	10.4	11.3	12.3	12.6	11.7
Stock - EAFE						5.8	6.4	4.6	4.6	4.6	6.5	7.4	7.8	7.6	9.4
Stock - Global	67.3	67.1	62.2	61.6	61.1	23.4	22.6	23.6	20.3	18.6	14.9	15.0	13.8	13.2	14.6
Stock - Other						2.5	3.1	2.9	3.0	3.9	3.3	3.7	4.0	4.3	4.3
Stock - Emerging						3.9	3.9	3.8	4.2	4.2	2.8	2.9	2.7	2.8	2.7
Stock - ACWI x U.S.											2.4	2.6	2.8	3.0	2.6
Stock - Aggregate	67.3	67.1	62.2	61.6	61.1	44.7	45.5	44.8	42.0	41.5	40.3	42.9	43.4	43.6	45.2
Fixed Income - U.S.						5.3	5.1	5.0	6.0	5.9	7.1	6.0	6.2	6.9	5.9
Fixed Income - EAFE						4.4	4.4	4.5	4.2	3.9	3.3	3.8	3.8	4.6	4.8
Fixed Income - Global	32.7	33.0	35.3	35.3	36.7	5.4	5.5	2.5	2.6	3.2	2.8	3.1	3.2	3.1	3.4
Fixed Income - Other						7.0	6.8	10.2	11.2	11.9	5.1	6.0	6.4	6.3	6.2
Fixed Income - Long Bonds						1.2	1.2	1.2	1.2	1.1	13.2	11.4	10.8	10.4	9.2
Fixed Income - Emerging						1.2	1.2	1.0	1.1	1.0	1.1	1.0	1.0	1.1	1.0
Fixed Income - Inflation Indexed						2.9	3.1	3.1	3.0	3.0	2.1	2.3	2.6	2.2	2.1
Fixed Income - High Yield						0.7	0.8	0.9	0.6	0.6	1.2	1.2	1.4	1.4	1.2
Fixed Income - Bundled LDI											2.3	1.2	0.1	0.1	0.1
Fixed Income - Convertibles											0.0	0.1	0.0	0.0	0.0
Cash						0.5	0.9	0.9	0.5	0.6	0.4	0.6	0.9	0.7	0.8
Fixed Income - Aggregate	32.7	33.0	35.3	35.3	36.7	28.6	29.2	29.1	30.5	31.3	38.5	36.8	36.4	36.7	34.8
Commodities						0.8	0.8	0.9	1.1	1.2	0.3	0.3	0.4	0.5	0.5
Infrastructure						2.9	2.5	2.1	2.3	2.1	2.2	2.0	1.9	1.5	1.4
Natural Resources						0.9	0.7	0.7	1.9	1.9	0.3	0.3	0.3	0.3	0.2
REITs						1.1	1.2	1.2	1.3	1.3	0.6	0.6	0.5	0.5	0.5
Real Estate			2.5	3.1	2.2	8.1	7.9	8.1	7.7	7.6	6.4	6.0	5.8	5.6	5.8
Other Real Assets						0.1	0.1	0.1	0.1	0.7	0.3	0.3	0.3	0.4	0.3
Real Assets			2.5	3.1	2.2	14.0	13.1	13.1	14.4	14.7	10.1	9.6	9.3	8.8	8.8
Hedge Funds						3.0	2.8	2.5	3.0	3.1	3.0	3.1	3.3	3.3	3.4
Global TAA						0.1	0.2	0.7	0.5	0.5	1.0	1.0	1.3	1.6	2.5
Balanced Funds											0.2	0.2	0.2	0.2	0.2
Risk Parity						1.0	1.1	0.5	0.5	0.5	0.4	0.4	0.3	0.2	0.2
Mortgages						0.3	0.3	1.0	0.6	0.6	0.7	0.5	0.4	0.4	0.2
Private Credit						0.7	0.8	0.3	0.0	0.0	1.1	0.9	0.7	0.6	0.4
Diversified Private Equity						7.4	7.1	8.0	8.5	7.9	4.0	4.0	4.1	4.0	3.7
Venture Capital						0.0	0.0				0.2	0.1	0.2	0.2	0.2
LBO											0.4	0.3	0.3	0.4	0.2
Other Private Equity											0.1	0.2	0.2	0.1	0.1
Private Equity						7.5	7.1	8.0	8.5	7.9	4.7	4.6	4.8	4.6	4.2
Total Fund	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
Count	1	1	1	1	1	10	10	10	10	10	332	351	345	362	425

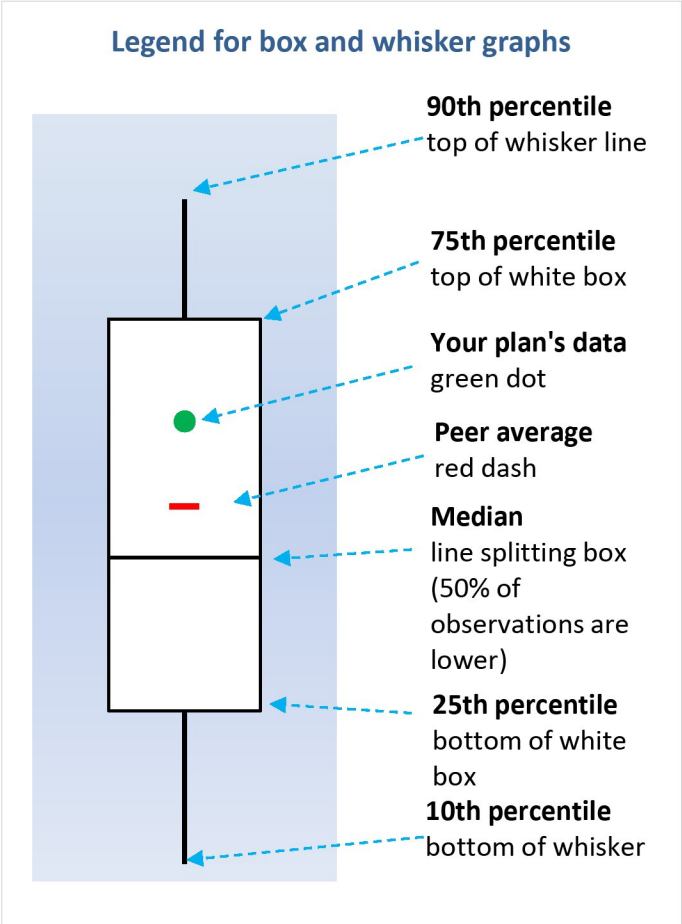
# 3

## Returns, Benchmarks and Value Added

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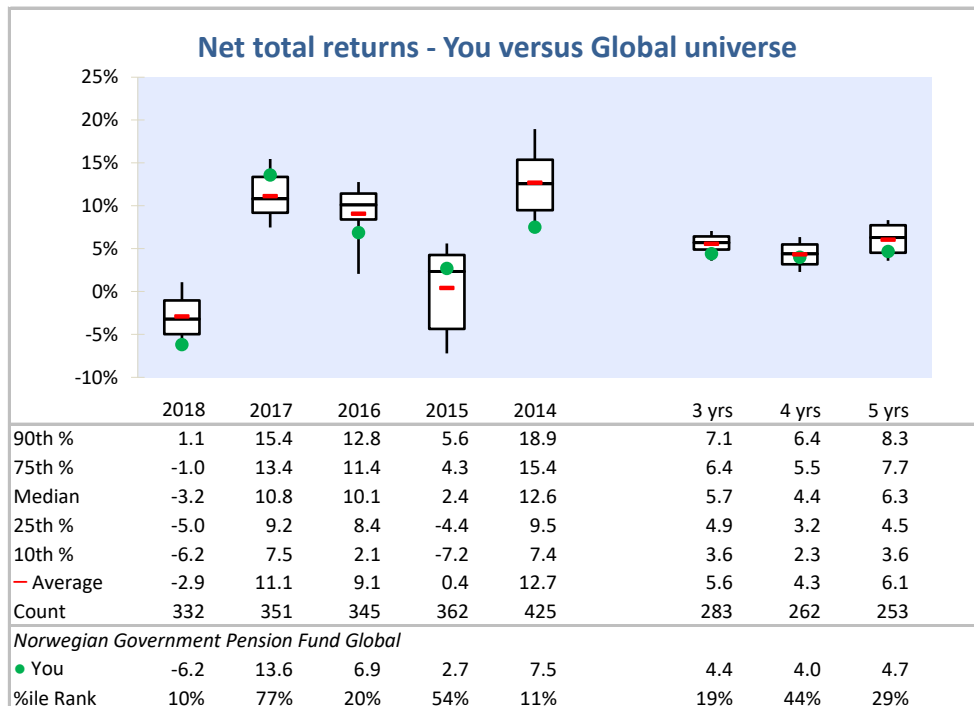
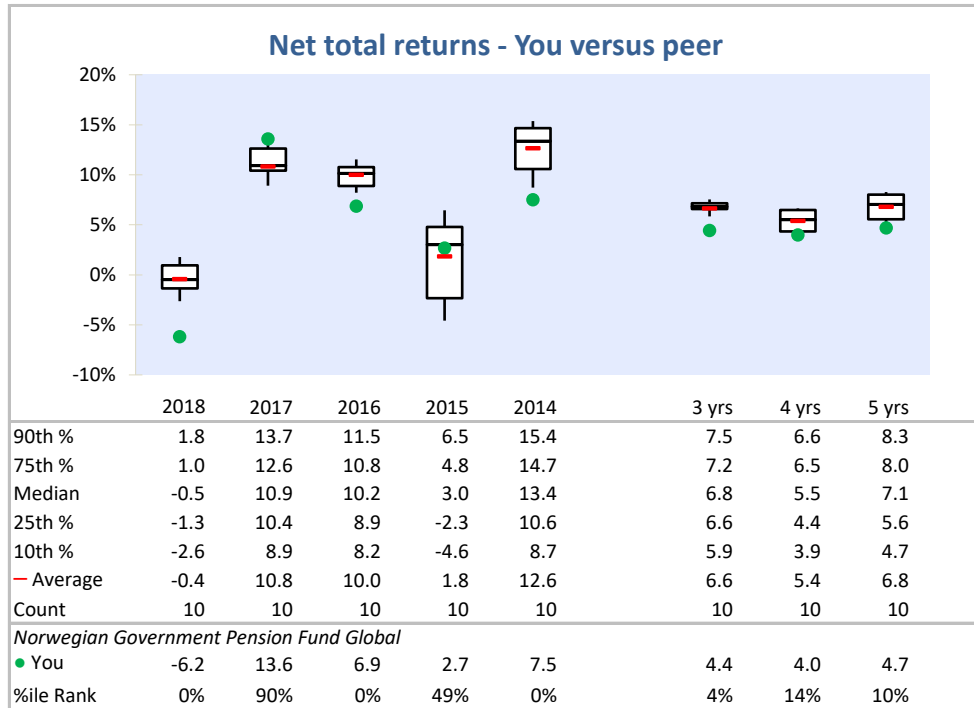
# Interpreting box and whisker graphs

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.



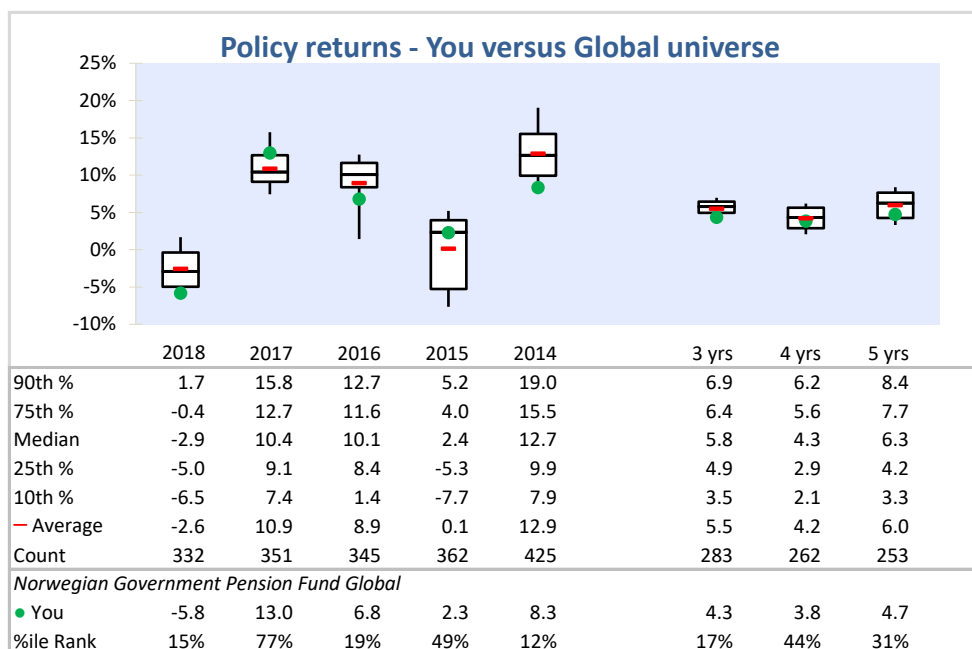
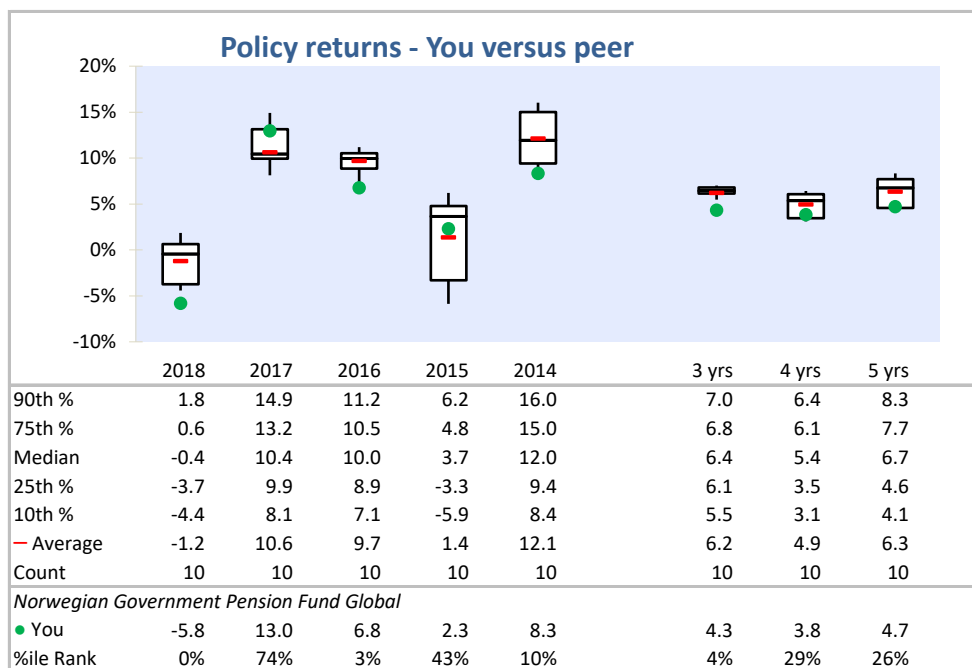
## Net total returns

Your 5-year net total return of 4.7% was below the peer median and below the median of the Global universe. 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

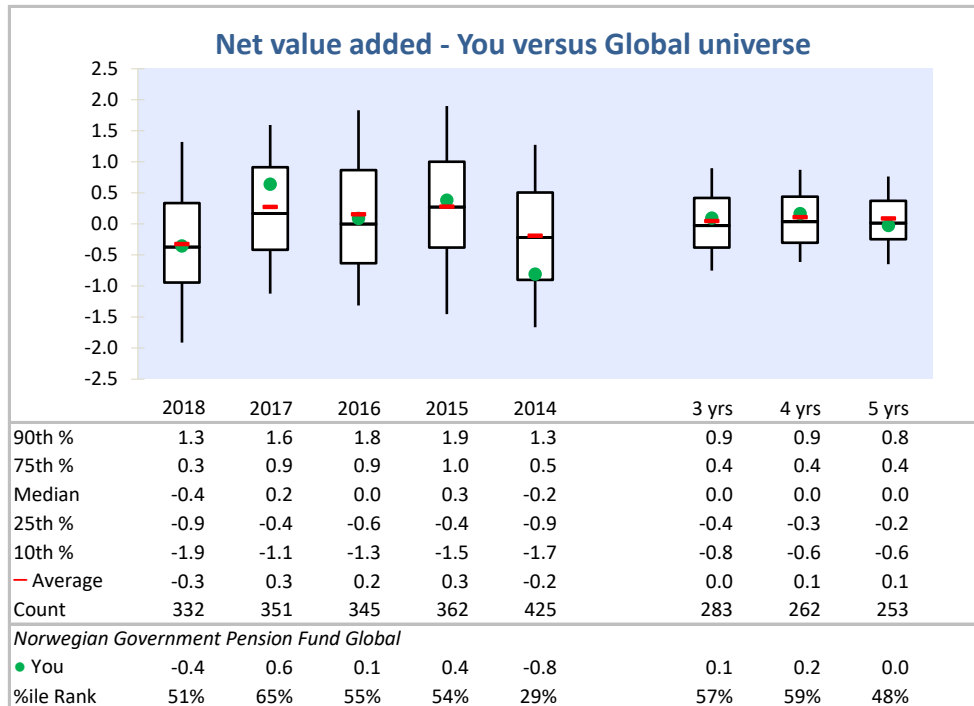
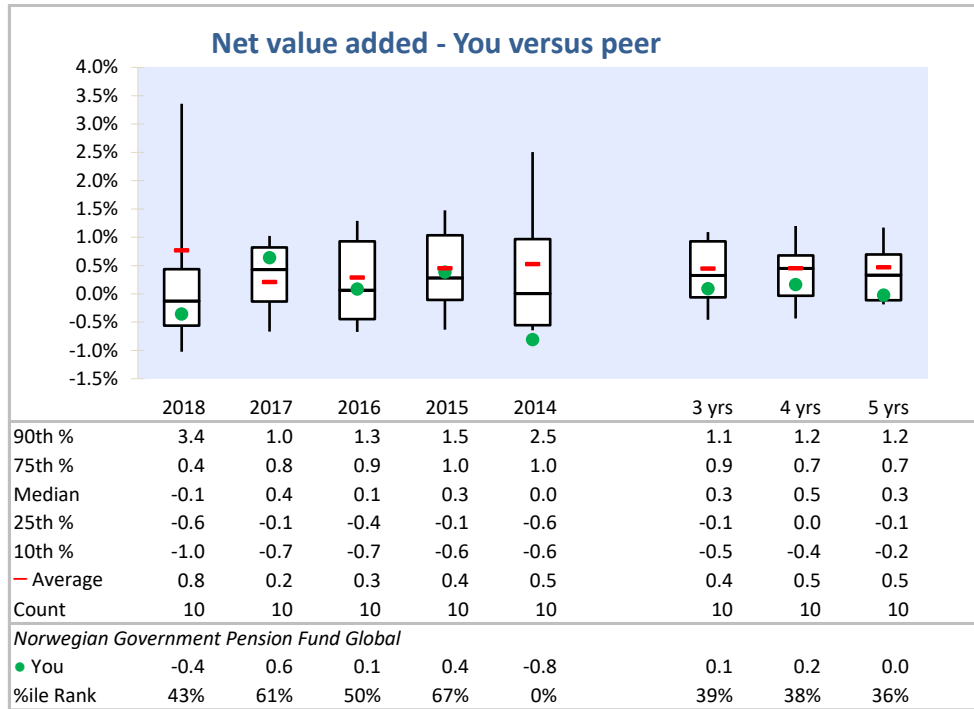
Your 5-year policy return of 4.7% was below the peer median and below the median of the Global universe. Policy return is the return you would have earned had you passively implemented your policy asset mix decision through your benchmark portfolios.



To enable fairer comparisons, the policy returns of all participants except your fund 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 0.0% was below the peer median and close to the Global universe median. 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 %						Global average %					
	2018	2017	2016	2015	2014	5-yr <sup>1</sup>	2018	2017	2016	2015	2014	5-yr <sup>1</sup>	2018	2017	2016	2015	2014	5-yr <sup>1</sup>
Stock - U.S.	0.0	18.4	22.7				-3.1	14.2	14.7	5.0	16.9	9.3	-4.0	14.9	14.8	3.9	18.4	9.3
Stock - EAFE	-15.2	27.2	2.1				-11.8	20.1	5.0	3.7	1.7	3.4	-12.4	19.8	3.7	3.6	2.6	3.1
Stock - Global	-9.2	18.9	8.7	3.8	7.9	5.6	-4.8	14.4	9.6	3.9	11.5	6.6	-6.6	19.0	8.7	3.2	11.4	6.8
Stock - Other							-10.6	15.6	18.7	-2.9	12.9	4.4	-11.7	9.9	21.4	-11.4	9.4	2.7
Stock - Emerging	-13.9	26.1	11.0				-12.1	29.1	13.6	-10.3	7.0	4.3	-13.1	28.4	12.4	-10.1	5.2	3.5
Stock - ACWI x U.S.													-12.9	22.3	5.7	1.9	3.4	3.6
Stock - Aggregate	-9.5	19.4	8.7	3.8	7.9	5.6	-7.2	17.4	11.8	1.1	10.9	6.4	-8.2	18.1	11.2	0.7	10.6	6.1
Fixed Income - U.S.							2.3	-0.8	6.0	4.8	16.0	5.5	1.4	0.1	6.2	3.9	13.8	4.9
Fixed Income - EAFE							-1.2	7.6	3.5	-5.2	5.3	1.9	-2.1	7.0	0.7	-4.3	14.0	2.6
Fixed Income - Global	0.5	3.3	4.2	0.3	6.9	3.0	1.5	0.4	5.2	2.9	13.6	5.2	-2.3	5.4	4.7	-1.6	9.2	2.7
Fixed Income - Other							4.0	61.2	25.9	1.9	10.0	4.6	-1.3	6.1	7.3	-3.8	9.4	2.6
Fixed Income - Long Bonds							-1.3	5.0	6.8	-2.1	24.7	8.3	-3.5	6.2	9.6	-1.8	24.3	6.9
Fixed Income - Emerging		5.8	13.1				-4.4	6.7	9.9	-5.2	0.5	1.6	-4.5	8.1	12.3	-3.4	5.1	3.4
Fixed Income - Inflation Indexed							-2.8	2.4	5.6	-2.4	8.1	2.1	-2.4	2.0	7.7	-2.2	14.0	3.4
Fixed Income - High Yield							1.4	2.0	15.2	1.8	13.2	6.2	-0.9	3.8	13.0	-0.8	7.3	4.3
Fixed Income - Bundled LDI													-3.1	8.3	13.2	-9.2	66.5	14.9
Fixed Income - Convertibles							3.0	6.7					-1.6	7.4	4.3	-2.1	1.7	1.8
Cash							1.3	0.7	5.7	-3.3	5.2	2.1	0.7	-0.5	1.2	-0.8	3.4	0.9
Fixed Income - Aggregate	0.5	3.3	4.3	0.3	6.9	3.0	1.1	1.6	6.0	0.3	11.7	4.0	-1.9	4.1	6.9	-1.5	13.8	4.3
Commodities							-17.3	16.3	22.4	-36.2	-21.0	-15.9	-10.5	-0.7	15.0	-23.7	-11.6	-8.3
Infrastructure							8.0	11.9	10.5	5.1	18.2	10.5	6.6	13.9	6.2	8.7	12.5	9.5
Natural Resources							1.3	-1.1	3.0	-8.2	11.0	0.5	4.5	2.1	8.3	-1.9	15.7	5.5
REITs	-10.4						-7.0	4.3	13.4	1.7	23.6	7.1	-3.0	6.2	6.3	4.1	25.3	7.7
Real Estate	7.3	8.8	0.6	9.8	10.1	7.3	9.0	7.5	12.4	12.5	16.1	11.3	9.3	7.3	6.9	11.1	14.3	9.3
Other Real Assets							-5.5	-10.6	6.4	0.3	9.3	-2.4	-2.9	-0.8	8.2	-4.3	8.9	0.5
Real Assets	2.8	8.8	0.6	9.8	10.1	6.3	6.1	6.6	11.0	6.6	13.9	8.7	6.0	7.0	7.0	8.0	13.5	8.3
Hedge Funds							-0.4	-1.4	1.9	4.1	8.1	2.4	-1.0	2.1	2.0	1.7	9.3	3.3
Global TAA							-8.0	4.8	9.7	1.5	16.4	4.5	-3.5	4.9	6.1	0.1	9.1	3.8
Balanced Funds													-14.3	15.8	-6.2	1.8	8.0	0.1
Risk Parity							-4.2	8.6	16.1		15.3		-5.1	8.5	13.4	-3.3	14.5	4.9
Mortgages							1.3	6.4	7.3	1.8	11.4	5.8	0.1	6.2	6.2	0.0	8.6	3.6
Private Credit							5.6	4.8	12.0	5.8	8.0	7.0	5.1	6.6	7.1	2.9	9.4	6.4
Diversified Private Equity							11.8	13.7	13.3	12.6	18.3	13.7	15.5	12.9	9.4	12.5	19.8	14.0
Venture Capital							14.4	8.8	6.3	12.2	18.7	10.8	19.7	9.5	3.3	15.7	21.2	13.1
LBO							15.0	14.9	13.4	6.8	25.2	14.7	15.4	13.3	12.7	11.2	22.3	13.5
Other Private Equity							95.2	11.9	16.7	13.0	17.5	24.0	12.4	7.7	8.6	9.3	17.1	11.5
Private Equity							13.1	14.1	13.1	10.5	19.9	13.9	15.5	12.7	9.5	12.4	19.8	14.1
Total Fund Return	-6.2	13.6	6.9	2.7	7.5	4.7	-0.4	10.8	10.0	1.8	12.6	6.8	-2.9	11.1	9.1	0.4	12.7	6.1

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 %						Global average %					
	2018	2017	2016	2015	2014	5-yr <sup>1</sup>	2018	2017	2016	2015	2014	5-yr <sup>1</sup>	2018	2017	2016	2015	2014	5-yr <sup>1</sup>
Stock - U.S.	3.6	18.9	16.1				-2.5	13.9	16.2	5.4	18.5	10.4	-3.6	14.9	15.3	4.1	19.0	9.6
Stock - EAFE	-13.7	25.6	3.8				-11.7	18.5	5.2	2.7	2.4	2.6	-11.4	18.7	3.5	2.9	2.5	2.8
Stock - Global	-8.8	18.7	8.6	3.0	8.7	5.7	-5.6	14.8	10.3	3.8	9.1	6.1	-7.0	17.2	9.8	2.8	11.4	6.6
Stock - Other							-9.4	14.2	11.8	-1.0	8.0	3.7	-10.8	10.9	20.2	-12.0	9.3	2.4
Stock - Emerging	-14.7	20.5	10.7				-11.3	29.0	13.6	-10.8	6.1	4.2	-12.0	29.2	13.1	-10.5	5.2	3.9
Stock - ACWI x U.S.													-12.2	21.1	6.7	0.1	3.2	3.3
Stock - Aggregate	-8.8	18.7	8.6	3.0	8.7	5.7	-7.1	17.1	11.3	1.7	9.8	6.2	-7.9	17.5	11.7	0.2	10.7	6.0
Fixed Income - U.S.							1.8	-0.3	4.5	5.1	15.5	5.2	1.5	-0.2	5.2	3.6	13.0	4.4
Fixed Income - EAFE							-0.8	7.2	3.6	-4.8	3.4	1.6	-2.0	6.6	0.9	-3.7	15.2	2.5
Fixed Income - Global	0.6	2.9	4.2	0.6	7.6	3.1	1.4	0.2	5.3	3.5	11.6	4.5	-1.6	4.3	3.2	-0.8	8.8	2.2
Fixed Income - Other							2.0	1.7	7.2	-1.0	9.6	4.1	-1.4	3.5	6.6	-3.2	11.3	2.4
Fixed Income - Long Bonds							-1.4	3.9	5.4	-0.3	26.5	8.2	-3.4	5.9	9.0	-1.7	24.0	6.6
Fixed Income - Emerging		2.9	13.0				-4.1	6.7	10.6	-5.8	0.7	1.5	-3.3	6.9	11.3	-2.3	6.7	3.7
Fixed Income - Inflation Indexed							-3.0	2.0	5.6	-2.2	6.7	2.0	-2.3	2.3	8.0	-2.0	15.0	3.4
Fixed Income - High Yield							1.3	1.5	14.7	1.5	9.0	5.3	-1.0	4.1	15.4	-1.7	7.0	4.7
Fixed Income - Bundled LDI													-2.9	8.1	9.8	-9.1	53.2	13.0
Fixed Income - Convertibles							3.0	9.7					-1.9	12.1	9.3	-0.8	2.5	4.3
Cash							0.9	-0.6	2.5	-1.7	3.0	0.7	0.6	-0.4	0.7	-1.1	3.1	0.6
Fixed Income - Aggregate	0.6	2.9	4.2	0.6	7.6	3.1	0.3	1.8	5.8	-0.1	11.8	3.7	-1.9	4.1	6.6	-1.4	14.6	4.3
Commodities							-12.9	2.4	15.5	-28.2	-23.3	-13.8	-9.3	-0.3	12.7	-22.6	-12.5	-8.2
Infrastructure							4.0	5.7	9.3	1.1	13.6	6.5	2.1	9.9	3.6	2.9	9.2	4.8
Natural Resources							5.9	0.1	8.0	-10.3	6.7	4.1	2.4	1.9	7.4	1.5	11.4	5.1
REITs	-4.6						-3.9	6.4	11.1	6.8	24.4	8.1	-2.6	6.3	7.3	4.4	24.4	7.7
Real Estate	-2.1	8.3	0.8	10.0	10.4	5.4	8.4	5.3	12.0	12.5	14.1	10.3	6.3	5.9	6.7	10.5	14.0	8.6
Other Real Assets							-0.5	8.9	10.5	1.3	12.0	5.2	-1.0	2.1	7.7	-2.3	9.1	3.9
Real Assets	-2.7	8.3	0.8	10.0	10.4	5.2	5.9	4.7	11.4	5.9	12.9	7.9	4.2	6.1	6.4	6.8	12.3	7.0
Hedge Funds							2.0	0.6	4.1	4.6	8.6	4.0	0.3	3.2	3.3	2.7	7.9	3.6
Global TAA							-3.3	7.0	9.1	9.3	13.9	7.0	-1.5	7.1	4.9	3.2	7.9	4.6
Balanced Funds													-14.2	20.2	-7.9	5.1	7.3	1.1
Risk Parity							-4.0	9.9	14.7	-3.5	15.1	5.8	-1.5	7.4	12.8	1.3	14.0	6.0
Mortgages							-0.3	2.7	5.4	-2.7	8.4	2.7	-1.0	4.4	5.2	-2.6	5.6	1.5
Private Credit							2.3	1.4	13.4	-2.0	4.6	4.1	1.5	5.5	5.2	0.2	6.4	4.3
Diversified Private Equity							16.1	14.7	10.7	7.6	18.1	13.1	19.4	18.4	7.7	7.1	21.0	14.2
Venture Capital							17.1	16.1	9.7	6.0	20.2	13.9	19.9	17.0	6.9	7.5	21.6	14.6
LBO							18.9	16.4	9.7	6.0	20.2	13.9	20.2	17.0	7.1	7.8	21.9	14.3
Other Private Equity							26.5	8.1	11.1	6.5	18.1	15.8	17.6	19.3	6.0	6.9	18.9	12.9
Private Equity							16.1	14.7	10.7	7.6	18.1	13.1	19.4	18.5	7.6	7.2	20.9	14.3
Total Policy Return	-5.8	13.0	6.8	2.3	8.3	4.7	-1.2	10.6	9.7	1.4	12.1	6.3	-2.6	10.9	8.9	0.1	12.9	6.0

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 except your fund 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 %						Global average %					
	2018	2017	2016	2015	2014	5-yr <sup>1</sup>	2018	2017	2016	2015	2014	5-yr <sup>1</sup>	2018	2017	2016	2015	2014	5-yr <sup>1</sup>
Stock - U.S.	-3.6	-0.5	6.6				-0.6	0.3	-1.5	-0.3	-1.7	-0.8	-0.3	0.0	-0.5	-0.2	-0.7	-0.2
Stock - EAFE	-1.5	1.6	-1.7				-0.1	1.6	-0.2	1.1	-0.7	0.8	-0.9	1.1	0.2	0.7	0.1	0.2
Stock - Global	-0.4	0.2	0.1	0.8	-0.9	-0.1	0.8	-0.4	-0.7	0.1	2.4	0.6	0.5	1.8	-1.1	0.3	-0.2	0.2
Stock - Other							-1.2	1.3	7.0	-1.9	4.7	1.9	-0.7	-0.8	0.5	1.1	0.3	0.5
Stock - Emerging	0.8	5.6	0.4				-0.8	0.1	0.0	0.5	0.9	0.2	-1.1	-1.0	-0.8	0.4	-0.1	-0.3
Stock - ACWI x U.S.													-0.6	1.2	-1.1	1.8	0.2	0.3
Stock - Aggregate	-0.7	0.7	0.1	0.8	-0.9	0.0	-0.1	0.3	0.5	-0.5	1.0	0.2	-0.2	0.6	-0.6	0.5	-0.1	0.1
Fixed Income - U.S.							0.4	-0.5	1.6	-0.3	0.6	0.4	-0.1	0.3	1.0	0.3	0.4	0.5
Fixed Income - EAFE							-0.4	0.4	-0.1	-0.4	1.9	0.3	-0.1	0.4	-0.1	-0.2	-1.2	0.0
Fixed Income - Global	0.0	0.4	0.1	-0.3	-0.7	-0.1	0.1	0.2	-0.1	-0.5	0.4	0.2	-0.7	1.4	1.5	-1.0	-0.1	0.4
Fixed Income - Other							2.0	59.5	18.7	4.0	0.5	1.2	0.2	2.6	0.7	-0.3	-0.3	0.3
Fixed Income - Long Bonds							0.1	1.1	0.8	-1.7	-1.8	0.1	-0.1	0.3	0.3	-0.2	0.3	0.2
Fixed Income - Emerging		2.9	0.1				-0.3	-0.1	-0.7	0.6	-0.2	0.1	-1.3	1.2	1.0	-1.0	-1.8	-0.3
Fixed Income - Inflation Indexed							0.1	0.3	0.0	-0.2	0.0	0.1	0.0	-0.1	-0.3	0.0	-1.3	0.1
Fixed Income - High Yield							0.0	0.5	0.6	0.3	4.2	1.0	0.2	-0.3	-2.1	1.1	0.0	-0.2
Fixed Income - Bundled LDI													-0.1	0.0	1.7	-0.2	13.3	1.9
Fixed Income - Convertibles							0.0	-2.9					0.3	-4.7	-5.0	-1.3	-0.8	-2.5
Cash							-0.5	1.9	3.9	-2.2	1.3	0.7	0.0	-0.1	0.4	0.0	0.2	0.0
Fixed Income - Aggregate	0.0	0.4	0.2	-0.3	-0.7	-0.1	0.8	-0.2	0.2	0.4	-0.1	0.3	0.0	0.1	0.3	-0.2	-0.8	-0.1
Commodities							-4.4	12.2	6.8	-8.0	2.3	-2.1	-1.0	-0.2	1.4	-0.7	2.4	0.2
Infrastructure							4.1	6.2	1.1	4.0	4.6	4.0	4.5	4.0	2.3	6.2	3.0	4.5
Natural Resources							-4.7	-1.3	-5.3	2.1	4.3	-5.0	2.1	0.2	0.7	-3.4	4.1	0.3
REITs	-5.7						-3.1	-2.1	2.2	-5.1	-0.9	-1.1	-0.4	0.1	-1.2	-0.6	0.8	-0.1
Real Estate	9.4	0.5	-0.2	-0.2	-0.3	1.9	0.6	2.2	0.4	0.0	2.0	1.0	2.9	1.3	0.3	0.3	0.3	0.7
Other Real Assets							-5.0	-19.5	-4.2	-1.0	-2.7	-7.6	-1.7	-2.7	-0.2	-2.7	-0.8	-2.7
Real Assets	5.5	0.5	-0.2	-0.2	-0.3	1.1	0.2	1.9	-0.3	0.7	1.1	0.7	1.7	0.9	0.6	1.2	1.2	1.2
Hedge Funds							-3.2	-1.9	-1.8	-2.7	-2.0	-2.5	-1.3	-1.1	-1.2	-1.0	1.0	-0.5
Global TAA							-4.7	-2.2	0.6	-7.8	2.6	-2.5	-2.2	-2.0	1.4	-3.2	1.2	-0.5
Balanced Funds													-0.1	-4.4	1.8	-3.3	0.7	-1.1
Risk Parity							-0.2	-1.3	1.4		0.2		-3.7	1.1	1.0	-5.7	-0.1	-1.2
Mortgages							1.6	2.9	2.8	4.0	3.0	3.6	1.1	1.5	1.1	2.2	2.6	2.2
Private Credit							3.3	0.9	-1.4	7.8	3.4	3.0	3.8	1.2	0.8	3.0	2.6	2.5
Diversified Private Equity							-4.3	-1.0	2.6	4.1	1.1	0.9	-3.7	-5.7	1.6	5.2	-1.4	-0.3
Venture Capital							-2.7	-7.3	-3.4	2.7	1.4	-2.5	-0.3	-7.0	-3.9	7.7	-0.9	-1.4
LBO							-3.9	-1.4	3.7	0.8	5.0	0.8	-4.8	-3.8	6.4	2.8	0.5	-0.7
Other Private Equity							68.7	3.7	5.6	2.9	3.4	8.2	-5.4	-11.3	2.2	1.7	-1.7	-1.6
Private Equity							-3.0	-0.5	2.4	2.9	1.7	0.9	-3.7	-5.9	1.9	4.9	-1.2	-0.2
Total Fund Return	-0.4	0.6	0.1	0.4	-0.8	0.0	0.8	0.2	0.3	0.4	0.5	0.5	-0.3	0.3	0.2	0.3	-0.2	0.1

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.

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 except your fund 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 - 2018

### 2018 Policy Return and Value Added

Asset class	Policy weight	Benchmark Description	Return	Net return	Value added
Stock - U.S.		Custom	3.6%	0.0%	-3.6%
Stock - EAFE		Custom	-13.7%	-15.2%	-1.5%
Stock - Global	67.3%	Your Stock: Global benchmark	-8.8%	-9.2%	-0.4%
Stock - Emerging		Custom	-14.7%	-13.9%	0.8%
Fixed Income - Global	32.7%	Barclays Global Aggregate + Barclays Global Inflation	0.6%	0.5%	0.0%
REITs		Custom	-4.6%	-10.4%	-5.7%
Real Estate		Custom	-2.1%	7.3%	9.4%
<b>Total</b>	<b>100.0%</b>				
Net Actual Return (reported by you)					-6.2%
Calculated Policy Return = sum of (policy weights X benchmark returns)				-5.7%	
Adjustment to reflect rebalancing and overlay impacts				<u>-0.1%</u>	
Policy Return (reported by you)					<u>-5.8%</u>
Net Value Added (Net Return - Policy Return)					-0.4%

The fund return consists of Equity, Fixed Income and Real Estate. The fund benchmark is the weighted benchmark of Equity and Fixed Income. The benchmark for Real Estate used in the report prior to 2017 was the actual portfolio return, and thereafter the financing cost for the real estate investments.

## Your policy return and value added calculations - 2014 to 2017

### 2017 Policy Return and Value Added

Asset class	Policy weight	Benchmark		Net return	Value added
		Description	Return		
Stock - U.S.		Custom	18.9%	18.4%	-0.5%
Stock - EAFE		Custom	25.6%	27.2%	1.6%
Stock - Global	67.1%	Your Stock: Glot	18.7%	18.9%	0.2%
Stock - Emerging		Custom	20.5%	26.1%	5.6%
Fixed Income - Global	33.0%	Barclays Global	2.9%	3.3%	0.4%
Fixed Income - Emerging		Barclays Global	2.9%	5.8%	2.9%
Real Estate		Custom	8.3%	8.8%	0.5%
<b>Total</b>	<b>100.0%</b>				
Net Return (reported by you)					13.6%
Calculated policy return (sum: Policy weights x benchmarks)				13.5%	
Adjustment to reflect rebalancing and overlay impacts				<u>-0.5%</u>	
Policy return (reported by you)					<u>13.0%</u>
Net Value Added (Net Return - Policy Return)					0.6%

### 2015 Policy Return and Value Added

Asset class	Policy weight	Benchmark		Net return	Value added
		Description	Return		
Stock - Global	61.6%	Your Stock: Glot	3.0%	3.8%	0.8%
Fixed Income - Global	35.3%	Barclays Global	0.6%	0.3%	-0.3%
Real Estate	3.1%	Custom (Actual)	10.0%	9.8%	-0.2%
<b>Total</b>	<b>100.0%</b>				
Net Return (reported by you)					2.7%
Calculated policy return (sum: Policy weights x benchmarks)				2.4%	
Adjustment to reflect rebalancing and overlay impacts				<u>-0.1%</u>	
Policy return (reported by you)					<u>2.3%</u>
Net Value Added (Net Return - Policy Return)					0.4%

### 2016 Policy Return and Value Added

Asset class	Policy weight	Benchmark		Net return	Value added
		Description	Return		
Stock - U.S.		Your Stock: U.S.	16.1%	22.7%	6.6%
Stock - EAFE		Your Stock: Eurc	3.8%	2.1%	-1.7%
Stock - Global	62.2%	Your Stock: Glot	8.6%	8.7%	0.1%
Stock - Emerging		Your Stock: Eme	10.7%	11.0%	0.4%
Fixed Income - Global	35.3%	Barclays Global	4.2%	4.2%	0.1%
Fixed Income - Emerging		Custom	13.0%	13.1%	0.1%
Real Estate	2.5%	Custom (Actual)	0.8%	0.6%	-0.2%
<b>Total</b>	<b>100.0%</b>				
Net Return (reported by you)					6.9%
Calculated policy return (sum: Policy weights x benchmarks)				6.8%	
Adjustment to reflect rebalancing and overlay impacts				<u>0.0%</u>	
Policy return (reported by you)					<u>6.8%</u>
Net Value Added (Net Return - Policy Return)					0.1%

### 2014 Policy Return and Value Added

Asset class	Policy weight	Benchmark		Net return	Value added
		Description	Return		
Stock - Global	61.1%	Your Stock: Glot	8.7%	7.9%	-0.9%
Fixed Income - Global	36.7%	Barclays Global	7.6%	6.9%	-0.7%
Real Estate	2.2%	Custom (Actual)	10.4%	10.1%	-0.3%
<b>Total</b>	<b>100.0%</b>				
Net Return (reported by you)					7.5%
Calculated policy return (sum: Policy weights x benchmarks)				8.3%	
Adjustment to reflect rebalancing and overlay impacts				<u>0.0%</u>	
Policy return (reported by you)					<u>8.3%</u>
Net Value Added (Net Return - Policy Return)					-0.8%

## Profit/Loss on overlay programs

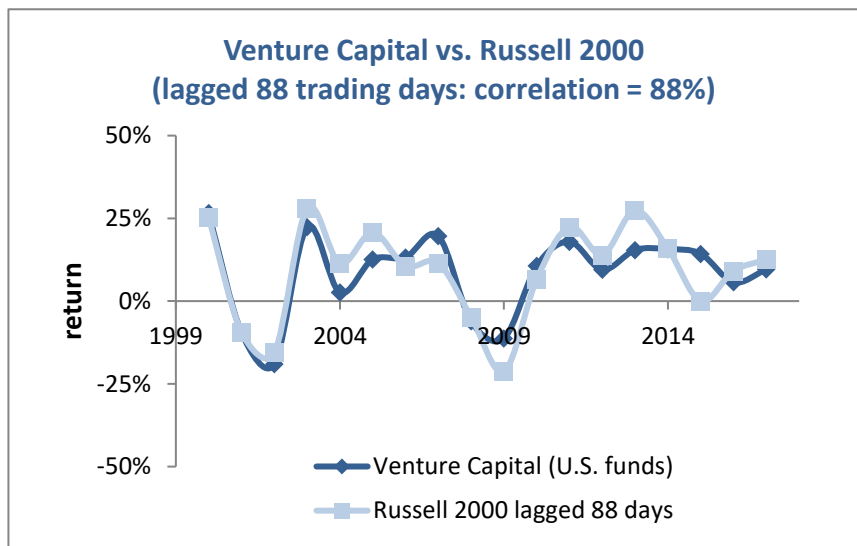
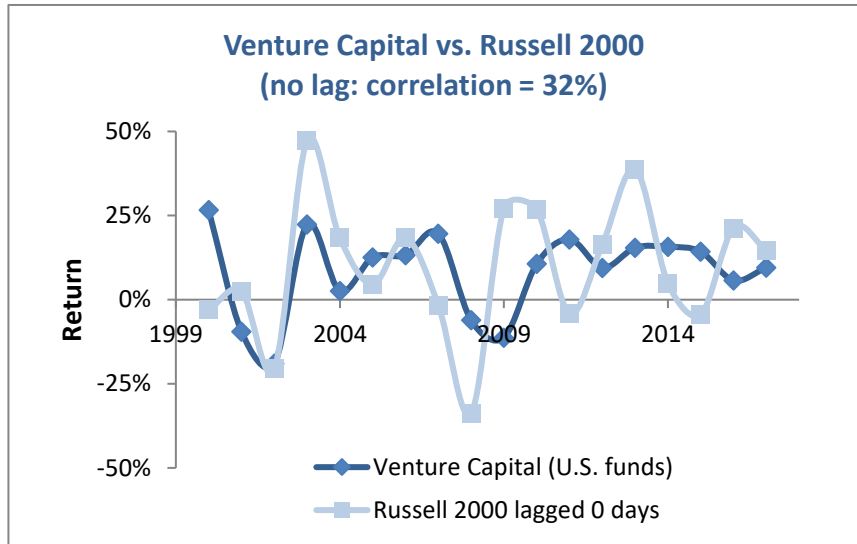
Overlay type	Your fund		Peer median				Global median			
	2018	2017	2018		2017		2018		2017	
	bps	bps	bps	#	bps	#	bps	#	bps	#
Int. Discretionary Currency			-3.4	1	-4.8	1	-0.1	14	0.1	13
Ext. Discretionary Currency			-0.8	1	-0.1	1	-0.3	10	-0.1	12
Internal Global TAA			0.0	1	0.4	2	-16.5	9	15.0	8
External Global TAA							-1.1	3	6.4	3
Internal PolicyTilt TAA			0.0	1	0.6	1	0.0	13	-0.1	11
External PolicyTilt TAA							0.0	2	18.2	2
Internal Commodities					0.1	1	-4.7	3	0.4	3
External Commodities							-2.7	4	1.9	3
Internal Long/Short			-26.5	1	46.2	1	-0.7	7	14.4	8
External Long/Short							0.0	1	38.6	1
Internal Other			0.0	1	-0.3	1	0.0	11	0.6	12
External Other							0.0	15	0.0	11

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 Russell 2000 index return was -33.8% versus -4.8% 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 27.7% using the un-lagged benchmarks versus -1.3% using the same benchmark lagged to match the average 88 day reporting lag of venture capital funds.



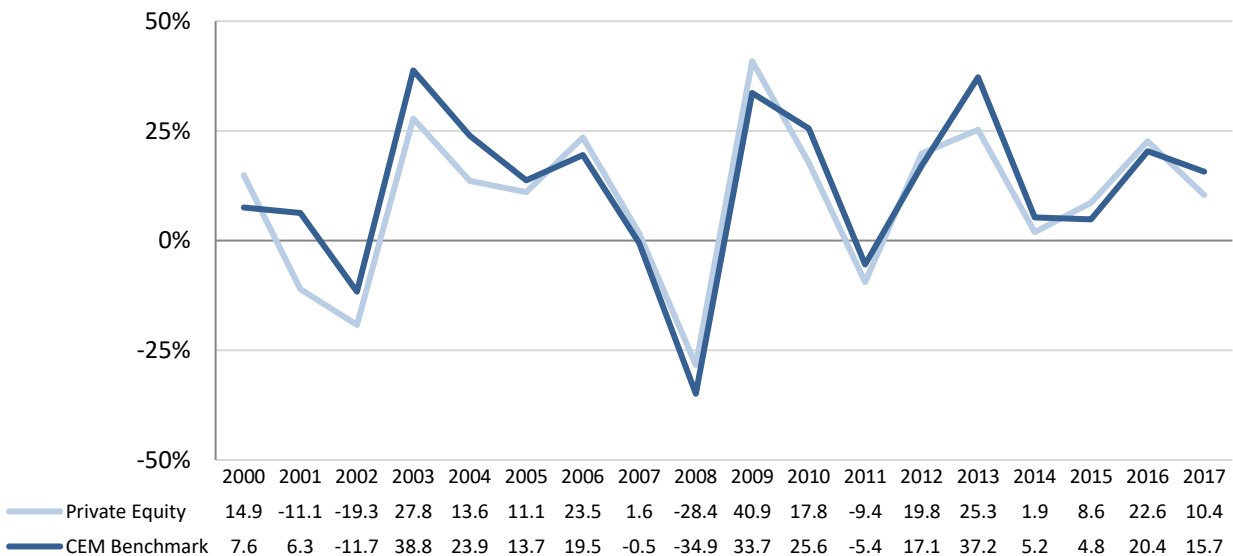
- Un-investable peer-based benchmarks. Peer based benchmarks reflect the reporting lags in peer portfolios so they have much better correlations than un-lagged investable benchmarks. But their relationship statistics are not as good as for lagged investable benchmarks.
- Aspirational premiums (i.e., 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 the reported private equity benchmarks of all funds except yours with defaults. The defaults are:

- Investable. They are comprised of lagged small cap benchmarks.
- Custom lagged for each participant. Different portfolios had different lags. CEM estimated the lag on private equity portfolios 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 some number of days lag, correlation between the two series is maximized. The median lag was 85 trading days (i.e., approximately 119 calendar days or 3.9 calendar months)
- Regional mix adjusted based on the average estimated mix of regions in private equity portfolios for a given country.
- 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 reported and 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

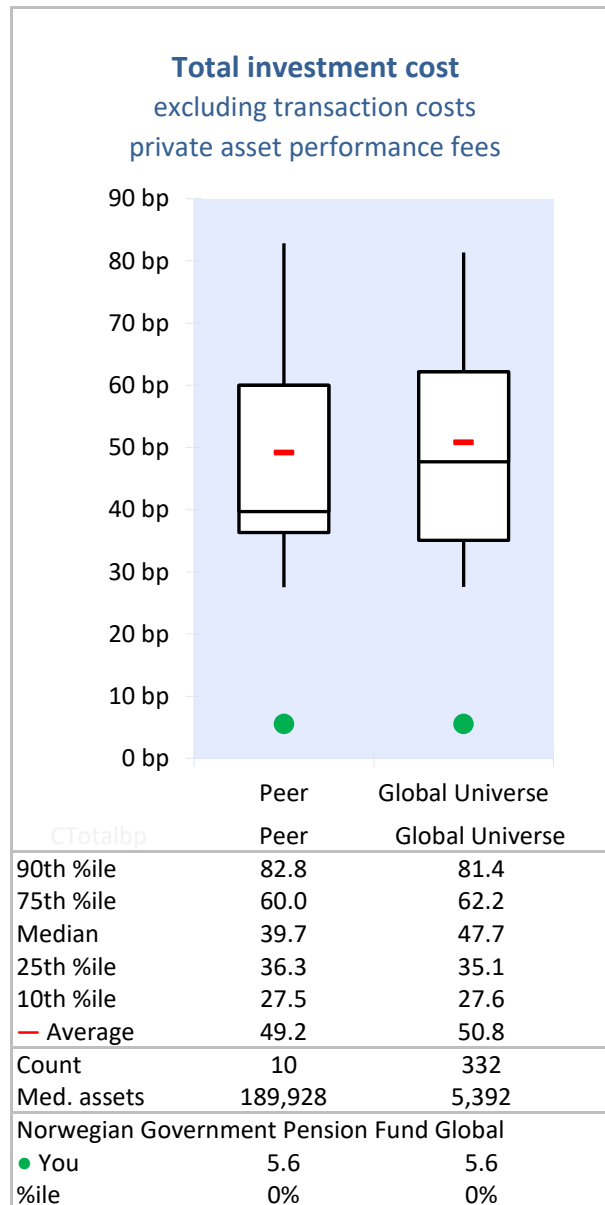
## Total cost and benchmark cost

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## Comparisons of total investment cost

Your total investment cost, excluding transaction costs and private asset performance fees, of 5.6 bps was below the peer median of 39.7 bps.

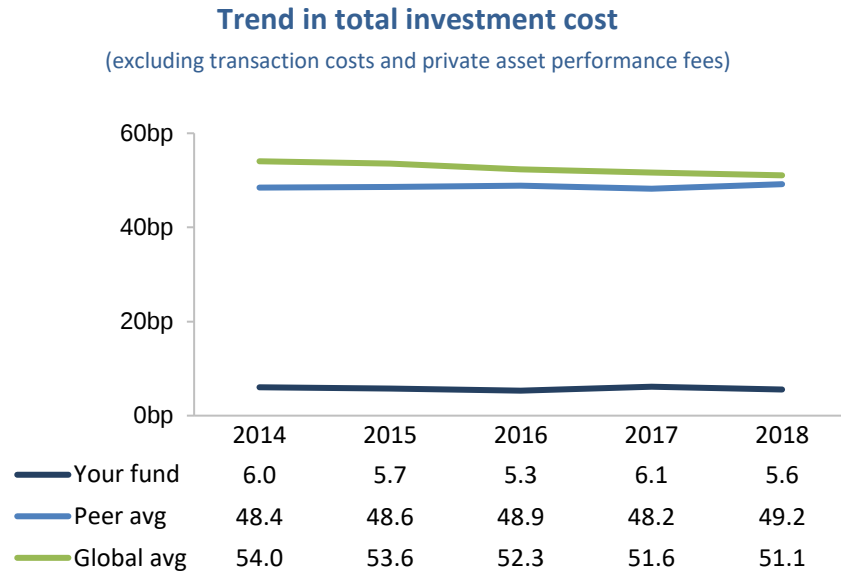
Differences in total investment cost are often caused by two factors that are usually outside of management's control: asset mix and fund size. Therefore, to assess whether your fund's total investment cost is high or low given your unique asset mix and size, CEM calculates a benchmark cost for your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





## Trend in total investment cost

Your total investment cost, excluding transaction costs and private asset performance fees, decreased from 6.0 bps in 2014 to 5.6 bps in 2018.



Trend analysis is based on 253 Global funds and 10 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 &amp; 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.
- Green shading indicates that the cost type has been newly added for the 2014 data year.
- CEM currently excludes external private asset performance fees 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 2018 total investment cost, excluding transaction costs and private asset performance fees, was 5.6 bp or €484.4 million.

### Your investment costs

	Internal		External Passive	External Active			Total <sup>1</sup>		
	Passive	Active	Monitoring Fees & Other	Base Fees	Perform. Fees	Monitor. & Other	€000s	bps	% of Total
<b>Asset management</b>									
Stock - U.S.				816		39	855		0%
Stock - EAFE				18,307	8,043	1,203	27,553		6%
Stock - Emerging				56,220	62,008	4,030	122,257		25%
Stock - Global		104,260					104,260		22%
Fixed Income - Emerging									
Fixed Income - Global		42,087					42,087		9%
REITs		2,013					2,013		0%
Real Estate <sup>1</sup>		50,360					50,360		10%
Real Estate - Operating Sub. <sup>1</sup>									
Total asset management costs excluding private asset performance fees							349,386	4.0bp	72%
<b>Oversight, custodial &amp; other asset related costs</b>									
Oversight of the Fund							76,723		16%
Trustee & Custodial							39,045		8%
Consulting and Performance Measurement							14,930		3%
Audit							4,358		1%
Other									
Total oversight, custodial & other costs							135,056	1.5bp	28%
Total investment costs excluding transaction costs and private asset performance fees							484,442	5.6bp	100%

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

## 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 (2018 - 2014)

	Investment costs (€000s)					Change (€000s)				Change (%)			
	2018	2017	2016	2015	2014	2018	2017	2016	2015	2018	2017	2016	2015
<b>Asset management</b>													
Stock - U.S.	855	1,608	1,827			-753	-219			-47%	-12%		
Stock - EAFE	27,553	26,360	25,123			1,193	1,237			5%	5%		
Stock - Emerging	122,257	156,712	67,156			-34,455	89,556			-22%	133%		
Stock - Global	104,260	108,209	102,953	249,652	214,185	-3,949	5,256	-146,699	35,467	-4%	5%	-59%	17%
Fixed Income - Emerging		186	5,042				-4,856				-96%		
Fixed Income - Global	42,087	41,515	40,473	37,010	29,004	572	1,042	3,463	8,006	1%	3%	9%	28%
REITs	2,013												
Real Estate <sup>1</sup>	50,360	54,425	0	0	0	-4,065	54,425			-7%			
Real Estate - Operating Sub. <sup>1</sup>			47,438	39,477	28,131			7,961	11,346			20%	40%
Total excl. private asset perf. fees	349,386	389,015	290,012	326,139	271,320	-39,629	99,003	-36,127	54,819	-10%	34%	-11%	20%
<b>Oversight, custodial &amp; other asset related costs</b>													
Oversight of the Fund	76,723	73,798	66,954	67,859	59,310	2,925	6,844	-905	8,549	4%	10%	-1%	14%
Trustee & Custodial	39,045	41,965	39,503	42,400	51,964	-2,920	2,462	-2,897	-9,564	-7%	6%	-7%	-18%
Consulting and Performance Measurement	14,930	10,050	9,570	8,868	6,363	4,880	480	702	2,505	49%	5%	8%	39%
Audit	4,358	4,312	6,110	4,840	4,314	46	-1,798	1,270	526	1%	-29%	26%	12%
Other													
Total oversight, custodial & other	135,056	130,125	122,137	123,967	121,951	4,931	7,988	-1,830	2,016	4%	7%	-1%	2%
Total investment costs <sup>1</sup>	484,442	519,140	412,149	450,106	393,271	-34,698	106,991	-37,957	56,835	-7%	26%	-8%	14%
Total in basis points	5.6bp	6.1bp	5.3bp	5.7bp	6.0bp								

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

## Total cost versus benchmark cost

Your fund's total investment cost, excluding transaction costs and private asset performance fees, was 14.1 bps below your benchmark cost of 19.7 bps. This implies that your fund was low cost by 14.1 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 cost excluding transaction costs and illiquid asset performance fees	484,442	5.6 bp
- Your fund's benchmark	1,715,475	19.7 bp
= Your fund's cost savings	-1,231,033	-14.1 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>		
Less passive	675,925	7.8 bp
More int. active % of total active	-1,417,116	-16.3 bp
Less overlays and unfunded strategies	-73,655	-0.8 bp
Total style impact	-814,845	-9.3 bp
<u>Paying more/-less for similar services:</u>		
External investment management	-30,486	-0.3 bp
Internal investment management	-346,683	-4.0 bp
Oversight, custodial and other	-39,019	-0.4 bp
Total impact of paying more /-less	-416,188	-4.8 bp
Total savings	-1,231,033	-14.1 bp

## Benchmark cost calculation

Your 2018 benchmark cost was 19.7 basis points or 1.7 billion. 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 (A)	Weighted peer median cost <sup>1</sup> (B)	Benchmark €000s (A X B)
<b>Asset management costs</b>			
Stock - U.S.	283	8.9 bp	252
Stock - EAFE	8,758	22.0 bp	19,243
Stock - Emerging	29,349	32.1 bp	94,145
Stock - Global	538,129	17.2 bp	926,471
Fixed Income - Global	264,501	8.8 bp	231,948
REITs	7,937	10.0 bp	7,968
Real Estate	23,008	81.6 bp	187,719
Overlay Programs <sup>2</sup>	871,966	0.8 bp	73,655
Benchmark for asset management	871,966	17.7 bp	1,541,400
<b>Oversight, custody and other costs<sup>3</sup></b>			
Oversight	871,966	0.5 bp	
Trustee & Custodial	871,966	0.5 bp	
Consulting	871,966	0.0 bp	
Audit	871,966	0.0 bp	
Other	871,966	0.2 bp	
Benchmark for oversight, custody & other	871,966	2.0 bp	174,075
<b>Total benchmark cost</b>		<b>19.7 bp</b>	<b>1,715,475</b>

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). 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.

## Cost impact of differences in implementation style

Differences in implementation style (passive vs. active, internal vs. external, etc.) relative to your peers saved you 9.3 bps.

Implementation choices	Assets by style	Peer benchmark cost			Style 1 % Peer More/ -Less			Cost/ -Savings	
		Style 1	Style 2	Style 1 -Savings	Your	average	e	€000s	bps
	a	b	c	d = b - c				a x d x e	
<u>Passive vs active</u>	Total	Passive	Active		Passive % of total assets				
Stock - U.S.	283	2 bp	24 bp	-22 bp	0%	69%	-69%	435	
Stock - EAFE	8,758	4 bp	32 bp	-28 bp	0%	36%	-36%	8,738	
Stock - Emerging	29,349	6 bp	43 bp	-37 bp	0%	30%	-30%	32,705	
Stock - Global	538,129	3 bp	27 bp	-24 bp	0%	40%	-40%	528,552	
Fixed Income - Global	264,501	2 bp	13 bp	-11 bp	0%	37%	-37%	105,495	
Less passive								675,925	7.8 bp
<u>Internal active vs external active</u>	Active assets	Internal active	External active		Internal active % of active				
Stock - U.S.	283	6 bp	30 bp	-24 bp	0%	23%	-23%	154	
Stock - EAFE	8,758	7 bp	38 bp	-31 bp	0%	20%	-20%	5,324	
Stock - Emerging	29,349	13 bp	50 bp	-37 bp	0%	19%	-19%	20,155	
Stock - Global	538,129	7 bp	40 bp	-33 bp	100%	40%	60%	-1,073,802	
Fixed Income - Global	264,501	4 bp	32 bp	-29 bp	100%	68%	32%	-240,365	
REITs	7,937	6 bp	50 bp	-44 bp	100%	91%	9%	-3,260	
Real Estate	23,008	27 bp	106 bp	-79 bp	100%	31%	69%	-125,321	
More int. active % of total active								-1,417,116	-16.3 bp
Less overlays and unfunded strategies								-73,655	-0.8 bp
Total impact of differences in implementation style								-814,845	-9.3 bp

## Cost impact of overlays

As summarized on the previous page, the style impact of overlays saved you 0.8 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)	Cost as % of total holdings		Cost/-Savings Impact (000s)
		You	Peer avg.	
	(A)	(B)	(C)	A X (B - C)
<b>Internal Overlays</b>				
Currency - Hedge	871,966	NA	0.00 bp	-181
Currency - Discretionary	871,966	NA	0.00 bp	-422
Duration Management - Hedge	871,966	NA	0.01 bp	-683
Global TAA - Discretionary	871,966	NA	0.07 bp	-6,003
Policy tilt TAA - Discretionary	871,966	NA	0.04 bp	-3,771
Long/Short - Discretionary	871,966	NA	0.68 bp	-59,354
<b>External Overlays</b>				
Currency - Discretionary	871,966	NA	0.04 bp	-3,240
Total impact in 000s				-73,655
Total impact in basis points				-0.8 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 4.8 bps.

Style	Your avg holdings (mils)	Cost in bps			Cost/-Savings	
		Your	Peer median	More/-less	€000s	bps
<b>External asset management</b>	(A)			(B)	(A X B)	
Stock - U.S.	active	283	30.2	29.7	0.5	14
Stock - EAFE	active	8,758	31.5	38.0	-6.6	-5,752
Stock - Emerging	active	29,349	41.7	50.1	-8.4	-24,748
Total for external management						-30,486 -0.3 bp
<b>Internal asset management</b>	(A)			(B)	(A X B)	
Stock - Global	active	538,129	1.9	7.1	-5.1	-276,961
Fixed Income - Global	active	264,501	1.6	3.7	-2.1	-54,990
REITs	active	7,937	2.5	5.9	-3.4	-2,695
Real Estate ex-REITs	active	23,008	21.9	27.1	-5.2	-12,038
Total for internal management						-346,683 -4.0 bp
<b>Oversight, custodial, other<sup>1</sup></b>						
Oversight			0.9	0.5	0.4	
Trustee & Custodial			0.4	0.5	-0.1	
Consulting			0.2	0.0	0.2	
Audit			0.0	0.0	0.0	
Other			0.0	0.2	-0.2	
Total for oversight, custodial, other						-39,019 -0.4 bp
<b>Total</b>						<b>-416,188 -4.8 bp</b>

1. The benchmark for 'oversight, custodial and other costs' is based on the total costs for these activities.

## 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 <sup>1</sup>	Benchmark = peer weighted median cost <sup>1</sup>	More/-less	Your average assets (or fee basis)	More/-less in €000s		
					Total More/-less	Due to Impl. style	Due to paying more/less
<b>Asset management costs</b>	(A)	(B)	(C = A - B)	(D)	(C X D)		
Stock - U.S.	30.2 bp	8.9 bp	21.3 bp	283	603	589	14
Stock - EAFE	31.5 bp	22.0 bp	9.5 bp	8,758	8,310	14,062	-5,752
Stock - Emerging	41.7 bp	32.1 bp	9.6 bp	29,349	28,112	52,860	-24,748
Stock - Global	1.9 bp	17.2 bp	-15.3 bp	538,129	-822,211	-545,250	-276,961
Fixed Income - Global	1.6 bp	8.8 bp	-7.2 bp	264,501	-189,861	-134,871	-54,990
REITs	2.5 bp	10.0 bp	-7.5 bp	7,937	-5,955	-3,260	-2,695
Real Estate	21.9 bp	81.6 bp	-59.7 bp	23,008	-137,359	-125,321	-12,038
Overlay Programs <sup>2</sup>	0.0 bp	0.8 bp	-0.8 bp	871,966	-73,655	-73,655	0
Total asset management	4.0 bp	17.7 bp	-13.7 bp	871,966	-1,192,015	-814,845	-377,169
<b>Oversight, custody and other costs<sup>3</sup></b>							
Oversight of the Fund	0.9 bp	0.5 bp	0.4 bp				
Trustee & Custodial	0.4 bp	0.5 bp	-0.1 bp				
Consulting	0.2 bp	0.0 bp	0.2 bp				
Audit	0.0 bp	0.0 bp	0.0 bp				
Other	0.0 bp	0.2 bp	-0.2 bp				
Total oversight, custody & other	1.5 bp	2.0 bp	-0.4 bp	871,966	-39,019	n/a	-39,019
<b>Total</b>	<b>5.6 bp</b>	<b>19.7 bp</b>	<b>-14.1 bp</b>	<b>871,966</b>	<b>-1,231,033</b>	<b>-814,845</b>	<b>-416,188</b>

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.

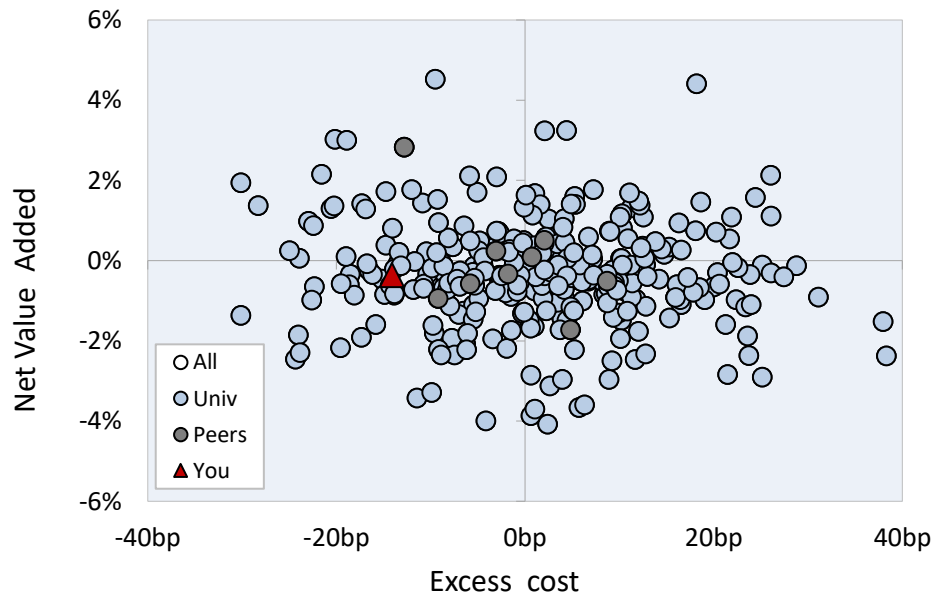
2. Total fund average holdings is used as the base when calculating the relative cost impact of the overlay programs.

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

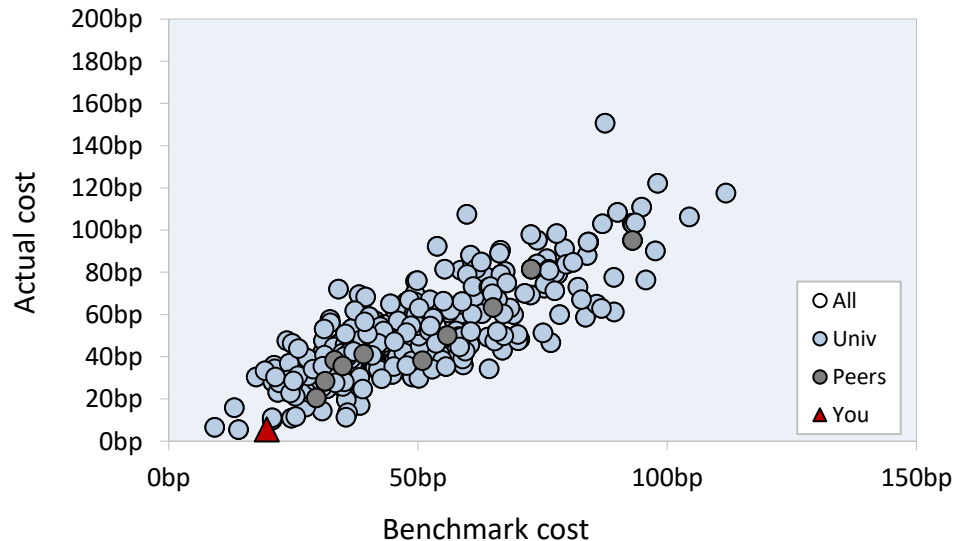
## Your cost effectiveness ranking

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 value added and excess cost to create a snapshot of your cost effectiveness performance relative to that of the global universe. In 2018, your fund ranked in the negative value added, low cost quadrant.

**Your 2018 Net value added -0.4%, Excess cost -14 bps**



**Your 2018 Actual cost 5.6 bps, Benchmark cost 19.7 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 is 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 7 of this section.

## Appendix A: Benchmarking methodology formulas and data

### a) Formulas

Example calculations for 'Stock - U.S.'

Asset class peer cost = weighted average by peer average style of peer median costs  
= (31% x 1.7 bp) + (7% x 6.0 bp) + (37% x 2.0 bp) + (24% x 29.7 bp) = 8.9 bp

Your cost versus benchmark (-savings/+excess) = asset class your cost - asset class peer cost  
= 30.2 bp - 8.9 bp = 21.3 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)  
= 15.4 bp + 0.0 bp + 5.4 bp = 20.8 bp

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

= (peer average passive cost - peer average active cost) x  
(passive % of asset, you - passive % of asset, peer average)  
= (1.9 bp - 24.3 bp) x (0% - 69%) = 15.4 bp

Peer average passive cost = weighted average by peer average style of peer median costs for  
internal passive and external passive management  
= [(31% x 1.7 bp) + (37% x 2.0 bp)] / (31% + 37%) = 1.9 bp

Peer average active cost = weighted average by peer average style of peer median costs for  
internal active and external active management  
= [(7% x 6.0 bp) + (24% x 29.7 bp)] / (7% + 24%) = 24.3 bp

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

= (peer average internal passive cost - peer average external passive cost) x  
(internal passive % of passive, you - internal passive % of passive, peer average) x passive % of asset, you  
= (1.7 bp - 2.0 bp) x (0% - 0%) x 0% = 0.0 bp

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

= (peer average internal active cost - peer average external active cost) x  
(internal active % of active, you - internal active % of active, peer avg) x active % of asset, you  
= (6.0 bp - 29.7 bp) x (0% - 23%) x 100% = 5.4 bp

Cost impact of paying more/-less

= (cost internal passive, you - cost internal passive, peer) x internal passive % of asset, you +  
(cost internal active, you - cost internal active, peer) x internal active % of asset, you +  
(cost external passive, you - cost external passive, peer) x external passive % of asset, you +  
(cost external active, you - cost external active, peer) x external active % of asset, you  
= (0.0 bp - 1.7 bp) \* 0% + (0.0 bp - 6.0 bp) \* 0% + (0.0 bp - 2.0 bp) \* 0% + (30.2 bp - 29.7 bp) \* 100% = 0.5 bp

Your cost versus benchmark (-savings/+excess)

= cost impact of differences in implementation style + cost impact of paying more/-less  
= 20.8 bp + 0.5 bp = 21.3 bp

## Appendix A: Benchmarking methodology formulas and data (page 2 of 2)

### b) 2018 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.				30.2				1.7	6.0	2.0	29.7				8.9
Stock - EAFE				31.5				4.1	7.3	4.0	38.0				22.0
Stock - Emerging				41.7				5.5	13.1	10.1	50.1				32.1
Stock - Global		1.9						2.7	7.1	2.7	40.3				17.2
Fixed Income - Global		1.6						1.9	3.7	3.4	32.5				8.8
REITs		2.5							5.9		49.7				10.0
Real Estate		21.9							27.1		75.7	44.6	127.6	44.0	81.3
Underlying base fees														101.0	0.3

### c) 2018 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.	0.0%	0.0%	0.0%	100.0%				31.3%	7.2%	37.4%	24.1%			
Stock - EAFE	0.0%	0.0%	0.0%	100.0%				15.3%	12.7%	20.5%	51.5%			
Stock - Emerging	0.0%	0.0%	0.0%	100.0%				25.0%	12.9%	5.2%	56.9%			
Stock - Global	0.0%	100.0%	0.0%	0.0%				27.2%	23.8%	13.2%	35.9%			
Fixed Income - Global	0.0%	100.0%	0.0%	0.0%				33.0%	42.9%	4.3%	19.8%			
REITs		100.0%		0.0%					90.6%		9.4%			
Real Estate		100.0%		0.0%	0.0%	0.0%	0.0%		31.2%		17.1%	7.0%	44.4%	0.3%
Underlying base fees		100.0%		0.0%	0.0%	0.0%	0.0%		31.2%		17.1%	7.0%	44.4%	0.3%

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

# 5

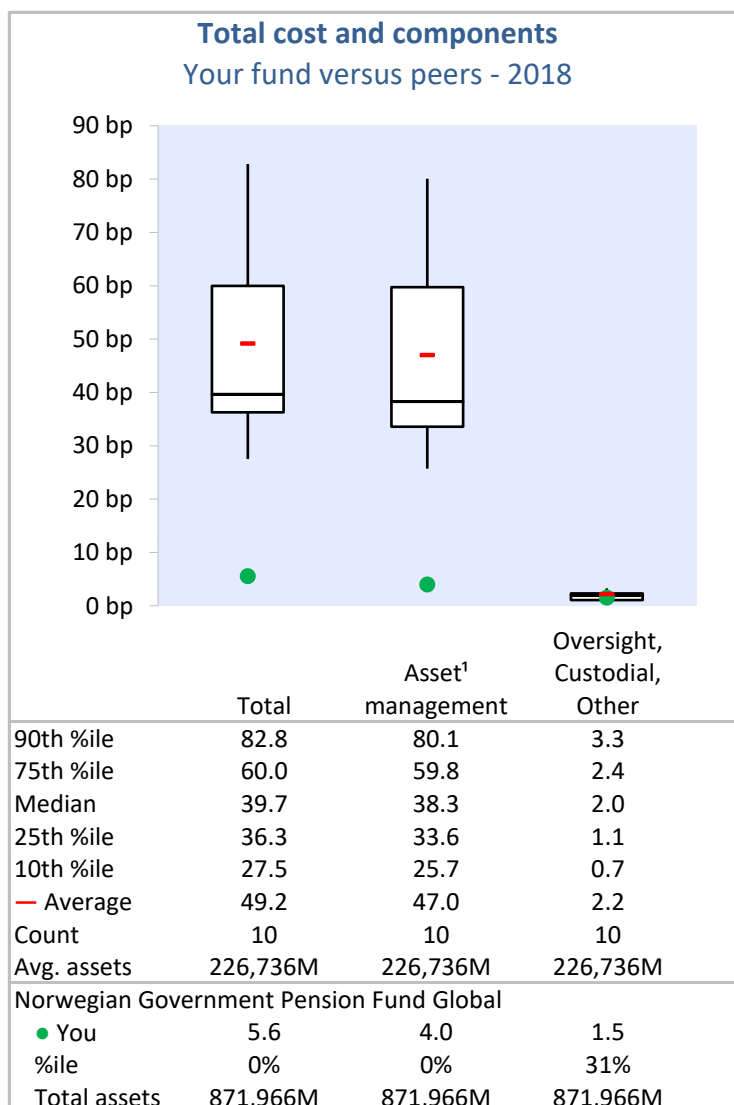
## Cost comparisons

Total fund cost	2
Governance, operations & support	3
Public asset classes	
- Stock	4
- Fixed Income	10
- Commodities	21
- REITs	22
Real asset classes	
- Real estate ex-REITs	23
- Infrastructure	24
- Natural resources	25
- Other real assets	26
Private equity	
- Diversified private equity	27
- LBO	28
- Venture capital	29
- Private credit	30
- Other private equity	32
Global TAA	33
RiskParity	34
Hedge Funds	35
Overlays	36

## Total fund cost

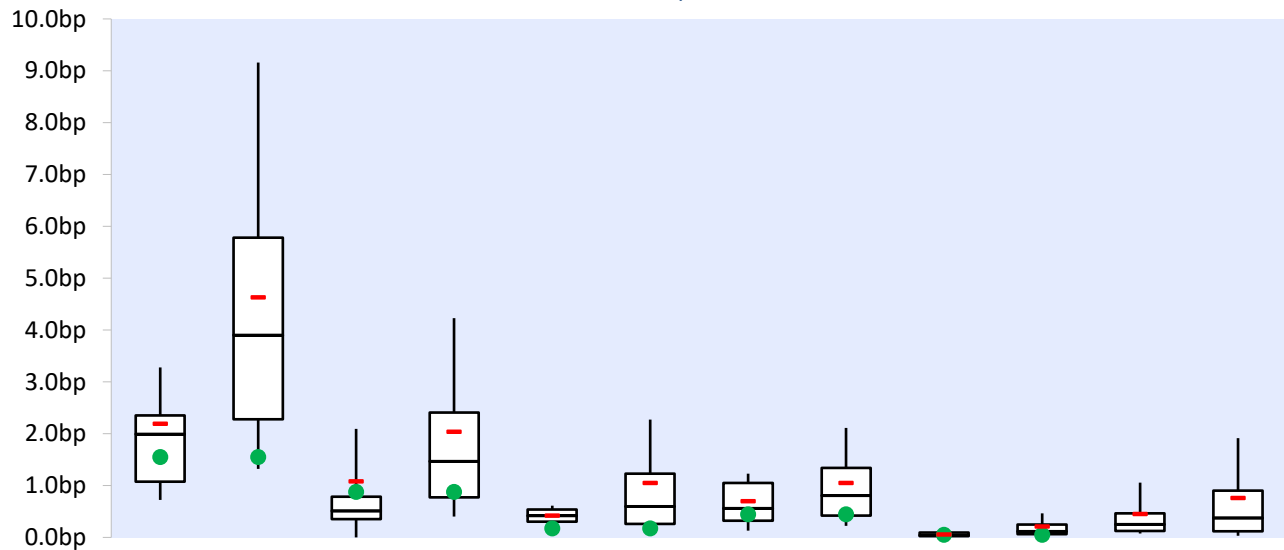
Total costs are benchmarked in the previous section. In this section, your fund's costs are compared on a line-item basis to your peers. This enables you to understand better why you may be a high or low cost fund and it also identifies and quantifies major cost differences that may warrant further investigation.

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

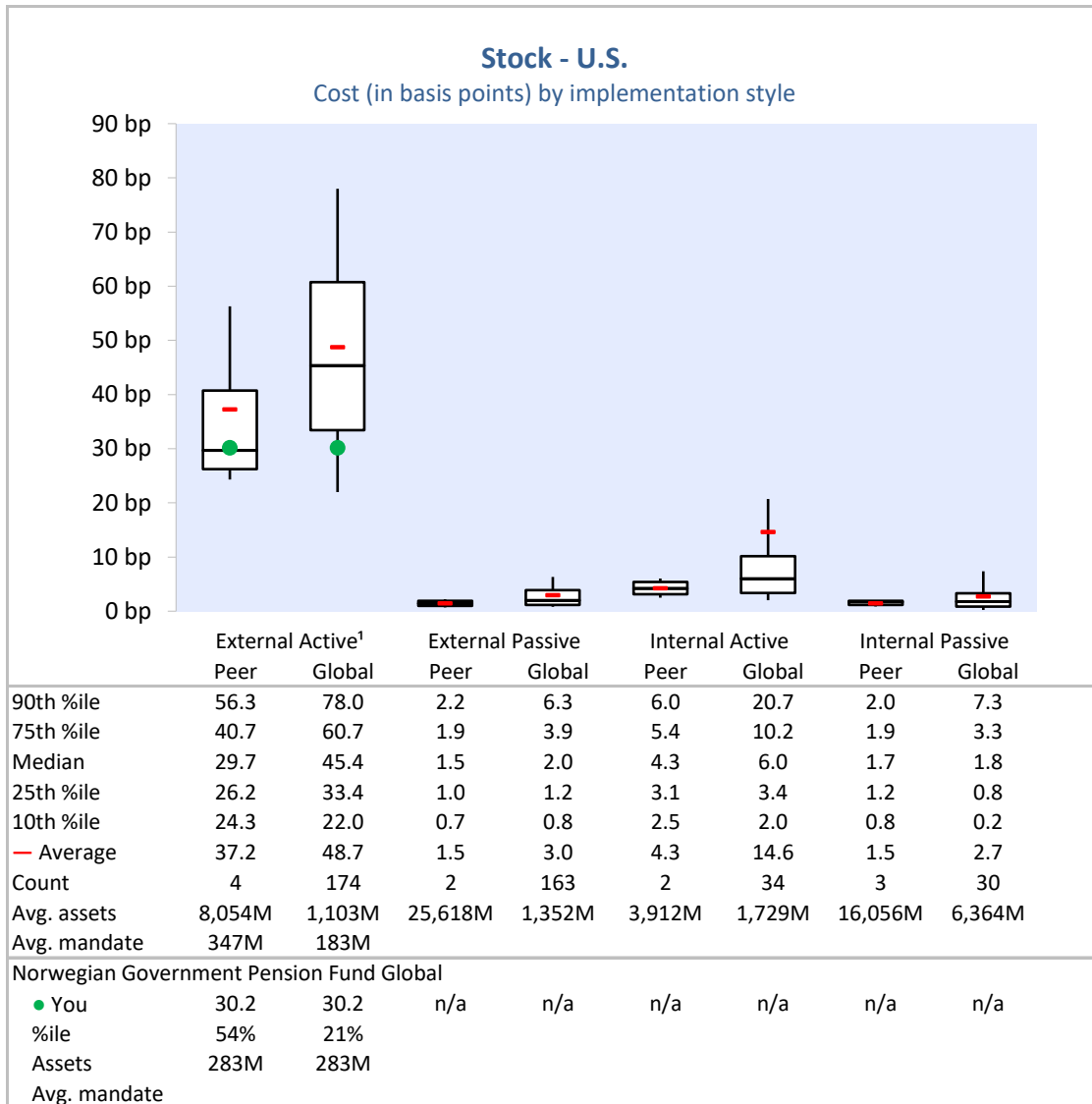
Cost as a % of total plan assets



	Total		Oversight <sup>1</sup>		Consulting & Perf. Meas.		Custody		Audit		Other	
	Peer	Global	Peer	Global	Peer	Global	Peer	Global	Peer	Global	Peer	Global
90th %ile	3.3	9.2	2.1	4.2	0.6	2.3	1.2	2.1	0.1	0.5	1.1	1.9
75th %ile	2.4	5.8	0.8	2.4	0.5	1.2	1.0	1.3	0.1	0.2	0.5	0.9
Median	2.0	3.9	0.5	1.5	0.4	0.6	0.6	0.8	0.0	0.1	0.3	0.4
25th %ile	1.1	2.3	0.3	0.8	0.3	0.3	0.3	0.4	0.0	0.1	0.1	0.1
10th %ile	0.7	1.3	0.0	0.4	0.2	0.1	0.1	0.2	0.0	0.0	0.1	0.0
— Average	2.2	4.6	1.1	2.0	0.4	1.1	0.7	1.0	0.1	0.2	0.5	0.8
Count	10	332	10	332	2	268	9	319	6	292	8	240
Avg. assets	226,736M	22,091M	226,736M	22,091M	226,736M	22,091M	226,736M	22,091M	226,736M	22,091M	226,736M	22,091M
Norwegian Government Pension Fund Global												
● You	1.5	1.5	0.9	0.9	0.2	0.2	0.4	0.4	0.0	0.0	n/a	n/a
%ile	31%	13%	78%	29%	0%	15%	34%	28%	56%	19%		
Plan assets	871,966M	871,966M	871,966M	871,966M	871,966M	871,966M	871,966M	871,966M	871,966M	871,966M	871,966M	871,966M

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.

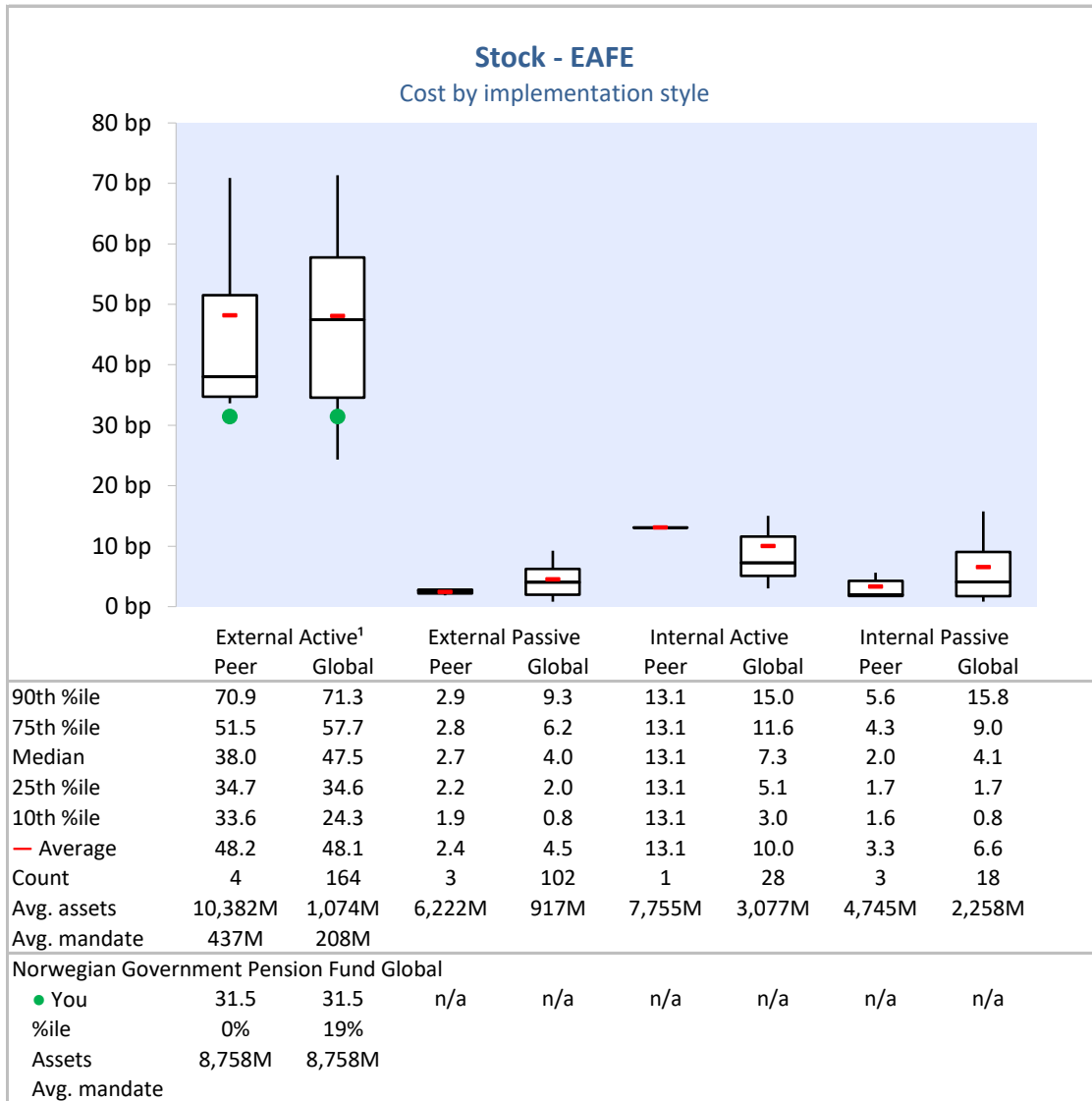




1. Breakdown of external active fees

	You	Peer Average	Global Average
Base fees	28.8	24.8	43.4
Performance fees*	n/a	10.9	4.6
Internal and other	<u>1.4</u>	<u>1.5</u>	<u>0.7</u>
Total	30.2	37.2	48.7

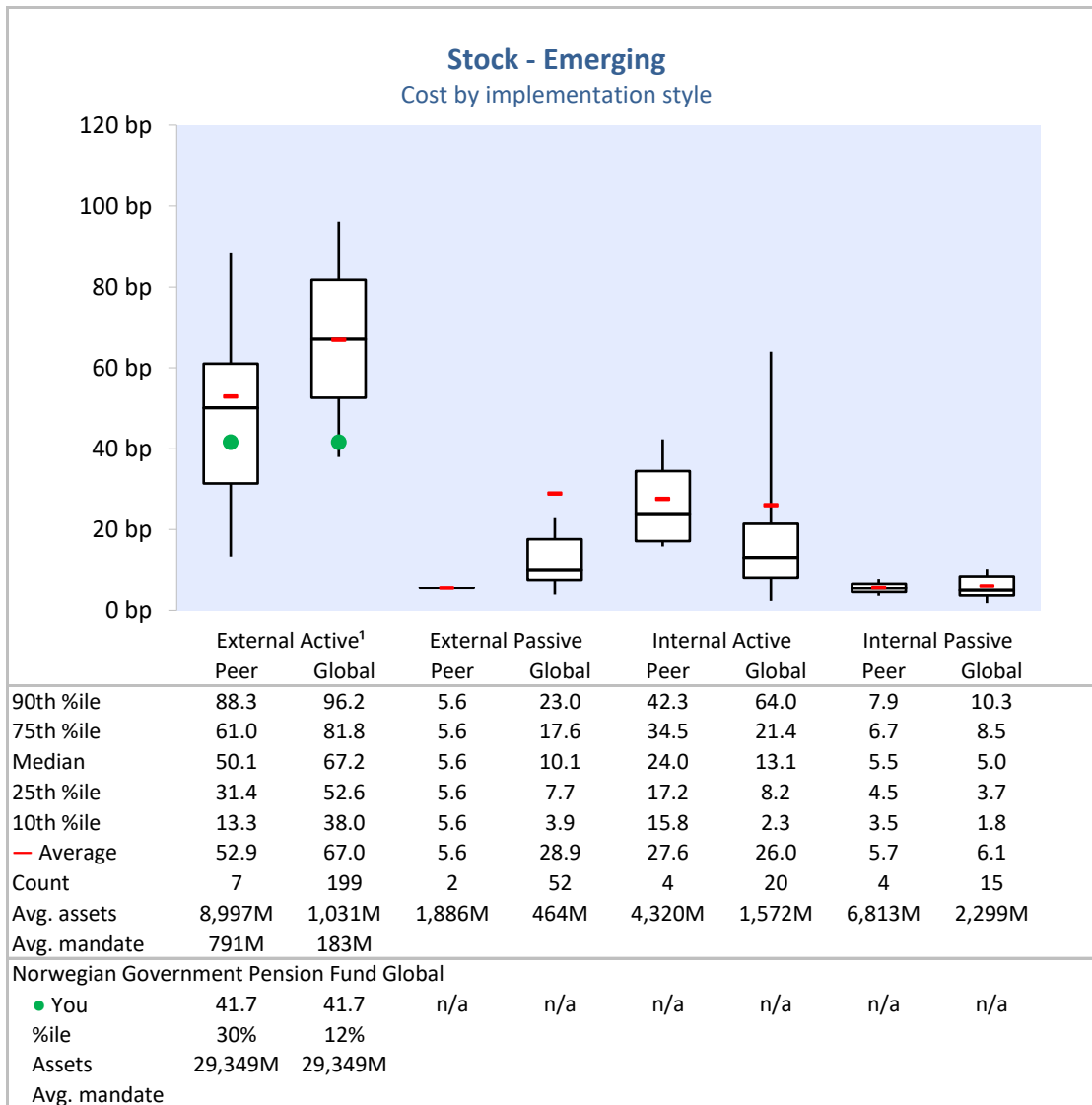
\* For funds that did not report a performance fee, a value of 'zero' was used. The average performance fee for those funds that reported a performance fee is 2.0 bps for peers (44 funds) and 16.9 bps for Global participants (47 funds).



#### 1. Breakdown of external active fees

	You	Peer Average	Global Average
Base fees	20.9	32.6	45.0
Performance fees*	9.2	14.6	2.4
Internal and other	<u>1.4</u>	<u>1.0</u>	<u>0.7</u>
Total	<u>31.5</u>	<u>48.2</u>	<u>48.1</u>

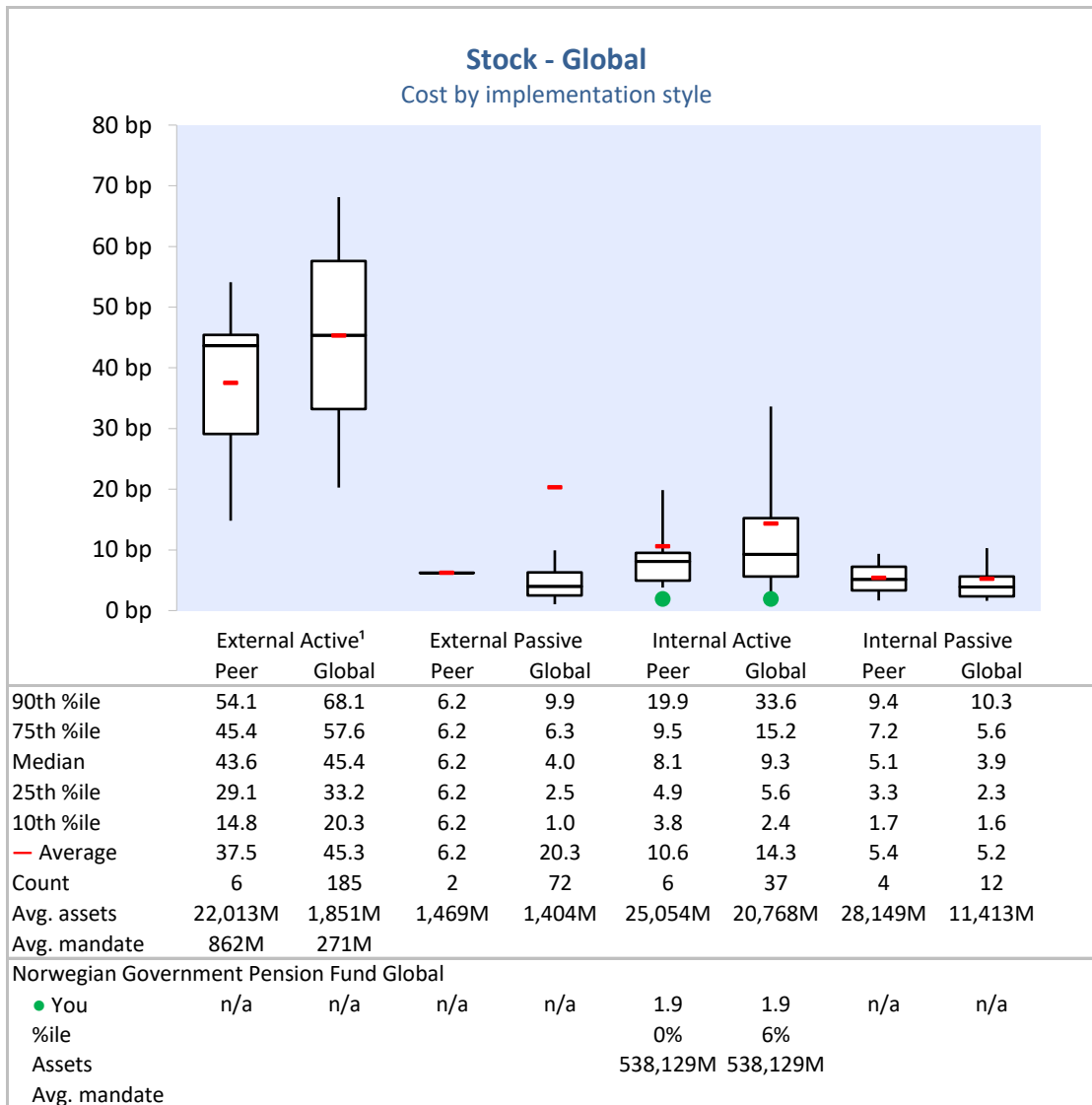
\* For funds that did not report a performance fee, a value of 'zero' was used. The average performance fee for those funds that reported a performance fee is 29.2 bps for peers (2 funds) and 11.4 bps for Global participants (35 funds).



#### 1. Breakdown of external active fees

	You	Peer Average	Global Average
Base fees	19.2	38.8	64.2
Performance fees*	21.1	9.0	1.6
Internal and other	<u>1.4</u>	<u>5.1</u>	<u>1.1</u>
Total	41.7	52.9	67.0

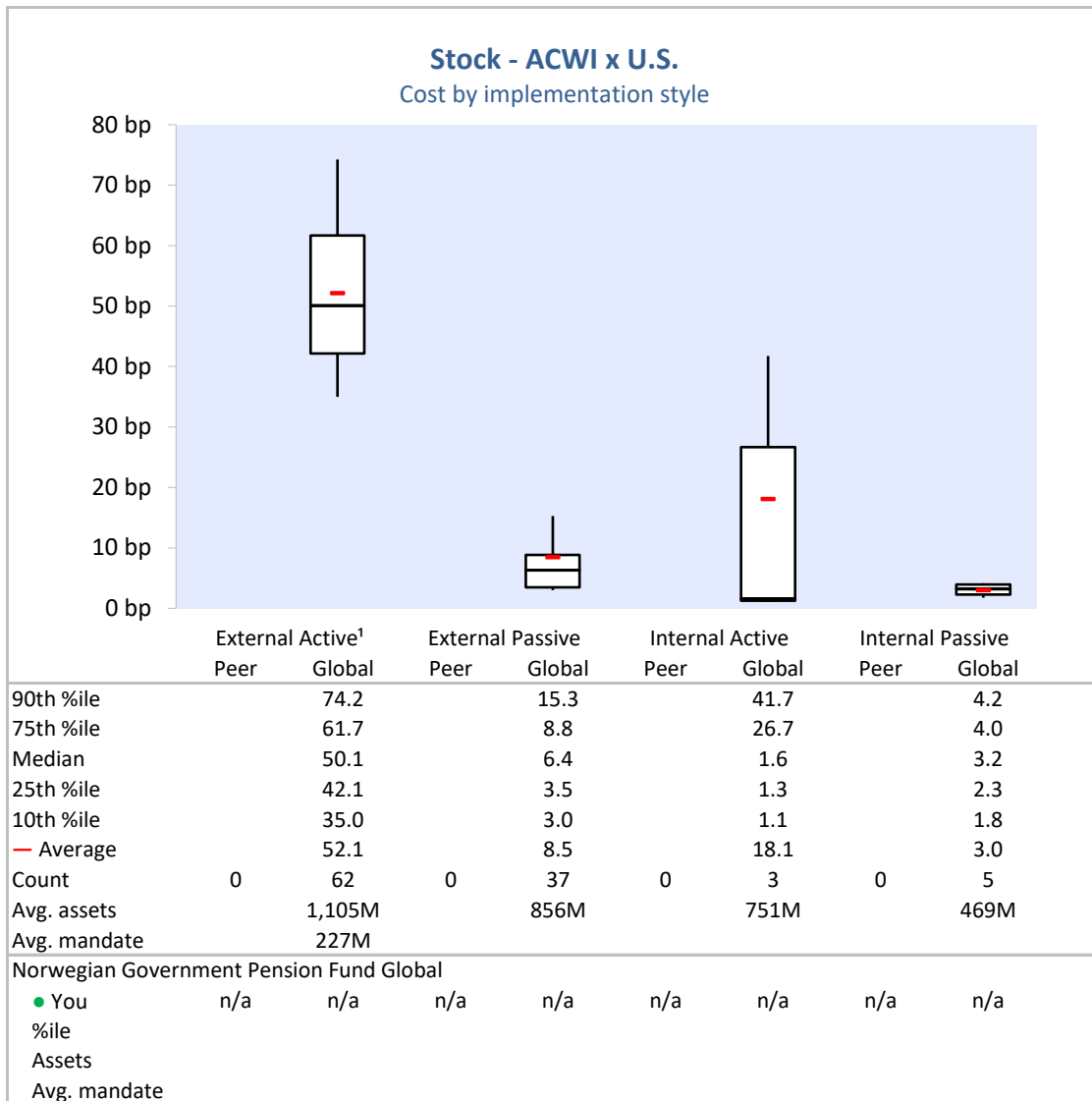
\* For funds that did not report a performance fee, a value of 'zero' was used. The average performance fee for those funds that reported a performance fee is 12.6 bps for peers (5 funds) and 9.0 bps for Global participants (36 funds).



#### 1. Breakdown of external active fees

	You	Peer Average	Global Average
Base fees	n/a	28.6	42.5
Performance fees*	n/a	6.3	2.0
Internal and other	<u>n/a</u>	<u>2.6</u>	<u>0.9</u>
Total	n/a	37.5	45.3

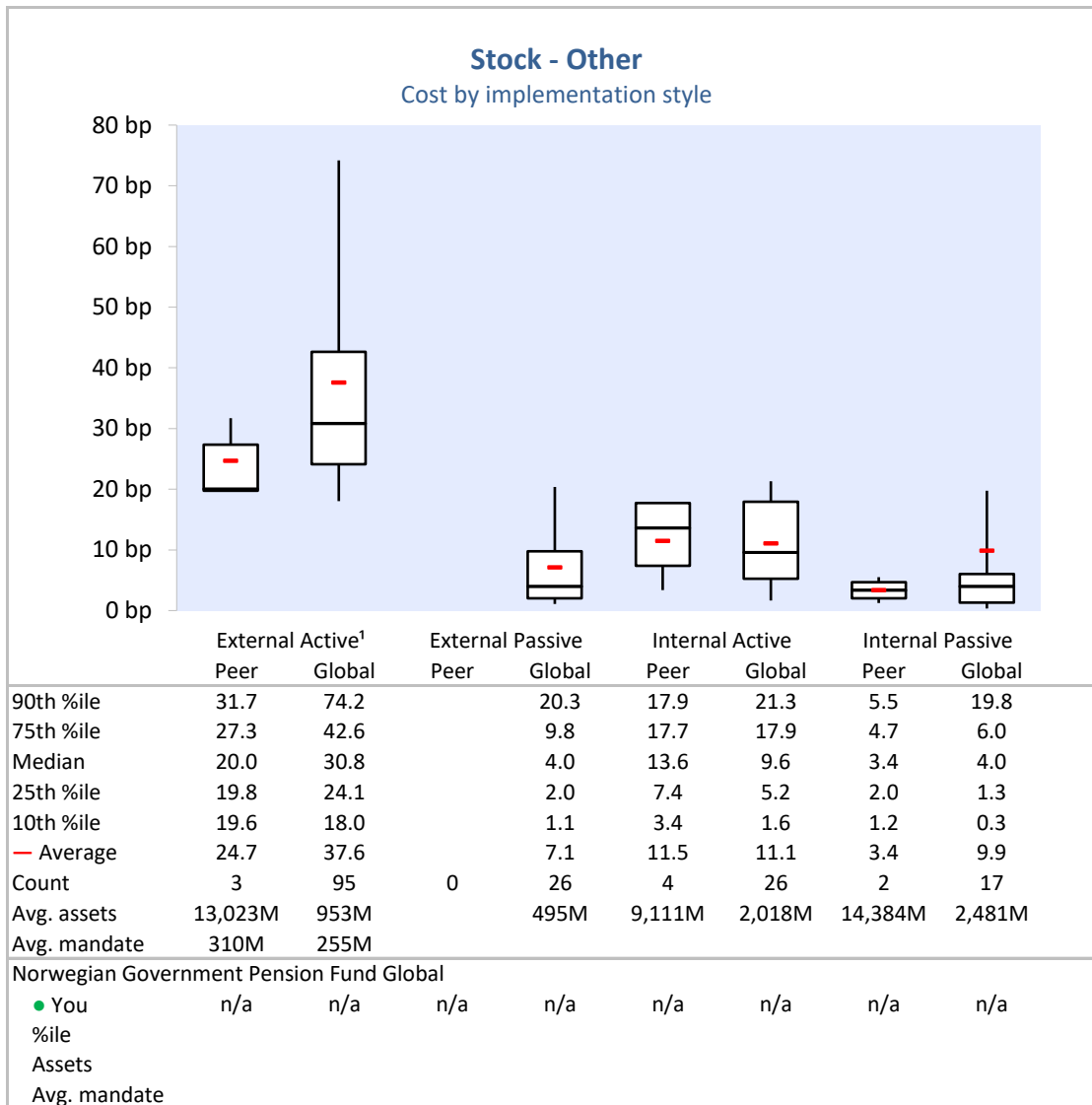
\* For funds that did not report a performance fee, a value of 'zero' was used. The average performance fee for those funds that reported a performance fee is 6.3 bps for peers (6 funds) and 7.2 bps for Global participants (50 funds).



#### 1. Breakdown of external active fees

	You	Peer Average	Global Average
Base fees	n/a	n/a	49.8
Performance fees*	n/a	n/a	2.1
Internal and other	<u>n/a</u>	<u>n/a</u>	<u>0.1</u>
Total	n/a	n/a	52.1

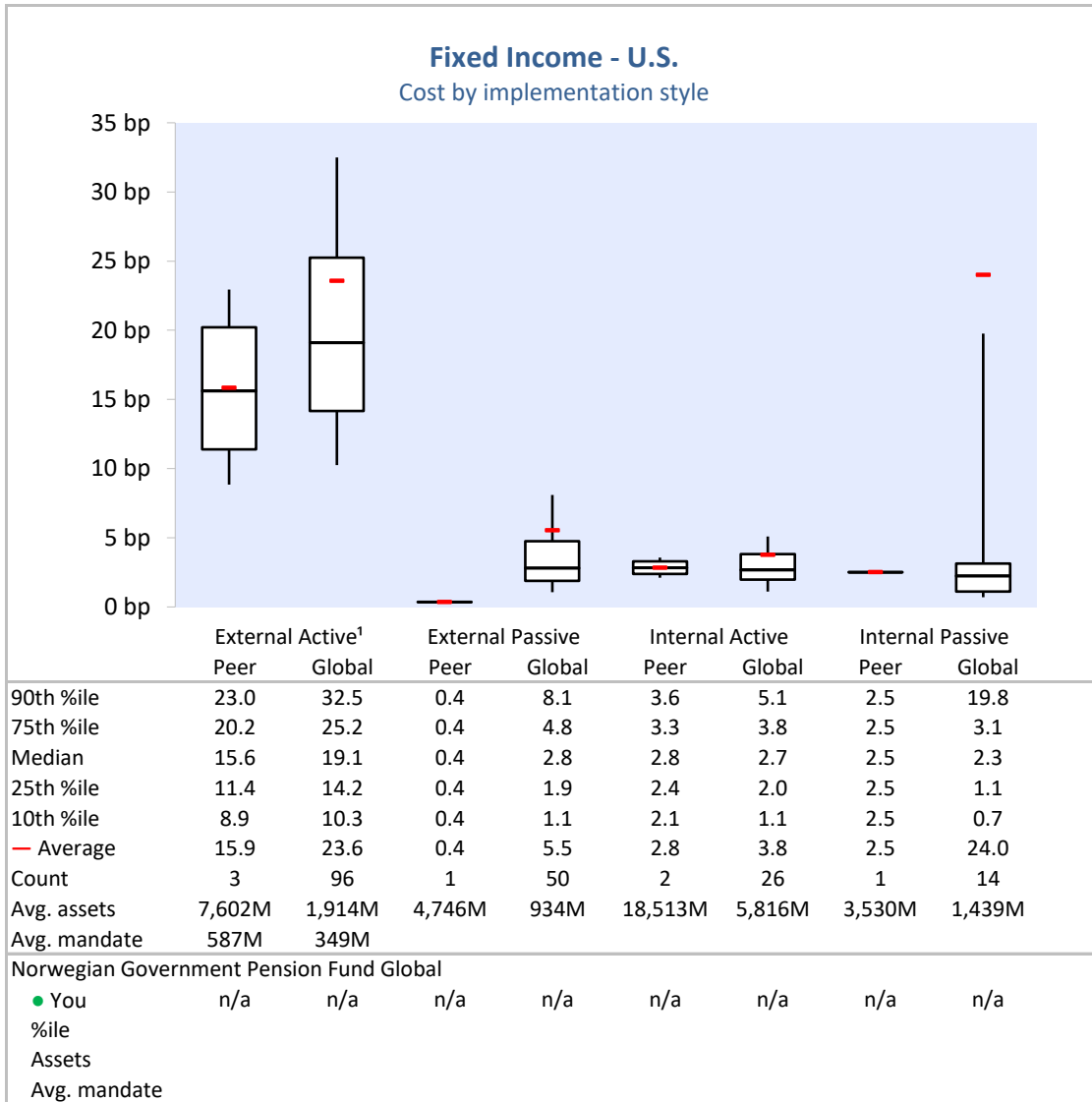
\* For funds that did not report a performance fee, a value of 'zero' was used. The average performance fee for those funds that reported a performance fee is 10.2 bps for Global participants (13 funds).



#### 1. Breakdown of external active fees

	You	Peer Average	Global Average
Base fees	n/a	23.9	36.1
Performance fees*	n/a	-0.2	0.8
Internal and other	<u>n/a</u>	<u>1.1</u>	<u>0.7</u>
Total	n/a	24.7	37.6

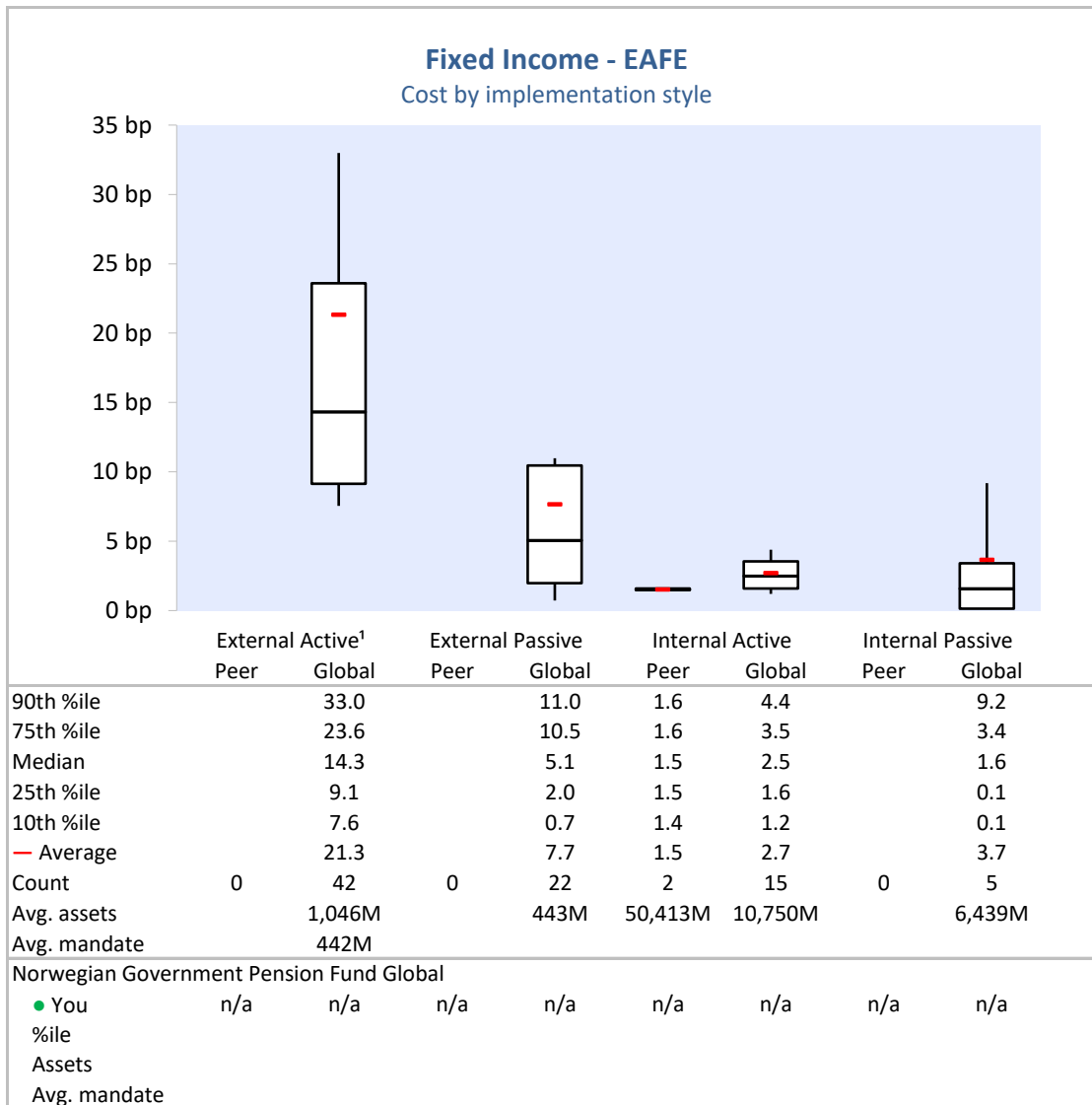
\* For funds that did not report a performance fee, a value of 'zero' was used. The average performance fee for those funds that reported a performance fee is -0.2 bps for peers (3 funds) and 5.6 bps for Global participants (14 funds).



#### 1. Breakdown of external active fees

	You	Peer Average	Global Average
Base fees	n/a	13.7	21.1
Performance fees*	n/a	0.0	2.0
Internal and other	<u>n/a</u>	<u>2.2</u>	<u>0.6</u>
Total	n/a	15.9	23.6

\* 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 0.0 bps for peers (1 fund) and 10.4 bps for Global participants (18 funds).



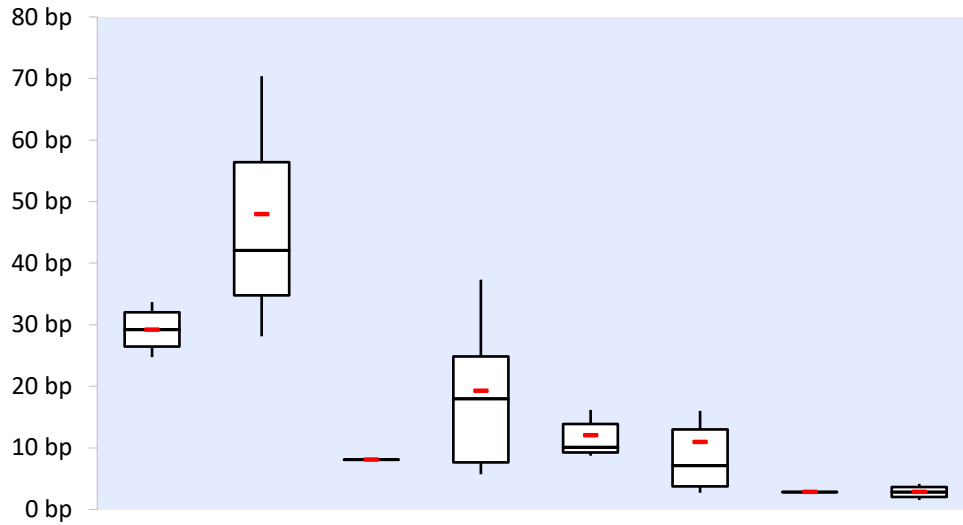
#### 1. Breakdown of external active fees

	You	Peer Average	Global Average
Base fees	n/a	n/a	16.2
Performance fees*	n/a	n/a	4.1
Internal and other	<u>n/a</u>	<u>n/a</u>	<u>1.0</u>
Total	n/a	n/a	21.3

\* 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 21.3 bps for Global participants (8 funds).



### Fixed Income - Emerging Cost by implementation style

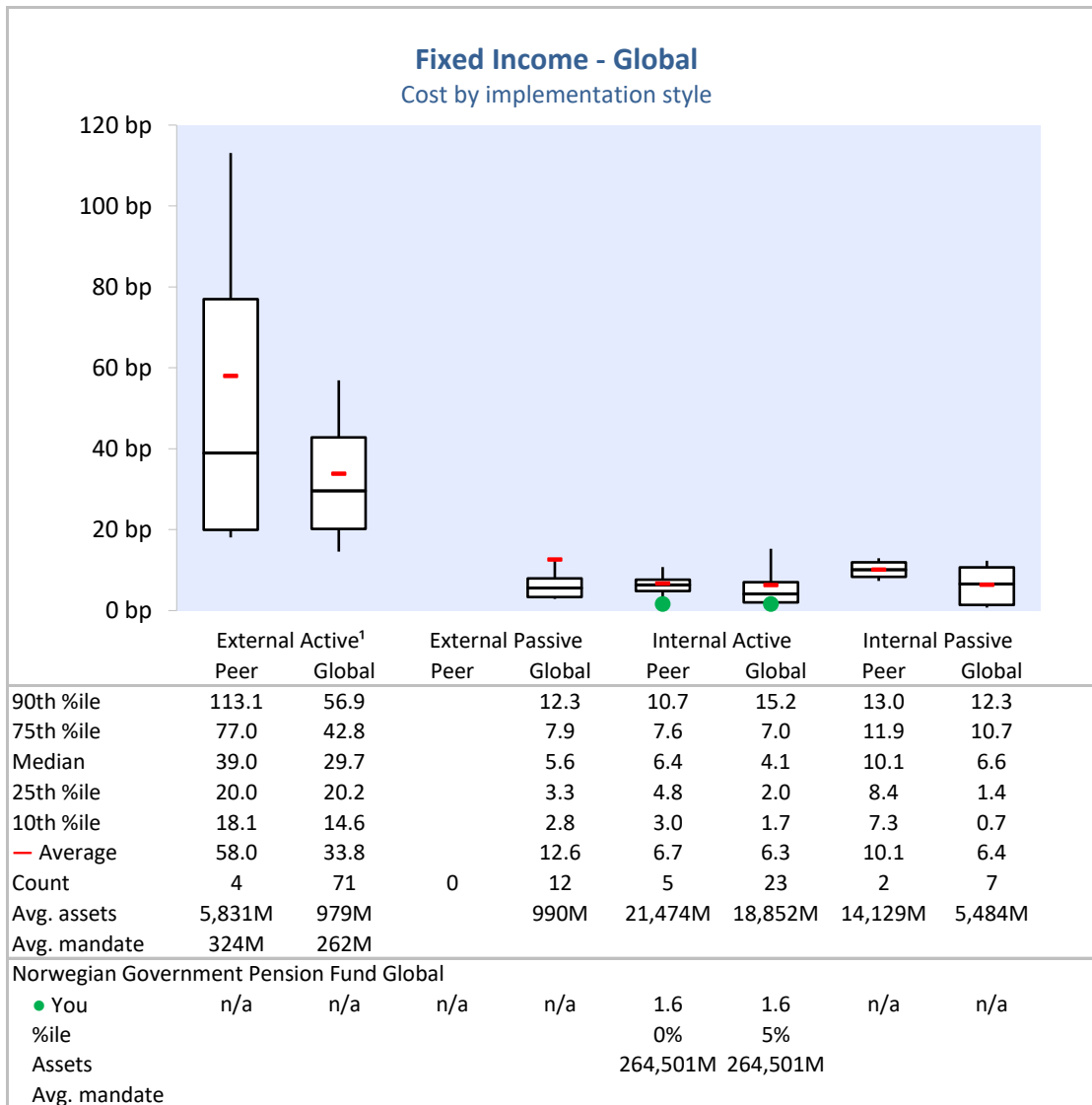


	External Active <sup>1</sup>		External Passive		Internal Active		Internal Passive	
	Peer	Global	Peer	Global	Peer	Global	Peer	Global
90th %ile	33.7	70.4	8.1	37.3	16.1	16.0	2.8	4.1
75th %ile	32.0	56.4	8.1	24.8	13.9	13.0	2.8	3.6
Median	29.2	42.1	8.1	18.0	10.1	7.1	2.8	2.8
25th %ile	26.4	34.8	8.1	7.6	9.3	3.7	2.8	2.0
10th %ile	24.8	28.1	8.1	5.7	8.7	2.7	2.8	1.5
— Average	29.2	48.0	8.1	19.3	12.1	10.9	2.8	2.8
Count	2	89	1	8	3	15	1	3
Avg. assets	5,662M	671M	9,258M	1,492M	2,872M	1,287M	1,761M	1,687M
Avg. mandate	733M	205M						
Norwegian Government Pension Fund Global								
● 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	Global Average
Base fees	n/a	24.8	46.1
Performance fees*	n/a	2.0	0.2
Internal and other	<u>n/a</u>	<u>2.4</u>	<u>1.7</u>
Total	n/a	29.2	48.0

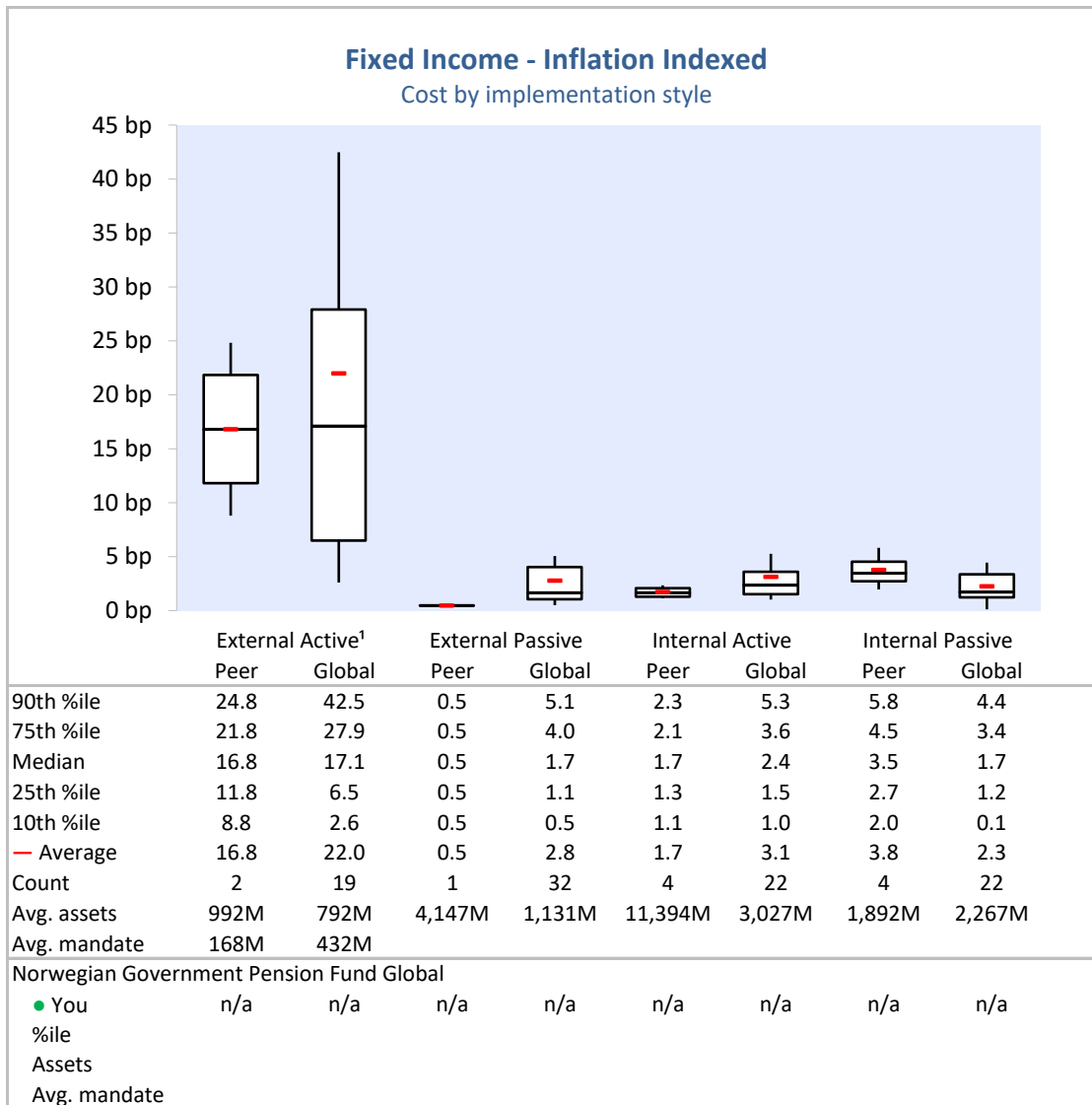
\* For funds that did not report a performance fee, a value of 'zero' was used. The average performance fee for those funds that reported a performance fee is 4.1 bps for peers (1 fund) and 1.2 bps for Global participants (12 funds).



#### 1. Breakdown of external active fees

	You	Peer Average	Global Average
Base fees	n/a	29.2	30.7
Performance fees*	n/a	21.5	2.5
Internal and other	<u>n/a</u>	<u>7.3</u>	<u>0.6</u>
Total	n/a	58.0	33.8

\* 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 43.0 bps for peers (2 funds) and 10.5 bps for Global participants (17 funds).



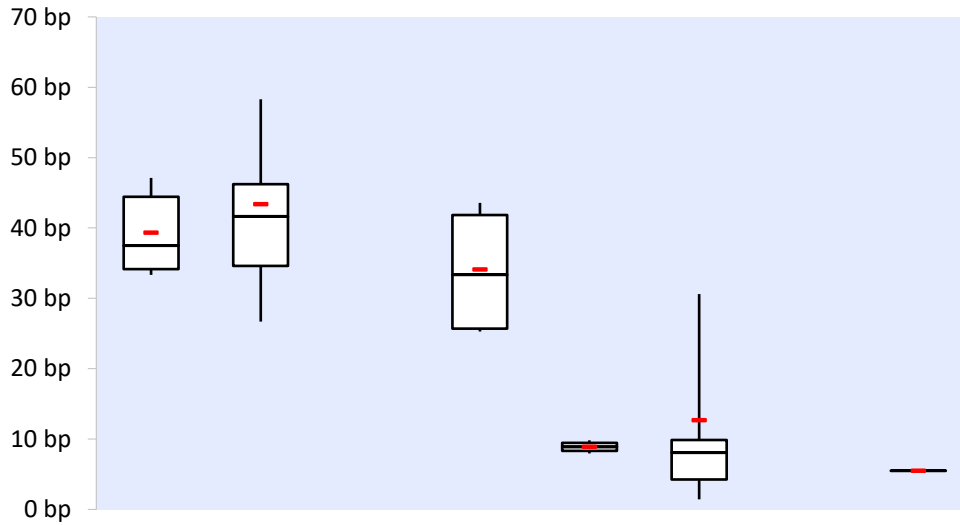
#### 1. Breakdown of external active fees

	You	Peer Average	Global Average
Base fees	n/a	11.7	20.1
Performance fees*	n/a	3.9	1.1
Internal and other	<u>n/a</u>	<u>1.3</u>	<u>0.7</u>
Total	n/a	16.8	22.0

\* 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 7.7 bps for peers (1 fund) and 3.6 bps for Global participants (6 funds).

## Fixed Income - High Yield

### Cost by implementation style



	External Active <sup>1</sup>		External Passive		Internal Active		Internal Passive	
	Peer	Global	Peer	Global	Peer	Global	Peer	Global
90th %ile	47.1	58.3		43.6	9.8	30.6		5.5
75th %ile	44.4	46.2		41.8	9.5	9.9		5.5
Median	37.5	41.7		33.4	8.9	8.1		5.5
25th %ile	34.1	34.6		25.7	8.3	4.2		5.5
10th %ile	33.3	26.7		25.3	8.0	1.4		5.5
— Average	39.3	43.4		34.1	8.9	12.7		5.5
Count	6	111	0	4	2	14	0	1
Avg. assets	2,223M	579M		653M	1,923M	680M		365M
Avg. mandate	249M	171M						
Norwegian Government Pension Fund Global								
● You	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
%ile								
Assets								
Avg. mandate								

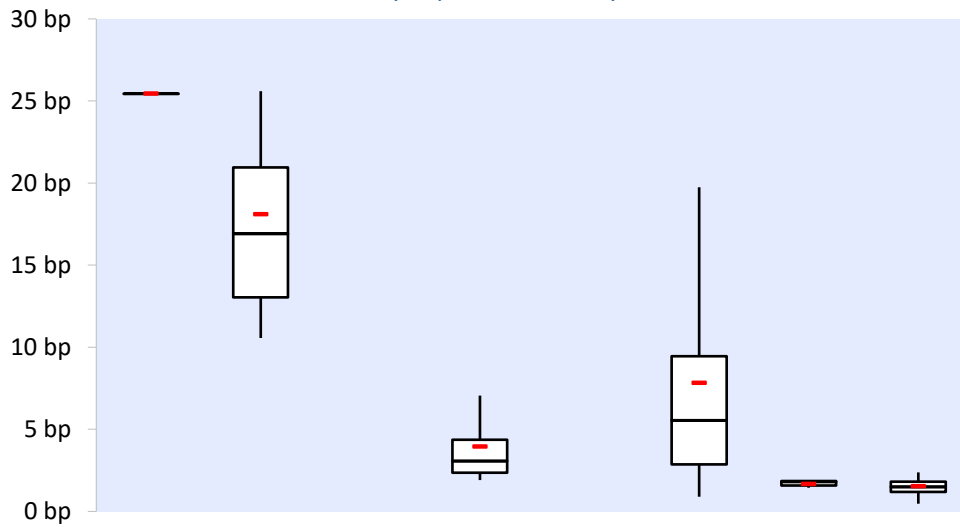
#### 1. Breakdown of external active fees

	You	Peer Average	Global Average
Base fees	n/a	32.1	41.0
Performance fees*	n/a	1.9	0.8
Internal and other	<u>n/a</u>	<u>5.3</u>	<u>1.6</u>
Total	n/a	39.3	43.4

\* 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 3.7 bps for peers (3 funds) and 5.6 bps for Global participants (16 funds).

## Fixed Income - Long Bonds

### Cost by implementation style



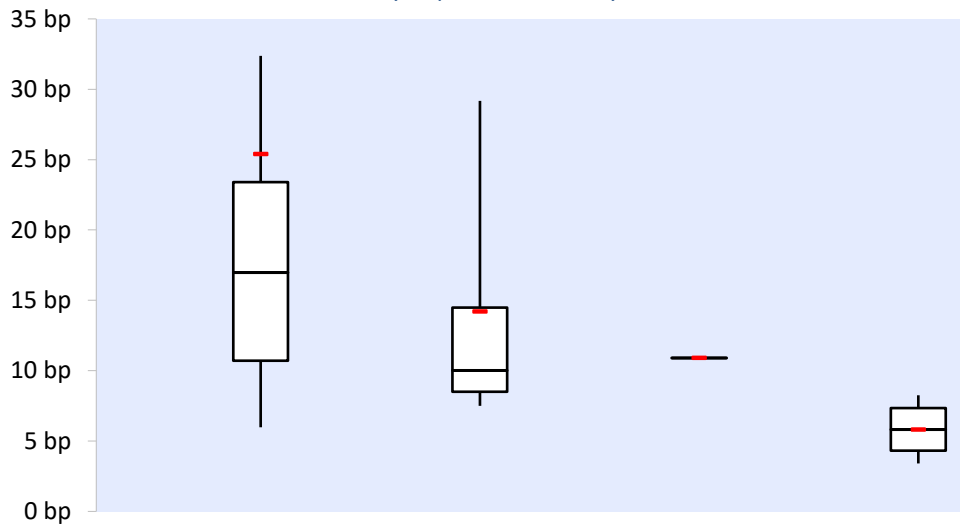
	External Active <sup>1</sup>		External Passive		Internal Active		Internal Passive	
	Peer	Global	Peer	Global	Peer	Global	Peer	Global
90th %ile	25.4	25.6		7.0		19.7	1.9	2.4
75th %ile	25.4	21.0		4.4		9.5	1.8	1.8
Median	25.4	16.9		3.1		5.6	1.8	1.5
25th %ile	25.4	13.0		2.4		2.9	1.6	1.2
10th %ile	25.4	10.6		1.9		0.9	1.4	0.5
— Average	25.4	18.1		4.0		7.8	1.7	1.5
Count	1	98	0	36	0	13	3	13
Avg. assets	1,343M	2,571M		365M		1,490M	6,173M	3,752M
Avg. mandate	336M	432M						
Norwegian Government Pension Fund Global								
● 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	Global Average
Base fees	n/a	16.6	17.0
Performance fees*	n/a	7.7	0.9
Internal and other	<u>n/a</u>	<u>1.1</u>	<u>0.2</u>
Total	n/a	25.4	18.1

\* 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 7.7 bps for peers (1 fund) and 6.6 bps for Global participants (13 funds).

### Fixed Income - Bundled LDI Cost by implementation style



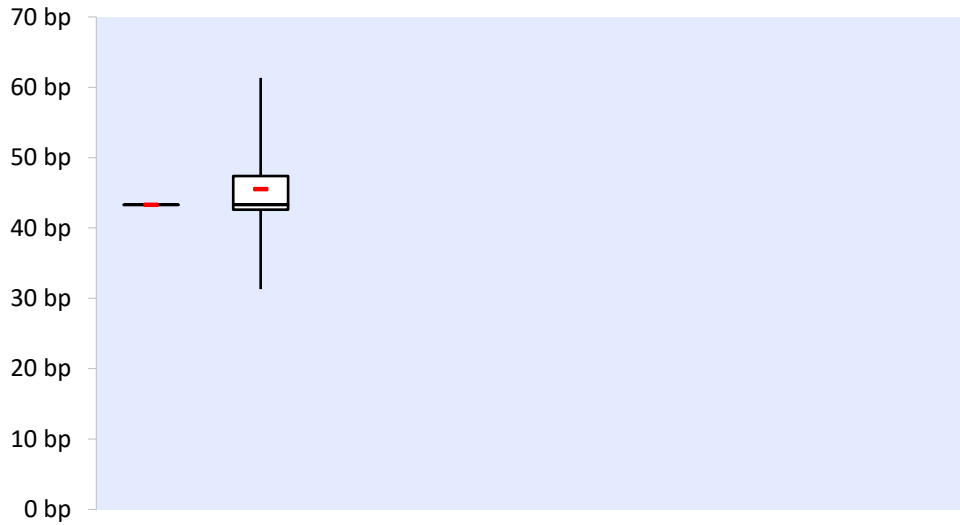
	External Active <sup>1</sup>		External Passive		Internal Active		Internal Passive	
	Peer	Global	Peer	Global	Peer	Global	Peer	Global
90th %ile		32.4		29.2		10.9		8.3
75th %ile		23.4		14.5		10.9		7.3
Median		17.0		10.0		10.9		5.8
25th %ile		10.7		8.5		10.9		4.3
10th %ile		6.0		7.5		10.9		3.4
— Average		25.4		14.2		10.9		5.8
Count	0	14	0	8	0	1	0	2
Avg. assets		1,646M		4,413M		846M		6,348M
Avg. mandate		786M						
Norwegian Government Pension Fund Global								
● 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	Global Average
Base fees	n/a	n/a	24.4
Performance fees*	n/a	n/a	1.0
Internal and other	<u>n/a</u>	<u>n/a</u>	<u>0.1</u>
Total	n/a	n/a	25.4

\* 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 13.7 bps for Global participants (1 fund).

### Fixed Income - Convertibles Cost by implementation style

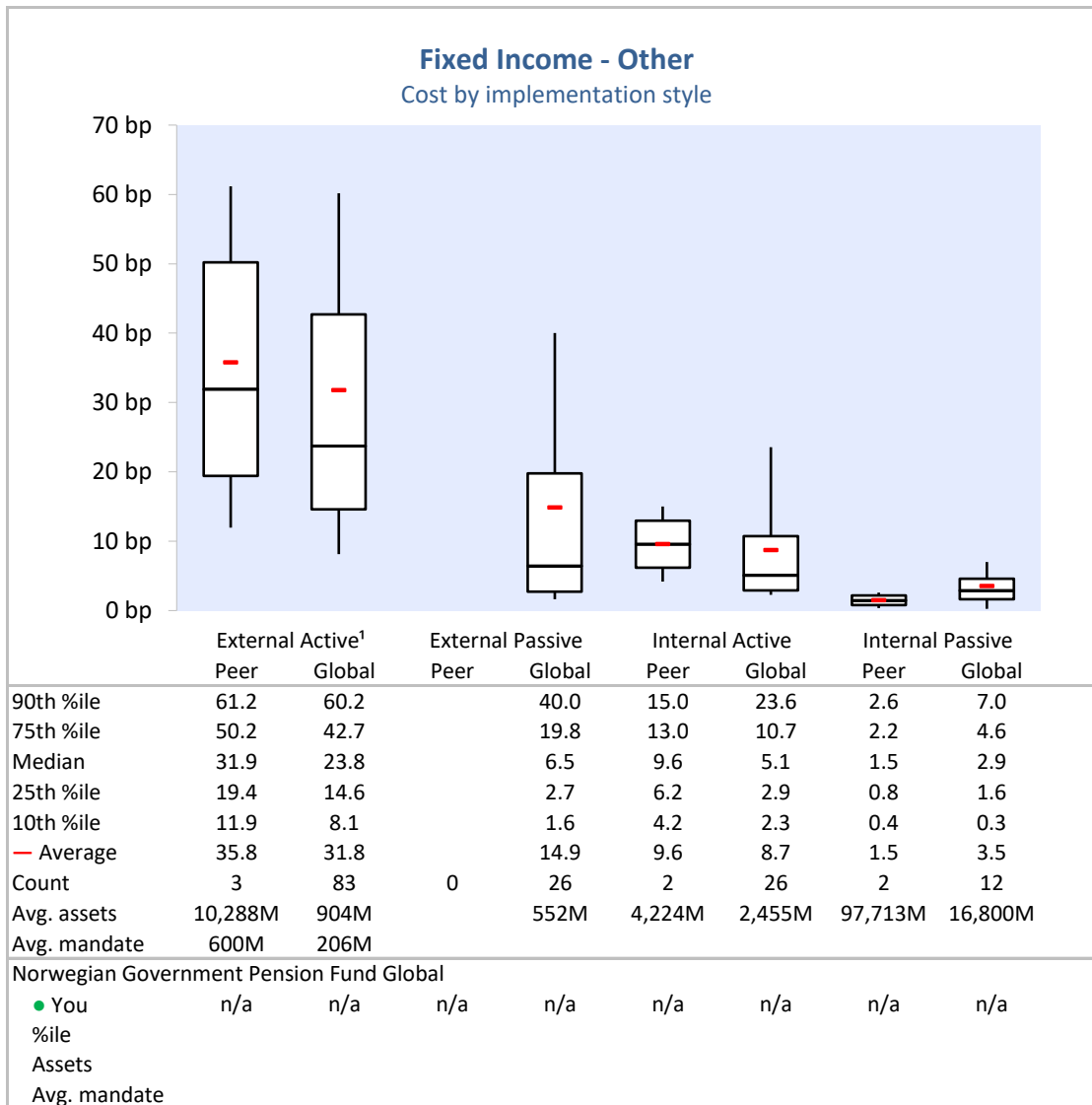


	External Active <sup>1</sup>		External Passive		Internal Active		Internal Passive	
	Peer	Global	Peer	Global	Peer	Global	Peer	Global
90th %ile	43.3	61.3						
75th %ile	43.3	47.4						
Median	43.3	43.3						
25th %ile	43.3	42.6						
10th %ile	43.3	31.3						
— Average	43.3	45.5						
Count	1	5	0	0	0	0	0	0
Avg. assets	1,354M	772M						
Avg. mandate		261M						
Norwegian Government Pension Fund Global								
● 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	Global Average
Base fees	n/a	43.3	40.5
Performance fees*	n/a	n/a	3.7
Internal and other	<u>n/a</u>	<u>n/a</u>	<u>1.4</u>
Total	n/a	43.3	45.5

\* 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 9.1 bps for Global participants (2 funds).

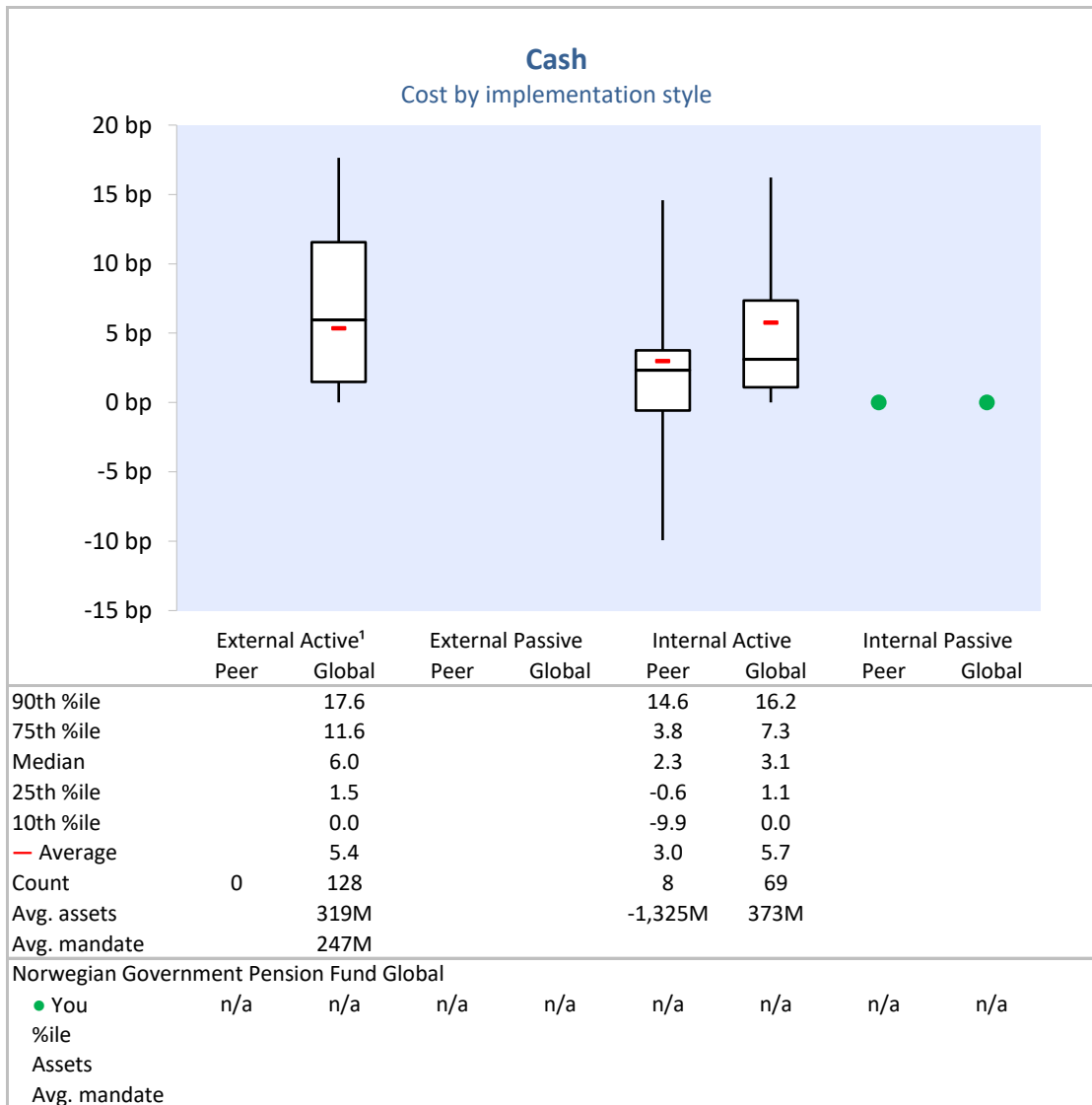


#### 1. Breakdown of external active fees

	You	Peer Average	Global Average
Base fees	n/a	34.3	28.8
Performance fees*	n/a	0.1	1.7
Internal and other	<u>n/a</u>	<u>1.4</u>	<u>1.3</u>
Total	n/a	35.8	31.8

\* 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 0.1 bps for peers (2 funds) and 12.8 bps for Global participants (11 funds).

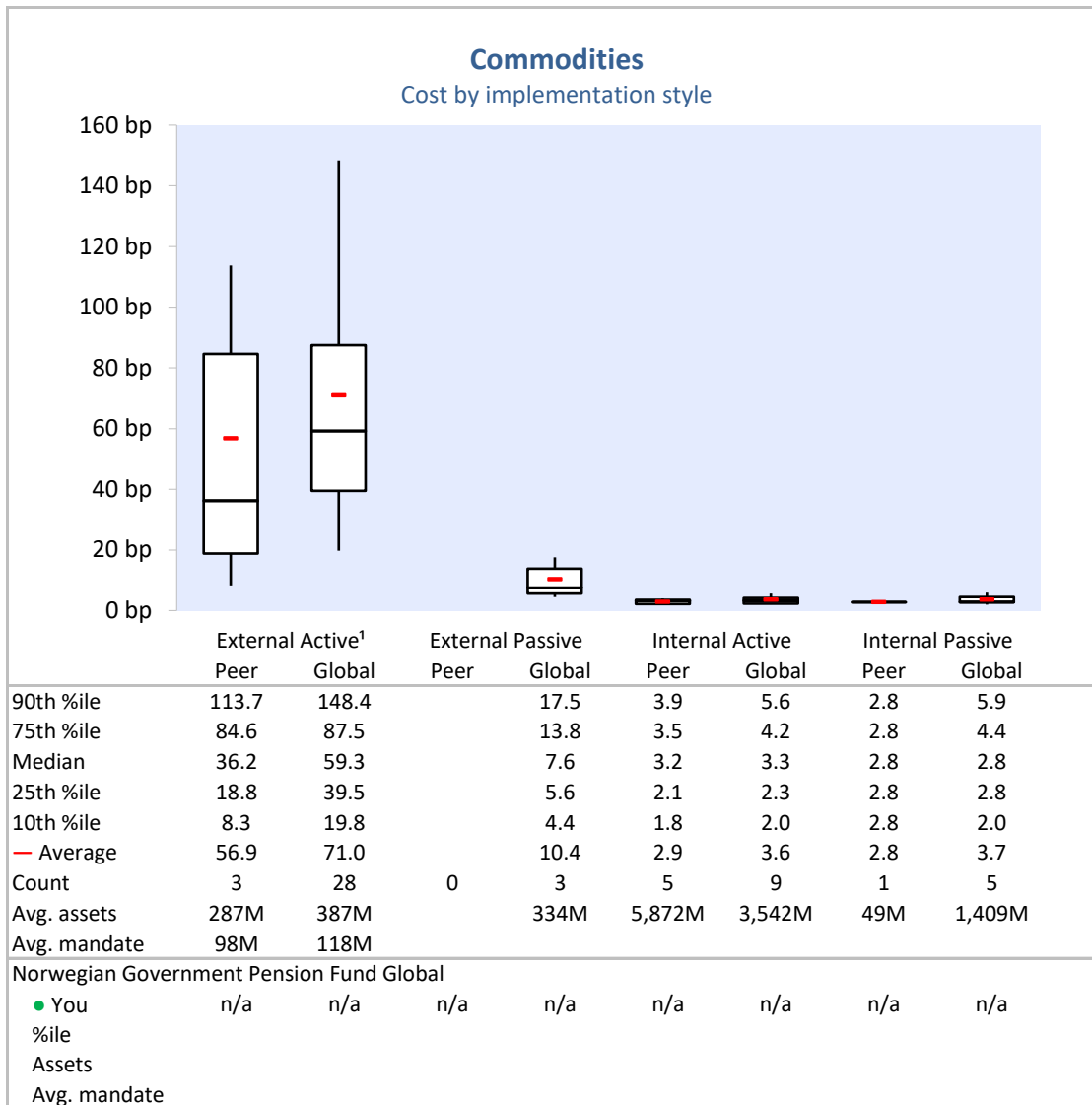




#### 1. Breakdown of external active fees

	You	Peer Average	Global Average
Base fees	n/a	n/a	4.9
Performance fees*	n/a	n/a	0.1
Internal and other	<u>n/a</u>	<u>n/a</u>	<u>0.3</u>
Total	n/a	n/a	5.4

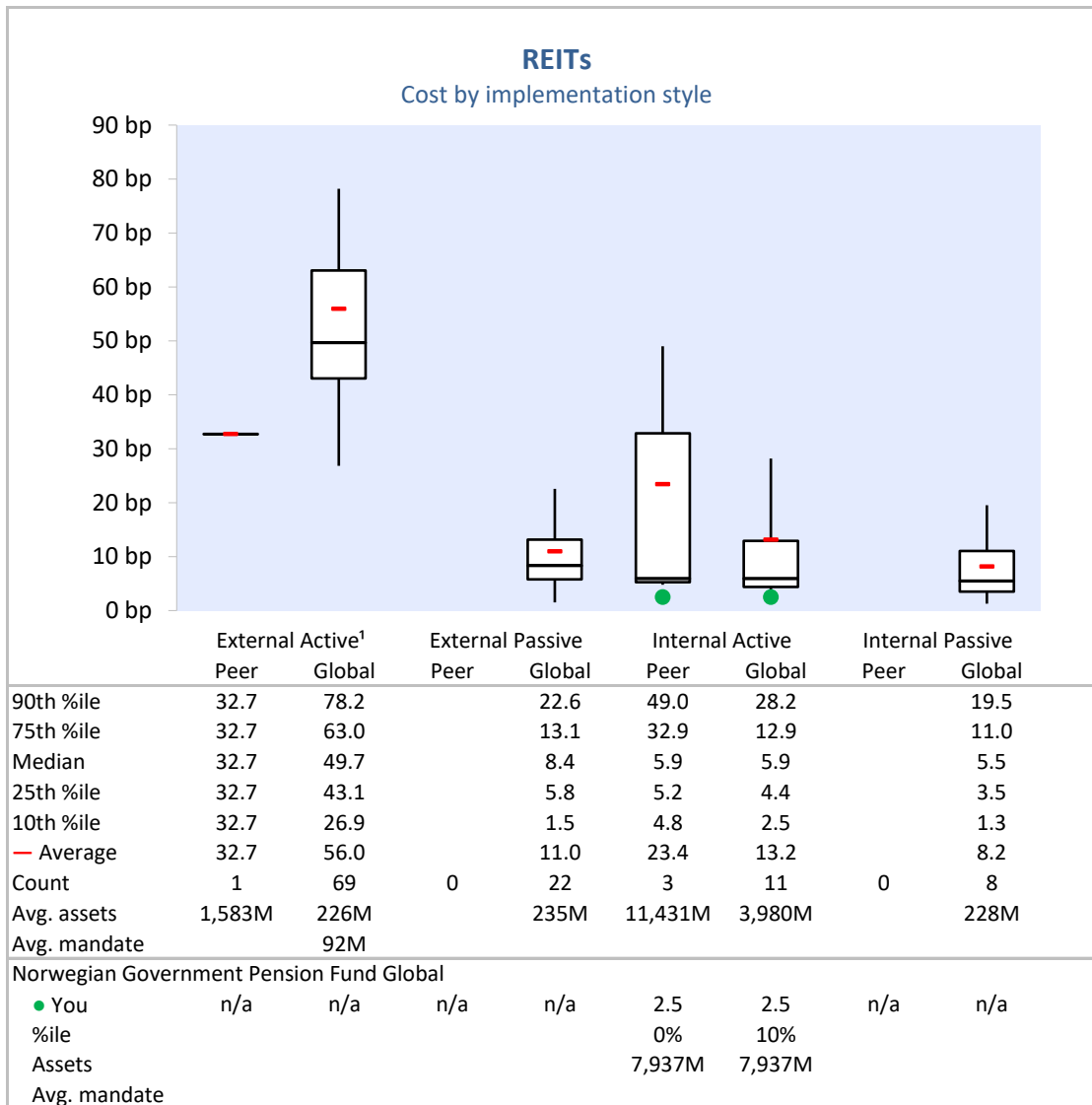
\* For funds that did not report a performance fee, a value of 'zero' was used. The average performance fee for those funds that reported a performance fee is 1.6 bps for Global participants (10 funds).



#### 1. Breakdown of external active fees

	You	Peer Average	Global Average
Base fees	n/a	31.9	60.6
Performance fees*	n/a	11.7	8.5
Internal and other	<u>n/a</u>	<u>13.3</u>	<u>1.9</u>
Total	n/a	56.9	71.0

\* 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 11.7 bps for peers (3 funds) and 15.9 bps for Global participants (15 funds).



1. Breakdown of external active fees

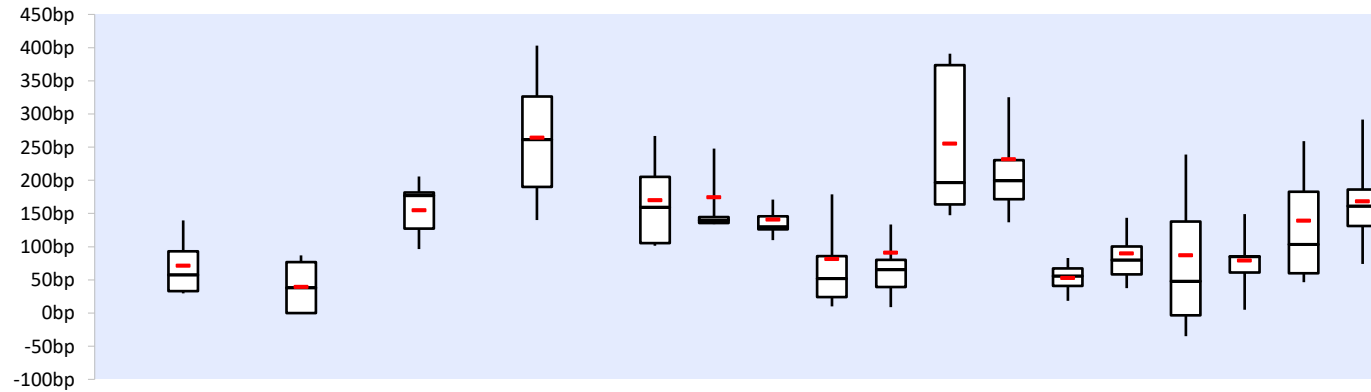
	You	Peer Average	Global Average
Base fees	n/a	32.7	50.0
Performance fees*	n/a	n/a	5.2
Internal and other	<u>n/a</u>	<u>n/a</u>	<u>0.8</u>
Total	n/a	32.7	56.0

\* 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 29.9 bps for Global participants (12 funds).

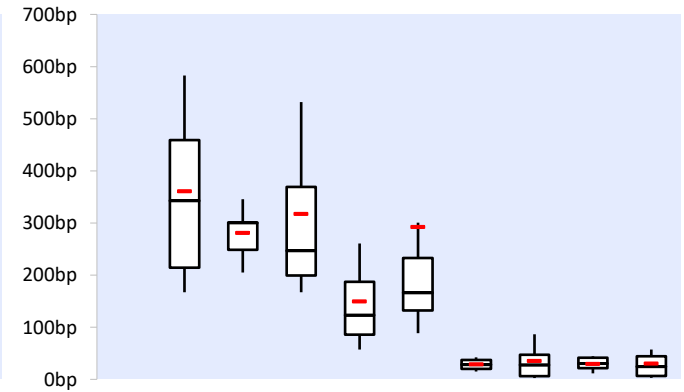


## Infrastructure

Cost as a % of the amount fees are based on<sup>1</sup>



Cost as a % of NAV

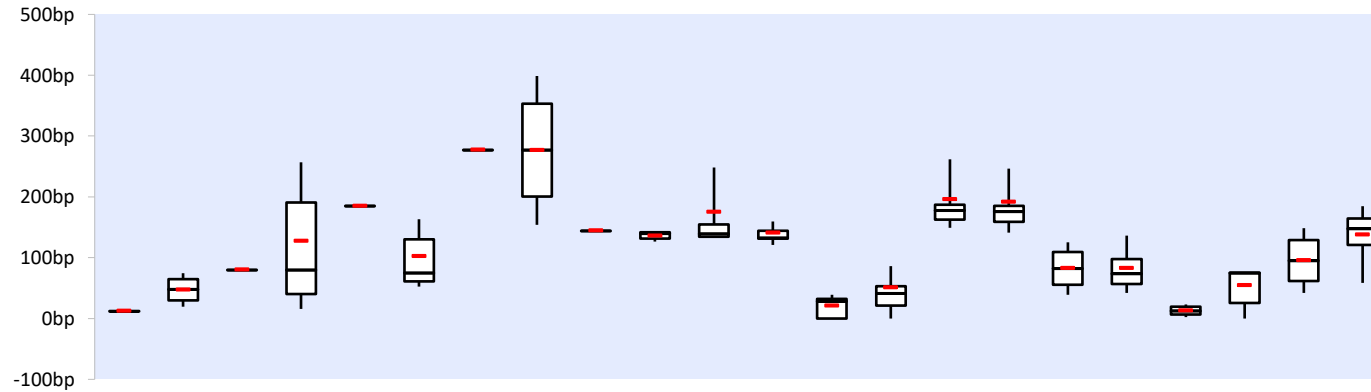


	Fund of Funds										Direct LP						Evergreen						Fund of Funds		Direct LP		Evergreen		Co-Inv.		Internal		
	Mgmt fees (Top layer)		Perf. fees (Top layer)		Underlying mgmt. & perf. <sup>2</sup>		Total <sup>3</sup> incl. perf.		Total <sup>3</sup> excl. perf.		Mgmt fees		Perf. fees		Total <sup>3</sup> incl. perf.		Mgmt fees		Perf. fees		Total <sup>3</sup> incl. perf.		Total <sup>3</sup> incl. perf.		Total		Total		Total				
	Peer	Global	Peer	Global	Peer	Global	Peer	Global	Peer	Global	Peer	Global	Peer	Global	Peer	Global	Peer	Global	Peer	Global	Peer	Global	Peer	Global	Peer	Global	Peer	Global	Peer	Global			
90th %ile		139.7		87.0		206.0		403.0		266.7	247.8	170.8	178.9	133.5	391.0	325.1	83.0	143.2	239.0	149.3	259.1	291.6	582.8	345.5	531.7	260.8	300.4	41.9	86.2	44.6	57.5		
75th %ile		92.9		76.6		181.5		326.4		205.3	144.3	145.6	85.8	80.0	373.6	230.7	67.2	100.5	137.9	85.0	182.6	186.2	459.0	300.8	368.9	186.8	232.8	36.9	47.5	41.2	44.2		
Median		57.9		38.2		176.9		261.5		159.8	139.9	130.1	52.3	65.3	196.7	199.5	55.9	80.0	47.9	85.0	103.8	161.4	342.9	300.3	247.2	123.7	166.2	28.4	28.0	30.8	24.8		
25th %ile		32.8		0.0		127.0		190.0		105.5	135.4	125.9	23.7	39.3	163.7	171.3	41.1	58.1	-3.5	60.9	60.1	131.0	214.3	248.2	199.2	85.7	132.3	20.0	6.1	21.5	6.4		
10th %ile		29.6		0.0		96.3		140.3		101.2	133.7	109.7	10.0	9.1	147.2	136.5	18.7	37.4	-34.9	4.8	46.7	74.1	167.3	204.9	166.8	56.9	88.6	14.9	2.5	11.8	2.8		
Average		70.9		38.6		154.3		263.8		169.4	173.8	140.5	80.7	90.6	254.5	231.1	52.3	89.0	86.6	78.9	138.9	167.9	360.2	280.1	316.8	148.8	291.4	28.4	34.9	29.1	29.4		
Count	0	25	0	25	0	25	0	25	0	25	5	99	5	99	5	99	4	62	4	62	4	62	0	25	5	99	4	62	2	18	6	30	
Avg. assets		90M		90M		90M		90M		90M	3,037M	423M	3,037M	423M	3,037M	423M	3,316M	598M	3,316M	598M	3,316M	598M	0	71M	2,734M	354M	3,074M	551M	1,309M	384M	7,749M	3,192M	
Norwegian Government Pension Fund Global																																	
● 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	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																																	

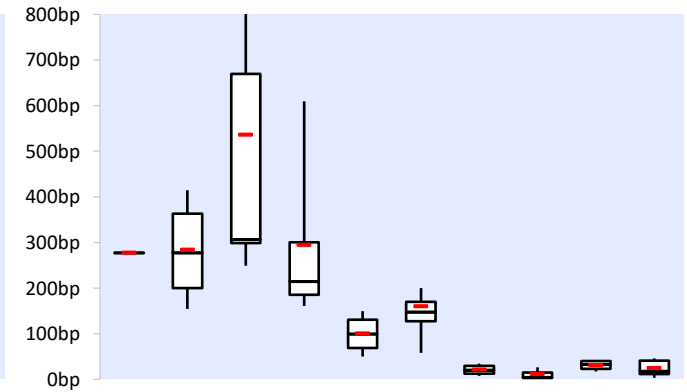
- The base for fees is usually the committed amount during the commitment period, and unreturned invested capital afterwards.
- The fees of fund of funds include both the top layer fees paid to the fund of funds manager and the underlying fees paid to the 'underlying partnerships' held by the fund of 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 total cost also includes the internal cost of monitoring and selecting infrastructure investments. The peer average cost of monitoring and selecting was 9.2 bps for LPs and 3.0 bps for external (not LPs).

## Natural Resources

Cost as a % of the amount fees are based on<sup>1</sup>



Cost as a % of NAV

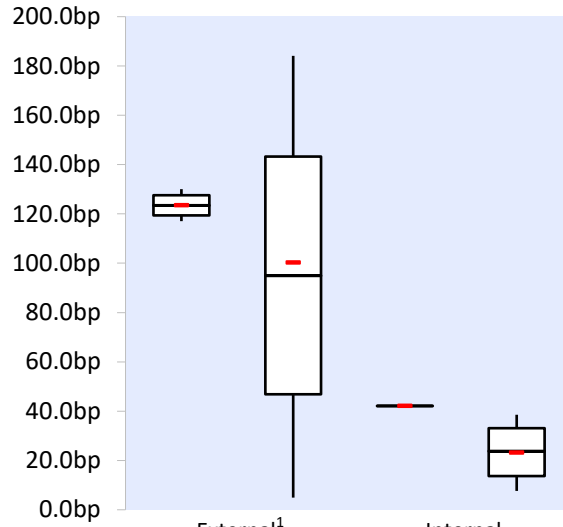


	Fund of Funds										Direct LP						Evergreen						Fund of Funds		Direct LP		Evergreen		Co-Inv.		Internal	
	Mgmt fees (Top layer)		Perf. fees (Top layer)		Underlying mgmt. & perf. <sup>2</sup>		Total <sup>3</sup> incl. perf.		Total <sup>3</sup> excl. perf.		Mgmt fees		Perf. fees		Total <sup>3</sup> incl. perf.		Mgmt fees		Perf. fees		Total <sup>3</sup> incl. perf.		Total <sup>3</sup> incl. perf.		Total incl. perf.		Total					
	Peer	Global	Peer	Global	Peer	Global	Peer	Global	Peer	Global	Peer	Global	Peer	Global	Peer	Global	Peer	Global	Peer	Global	Peer	Global	Peer	Global	Peer	Global	Peer	Global	Peer	Global		
90th %ile	12.3	74.4	80.0	256.8	185.0	163.1	277.3	398.8	144.3	143.4	248.6	159.8	39.2	86.1	261.5	246.7	125.6	136.1	23.2	75.0	148.8	184.5	277.3	414.9	979.6	609.8	149.7	200.2	34.1	26.4	41.1	45.6
75th %ile	12.3	64.5	80.0	190.5	185.0	130.2	277.3	353.2	144.3	142.1	154.6	144.2	32.3	53.0	186.8	185.0	109.4	97.7	19.3	75.0	128.8	164.7	277.3	363.3	669.6	300.2	131.0	170.3	29.2	15.1	40.3	40.8
Median	12.3	48.0	80.0	80.0	185.0	75.3	277.3	277.3	144.3	139.9	139.7	132.8	28.9	41.5	178.2	176.0	82.5	73.9	12.9	75.0	95.3	148.0	277.3	277.3	307.0	214.8	99.8	148.0	21.0	4.7	32.8	17.8
25th %ile	12.3	30.2	80.0	40.0	185.0	61.2	277.3	200.3	144.3	131.6	134.4	131.7	0.0	21.3	162.9	159.2	55.5	57.0	6.4	25.4	61.9	121.1	277.3	200.3	298.9	185.0	68.7	127.5	12.8	3.1	22.9	11.9
10th %ile	12.3	19.4	80.0	16.0	185.0	52.8	277.3	154.1	144.3	126.7	134.2	120.7	0.0	0.0	149.0	140.9	39.3	41.8	2.6	0.0	41.9	58.8	277.3	154.1	249.0	161.2	50.0	58.5	7.8	1.0	17.6	3.3
Average	12.3	47.1	80.0	127.0	185.0	102.5	277.3	276.6	144.3	135.9	174.8	140.8	21.0	50.8	195.8	191.5	82.5	82.8	12.9	54.8	95.3	137.5	277.3	283.3	535.5	293.7	99.8	159.8	21.0	11.2	30.4	24.0
Count	1	3	1	3	1	3	1	3	1	3	5	38	5	38	5	38	2	32	2	32	2	32	1	3	5	38	2	32	2	7	4	11
Avg. assets	17M	32M	17M	32M	17M	32M	17M	32M	17M	32M	1,837M	513M	1,837M	513M	1,837M	513M	976M	330M	976M	330M	976M	330M	17M	32M	1,082M	353M	954M	302M	1,030M	368M	1,804M	1,548M
Norwegian Government Pension Fund Global	n/a																															
● You	n/a																															
%ile	n/a																															
Assets	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 132 bps (on amount fees are based on) for underlying management fees and 53 bps (on NAV) for underlying performance fees were used.
3. The total cost also includes the internal cost of monitoring and selecting natural resource investments. The peer average cost of monitoring and selecting was 1.7 bps for fund of funds and 6.3 bps for LPs and 10.3 bps for external (not LPs).

## Other Real Assets

Cost as % of NAV by implementation style



	External <sup>1</sup>		Internal	
	Peer	Global	Peer	Global
90th %ile	130.0	184.1	42.2	38.5
75th %ile	127.6	143.3	42.2	33.0
Median	123.5	95.0	42.2	23.8
25th %ile	119.5	46.9	42.2	13.7
10th %ile	117.0	4.9	42.2	7.6
— Average	123.5	100.4	42.2	23.2
Count	2	39	1	3
Avg. assets	1,060M	359M	2,558M	1,016M
Avg. mandate	1,377M	100M		163M
Norwegian Government Pension Fund Global				
● You	n/a	n/a	n/a	n/a
%ile				
Assets	0M	0M	0M	0M
Avg. mandate				

### 1. Breakdown of external fees

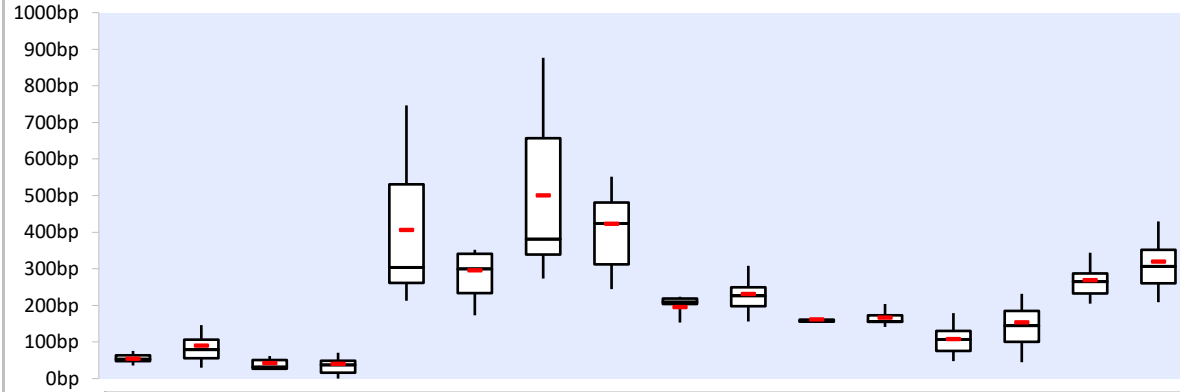
	Your Plan	Peer Average	Global Average
Base fees	n/a	116.4	97.4
Internal and other	<u>n/a</u>	<u>7.1</u>	<u>5.4</u>
Total*	n/a	123.5	100.4
Performance fees**	n/a	38.7	33.9

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

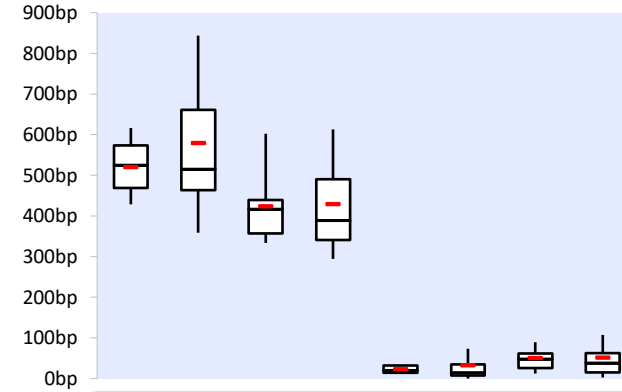
\*\* For funds that did not report a performance fee, a value of 'zero' was used. The average performance fee for only those funds that reported a performance fee is 38.7 bps for peers (2 funds) and 33.9 bps for Global participants (39 funds).

## Diversified Private Equity

Cost as a % of the amount fees are based on<sup>1</sup>



Cost as a % of NAV



	Fund of Funds										Direct LP					
	Mgmt fees (Top layer)		Perf. fees (Top layer)		Underlying mgmt. & perf. <sup>2</sup>		Total <sup>3</sup> incl. perf.		Total <sup>3</sup> excl. perf.		Mgmt fees		Perf. fees		Total <sup>3</sup> incl. perf.	
	Peer	Global	Peer	Global	Peer	Global	Peer	Global	Peer	Global	Peer	Global	Peer	Global	Peer	Global
90th %ile	75.4	146.1	61.7	70.5	746.7	352.0	876.6	551.6	223.6	307.9	164.7	204.2	179.1	231.4	343.8	429.6
75th %ile	63.7	106.9	50.2	49.0	530.9	341.0	656.9	481.6	218.8	249.7	161.3	173.4	130.7	185.0	286.8	352.0
Median	53.6	80.0	32.1	37.8	304.6	300.3	381.3	424.4	209.7	226.9	157.4	156.0	107.8	145.6	265.9	307.5
25th %ile	48.1	55.3	27.3	16.1	261.2	234.0	339.3	312.4	204.1	197.5	156.2	155.6	75.5	99.9	232.8	260.6
10th %ile	35.6	30.3	25.8	0.0	212.4	172.9	273.2	244.3	153.2	156.0	156.0	141.3	47.5	44.4	204.3	209.2
— Average	53.5	89.0	41.1	39.0	405.3	294.5	499.9	422.5	194.9	230.6	161.1	165.9	107.1	152.4	268.2	318.4
Count	7	138	7	138	7	138	7	138	7	138	10	163	10	163	10	163
Avg. assets	3,027M	510M	3,027M	510M	3,027M	510M	3,027M	510M	3,027M	510M	10,412M	1,932M	10,412M	1,932M	10,412M	1,932M
Norwegian Government Pension Fund Global																
● 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

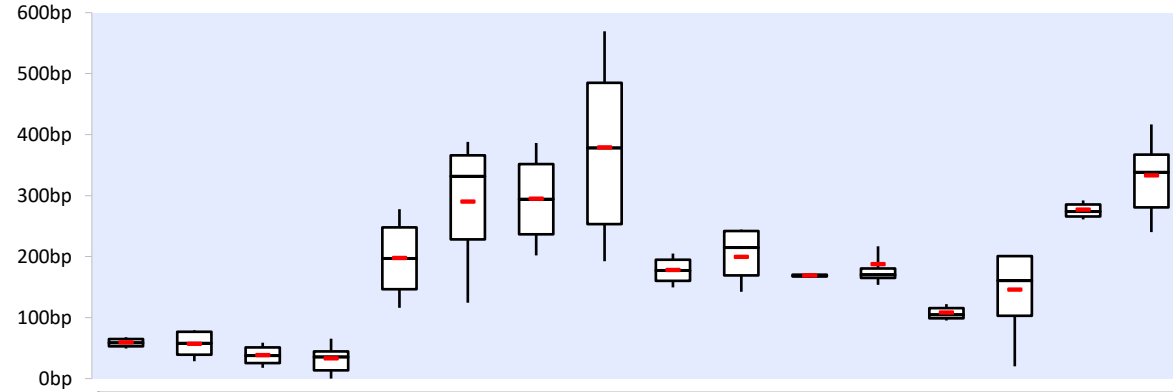
	Fund of Funds		Direct LP		Co-Investment		Internal	
	Total <sup>3</sup> incl. perf.		Total <sup>3</sup> incl. perf.		Total		Total	
	Peer	Global	Peer	Global	Peer	Global	Peer	Global
90th %ile	616.9	843.5	601.8	613.1	32.2	73.7	89.2	107.8
75th %ile	573.3	660.9	439.3	490.3	32.2	35.2	62.1	62.2
Median	525.2	515.4	416.9	389.6	20.0	14.4	48.7	38.7
25th %ile	469.2	463.6	356.6	341.0	14.4	7.6	25.8	15.1
10th %ile	428.3	358.4	333.7	294.2	11.6	0.0	12.2	3.0
— Average	519.9	578.2	422.5	428.1	21.7	31.6	49.4	50.6
Count	7	138	10	163	5	27	5	20
Avg. assets	3,711M	456M	7,461M	1,405M	1,981M	683M	4,156M	2,556M
● You	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

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 156 bps (on amount fees are based on) for underlying management fees and 185 bps (on NAV) for underlying performance fees were used.
3. The total cost also includes the internal cost of monitoring and selecting private equity investments. The peer average cost of monitoring and selecting was 4.8 bps for fund of funds.

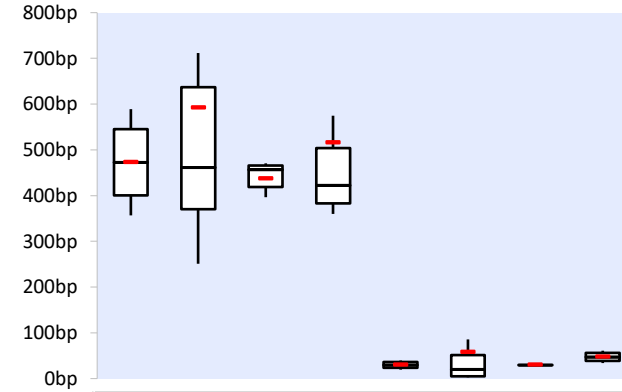


## LBO

Cost as a % of the amount fees are based on<sup>1</sup>



Cost as a % of NAV



	Fund of Funds										Direct LP					
	Mgmt fees (Top layer)		Perf. fees (Top layer)		Underlying mgmt. & perf. <sup>2</sup>		Total <sup>3</sup> incl. perf.		Total <sup>3</sup> excl. perf.		Mgmt fees		Perf. fees		Total <sup>3</sup> incl. perf.	
	Peer	Global	Peer	Global	Peer	Global	Peer	Global	Peer	Global	Peer	Global	Peer	Global	Peer	Global
90th %ile	68.1	79.2	59.1	65.7	278.0	388.3	386.5	569.4	205.1	244.2	170.5	216.8	121.8	201.0	292.3	416.6
75th %ile	64.6	77.0	51.3	44.8	247.7	366.0	351.9	485.0	194.8	242.0	170.1	180.4	115.3	201.0	285.4	367.0
Median	58.8	58.6	38.3	35.8	197.2	332.1	294.2	378.5	177.4	215.0	169.5	170.6	104.5	160.7	274.0	338.3
25th %ile	52.9	39.4	25.3	13.5	146.7	228.4	236.5	253.3	160.1	169.3	167.2	165.0	98.7	103.2	266.0	280.6
10th %ile	49.4	28.5	17.5	0.0	116.4	124.2	201.9	192.6	149.8	142.3	165.9	153.6	95.3	20.4	261.2	239.9
— Average	58.8	56.5	38.3	32.7	197.2	289.5	294.2	378.7	177.4	199.0	168.4	187.1	107.9	145.6	276.3	332.6
Count	2	16	2	16	2	16	2	16	2	16	3	44	3	44	3	44
Avg. assets	1,254M	302M	1,254M	302M	1,254M	302M	1,254M	302M	1,254M	302M	16,913M	2,435M	16,913M	2,435M	16,913M	2,435M
Norwegian Government Pension Fund Global																
● 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	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

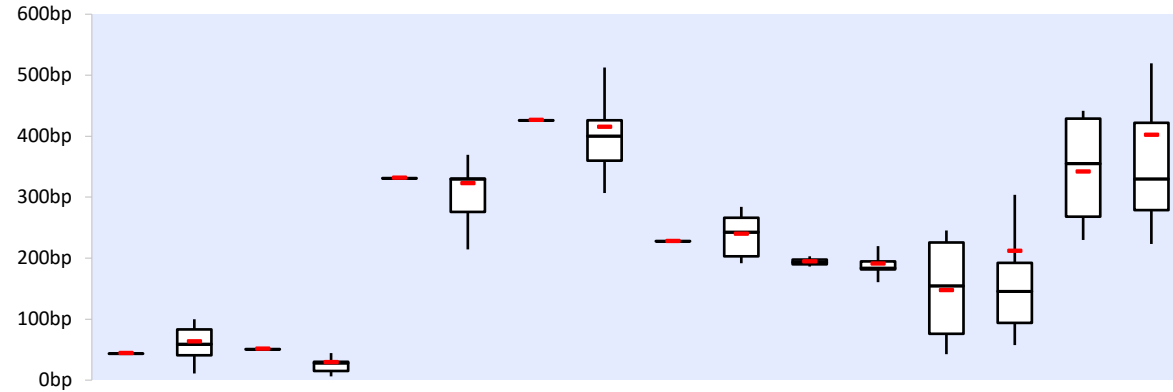
  

	Fund of Funds		Direct LP		Co-Investment		Internal	
	Total <sup>3</sup> incl. perf.		Total <sup>3</sup> incl. perf.		Total		Total	
	Peer	Global	Peer	Global	Peer	Global	Peer	Global
90th %ile	588.9	711.8	470.9	575.0	39.8	85.8	30.1	61.3
75th %ile	545.5	637.0	465.7	503.7	36.0	51.5	30.1	56.1
Median	473.0	462.1	457.1	422.7	29.7	20.4	30.1	47.4
25th %ile	400.5	370.7	419.1	382.8	23.4	5.0	30.1	38.8
10th %ile	357.0	251.2	396.3	359.7	19.6	2.7	30.1	33.6
— Average	473.0	592.4	437.5	516.1	29.7	57.8	30.1	47.4
Count	2	16	3	44	2	11	1	2
Avg. assets	771M	217M	10,380M	1,673M	2,443M	713M	11,568M	5,888M
● You	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
%ile	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

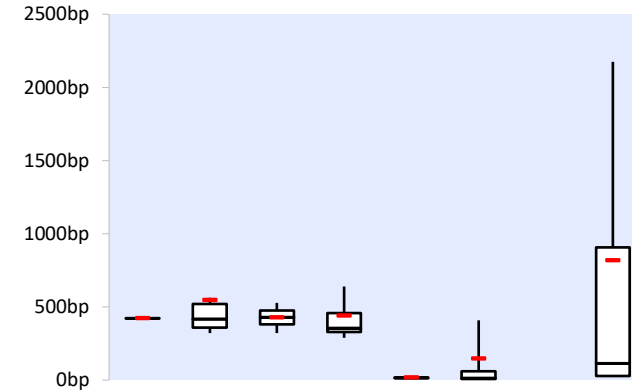
1. The base for fees is usually the committed amount during the commitment period, and unreturned invested capital afterwards.
2. The fees of fund of funds include both the top layer fees paid to the fund of funds manager and the underlying fees paid to the 'underlying partnerships' held by the fund of funds. Most funds were unable to provide the underlying fees so defaults of 119 bps (on amount fees are based on) for underlying management fees and 122 bps (on NAV) for underlying performance fees were used.
3. The total cost also includes the internal cost of monitoring and selecting private equity investments. The peer average cost of monitoring and selecting was 5.0 bps for fund of funds.

## Venture Capital

Cost as a % of the amount fees are based on<sup>1</sup>



Cost as a % of NAV



	Fund of Funds										Direct LP					
	Mgmt fees (Top layer)		Perf. fees (Top layer)		Underlying mgmt. & perf. <sup>2</sup>		Total <sup>3</sup> incl. perf.		Total <sup>3</sup> excl. perf.		Mgmt fees		Perf. fees		Total <sup>3</sup> incl. perf.	
	Peer	Global	Peer	Global	Peer	Global	Peer	Global	Peer	Global	Peer	Global	Peer	Global	Peer	Global
	Peer	Global	Peer	Global	Peer	Global	Peer	Global	Peer	Global	Peer	Global	Peer	Global	Peer	Global
90th %ile	43.8	100.0	51.0	44.6	331.3	369.5	426.1	512.6	227.8	284.0	203.2	220.0	245.1	304.1	441.4	519.5
75th %ile	43.8	83.3	51.0	30.0	331.3	330.0	426.1	426.1	227.8	266.1	197.8	194.6	225.7	192.5	428.8	421.8
Median	43.8	59.0	51.0	28.4	331.3	330.0	426.1	400.7	227.8	243.0	193.3	184.0	154.6	146.0	355.4	330.0
25th %ile	43.8	40.7	51.0	15.0	331.3	275.8	426.1	360.0	227.8	203.1	189.8	181.4	75.8	93.8	267.9	279.0
10th %ile	43.8	10.8	51.0	6.2	331.3	214.1	426.1	307.0	227.8	191.4	186.3	160.4	42.8	57.8	230.1	223.1
— Average	43.8	63.3	51.0	28.9	331.3	322.7	426.1	415.0	227.8	239.6	194.3	190.5	147.0	211.2	341.3	401.8
Count	1	21	1	21	1	21	1	21	1	21	4	49	4	49	4	49
Avg. assets	152M	213M	152M	213M	152M	213M	152M	213M	152M	213M	2,066M	407M	2,066M	407M	2,066M	407M
Norwegian Government Pension Fund Global																
● 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

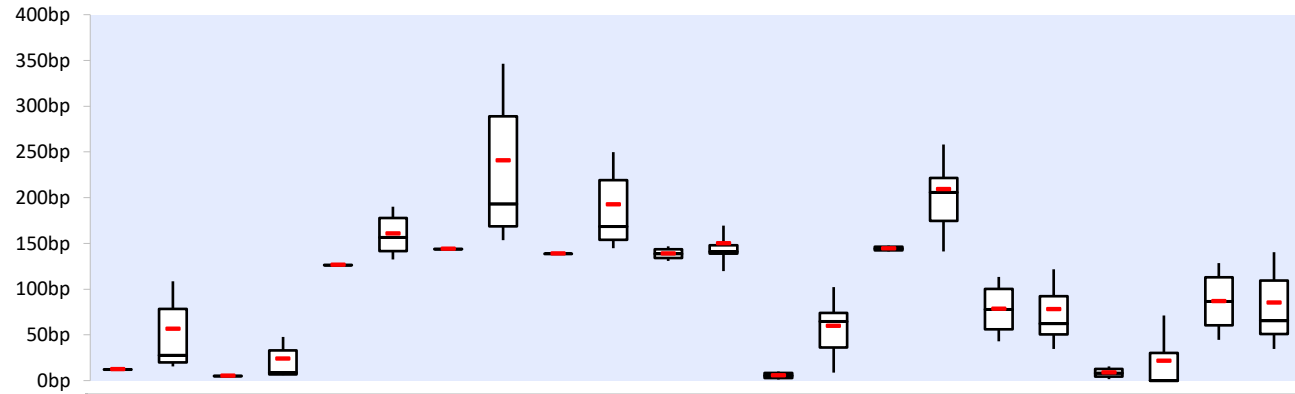
	Fund of Funds		Direct LP		Co-Investment		Internal	
	Total <sup>3</sup> incl. perf.		Total <sup>3</sup> incl. perf.		Total		Total	
	Peer	Global	Peer	Global	Peer	Global	Peer	Global
	Peer	Global	Peer	Global	Peer	Global	Peer	Global
90th %ile	422.4	562.6	527.9	640.0	18.7	408.4	2174.7	
75th %ile	422.4	520.1	476.6	457.1	17.9	60.2	906.8	
Median	422.4	419.0	430.7	355.6	16.8	14.6	116.3	
25th %ile	422.4	360.0	380.3	330.0	15.6	7.9	27.4	
10th %ile	422.4	322.3	320.7	290.4	14.9	1.3	22.4	
— Average	422.4	545.2	426.1	438.2	16.8	147.1	817.9	
Count	1	21	4	49	2	8	0	4
Avg. assets	152M	213M	1,657M	347M	21M	22M	162M	
● You %ile	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

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 184 bps (on amount fees are based on) for underlying management fees and 146 bps (on NAV) for underlying performance fees were used.

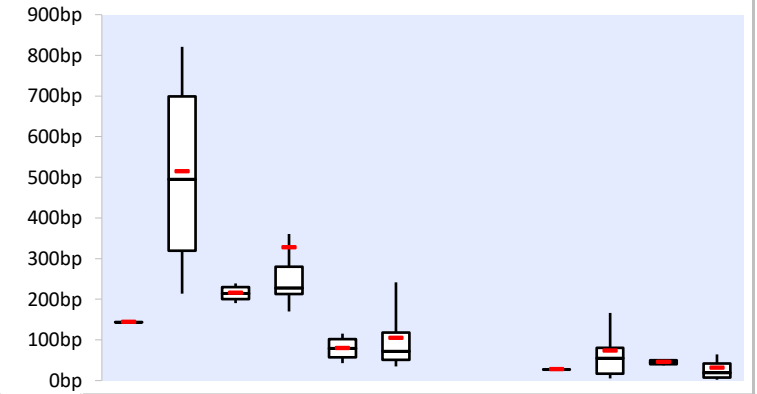
## Private Credit

### Cost as a % of the amount fees are based on<sup>1</sup>



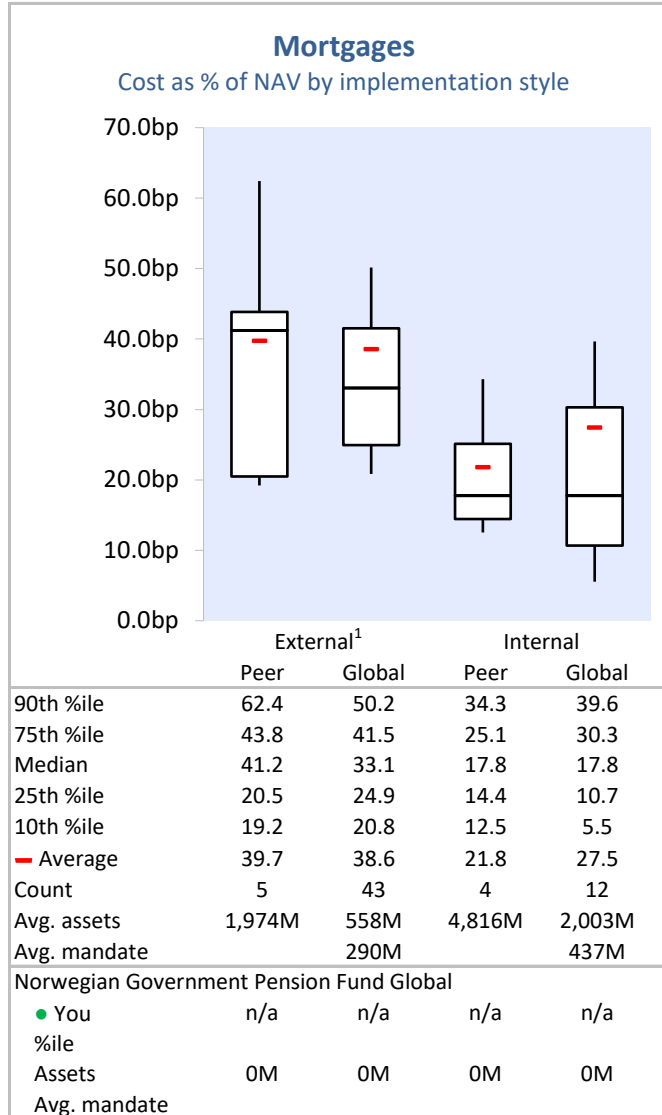
	Fund of Funds										Direct LP						Evergreen					
	Mgmt fees (Top layer)		Perf. fees (Top layer)		Underlying mgmt. & perf. <sup>2</sup>		Total <sup>3</sup> incl. perf.		Total <sup>3</sup> excl. perf.		Mgmt fees		Perf. fees		Total <sup>3</sup> incl. perf.		Mgmt fees		Perf. fees		Total <sup>3</sup> incl. perf.	
	Peer	Global	Peer	Global	Peer	Global	Peer	Global	Peer	Global	Peer	Global	Peer	Global	Peer	Global	Peer	Global	Peer	Global	Peer	Global
90th %ile	12.3	108.6	5.1	47.7	126.4	190.1	143.8	346.4	138.8	249.6	146.6	169.2	10.0	102.3	147.7	258.1	113.2	121.8	15.4	71.1	128.5	140.5
75th %ile	12.3	78.2	5.1	33.0	126.4	177.6	143.8	288.9	138.8	219.2	143.6	148.0	8.4	74.0	146.4	221.6	100.0	92.2	12.8	30.1	112.8	109.4
Median	12.3	27.7	5.1	8.6	126.4	156.8	143.8	193.1	138.8	168.7	138.8	141.0	5.6	64.8	144.3	205.9	78.1	62.5	8.5	0.1	86.6	65.6
25th %ile	12.3	20.0	5.1	6.8	126.4	141.6	143.8	168.5	138.8	153.7	133.9	138.9	2.8	36.4	142.2	174.5	56.1	50.5	4.3	0.0	60.4	50.9
10th %ile	12.3	15.4	5.1	5.8	126.4	132.5	143.8	153.7	138.8	144.7	131.0	119.9	1.1	8.7	141.0	141.0	43.0	34.5	1.7	0.0	44.7	34.5
— Average	12.3	56.3	5.1	23.7	126.4	160.6	143.8	240.5	138.8	192.4	138.8	149.8	5.6	59.4	144.3	209.2	78.1	77.8	8.5	21.4	86.6	85.1
Count	1	3	1	3	1	3	1	3	1	3	2	56	2	56	2	56	2	74	2	25	2	74
Avg. assets	106M	70M	106M	70M	106M	70M	106M	70M	106M	70M	3,215M	547M	3,215M	547M	3,215M	547M	1,758M	373M	1,758M	1,104M	1,758M	373M
Norwegian Government Pension Fund Global																						
● 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	n/a	n/a	n/a	n/a	n/a	n/a
%ile																						
Assets																						

### Cost as a % of NAV



	Fund of Funds		Direct LP		Evergreen		Oper. Sub.		Co-Inv.		Internal	
	Total <sup>3</sup> incl. perf.		Total <sup>3</sup> incl. perf.		Total <sup>3</sup> incl. perf.		Total		Total		Total	
	Peer	Global	Peer	Global	Peer	Global	Peer	Global	Peer	Global	Peer	Global
90th %ile	143.8	820.9	239.0	360.3	115.8	241.6			27.4	166.3	52.6	64.4
75th %ile	143.8	698.9	230.0	280.4	102.2	118.4			27.4	80.7	49.7	42.0
Median	143.8	495.5	215.0	228.3	79.5	72.3			27.4	55.1	44.9	19.6
25th %ile	143.8	319.7	200.0	212.8	56.9	51.2			27.4	16.9	40.1	7.4
10th %ile	143.8	214.2	191.0	170.2	43.3	34.5			27.4	5.2	37.3	2.1
— Average	143.8	513.9	215.0	326.7	79.5	104.8			27.4	73.1	44.9	30.8
Count	1	3	2	55	2	74	0	0	1	7	2	22
Avg. assets	106M	58M	2,347M	461M	1,931M	356M			546M	141M	4,576M	960M
Oper. Sub.												
Co-Inv.												
Internal												

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 126 bps (on amount fees are based on) for underlying management fees and 0 bps (on NAV) for underlying performance fees were used.
3. The total cost also includes the internal cost of monitoring and selecting real estate investments. The peer average cost of monitoring and selecting was 12.3 bps for fund of funds, 8.4 bps for LPs and 6.7 bps for external (not LPs).



#### 1. Breakdown of external fees

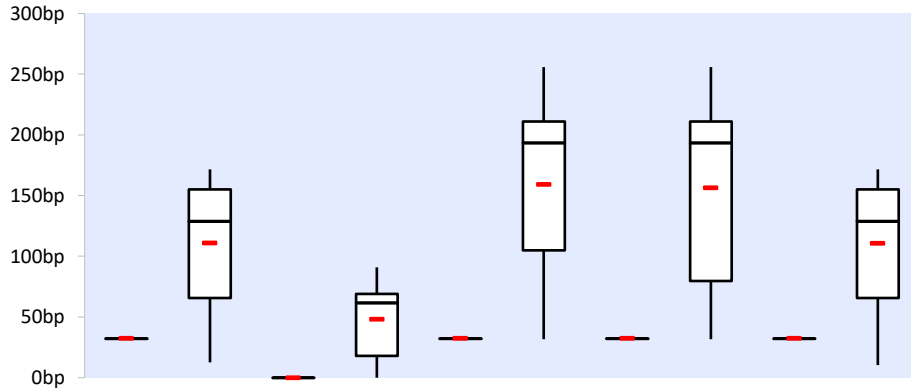
	Your Plan	Peer Average	Global Average
Base fees	n/a	35.1	34.4
Internal and other	<u>n/a</u>	<u>5.8</u>	<u>7.5</u>
Total*	n/a	39.7	38.6
Performance fees**	n/a	n/a	4.9

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

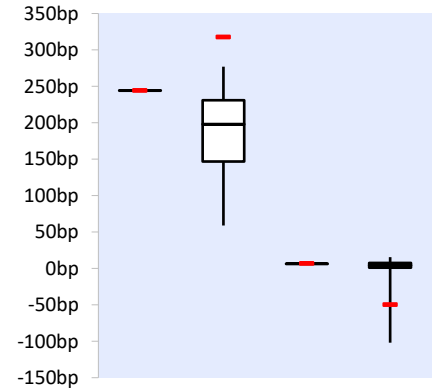
\*\* For funds that did not report a performance fee, a value of 'zero' was used. The average performance fee for only those funds that reported a performance fee is 38.7 bps for peers (2 funds) and 33.9 bps for Global participants (39 funds).

## Other Private Equity

Cost as a % of the amount fees are based on<sup>1</sup>

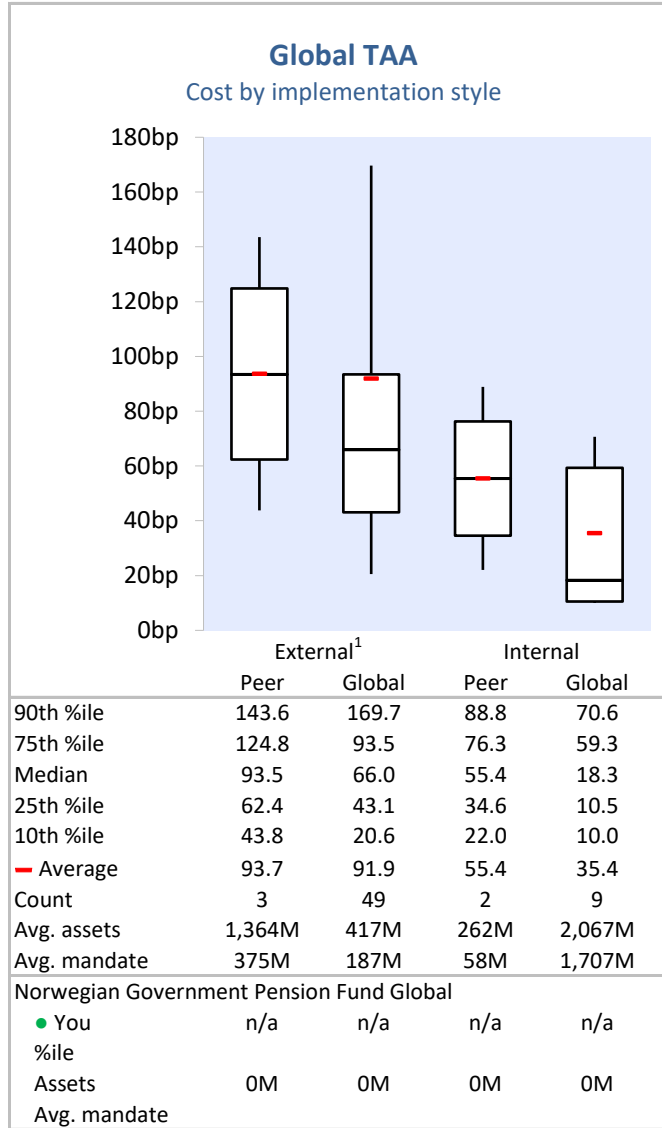


Cost as a % of NAV



	Direct LP						Direct LP & Co-Inv. <sup>3</sup>				Direct LP & Co-Inv. <sup>3</sup>		Internal	
	Mgmt fees		Perf. fees		Total <sup>2</sup> incl. perf.		Total <sup>2</sup> incl. perf.		Total <sup>2</sup> excl. perf.		Total <sup>2</sup> incl. perf.		Total	
	Peer	Global	Peer	Global	Peer	Global	Peer	Global	Peer	Global	Peer	Global	Peer	Global
90th %ile	32.4	171.5	0.0	90.8	32.4	255.9	32.4	255.9	32.4	171.5	244.5	277.0	6.7	15.5
75th %ile	32.4	155.1	0.0	69.0	32.4	211.0	32.4	211.0	32.4	155.1	244.5	230.9	6.7	7.6
Median	32.4	129.0	0.0	61.6	32.4	193.5	32.4	193.5	32.4	129.0	244.5	198.0	6.7	4.5
25th %ile	32.4	65.7	0.0	18.1	32.4	105.0	32.4	79.6	32.4	65.7	244.5	146.7	6.7	1.0
10th %ile	32.4	12.7	0.0	0.0	32.4	31.7	32.4	31.7	32.4	10.4	244.5	59.2	6.7	-101.9
— Average	32.4	111.1	0.0	48.2	32.4	159.3	32.4	156.5	32.4	110.8	244.5	317.6	6.7	-49.6
Count	1	29	1	29	1	29	1	29	1	29	1	29	1	9
Avg. assets	435M	453M	435M	453M	435M	453M	435M	464M	435M	464M	435M	464M	4M	234M
Norwegian Government Pension Fund Global														
● 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
%ile														
Assets	0M	0M	0M	0M	0M	0M	0M	0M	0M	0M	0M	0M	0M	0M

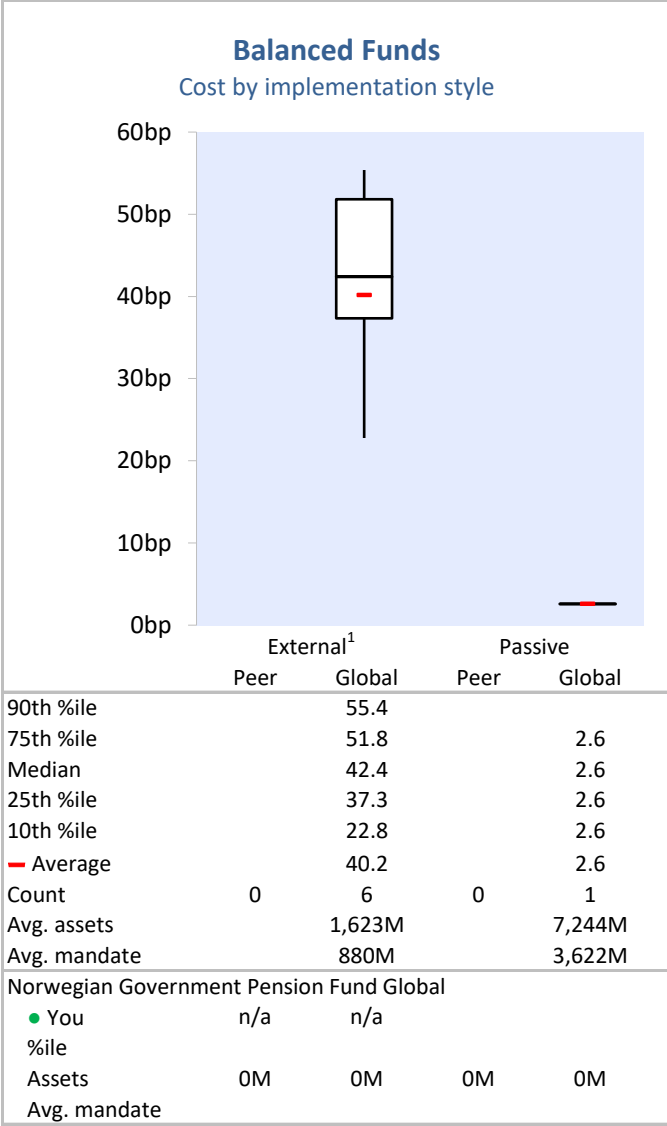
1. The base for fees is usually the committed amount during the commitment period, and unreturned invested capital afterwards.
2. The total cost also includes the internal cost of monitoring and selecting private equity investments.
3. Co-investment is included with direct LPs because it can only be done alongside direct LPs. Co-investment is done by none of your peers and 2 of the Global funds.



#### 1. Breakdown of external fees

	Your Plan	Peer Average	Global Average
Base fees	n/a	68.6	73.4
Internal and other	<u>n/a</u>	<u>8.3</u>	<u>12.7</u>
Performance fees	n/a	16.8	22.8
Total*	n/a	93.7	91.9

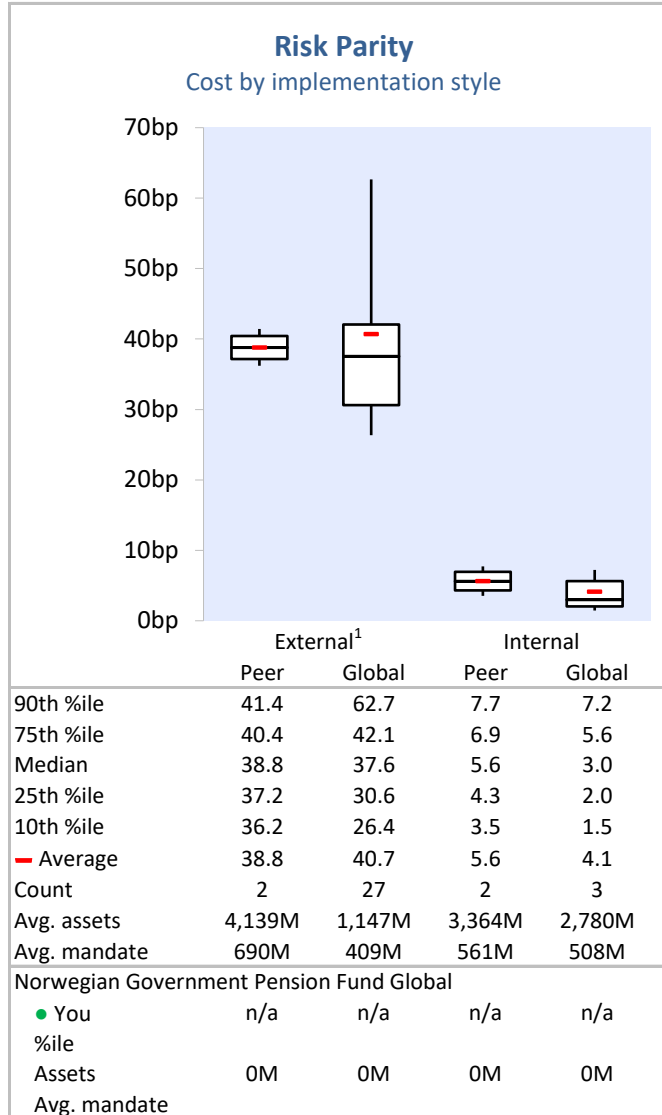
\* For funds that did not report a performance fee, a value of 'zero' was used. The average performance fee for those funds that reported a performance fee is 16.8 bps for peers (3 funds) and 22.8 bps for Global participants (32 funds).



1. Breakdown of external fees

	Your Plan	Peer Average	Global Average
Base fees	n/a	n/a	40.2
Internal and other	<u>n/a</u>	<u>n/a</u>	<u>n/a</u>
Performance fees	n/a	n/a	0.0
Total*	n/a	n/a	40.2

\* 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 Global participants (2 funds).



#### 1. Breakdown of external fees

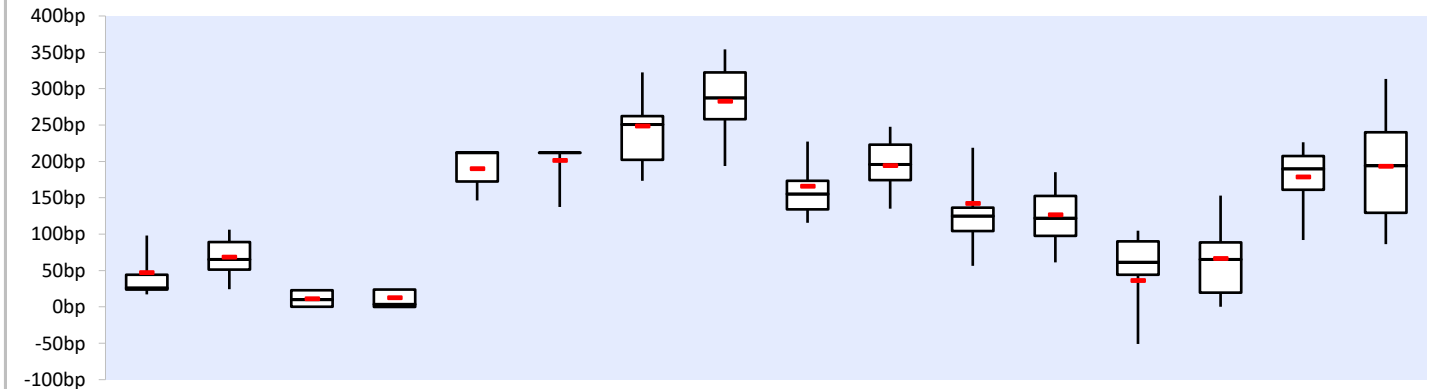
	Your Plan	Peer Average	Global Average
Base fees	n/a	34.3	38.8
Internal and other	<u>n/a</u>	<u>2.5</u>	<u>2.1</u>
Performance fees	n/a	3.9	1.6
Total*	n/a	38.8	40.7

\* 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 3.9 bps for peers (1 fund) and 1.6 bps for Global participants (16 funds).



## Hedge Funds

### Cost by implementation style

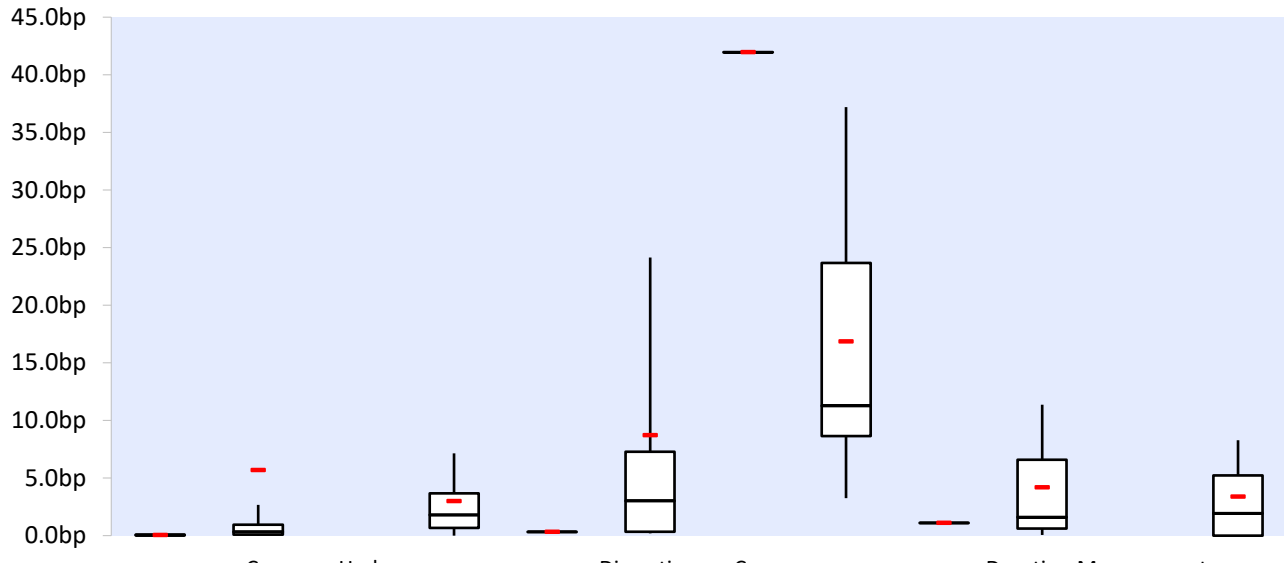


	Fund of Funds										External Direct					
	Mgmt fees (Top layer)		Perf. fees (Top layer)		Underlying mgmt. and perf. <sup>1</sup>		Total <sup>2</sup> incl. perf.		Total <sup>2</sup> excl. perf.		Mgmt fees		Perf. fees		Total <sup>2</sup> incl. perf.	
	Peer	Global	Peer	Global	Peer	Global	Peer	Global	Peer	Global	Peer	Global	Peer	Global	Peer	Global
90th %ile	98.2	106.4	24.0	24.0	212.0	212.0	322.2	354.1	227.2	247.6	218.6	185.4	105.0	153.0	226.4	313.6
75th %ile	44.4	89.3	22.7	24.0	212.0	212.0	262.3	322.4	173.4	222.8	136.5	152.8	89.9	88.5	207.6	240.1
Median	26.2	65.4	10.0	3.8	212.0	212.0	250.8	287.5	155.2	196.2	125.3	122.5	61.8	65.4	190.2	194.4
25th %ile	23.7	51.3	0.3	0.0	172.2	212.0	202.1	258.1	134.3	174.3	104.1	97.8	44.2	19.6	161.1	129.2
10th %ile	17.4	24.3	0.0	0.0	146.5	137.6	173.3	193.8	115.9	135.1	56.4	61.1	-50.9	0.0	91.8	86.5
— Average	47.3	68.6	11.3	12.8	190.2	201.5	248.8	282.9	166.1	194.2	142.5	126.6	36.1	66.5	178.6	193.1
Count	6	84	6	84	6	84	6	84	6	84	8	127	8	127	8	127
Avg. assets	3,905M	594M	3,905M	594M	3,905M	594M	3,905M	594M	3,905M	594M	6,605M	1,543M	6,605M	1,543M	6,605M	1,543M
Norwegian Government Pension Fund Global																
● 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

1. 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 83 bps (on NAV) for underlying performance fees were used.

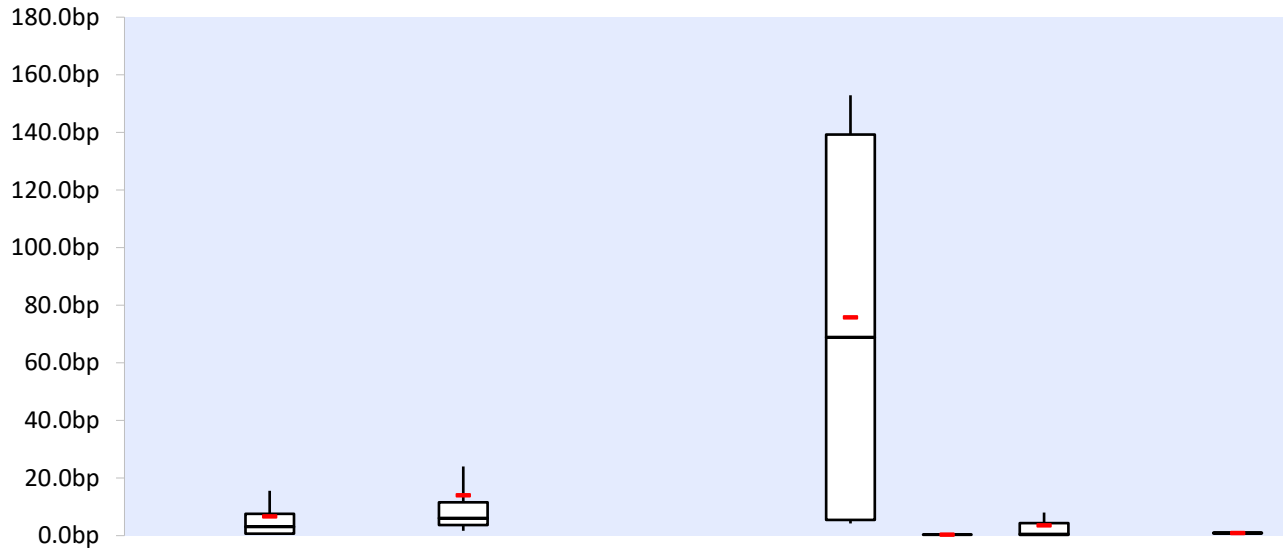
2. The total cost also includes the internal cost of monitoring and selecting real estate investments. The peer average cost of monitoring and selecting was 9.3 bps for fund of

### Overlays: currency, duration Cost by implementation style



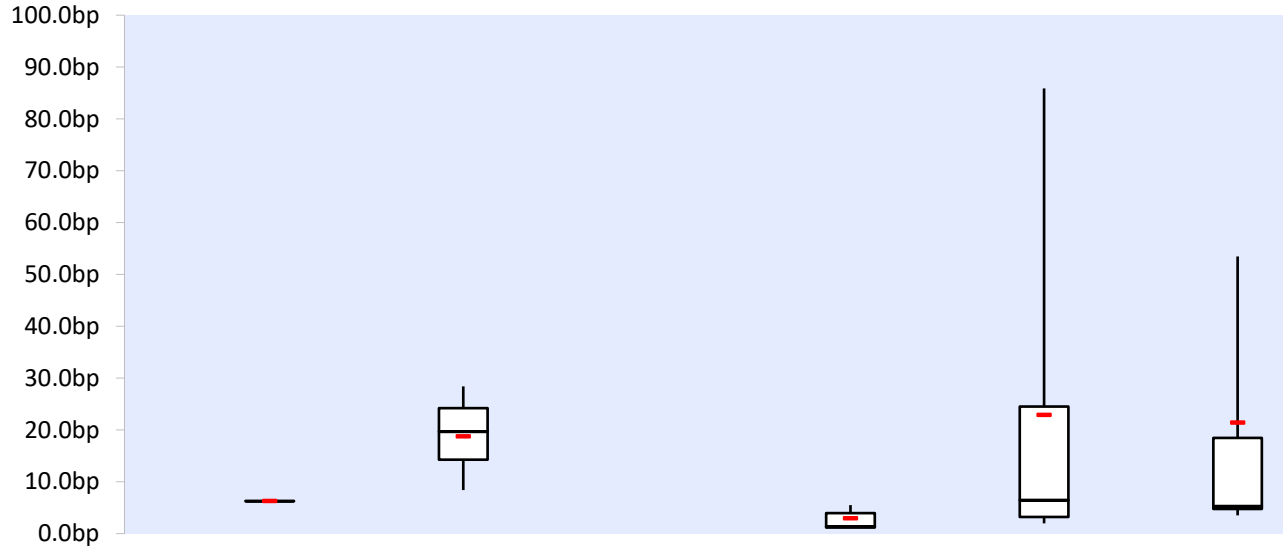
	Currency Hedge		Discretionary Currency				Duration Management					
	Internal		External		Internal		External		Internal		External	
	% of notional		% of notional		% of notional		% of notional		% of notional		% of notional	
	Peer	Global	Peer	Global	Peer	Global	Peer	Global	Peer	Global	Peer	Global
90th %ile	0.1	2.7	7.1	0.3	24.1	42.0	37.2	1.1	11.4	8.3		
75th %ile	0.1	0.9	3.7	0.3	7.3	42.0	23.7	1.1	6.6	5.2		
Median	0.1	0.3	1.8	0.3	3.0	42.0	11.3	1.1	1.6	2.0		
25th %ile	0.0	0.1	0.7	0.3	0.3	42.0	8.6	1.1	0.6	0.0		
10th %ile	0.0	0.0	0.0	0.3	0.2	42.0	3.2	1.1	0.1	0.0		
— Average	0.1	5.7	3.0	0.3	8.7	42.0	16.9	1.1	4.2	3.4		
Count	2	23	0	51	1	13	1	19	1	7	0	23
Avg. notional	36,634M	8,974M	27,011M	23,357M	7,859M	1,356M	1,115M	13,929M	5,046M	4,235M		
Norwegian Government Pension Fund Global												
● 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		External		Internal		External		Internal		External	
	% of notional		% of notional		% of notional		% of notional		% of notional		% of notional	
	Peer	Global	Peer	Global	Peer	Global	Peer	Global	Peer	Global	Peer	Global
90th %ile		15.6		24.0				152.9	0.4	8.0		1.1
75th %ile		7.5		11.6				139.2	0.4	4.3		1.0
Median		3.1		6.2				69.0	0.4	0.6		0.9
25th %ile		0.7		3.7				5.5	0.4	0.3		0.9
10th %ile		0.3		1.7				4.2	0.4	0.1		0.8
— Average		6.7		14.0				75.8	0.4	3.6		0.9
Count	0	10	0	34	0	0	0	4	1	10	0	2
Avg. notional		7,453M		1,091M				1,206M	177,384M	44,379M		196M
Norwegian Government Pension Fund Global												
● 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: 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	Global	Peer	Global	Peer	Global	Peer	Global	Peer	Global	Peer	Global
90th %ile		6.3		28.4				5.5		85.9		53.5
75th %ile		6.3		24.2				4.0		24.5		18.5
Median		6.3		19.7				1.3		6.5		5.3
25th %ile		6.3		14.3				1.2		3.2		4.8
10th %ile		6.3		8.4				1.1		2.0		3.5
— Average		6.3		18.8				3.0		22.9		21.4
Count	0	1	0	4	0	0	0	3	0	13	0	17
Avg. notional		391M		539M				3,359M		1,618M		560M
Norwegian Government Pension Fund Global												
● 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												

# 7

## Appendices

Appendix A - Data Summary

Appendix B - Currency conversion

Appendix C - Data quality

Appendix D - Glossary of terms

## Appendix A - Data Summary

### Norwegian Government Pension Fund Global

Plan Info	2018	2017	2016	2015	2014
Contact	Julie Belck-Olsen	Julie Belck-Olsen	Julie Belck-Olsen	Julie Belck-Olsen	Kyrre Nilsen
Type of fund (corporate, public, other)	Public	Public	Public	Public	Public
Total fund size (mils) as at December 31	834,042.8	864,249.0	827,241.0	777,429.0	708,824.0
Asset-class level holdings provided on survey are: year end or average?	Average	Average	Average	Average	Average
Total return for year ended Is the return net or gross?	-6.12% Gross	13.66% Gross	6.92% Gross	2.74% Gross	7.58% Gross
Total fund policy or benchmark return	-5.82%	12.96%	6.78%	2.30%	8.33%

Ancillary Data	2018	2017	2016	2015	2014
What is your hedging policy for: Foreign non-U.S. Holdings?					
What were your actuarial fees in 000s?					
How many plan members/beneficiaries do you have: Active? Active (no-accrual)? Retired? Other?					
What type of plan(s) do you have?					
To what extent are your retired members' benefits indexed to inflation? Contractual % If the indexation is subject to a cap, describe the cap					
What % of the plan's liabilities pertain to retired members?					
Actuarial valuation assumptions for funding purposes: Liability discount rate Salary progression rate					
What was your actuarial assumption for expected rate of return?					

## Appendix A - Data Summary: Policy Weights and Benchmarks

### Norwegian Government Pension Fund Global

Asset Class		Policy Weight	Benchmark	
			Description	Return
Stock - Europe	2018		Custom	-13.7
	2017		Custom	25.6
	2016		Your Stock: Europe benchmark	3.8
	2015			
	2014			
Stock - U.S. Broad/All	2018		Custom	3.6
	2017		Custom	18.9
	2016		Your Stock: U.S. Broad/All benchmark	16.1
	2015			
	2014			
Stock - Emerging	2018		Custom	-14.7
	2017		Custom	20.5
	2016		Your Stock: Emerging benchmark	10.7
	2015			
	2014			
Stock - Global	2018	67.3	Your Stock: Global benchmark	-8.8
	2017	67.1	Your Stock: Global benchmark	18.7
	2016	62.2	Your Stock: Global benchmark	8.6
	2015	61.6	Your Stock: Global benchmark	3.0
	2014	61.1	Your Stock: Global benchmark	8.7
Fixed Income - Emerging	2018			
	2017		Barclays Global Aggregate + Barclays Global Inflation Linked	2.9
	2016		Custom	13.0
	2015			
	2014			
Fixed Income - Global	2018	32.7	Barclays Global Aggregate + Barclays Global Inflation Linked	0.6
	2017	33.0	Barclays Global Aggregate + Barclays Global Inflation Linked	2.9
	2016	35.3	Barclays Global Aggregate + Barclays Global Inflation Linked	4.2
	2015	35.3	Barclays Global Aggregate + Barclays Global Inflation Linked	0.6
	2014	36.7	Barclays Global Aggregate + Barclays Global Inflation Linked	7.6
REITs	2018		Custom	-4.6
	2017			
	2016			
	2015			
	2014			
Real Estate ex-REITs	2018		Custom	-2.1
	2017		Custom	8.3
	2016	2.5	Custom (Actual)	0.8
	2015	3.1	Custom (Actual)	10.0
	2014	2.2	Custom (Actual)	10.4

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

Norwegian Government Pension Fund Global

Asset Class		Year	Asset (€millions)	Return %	Cost (€000)				
					Internal & Other	Base Fees	Perf Fees	Total	Bps
Stock - Europe	External Active	2018	8,758.3	-14.90	1,202.7	18,306.9	8,043.5	27,553.1	31.5
		2017	9,716.0	27.50	1,211.7	21,744.0	3,404.0	26,359.7	27.1
		2016	8,128.0	2.44	4,543.0	16,996.0	3,584.0	25,123.0	30.9
Stock - U.S. Broad/All	External Active	2018	283.1	0.30	38.9	815.8		854.7	30.2
		2017	664.0	18.60	82.8	1,862.0	(337.0)	1,607.8	24.2
		2016	767.0	22.90	156.0	1,333.0	338.0	1,827.0	23.8
Stock - Emerging	External Active	2018	29,349.0	-13.50	4,030.2	56,219.5	62,007.7	122,257.4	41.7
		2017	29,535.0	26.60	3,683.5	57,108.0	95,921.0	156,712.5	53.1
		2016	22,072.0	11.33	1,649.0	45,509.0	19,998.0	67,156.0	30.4
Stock - Global	Internal Active	2018	538,129.1	-9.19	104,260.3			104,260.3	1.9
		2017	509,143.0	18.92	108,209.0			108,209.0	2.1
		2016	436,866.0	8.71	102,953.0			102,953.0	2.4
		2015	454,193.0	4.26	114,509.0			114,509.0	2.5
		2014	375,631.0	7.73	81,998.0			81,998.0	2.2
	External Active	2018							
		2017							
		2016							
		2015	30,644.5	-2.67	6,696.0	63,858.0	64,589.0	135,143.0	44.1
		2014	25,859.0	10.60	4,326.0	50,165.0	77,696.0	132,187.0	51.1
Fixed Income - Emerging	External Active	2018							
		2017	583.0	5.79	-	186.0		186.0	3.2
		2016	2,075.0	13.31	287.0	4,755.0		5,042.0	24.3
Fixed Income - Global	Internal Active	2018	264,501.5	0.56	42,087.3			42,087.3	1.6
		2017	273,824.0	3.28	41,515.0			41,515.0	1.5
		2016	282,097.0	4.26	40,473.0			40,473.0	1.4
		2015	275,995.9	0.36	32,020.0			32,020.0	1.2
		2014	243,704.0	6.88	25,671.0			25,671.0	1.1
	External Active	2018							
		2017							
		2016							
		2015	1,530.1	-8.52	175.0	4,815.0		4,990.0	32.6
		2014	1,278.0	6.33	180.0	3,153.0		3,333.0	26.1
REITs	Internal Active	2018	7,937.4	-10.34	2,013.0			2,013.0	2.5



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

Norwegian Government Pension Fund Global

Asset Class	Year	NAV (€mils)	Fee Basis (€mils)	Return	Cost (€000)						
					Internal & Other	Base Fees	Perf. Fees	Underlying Base Fees	Underlying Perf Fees	Total	Total bps
Real Estate ex-REITs											
Internal Active	2018	23,008.1	23,008.1	7.5	50,360.0					50,360.0	21.9
	2017	20,936.0	20,936.0	9.0	54,425.0					54,425.0	26.0
Operating Subsidiary	2018										
	2017										
	2016	24,136.0	24,136.0	0.8	47,438.0	0.0				47,438.0	19.7
	2015	20,809.6	20,809.6	10.0	39,477.0	0.0				39,477.0	19.0
	2014	9,227.0	9,227.0	10.4	28,131.0	0.0				28,131.0	30.5

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

Norwegian Government Pension Fund Global

Oversight, Custodial and Other Costs			
		000s	bps
Oversight of the fund assets <sup>1</sup>	2018	76,722.7	0.9bp
	2017	73,798.0	0.9bp
	2016	66,954.0	0.9bp
	2015	67,859.0	0.9bp
	2014	59,310.0	0.9bp
Custodial total	2018	39,045.2	0.4bp
	2017	41,965.0	0.5bp
	2016	39,503.0	0.5bp
	2015	42,400.0	0.5bp
	2014	51,964.0	0.8bp
Custodial foreign (if available)	2015	42,400.0	0.5bp
Consulting / performance measurement	2018	14,930.4	0.2bp
	2017	10,050.0	0.1bp
	2016	9,570.0	0.1bp
	2015	8,868.0	0.1bp
	2014	6,363.0	0.1bp
Audit	2018	4,357.9	0.0bp
	2017	4,312.0	0.1bp
	2016	6,110.0	0.1bp
	2015	4,840.0	0.1bp
	2014	4,314.0	0.1bp
Total	2018	135,056.2	1.5bp
	2017	130,125.0	1.5bp
	2016	122,137.0	1.6bp
	2015	123,967.0	1.6bp
	2014	121,951.0	1.9bp

Summary of All Asset Management Costs			
		000s	bps
Investment Management Costs	2018	349,385.8	4.0bp
	2017	389,015.0	4.6bp
	2016	290,012.0	3.7bp
	2015	326,139.0	4.2bp
	2014	271,320.0	4.1bp
Oversight, Custodial & Other Costs	2018	135,056.2	1.5bp
	2017	130,125.0	1.5bp
	2016	122,137.0	1.6bp
	2015	123,967.0	1.6bp
	2014	121,951.0	1.9bp
Total	2018	484,442.0	5.6bp
	2017	519,140.0	6.1bp
	2016	412,149.0	5.3bp
	2015	450,106.0	5.7bp
	2014	393,271.0	6.0bp

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: Comments and defaults

Norwegian Government Pension Fund Global

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## Appendix B - Currency conversion

Norwegian Government Pension Fund Global

All currency amounts have been converted to Euros using Purchasing Power Parity figures per the OECD<sup>1</sup>. The table below shows the foreign exchange rates for the past 5 years.

Currency conversion table					
	2018	2017	2016	2015	2014
United States Dollars - USD*	0.723	0.747	0.732	0.761	0.777
Canada Dollars - CAD	0.580	0.597	0.576	0.624	0.619
Euro - EUR*	1.000	1.000	1.000	1.000	1.000
Sweden Kronor - SEK	0.080	0.084	0.081	0.084	0.089
United Kingdom Pounds - GBP	1.013	1.048	1.055	1.087	1.109
Australia Dollars - AUD	0.496	0.500	0.499	0.527	0.518
New Zealand Dollars - NZD	0.498	0.507	0.505	0.536	0.528

1. Source OECD website.

\* USD - Some participating Asia-Pacific funds report holdings and performance in USD.

EUR - Participating funds from Denmark and Norway report holdings and performance in Euros.

## Appendix C - 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 28th 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 D - 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.