

**Investment
Benchmarking Analysis**
(for the 5-year period ending December 31, 2021)

New Zealand Superannuation Fund



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Prepared October 07, 2022. 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 New Zealand Superannuation Fund.

Key Takeaways

Returns

- Your 5-year net total return was 12.6%. This compares to the Global median of 9.8% and the peer median of 9.9%.
- Your 5-year policy return was 12.0%. This compares to the Global median of 9.4% and the peer median of 9.1%.
- 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.

Value added

- Your 5-year net value added was 0.6%. This compares to the Global median of 0.4% and the peer median of 0.3%.

Cost

- Your investment cost of 29.1 bps was below your benchmark cost of 41.1 bps. This suggests that your fund was low cost compared to your peers.
- Your fund was low cost because it had a lower cost implementation style and it paid less than peers for similar services.
- Your costs decreased by 7.5 bps, from 36.6 bps in 2017 to 29.1 bps in 2021, because you paid less in total for similar investment styles and had a lower cost implementation style. This was partly offset by a higher cost asset mix.

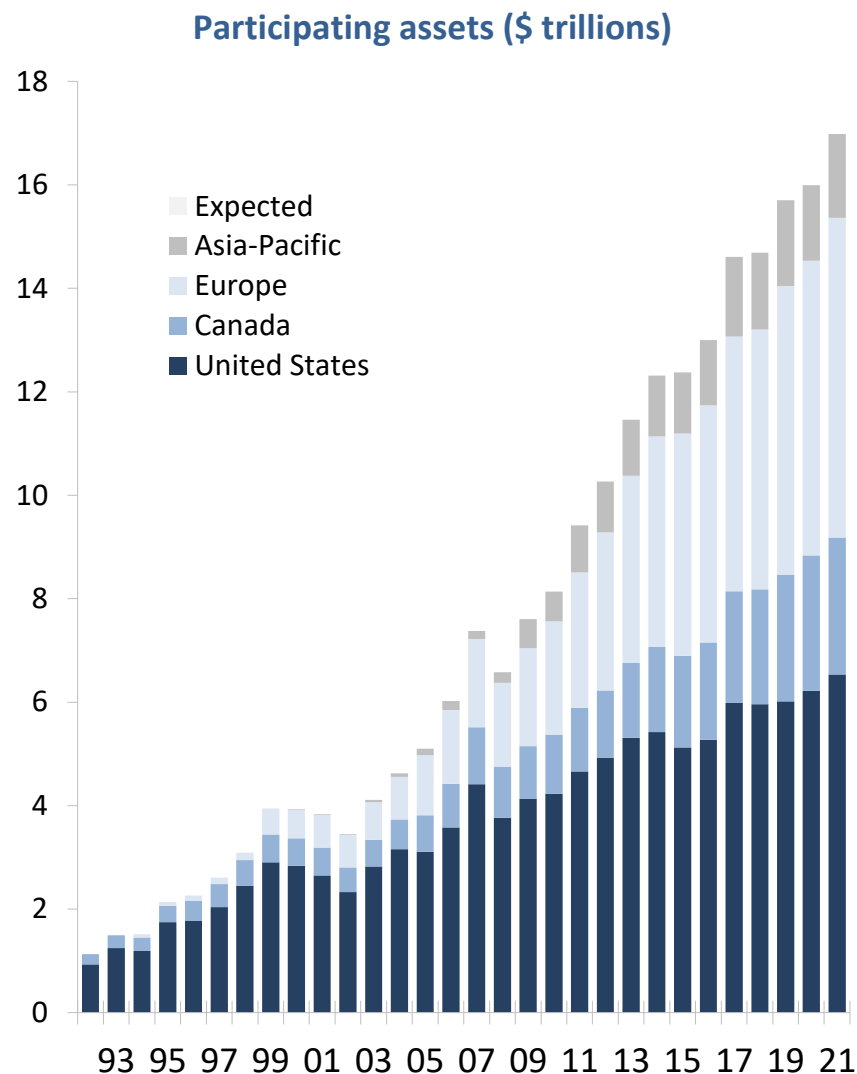
Risk

- Your asset risk of 11.5% was above the Global median of 9.1%.

This benchmarking report compares your cost and return performance to the 273 funds in CEM's extensive pension database.

- 145 U.S. pension funds participate. The median U.S. fund had assets of \$18.8 billion and the average U.S. fund had assets of \$45.1 billion. Total participating U.S. assets were \$6.5 trillion.
- 66 Canadian funds participate with assets totaling \$2.6 trillion.
- 54 European funds participate with aggregate assets of \$6.2 trillion. Included are funds from the Netherlands, Norway, Sweden, Finland, Ireland, Denmark and the U.K.
- 6 Asia-Pacific funds participate with aggregate assets of \$1.6 trillion. Included are funds from Australia, New Zealand, China and South Korea.
- 2 funds from other regions participate.

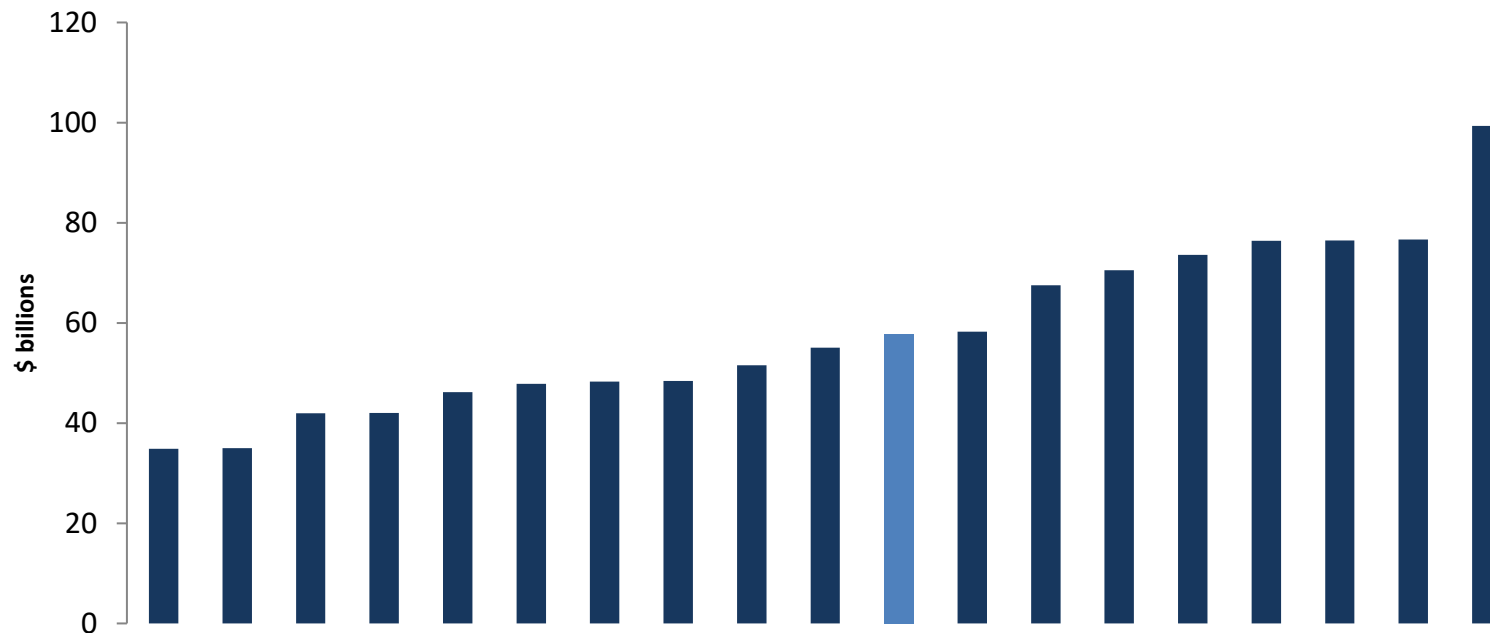
The most meaningful comparisons for your returns and value added are to the Global universe, which consists of 273 funds.



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

Peer group for New Zealand Superannuation Fund

- 19 Global sponsors from \$34.9 billion to \$99.4 billion
- Median size of \$55.1 billion versus your \$57.9 billion



Your 5-year net total return of 12.6% compares to the Global median of 9.8% and the peer median of 9.9%

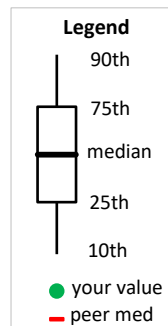
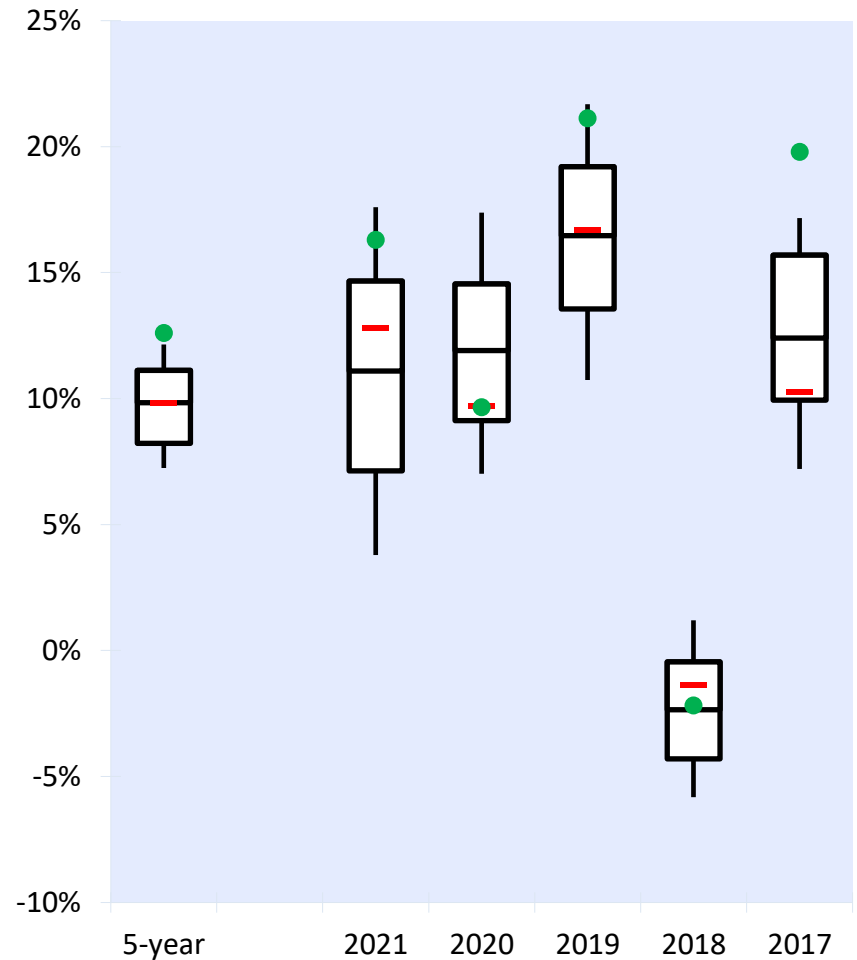
Total returns, by themselves, provide little insight into the reasons behind relative performance. Therefore, we separate total return into its more meaningful components: policy return and value added.

	Your 5-year
Net total fund return	12.6%
- Policy return	12.0%
= Net value added	0.6%

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).

Returns are reported in local currency.

Global net total returns - quartile rankings



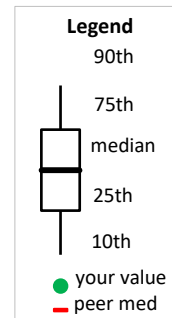
Your 5-year policy return of 12.0% compares to the Global median of 9.4% and the peer median of 9.1%.

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

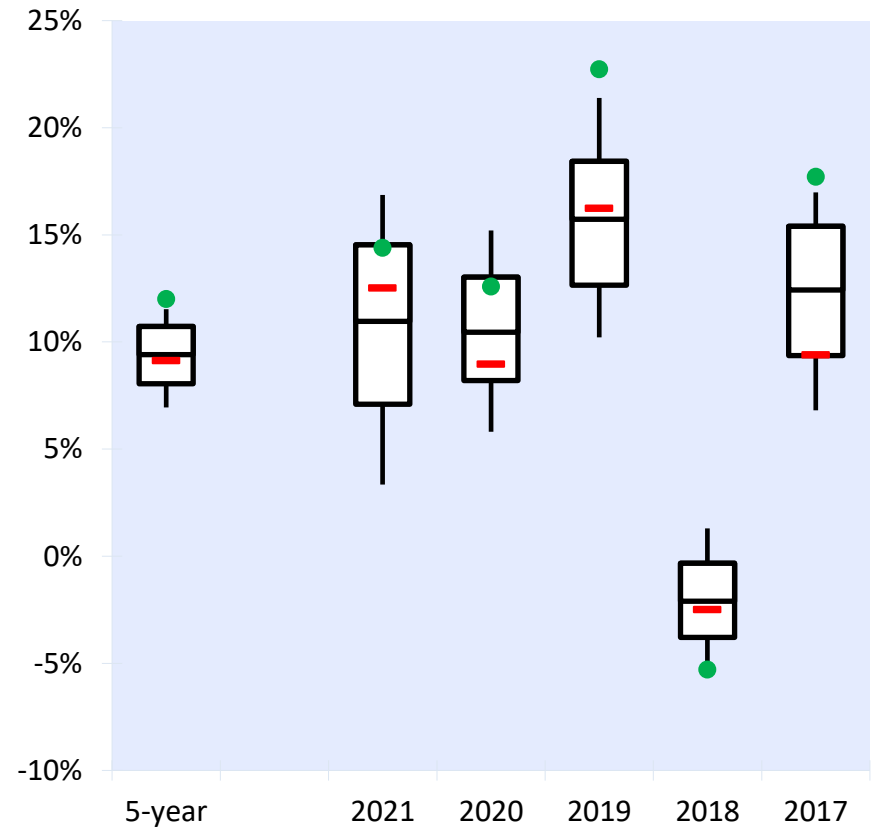
Having a higher or lower relative policy return is not necessarily good or bad. Your policy return reflects your investment policy, which should reflect your:

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

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



Global policy returns - quartile rankings



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

Differences in policy return are caused by differences in policy mix and benchmarks. At the end of 2021 your policy mix compared to your peers and the Global universe as follows:

- Your fund had substantially more stock than the peer and Global averages (your 80% versus a Global average of 39% and peer average of 43%).

2021 Policy asset mix

	Your fund	Peer avg.	Global avg.
Stock - Europe & Far East	5%	2%	3%
Stock - U.S.	0%	7%	9%
Stock - Emerging	0%	4%	2%
Stock - Global	75%	20%	16%
Other Stock ¹	0%	10%	9%
Total Stock	80%	43%	39%
Fixed income - U.S.	0%	1%	7%
Fixed income - Long bonds	0%	12%	14%
Fixed income - Global	20%	6%	2%
Cash	0%	1%	0%
Other Fixed Income ¹	0%	13%	15%
Total Fixed Income	20%	33%	39%
Hedge funds	0%	3%	2%
Real estate incl. REITs	0%	8%	7%
Other Real Assets ¹	0%	3%	4%
Private equity	0%	6%	6%
Private debt	0%	2%	3%
Total	100%	100%	100%

1. Other stock includes Canada and ACWI x U.S. stock. Other fixed income includes Canada, Inflation Indexed, Europe/Far East, High Yield and Emerging bonds. Real assets includes commodities, natural resources and infrastructure.

Your fund uses derivatives to adjust exposure to several asset classes.

Asset class	Policy mix	Actual asset mix	
		excluding derivatives	including derivatives
Stock - New Zealand (EAFE)	5%	4%	0%
Stock - Emerging	0%	3%	8%
Stock - Global	75%	45%	60%
	80%	52%	67%
Fixed Income - U.S.	0%	0%	0%
Fixed Income - Global	20%	9%	9%
Cash	0%	19%	-1%
	20%	28%	8%
Real Estate ex-REITs	0%	1%	1%
Infrastructure	0%	2%	2%
Natural Resources	0%	5%	5%
Hedge Funds	0%	6%	6%
Diversified Private Equity	0%	1%	1%
Other Private Equity	0%	6%	6%
	100%	100%	96%

Net value added is the component of total return from active management. Your 5-year net value added was 0.6%.

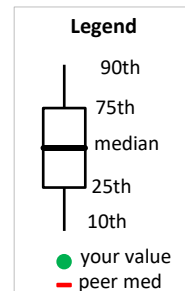
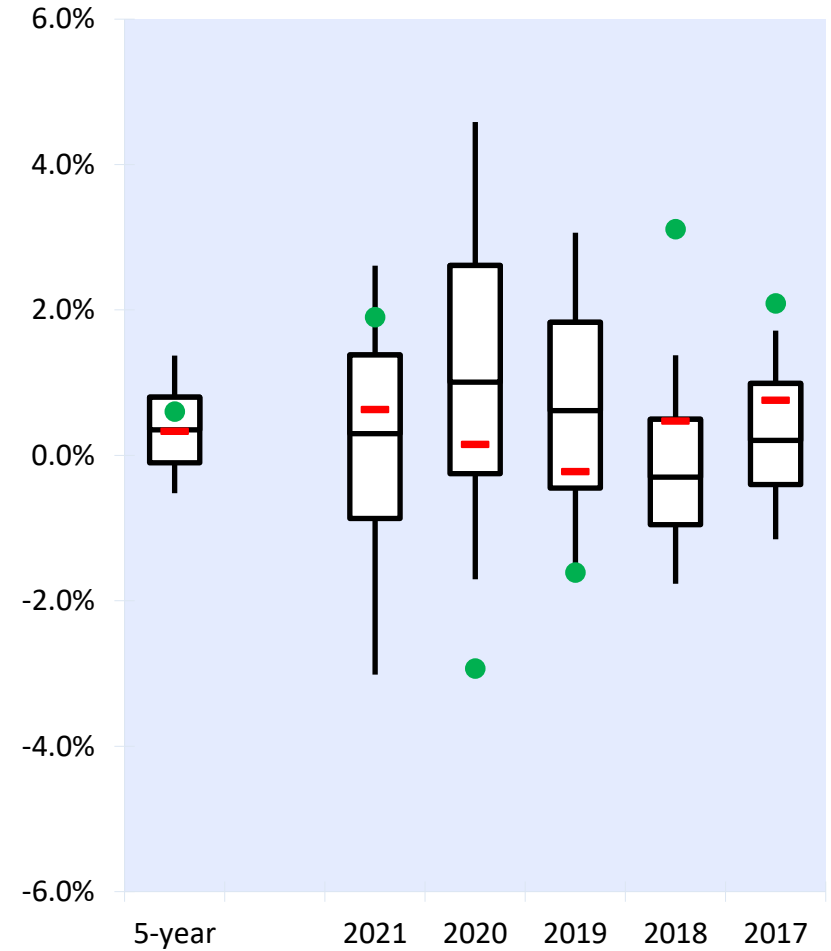
Net value added equals total net return minus policy return.

Value added for New Zealand Superannuation Fund

Year	Net return	Policy return	Net value added
2021	16.3%	14.4%	1.9%
2020	9.7%	12.6%	-2.9%
2019	21.1%	22.7%	-1.6%
2018	-2.2%	-5.3%	3.1%
2017	19.8%	17.7%	2.1%
5-Year	12.6%	12.0%	0.6%

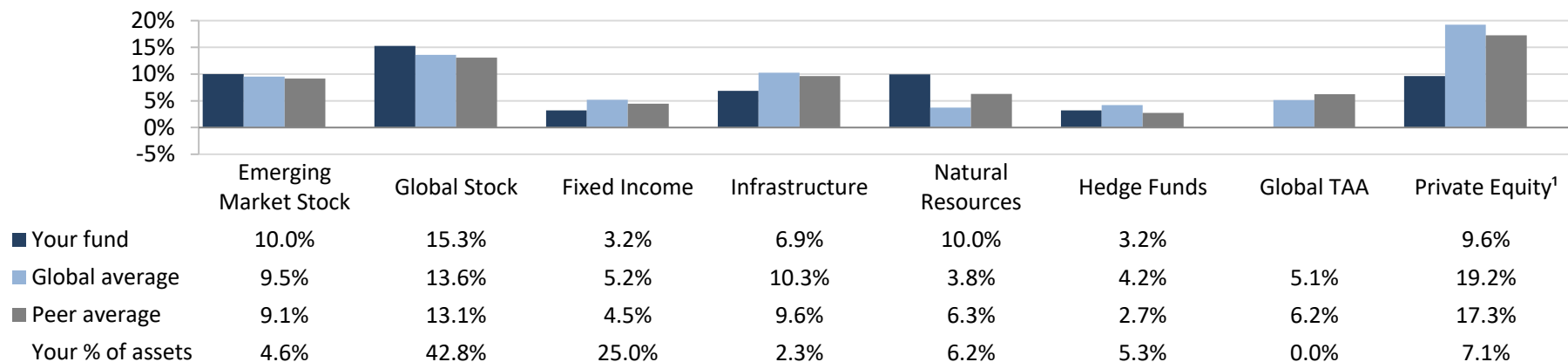
Your 5-year net value added of 0.6% compares to a median of 0.3% for your peers and 0.4% for the Global universe.

Global net value added - quartile rankings

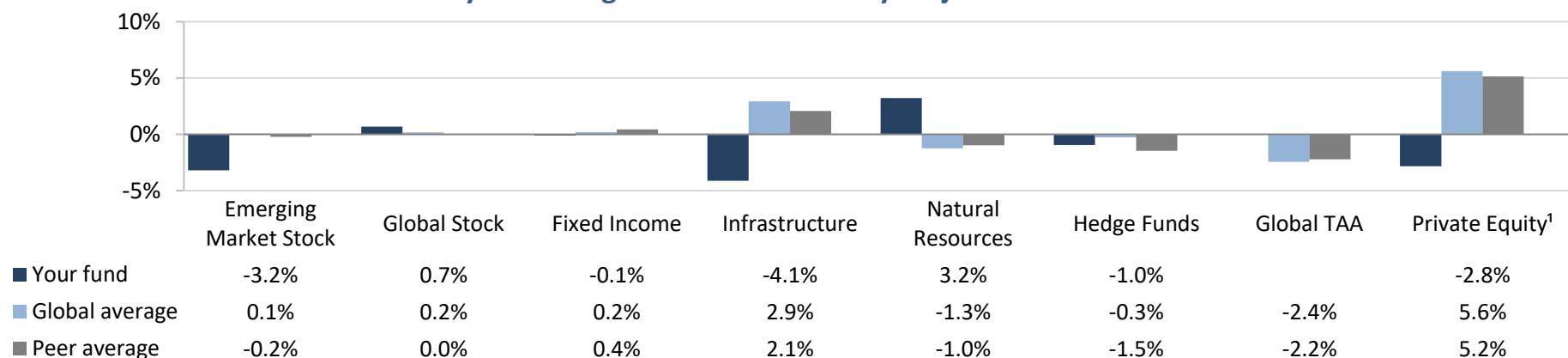


Comparisons of your 5-year net return and net value added by major asset class:

5-year average net return by major asset class



5-year average net value added by major asset class



1. To enable fairer comparisons, the private equity benchmarks of all participants, including your fund were adjusted to reflect lagged, investable, public-market indices.

Your investment costs, excluding private asset performance fees, were \$168.5 million or 29.1 basis points in 2021.

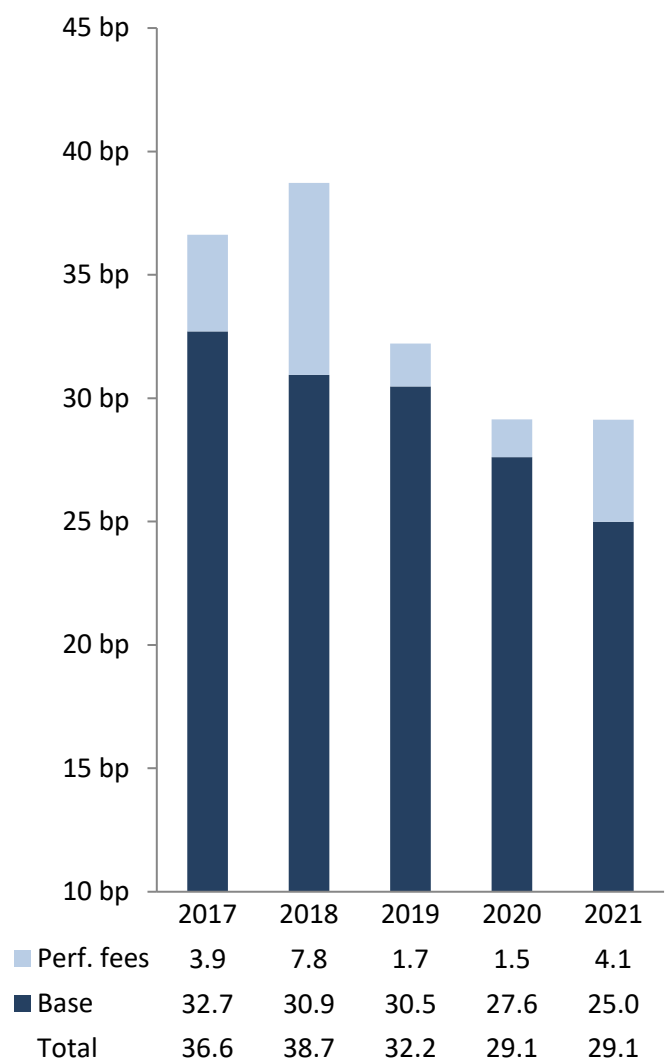
Asset management costs by asset class and style (\$000s)	Internal Management			External Management			Total
	Passive	Active	Overseeing of external	Passive fees	Active base fees	Perform. fees ³	
Stock - Europe & Far East	967	2,649	707		4,006		8,329
Stock - Emerging			707	958			1,665
Stock - Global			4,418	9,335			13,753
Fixed income - U.S.	314						314
Fixed income - Global	808		515	1,275			2,598
Cash		3,454					3,454
Infrastructure ³		683	328		1,564	1,660	2,575
Infrastructure - LP ³			662		1,869	256	2,531
Natural resources ³		1,608	1,824		2,441	2,080	5,873
Real estate ex-REITs ³		1,023					1,023
Real estate ex-REITs - LP ³			2,960		1,101	6,209	4,061
Real estate ex-REITs - Co-invest. ³			1,977		1,579		3,556
Hedge funds - External active			3,130		20,099	23,895	47,124
Private equity - Diversified - LP ³			4,999		7,762	3,913	12,761
Private equity - Diversified - Co-invest. ³			620				620
Private equity - Diversified - FoFs ^{2 3}			881		276	383	1,157
Venture capital - LP ^{1 3}			304		11	16	315
Venture capital - Co-invest. ³			317				317
Private equity - Other - LP ³		5,022					5,022
Private equity - Other - Co-invest. ³			3,631		15,013		18,644
Derivatives/Overlays	3,641	9,028					12,669
Total excluding private asset performance fees							148,361
							25.6bp
Oversight, custodial and other costs ⁴							
Oversight of the fund							14,014
Trustee & custodial							5,510
Consulting and performance measurement							0
Audit							612
Other							0
Total oversight, custodial & other costs							20,136
							3.5bp
Total investment costs (excl. transaction costs & private asset performance fees)							168,497
							29.1bp

Footnotes

1. Default base fees were added: Venture capital - LP 165 bp.
2. Default underlying costs were added: Private equity - Diversified - FoFs 154 bps. Refer to Appendix A for full details regarding defaults.
3. Total cost excludes carry/performance fees for real estate, infrastructure, natural resources and private equity. Performance fees are included for the public market asset classes and hedge funds.
4. Excludes non-investment costs, such as benefit insurance premiums and preparing cheques for retirees.

Your costs decreased by 7.5 bps, from 36.6 bps in 2017 to 29.1 bps in 2021, because you paid less in total for similar investment styles and had a lower cost implementation style. This was partly offset by a higher cost asset mix.

Trend in cost



Reasons why your costs decreased by 7.5 bps

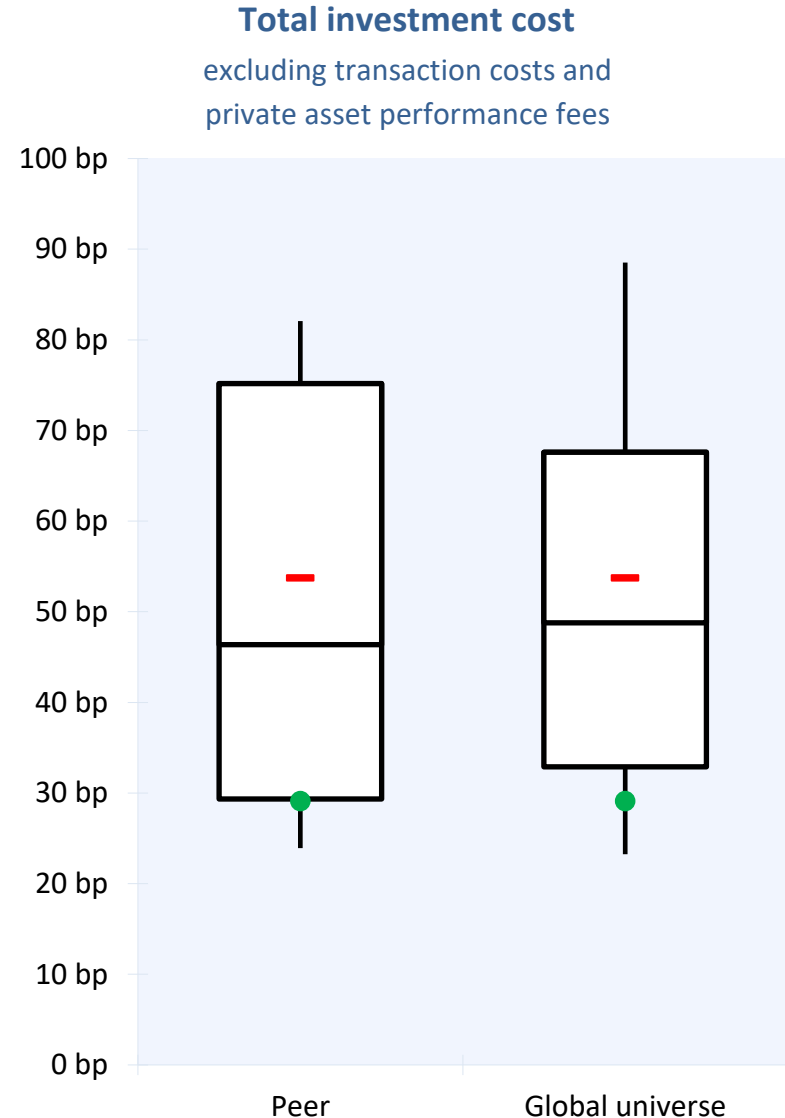
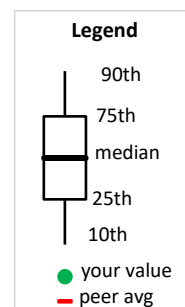
	Impact in bps	
1. Higher cost asset mix		
• More Real estate ex-REITs: 2017 0% vs 2021 1%		3.8
• Less Infrastructure & Natural resources: 2017 10% vs 2021 7%		(2.2)
• More Hedge funds & multi-asset: 2017 5% vs 2021 6%		2.0
• All other mix changes		(0.1)
		<u>3.5</u>
2. Lower cost implementation style		
• More passive, less active		(0.6)
• More internal as a % of active		(1.4)
• More co-investment as a % of LP/Co		(0.9)
• All other implementation style changes		(0.1)
		<u>(2.9)</u>
3. Paid less in total for similar investment styles		
	<u>2017 cost</u>	<u>2021 cost</u>
• Lower Hedge funds base fees	110.0 bp	72.2 bp
• Lower Private equity base fees	360.1 bp	284.2 bp
• Lower Hedge funds performance fees	86.4 bp	74.3 bp
• Lower internal investment management costs		
• Lower internal active Cash Fixed Income costs	8.6 bp	3.7 bp
• All other internal investment mgmt. differences		
• Lower oversight, custodial & other costs	6.2 bp	3.5 bp
• All other differences		
		<u>(8.0)</u>
Total decrease		<u>(7.5)</u>

Your total investment cost of 29.1 bps was below the peer median of 46.4 bps.

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

- Asset mix, particularly holdings of the highest cost asset classes: real estate (excl. REITs), infrastructure, hedge funds, private equity and private credit. These high cost assets equaled 20% of your funds assets at the end of 2021 versus a peer average of 24%.
- Fund size. Bigger funds have advantages of scale.

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



Benchmark cost analysis suggests that, after adjusting for fund size and asset mix, your fund was low cost by 12.0 basis points in 2021.

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 29.1 bp was below your benchmark cost of 41.1 bp. Thus, your cost savings were 12.0 bp.

Your cost versus benchmark

	\$000s	basis points
Your total investment cost	168,497	29.1 bp
Your benchmark cost	237,742	41.1 bp
Your excess cost	(69,245)	(12.0) bp

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

Reasons for your low cost status

	Excess Cost/ (Savings)	
	\$000s	bps
1. Lower cost implementation style		
• Less active management, more lower cost passive	(35,731)	(6.2)
• Less external management, more lower cost internal	(11,035)	(1.9)
• Less LPs as a percentage of external	(1,710)	(0.3)
• Less fund of funds	(705)	(0.1)
• More co-investment as a percentage of LP/Co	(2,492)	(0.4)
• More overlays	1,350	0.2
	<u>(50,324)</u>	<u>(8.7)</u>
2. Paying less than peers for similar services		
• External investment management costs	(25,752)	(4.5)
• Internal investment management costs	(197)	(0.0)
• Oversight, custodial & other costs	7,028	1.2
	<u>(18,921)</u>	<u>(3.3)</u>
Total savings	(69,245)	(12.0)

Your implementation style was 8.7 bps lower cost than the peer average.

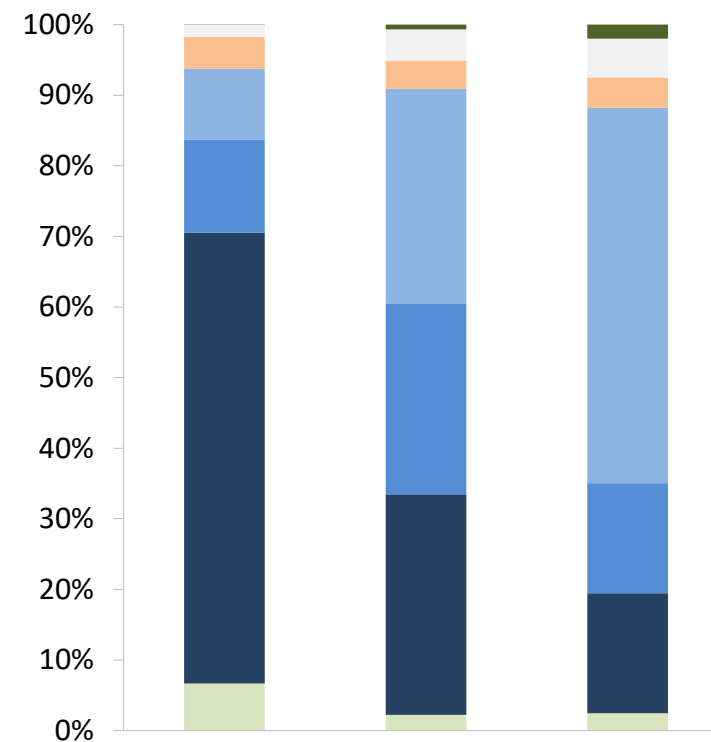
Implementation style is the way in which your fund implements asset allocation. Each implementation choice has a cost. Your first choice is how much to implement passively or actively. The table below summarizes your aggregate choices versus peers and their cost impact.

Implementation choices	Impact
More passive, less active	(6.2) bp
More internal as a % of passive	(0.0) bp
More internal as a % of active	(1.9) bp
More evergreen % in private assets, excl. PE	(0.3) bp
Less fund of funds % of LP/Co/FoF	(0.1) bp
More co-investment % of LP/Co	(0.4) bp
More overlays	0.2 bp
Total impact	(8.7) bp

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

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

Implementation style¹



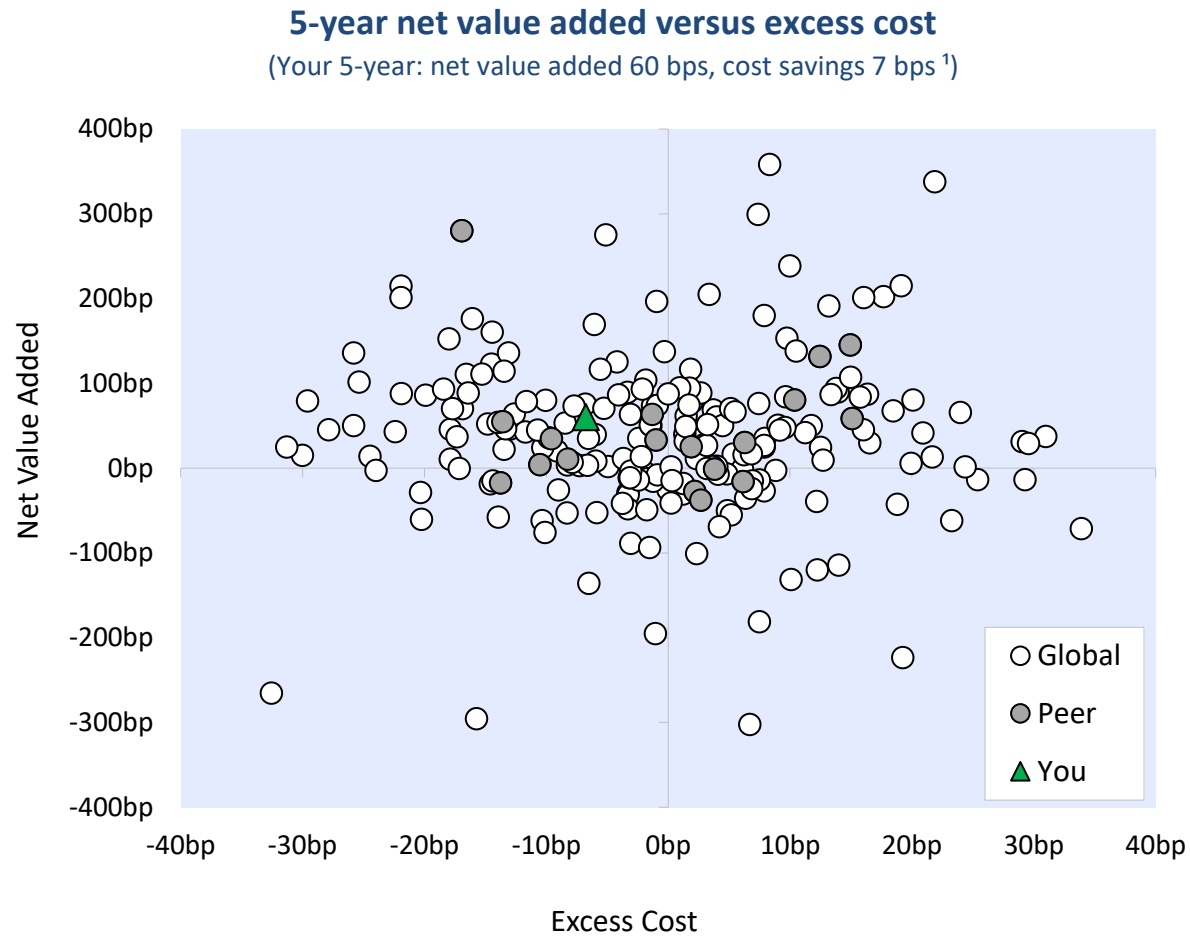
■ Fund of funds	0.0%	0.7%	2.0%
■ LP	1.7%	4.4%	5.5%
■ Co-investment	4.5%	4.0%	4.3%
■ External active	10.0%	30.5%	53.2%
■ Internal active	13.2%	27.0%	15.6%
■ External passive	63.9%	31.2%	17.0%
■ Internal passive	6.7%	2.3%	2.5%

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

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

Asset class/category	Impl. style \$000s	Paying more/(less) \$000s	Total \$000s	Total bps
Stock - Europe & Far East	(132)	2,618	2,486	9.9 bp
Stock - Emerging	(5,783)	(254)	(6,037)	(38.6) bp
Stock - Global	(27,901)	0	(27,901)	(10.8) bp
Fixed income - U.S.	(22)	310	287	122.8 bp
Fixed income - Global	(3,161)	155	(3,006)	(5.5) bp
Real estate ex-REITs	(337)	4,574	4,236	74.4 bp
Infrastructure	(2,189)	(548)	(2,737)	(30.3) bp
Natural resources	(8,767)	(2,431)	(11,199)	(37.3) bp
Hedge funds	(1,822)	(37,856)	(39,679)	(123.3) bp
Private equity - Diversified	(605)	7,171	6,565	138.5 bp
Venture capital	(952)	313	(639)	(1829.6) bp
Private equity - Other	--	--	Excluded	Excluded
Derivatives and overlays	1,350	0	1,350	0.2 bp
Oversight, custodial & other	n/a	7,028	7,028	1.2 bp
Total	(50,324)	(18,921)	(69,245)	(12.0) bp

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



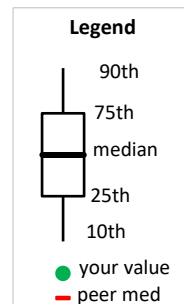
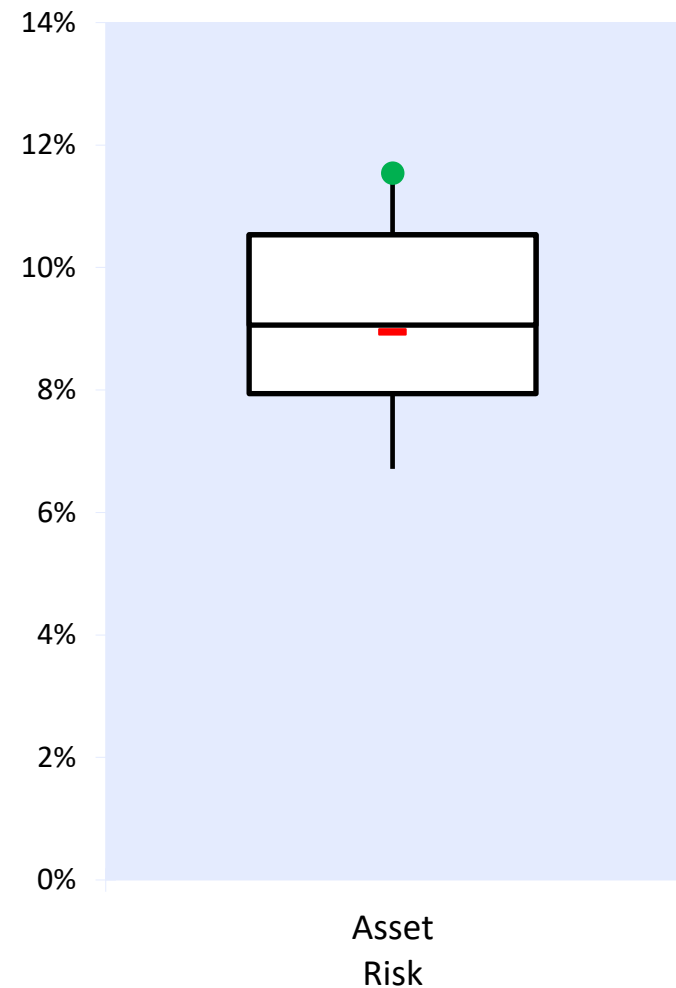
1. Your 5-year savings of 6.8 basis points is the average of your peer-based savings for the past 5 years.

	2021	2020	2019	2018	2017	5-year
Net value added	190.0bp	(293.0) bp	(161.0) bp	311.0bp	209.0bp	60.2bp
Excess cost	(12.0) bp	(10.1) bp	(8.4) bp	(2.0) bp	(1.4) bp	(6.8) bp

Comparison of risk levels:

Your asset risk of 11.5% was above the Global median of 9.1%. Asset risk is the standard deviation of your policy return. It is based on the historical variance of, and covariance between, the asset classes in your policy mix.

Global risk levels at December 31, 2021



2

Description of peer group and universe

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Peer group

Your peer group is comprised of 19 Global funds, with assets ranging from \$34.9 billion to \$99.4 billion versus your \$57.9 billion. The median size is \$55.1 billion.

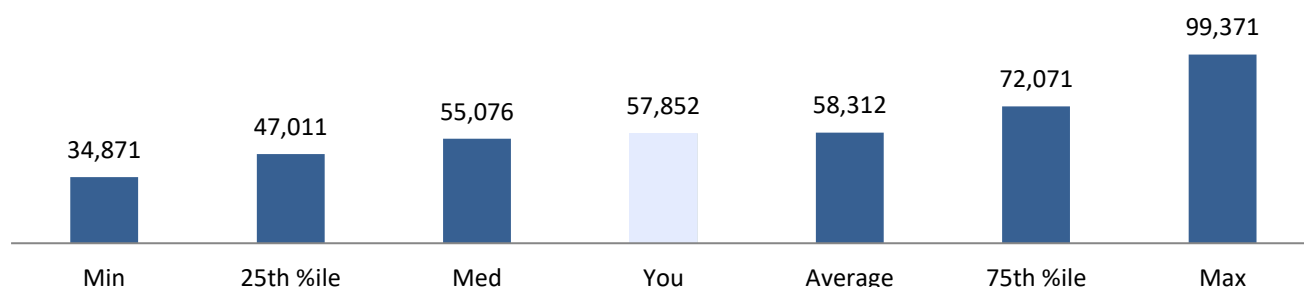
In order to preserve client confidentiality, we do not disclose your peers' names in this document. Your peer group consist of plans with the following characteristics:

Peer Group Characteristics - 2021

	You	Peers	Global average
<u>Plan Assets (\$ billions)</u>			
Range	57.9	34.9 - 99.4	0.1 - 2,326.5
Median		55.1	15.5
<u># of Plans</u>			
Corporate		6	124
Public		6	111
Other	1	7	38
Total		19	273
<u>Implementation style</u>			
% External active	12.9	55.3	66.8
% External passive	51.9	17.2	17.6
% Internal active	28.1	22.4	11.7
% Internal passive	7.1	5.1	3.8
<u>Asset mix</u>			
% Stock	51.6	40.3	38.2
% Fixed Income	25.7	32.3	37.9
% Real Assets	7.7	11.6	10.1
% Private Equity	6.7	6.9	6.3
% Private Credit	0.0	2.0	2.5
% Hedge Funds & Other	8.3	6.8	5.1

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

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

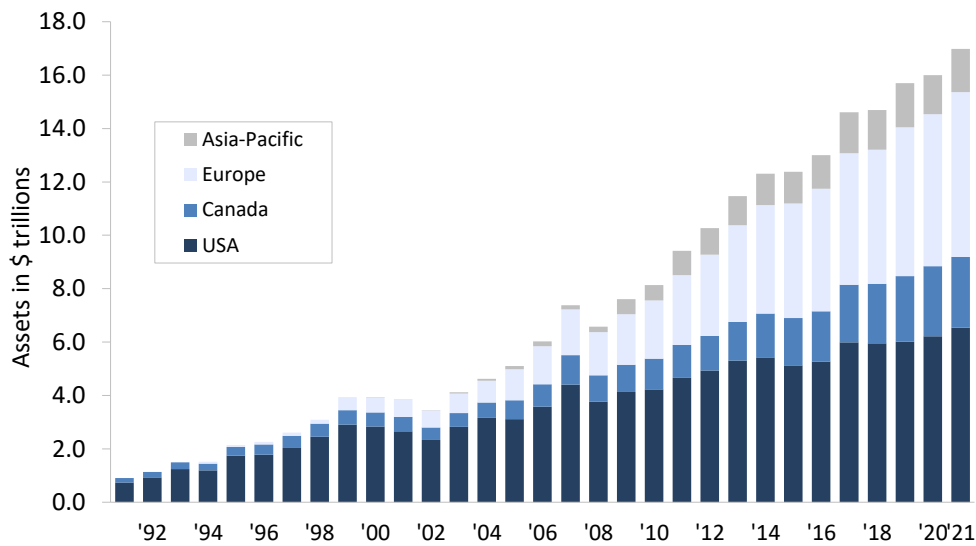


CEM global universe

CEM has been providing investment benchmarking solutions since 1991. The 2021 survey universe is comprised of 273 funds representing \$17.0 trillion in assets. The breakdown by region is as follows:

- 145 U.S. pension funds with aggregate assets of \$6.5 trillion.
- 66 Canadian pension funds with aggregate assets of \$2.6 trillion.
- 54 European pension funds with aggregate assets of \$6.2 trillion. Included are funds from the Netherlands, Norway, Sweden, Finland, Denmark, UK, and Ireland.
- 6 Asia-Pacific pension funds with aggregate assets of \$1.6 trillion.

CEM global universe



Universe subsets

CEM's global survey universe is comprised of 273 funds with total assets of \$17.0 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 19 Global funds ranging in size from \$34.9 - \$99.4 billion. The peer median of \$55.1 billion compares to your \$57.9 billion.
- Global - The global universe is comprised of 273 funds ranging in size from \$0.1 - \$2,326.5 billion. The median fund is \$15.5 billion.

Universe subsets by number of funds and assets

	Peer group ¹	Global by type				Global by Country				
		Corp.	Public	Other	Total	U.S.	Canada	Europe	Asia-Pacific	Total
# of funds										
2021	19	124	111	38	273	145	66	54	8	273
2020	19	135	136	37	308	158	69	72	9	308
2019	19	135	136	42	313	152	72	75	14	313
2018	19	147	148	44	339	170	78	77	14	339
2017	19	151	154	47	352	167	80	89	16	352
# of funds with uninterrupted data for:										
1 yr	19	124	111	38	273	145	66	54	8	273
2 yrs	19	118	107	33	258	137	62	52	7	258
3 yrs	19	109	101	32	242	125	61	49	7	242
4 yrs	19	104	101	31	236	121	60	48	7	236
5 yrs	19	97	95	30	222	115	54	46	7	222
Total assets (\$ billions)										
2021	1,108	2,440	11,203	3,399	17,042	6,538	2,648	6,177	1,679	17,042
2020	1,023	2,508	10,621	3,049	16,178	6,218	2,620	5,696	1,643	16,178
2019	966	2,438	10,259	3,219	15,915	6,017	2,447	5,579	1,871	15,915
2018	878	2,246	9,884	2,732	14,861	5,958	2,221	5,027	1,655	14,861
2017	873	2,246	9,880	2,954	15,079	5,986	2,155	4,928	2,010	15,079
2021 asset distribution (\$ billions)										
Avg	58.3	19.7	100.9	89.4	62.4	45.1	40.1	114.4	209.9	62.4
Max	99.4	185.8	2,326.5	1,073.8	2,326.5	589.0	517.7	2,326.5	1,143.4	2,326.5
75th %ile	72.1	26.0	85.4	96.4	47.8	38.6	24.6	70.5	130.5	47.8
Median	55.1	9.0	24.8	24.8	15.5	18.8	8.6	21.1	72.8	15.5
25th %ile	47.0	3.6	8.6	4.6	5.1	5.1	3.1	8.0	39.4	5.1
Min	34.9	0.5	0.1	0.1	0.1	0.5	0.1	1.0	5.1	0.1

1. Peer group statistics are for your 2021 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 - 2021 (as a % of year-end assets)

	Your fund ¹	Peer group	Global by type				Global by Country				
			Corp.	Public	Other	Total	U.S.	Canada	Europe	Asia-Pacific	Total
Implementation style											
External Active	12.9	53.5	73.1	56.0	60.4	64.3	72.1	62.5	48.0	48.9	64.3
Fund of funds	0.0	1.7	2.3	2.7	2.2	2.5	2.6	1.7	3.0	2.0	2.5
External passive	51.9	17.2	18.0	16.8	19.0	17.6	18.1	11.9	23.4	17.3	17.6
Internal Active	28.1	22.4	5.2	18.4	13.6	11.7	4.1	18.8	22.5	19.8	11.7
Internal Passive	<u>7.1</u>	<u>5.1</u>	<u>1.4</u>	<u>6.2</u>	<u>4.9</u>	<u>3.8</u>	<u>3.1</u>	<u>5.0</u>	<u>3.1</u>	<u>12.1</u>	<u>3.8</u>
Total	100	100	100	100	100	100	100	100	100	100	100
Actual asset mix											
Stock	51.6	40.3	29.4	46.0	44.0	38.2	35.4	37.7	44.9	46.8	38.2
Fixed Income ²	28.5	33.6	52.3	25.4	33.3	38.7	42.9	34.5	33.7	31.0	38.7
Global TAA	0.0	0.3	0.5	0.8	0.2	0.6	0.6	0.5	0.6	0.1	0.6
Real Assets	7.7	11.6	6.3	13.5	12.3	10.1	6.6	16.8	11.1	10.6	10.1
Hedge Funds	5.6	4.0	3.9	2.7	1.9	3.2	4.5	1.7	1.2	3.3	3.2
Balanced Funds	0.0	0.1	0.0	0.3	0.0	0.1	0.0	0.0	0.7	0.0	0.1
Risk Parity	0.0	1.2	0.5	0.4	0.1	0.4	0.8	0.0	0.0	0.1	0.4
Private Debt	0.0	2.0	1.9	2.7	3.7	2.5	1.6	3.3	3.9	1.4	2.5
Private Equity	<u>6.7</u>	<u>6.9</u>	<u>5.3</u>	<u>8.1</u>	<u>4.5</u>	<u>6.3</u>	<u>7.6</u>	<u>5.4</u>	<u>3.8</u>	<u>6.8</u>	<u>6.3</u>
Total	100	100	100	100	100	100	100	100	100	100	100
Policy asset mix											
Stock	80.0	41.9	29.4	45.5	43.7	38.0	35.5	36.9	43.8	52.9	38.0
Fixed Income	20.0	33.4	53.5	25.6	33.6	39.3	44.3	34.9	33.1	27.8	39.3
Global TAA	0.0	0.2	0.4	1.0	0.2	0.6	0.6	0.7	0.4	0.2	0.6
Real Assets	0.0	11.1	6.5	14.9	13.1	10.9	7.2	17.5	12.6	10.6	10.9
Hedge funds	0.0	3.3	3.2	1.9	1.7	2.4	3.4	1.4	1.1	2.3	2.4
Balanced Funds	0.0	0.1	0.0	0.2	0.0	0.1	0.0	0.0	0.4	0.0	0.1
Risk Parity	0.0	1.3	0.5	0.4	0.0	0.4	0.7	0.0	0.0	0.0	0.4
Private Debt	0.0	2.5	1.8	3.2	3.6	2.6	1.4	4.1	4.5	1.2	2.6
Private Equity	<u>0.0</u>	<u>6.3</u>	<u>4.7</u>	<u>7.3</u>	<u>4.2</u>	<u>5.7</u>	<u>6.8</u>	<u>4.5</u>	<u>4.0</u>	<u>5.1</u>	<u>5.7</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.

2. Includes derivatives and overlays.

Implementation style, actual mix and policy mix trends

Implementation style, actual mix and policy mix - 2017 to 2021 (as a % of year-end assets)

	Your fund ¹					Peer average ²					Global average ²				
	2021	2020	2019	2018	2017	2021	2020	2019	2018	2017	2021	2020	2019	2018	2017
Implementation style															
External active	12.9	14.0	13.7	14.6	12.7	53.5	55.1	54.9	55.1	55.9	61.7	61.4	61.3	61.1	60.7
Fund of funds	0.0	0.0	0.0	0.1	0.1	1.7	1.8	2.2	2.4	2.2	2.6	2.2	2.3	2.5	2.4
External passive	51.9	43.5	58.6	59.5	57.1	17.2	17.0	17.9	17.3	15.3	18.1	18.4	18.3	18.4	18.9
Internal active	28.1	36.2	26.5	25.6	29.2	22.4	22.4	21.1	21.0	23.8	13.2	13.6	13.6	13.4	13.7
Internal passive	<u>7.1</u>	<u>6.2</u>	<u>1.1</u>	<u>0.3</u>	<u>0.9</u>	<u>5.1</u>	<u>3.7</u>	<u>3.8</u>	<u>4.2</u>	<u>2.8</u>	<u>4.4</u>	<u>4.4</u>	<u>4.5</u>	<u>4.6</u>	<u>4.2</u>
Total	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
Actual asset mix															
Stock	71.6	69.5	69.6	69.9	69.7	40.3	39.7	39.7	39.4	40.9	37.7	38.6	38.5	38.6	42.4
Fixed income ³	8.3	7.7	8.3	8.2	10.1	33.6	33.6	33.2	34.1	34.0	38.7	38.9	38.5	38.5	36.5
Global TAA	0.0	0.0	0.0	0.0	0.0	0.3	0.3	0.4	0.4	0.4	0.6	0.7	0.8	0.9	0.9
Real assets	7.7	9.0	8.9	10.2	9.0	11.6	12.2	12.5	12.1	11.5	10.6	10.4	10.7	10.6	9.8
Hedge funds	5.6	6.0	5.5	5.1	4.5	4.0	4.7	5.4	5.3	5.1	3.0	3.0	3.2	3.4	3.4
Balanced Funds	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.1	0.1	0.4	0.4	0.4
Risk Parity	0.0	0.0	0.0	0.0	0.0	1.2	1.6	1.8	1.9	1.9	0.4	0.5	0.5	0.5	0.5
Private credit	0.0	0.0	0.0	0.0	0.0	2.0	1.8	1.4	1.2	1.4	2.3	2.2	2.0	1.8	1.4
Private equity	<u>6.7</u>	<u>7.9</u>	<u>7.6</u>	<u>6.6</u>	<u>6.7</u>	<u>6.9</u>	<u>6.0</u>	<u>5.6</u>	<u>5.4</u>	<u>4.9</u>	<u>6.6</u>	<u>5.7</u>	<u>5.5</u>	<u>5.3</u>	<u>4.8</u>
Total	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
Policy asset mix															
Stock	80.0	80.0	80.0	80.0	80.0	41.9	41.6	40.4	41.2	41.3	37.8	38.9	39.2	39.9	42.7
Fixed income	20.0	20.0	20.0	20.0	20.0	33.4	33.2	34.9	34.0	33.6	39.0	38.2	38.8	38.5	36.6
Global TAA	0.0	0.0	0.0	0.0	0.0	0.2	0.3	0.4	0.4	0.4	0.6	0.7	0.7	0.8	0.9
Real assets	0.0	0.0	0.0	0.0	0.0	11.1	11.5	11.2	11.3	11.2	11.3	11.2	10.8	10.6	10.1
Hedge funds	0.0	0.0	0.0	0.0	0.0	3.3	4.1	4.9	4.9	5.3	2.4	2.6	2.8	3.1	3.1
Balanced Funds	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1
Risk Parity	0.0	0.0	0.0	0.0	0.0	1.3	1.3	1.5	1.9	1.9	0.4	0.4	0.4	0.5	0.5
Private credit	0.0	0.0	0.0	0.0	0.0	2.5	2.2	1.3	1.3	1.4	2.4	2.2	1.8	1.5	1.3
Private equity	<u>0.0</u>	<u>0.0</u>	<u>0.0</u>	<u>0.0</u>	<u>0.0</u>	<u>6.3</u>	<u>5.7</u>	<u>5.4</u>	<u>4.9</u>	<u>4.9</u>	<u>6.0</u>	<u>5.6</u>	<u>5.3</u>	<u>5.1</u>	<u>4.9</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 222 Global and 19 peer funds with 5 or more consecutive years of data ending 2021.

3. Includes derivatives and overlays.

Implementation style by asset class

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

Implementation style by asset class - 2021 (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	FOFs	Index	Active	Index		
Stock - U.S.					46.5	45.6	7.9	0.0	33.9	52.1	6.9	7.1			
Stock - Europe & Far East	38.0		0.0	46.5	15.4	38.2	28.0	33.0	0.8	51.4	25.3	21.4	1.9		
Stock - Global	0.0		100.0	0.0	0.0	31.5	47.7	18.1	2.6	61.7	24.9	10.4	3.1		
Stock - other					54.1	7.5	38.3	0.1	68.6	11.3	11.7	8.4			
Stock - Emerging	0.0		100.0	0.0	0.0	68.4	17.5	11.8	2.3	73.6	15.7	7.2	3.6		
Stock - ACWI x U.S.					72.7	27.3	0.0	0.0	72.2	26.0	0.9	0.9			
Stock - Aggregate	3.2		91.6	3.9	1.3	45.2	35.7	17.7	1.3	54.5	30.8	10.4	4.4		
Fixed income - U.S.	0.0		0.0	0.0	100.0	59.1	0.0	40.7	0.2	68.9	14.2	13.2	3.7		
Fixed income - EAFE					63.3	0.6	36.0	0.0	34.6	31.4	21.0	13.0			
Fixed income - Global	0.0		50.1	0.0	49.9	12.6	23.0	58.2	6.2	59.0	10.7	25.3	5.0		
Fixed income - other					12.8	0.0	69.6	17.6	59.9	15.8	19.1	5.3			
Fixed income - Long bonds					72.7	0.6	12.4	14.3	83.1	7.2	5.7	4.0			
Fixed income - Emerging					48.7	15.1	34.0	2.2	83.5	6.3	9.0	1.2			
Fixed income - Inflation indexed					4.6	26.5	40.6	28.3	13.9	47.3	17.9	20.9			
Fixed income - High yield					95.2	0.0	4.8	0.0	83.8	6.5	7.4	2.3			
Fixed income - Absolute return bonds					100.0	0.0	0.0	0.0	98.3	1.7	0.0	0.0			
Fixed income - Bundled LDI					13.9	5.1	0.0	81.0	59.7	15.9	18.6	5.8			
Fixed income - Convertibles					100.0	0.0	0.0	0.0	100.0	0.0	0.0	0.0			
Fixed income - Public mortgages					0.0	0.0	0.0	100.0	93.8	0.0	6.1	0.0			
Cash	0.0		100.0			20.5		79.5		43.9		56.1			
Fixed income - Aggregate	0.0		18.4	63.2	18.5	45.8	6.6	33.6	14.0	66.9	13.4	14.4	5.3		
Commodities					0.0	0.0	0.0	0.0	30.2	15.0	21.3	33.6			
Infrastructure	54.7	0.0		45.3		82.0	0.5	17.5		78.8	4.5	16.8			
Natural resources	9.8	0.0		90.2		43.3	0.0	56.7		75.4	2.4	22.2			
REITs					57.9	33.7	8.4	0.0	70.0	15.8	12.0	2.2			
Real estate ex-REITs	78.4	0.0		21.6		56.9	1.0	42.1		76.5	5.6	17.9			
Other real assets					100.0	0.0		0.0	89.6	0.0		10.4			
Other listed real assets					0.0	0.0	0.0	0.0	84.3	12.2	0.0	3.5			
Real assets - Aggregate	27.0	0.0	0.0	73.0	0.0	62.7	0.7	1.5	35.0	0.0	75.9	4.8	1.3	17.1	0.8
Hedge funds	100.0	0.0				93.5	6.5			79.3	20.7				
Global TAA					100.0			0.0		62.9		37.1			
Risk parity					100.0			0.0		93.3		6.7			
Private credit					99.8	0.0		0.2		92.2	0.9	6.8			
Mortgages					100.0			0.0		89.9		10.1			
Private equity - Diversified	96.9	3.1		0.0		74.0	26.0		0.0	73.8	21.6	4.6			
Venture capital	100.0	0.0		0.0		74.5	25.5		0.0	48.5	49.7	1.8			
LBO					94.3	5.7		0.0		93.2	6.6	0.2			
Private equity - Other	49.0	0.0		51.0		76.2	0.0		23.8	79.5	0.0	20.5			
Private equity - Aggregate	53.5	0.3		46.2		77.7	19.9		2.4	74.7	20.8	4.5			
Total Fund - Avg. Holdings	12.9	0.0	51.9	28.1	7.1	53.5	1.7	17.2	22.4	5.1	64.3	2.5	17.6	11.7	3.8

Actual mix

Actual asset mix - 2017 to 2021 (as a % of total average assets)

	Your fund ¹					Peer average %					Global average %				
	2021	2020	2019	2018	2017	2021	2020	2019	2018	2017	2021	2020	2019	2018	2017
Stock - U.S.						8.9	8.8	8.4	8.3	8.5	10.6	10.4	10.5	11.1	12.3
Stock - Europe & Far East	4.3	4.3	4.2	4.2	4.2	6.5	6.7	6.8	7.4	7.6	5.9	6.4	6.3	6.8	8.2
Stock - Global	44.5	35.7	46.0	46.1	41.9	13.8	12.8	12.8	12.7	13.2	13.4	14.3	13.5	12.8	12.8
Stock - other						3.2	3.2	3.5	3.1	3.4	3.0	2.9	3.1	3.4	3.8
Stock - Emerging	2.7	3.5	5.5	5.7	5.6	5.0	5.0	5.0	5.0	4.9	2.9	3.2	3.0	3.2	3.5
Stock - ACWI x U.S.						2.9	3.2	3.2	2.8	3.2	2.3	2.4	2.4	2.3	2.5
Stock - Aggregate	51.6	43.4	55.7	55.9	51.6	40.3	39.7	39.7	39.4	40.9	38.2	39.6	38.7	39.5	43.2
Fixed income - U.S.	0.0	0.1	0.1	0.1	0.1	1.4	1.5	2.0	2.2	1.6	6.9	6.5	6.6	6.8	5.7
Fixed income - EAFE						2.7	2.7	2.9	3.3	4.9	2.7	2.6	3.0	3.1	3.8
Fixed income - Global	9.4	8.2	9.1	9.8	10.9	4.0	4.0	5.0	5.5	6.4	2.0	2.3	2.5	2.4	2.8
Fixed income - other						1.4	2.4	2.4	3.1	3.3	5.0	4.8	5.0	5.0	5.4
Fixed income - Long bonds						11.6	10.7	10.2	9.2	7.6	12.8	12.8	12.7	12.8	10.7
Fixed income - Emerging						2.5	2.4	2.3	2.3	2.2	1.2	1.1	1.3	1.1	1.1
Fixed income - Inflation indexed						2.4	1.9	1.9	1.7	1.9	1.5	1.4	1.9	1.7	2.0
Fixed income - High yield						0.7	0.8	0.7	0.7	0.8	1.2	1.1	1.2	1.2	1.2
Fixed income - Absolute return bonds						0.2	0.2				0.1	0.3	0.2	0.1	0.1
Fixed income - Bundled LDI						2.0	2.3	2.3	2.4		2.9	3.1	2.2	2.2	1.2
Fixed income - Convertibles						0.0	0.0	0.0	0.1	0.1	0.1	0.0	0.0	0.0	0.1
Fixed income - Public mortgages						0.0					0.1	0.0	0.0	0.0	0.0
Cash	16.2	21.6	11.9	11.9	15.6	3.5	4.2	3.1	2.9	4.2	1.4	1.5	1.4	1.6	2.1
Fixed income - Aggregate	25.7	29.9	21.1	21.8	26.5	32.3	33.0	32.8	33.3	32.9	37.9	37.9	38.0	38.2	36.1
Commodities							0.7	0.8	0.7	1.0	0.2	0.2	0.3	0.3	0.3
Infrastructure	1.6	2.0	2.1	3.4	2.6	2.3	2.3	2.4	2.3	2.0	2.6	2.4	2.3	2.1	1.8
Natural resources	5.2	6.4	6.5	6.6	6.3	0.8	0.9	0.9	0.9	0.8	0.4	0.3	0.3	0.4	0.5
REITs						0.5	0.4	0.4	0.3	0.4	0.6	0.5	0.5	0.6	0.6
Real estate ex-REITs	0.9	0.7	0.3	0.1	0.1	7.4	7.4	7.3	7.3	6.7	5.6	5.4	5.5	5.7	4.9
Other real assets						0.0	0.1	0.1	0.1	0.2	0.1	0.2	0.2	0.2	0.2
Other listed real assets											0.1	0.1	0.0	0.0	0.0
Real assets - Aggregate	7.7	9.0	8.9	10.2	9.0	11.6	12.2	12.5	12.1	11.5	10.1	9.8	10.0	9.9	9.0
Hedge funds	5.6	6.0	5.5	5.1	4.5	4.0	4.7	5.4	5.3	5.1	3.2	3.1	3.3	3.4	3.4
Global TAA						0.3	0.3	0.4	0.4	0.4	0.6	0.9	0.9	0.9	1.0
Risk parity						1.2	1.6	1.8	1.9	1.9	0.4	0.5	0.6	0.5	0.5
Mortgages						0.3	0.3	0.3	0.2	0.5	0.6	0.4	0.6	0.6	0.4
Private credit						1.7	1.5	1.2	1.0	0.9	1.9	1.6	1.6	1.3	1.0
Private equity - Diversified	0.6	0.7	0.6	0.6	0.6	4.4	3.1	2.9	2.8	2.7	5.1	4.2	4.3	3.9	3.3
Venture capital	0.0					0.7	0.6	0.6	0.5	0.4	0.3	0.3	0.3	0.3	0.2
LBO						1.2	1.6	1.5	1.4	1.2	0.7	0.6	0.5	0.5	0.5
Private equity - Other	6.1	7.2	7.1	6.0	6.1	0.7	0.7	0.7	0.7	0.6	0.2	0.2	0.2	0.2	0.2
Private equity - Aggregate	6.7	7.9	7.6	6.6	6.7	6.9	6.0	5.6	5.4	4.9	6.3	5.2	5.3	4.9	4.3
Derivatives/Overlays Mkt Value	2.8	3.8	1.1	0.4	1.6	1.2	0.6	0.4	0.9	1.0	0.8	0.8	0.6	0.3	0.6
Total Fund	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
Count	1	1	1	1	1	19	19	19	19	19	273	308	313	339	352
Median Assets (\$ billions)	57.9	46.1	43.1	39.3	35.5	55.1	50.1	46.4	41.9	41.9	15.5	12.4	12.9	10.9	9.9

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

Policy mix

Policy asset mix - 2017 to 2021 (as a % of total assets)

	Your fund %					Peer average %					Global average %				
	2021	2020	2019	2018	2017	2021	2020	2019	2018	2017	2021	2020	2019	2018	2017
Stock - U.S.						6.7	7.0	7.2	7.1	7.0	9.0	9.5	9.6	10.5	11.4
Stock - Europe & Far East	5.0	5.0	5.0	5.0	5.0	4.8	5.0	5.4	6.2	6.1	5.2	5.6	5.6	6.4	7.5
Stock - Global	75.0	65.0	65.0	65.0	65.0	20.4	19.3	17.7	18.6	18.4	16.2	16.4	15.5	14.8	14.8
Stock - other						3.0	2.8	2.8	2.2	2.9	3.0	3.0	3.3	3.2	3.7
Stock - Emerging		10.0	10.0	10.0	10.0	4.4	5.1	5.0	4.8	4.5	2.4	2.7	2.7	2.8	2.9
Stock - ACWI x U.S.						2.6	2.4	2.4	2.4	2.3	2.2	2.2	2.4	2.6	2.6
Stock - Aggregate	80.0	80.0	80.0	80.0	80.0	41.9	41.6	40.4	41.2	41.3	38.0	39.6	39.2	40.4	42.9
Fixed income - U.S.						0.9	1.1	1.1	1.1	0.5	7.4	6.8	6.7	7.1	6.0
Fixed income - EAFE						2.8	2.9	3.2	3.5	5.2	2.8	2.7	3.3	3.2	3.8
Fixed income - Global	20.0	20.0	20.0	20.0	20.0	6.2	6.3	7.4	7.2	8.1	2.3	2.6	2.8	2.7	3.1
Fixed income - other						1.5	2.3	3.0	2.9	3.4	5.2	4.8	5.2	5.0	6.0
Fixed income - Long bonds						12.1	10.5	10.5	10.2	9.2	14.2	13.2	13.1	13.2	11.4
Fixed income - Emerging						2.6	2.5	2.2	2.1	2.2	1.1	1.1	1.2	1.1	1.0
Fixed income - Inflation indexed						2.9	2.2	2.0	2.0	2.2	1.6	1.5	2.1	1.9	2.3
Fixed income - High yield						0.7	0.7	0.8	0.7	0.9	1.1	1.1	1.2	1.1	1.2
Fixed income - Absolute return bonds						0.3	0.3				0.1	0.3	0.2	0.1	0.1
Fixed income - Bundled LDI						2.2	2.4	2.4	2.3		3.0	3.2	2.4	2.2	1.2
Fixed income - Convertibles						0.0	0.0	0.0	0.1	0.2	0.1	0.0	0.0	0.0	0.1
Fixed income - Public mortgages											0.1	0.0	0.0	0.0	0.0
Cash						1.3	1.9	2.2	1.9	1.8	0.2	0.3	0.4	0.5	0.6
Fixed income - Aggregate	20.0	20.0	20.0	20.0	20.0	33.4	33.2	34.9	34.0	33.6	39.3	38.0	38.7	38.2	36.8
Commodities						0.1	0.7	0.6	1.0	1.1	0.2	0.3	0.3	0.3	0.3
Infrastructure						2.5	2.3	2.2	2.2	1.9	2.9	2.8	2.5	2.2	1.9
Natural resources						0.4	0.4	0.4	0.3	0.2	0.3	0.3	0.3	0.3	0.3
REITs						0.2	0.2	0.2	0.2	0.2	0.5	0.5	0.5	0.6	0.6
Real estate ex-REITs						7.4	7.2	7.1	7.1	6.9	6.2	5.9	5.8	5.8	5.3
Other real assets						0.1	0.1	0.1	0.1	0.3	0.2	0.2	0.2	0.3	0.3
Other listed real assets											0.1	0.0	0.0		0.0
Real assets - Aggregate						11.1	11.5	11.2	11.3	11.2	10.9	10.9	10.4	10.1	9.5
Hedge funds						3.3	4.1	4.9	4.9	5.3	2.4	2.7	2.9	3.2	3.1
Global TAA						0.2	0.3	0.4	0.4	0.4	0.6	0.9	0.9	0.9	1.0
Risk parity						1.3	1.3	1.5	1.9	1.9	0.4	0.4	0.5	0.5	0.4
Mortgages						0.4	0.4	0.3	0.3	0.5	0.6	0.5	0.6	0.6	0.5
Private credit						2.1	1.9	1.1	1.0	0.9	2.0	1.8	1.5	1.3	0.9
Private equity - Diversified						5.6	4.4	4.4	3.5	4.2	4.9	4.5	4.6	4.1	4.0
Venture capital						0.1	0.1	0.3	0.1	0.1	0.1	0.2	0.1	0.2	0.1
LBO						0.3	0.9	0.6	1.0	0.3	0.5	0.4	0.4	0.5	0.3
Private equity - Other						0.4	0.4	0.1	0.2	0.4	0.1	0.1	0.1	0.1	0.2
Private equity - Aggregate						6.3	5.7	5.4	4.9	4.9	5.7	5.2	5.2	4.8	4.6
Total Fund	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
Count	1	1	1	1	1	19	19	19	19	19	272	306	313	339	352

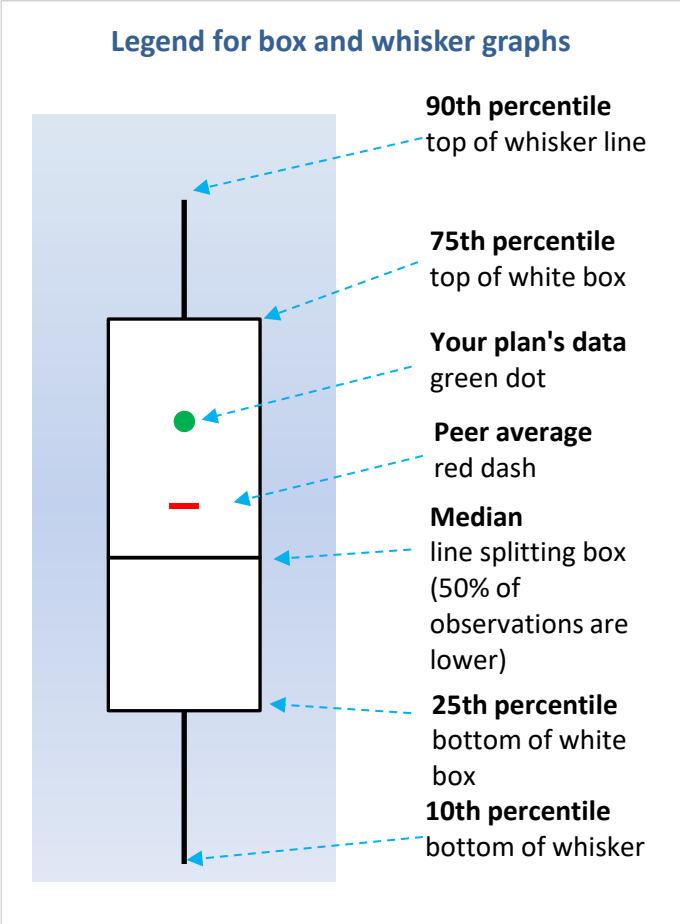
3

Returns, Benchmarks and Value Added

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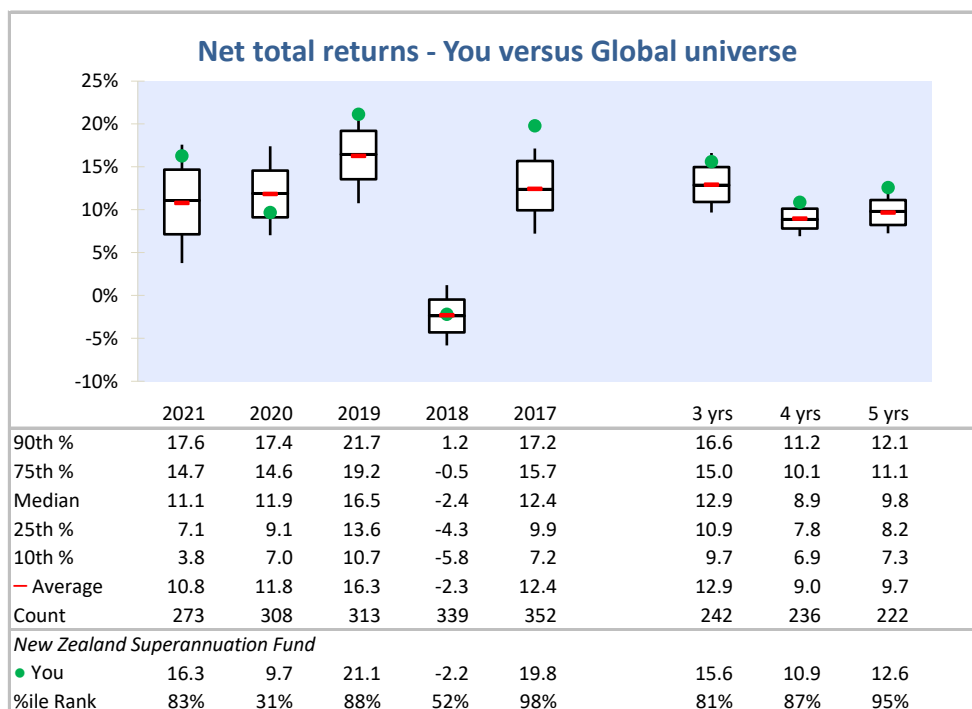
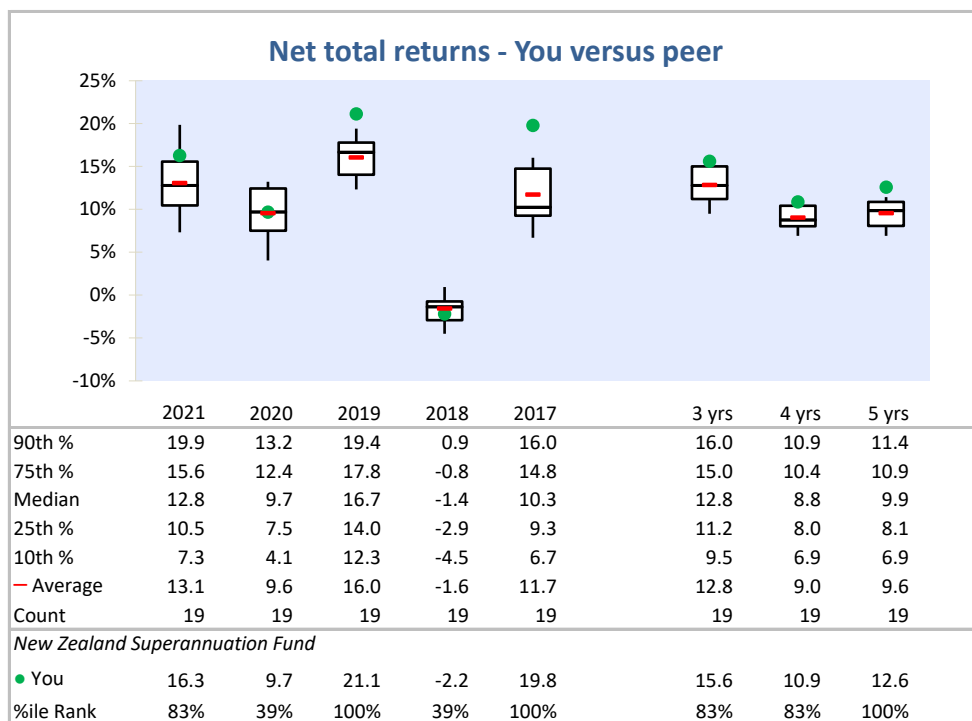
Interpreting box and whisker graphs

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.



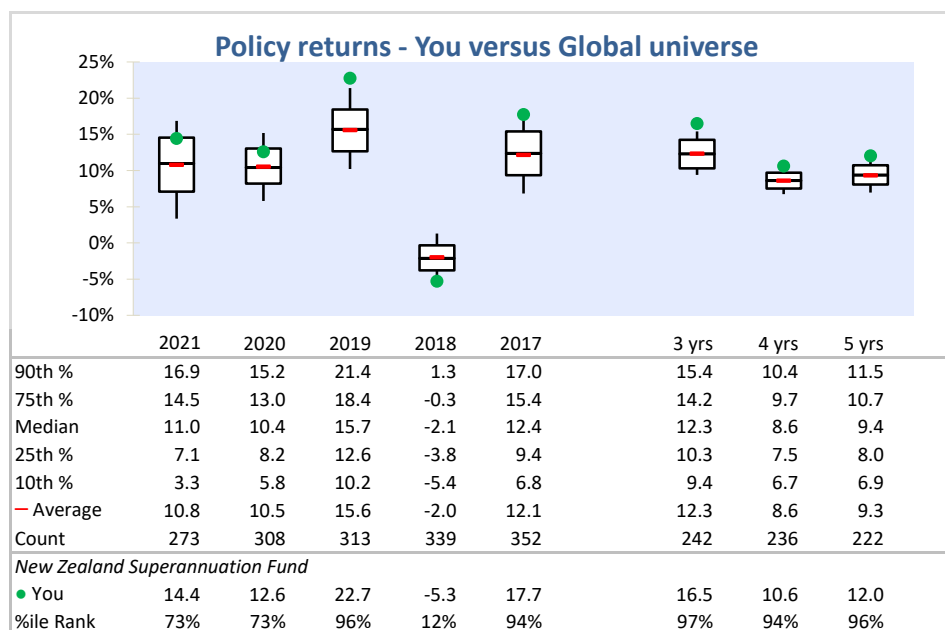
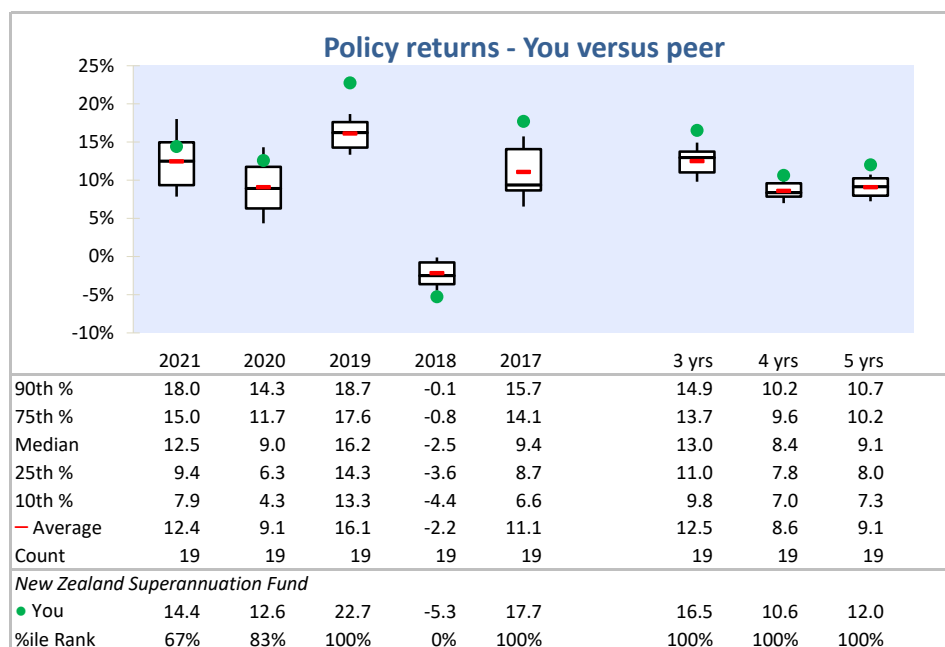
Net total returns

Your 5-year net total return of 12.6% was among the highest in your peer group and among the highest in 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

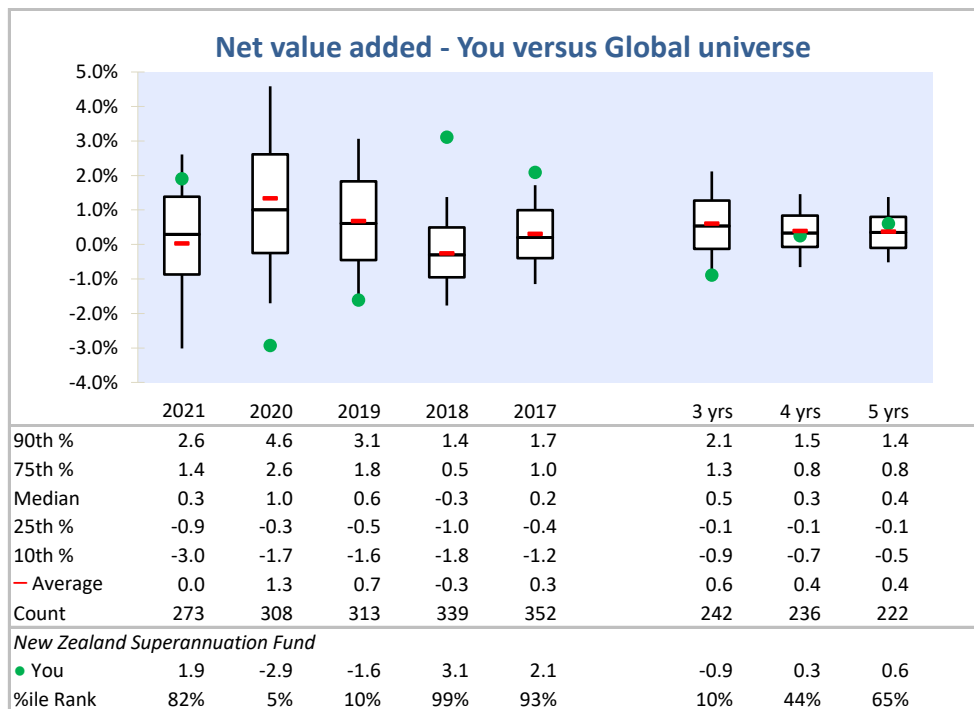
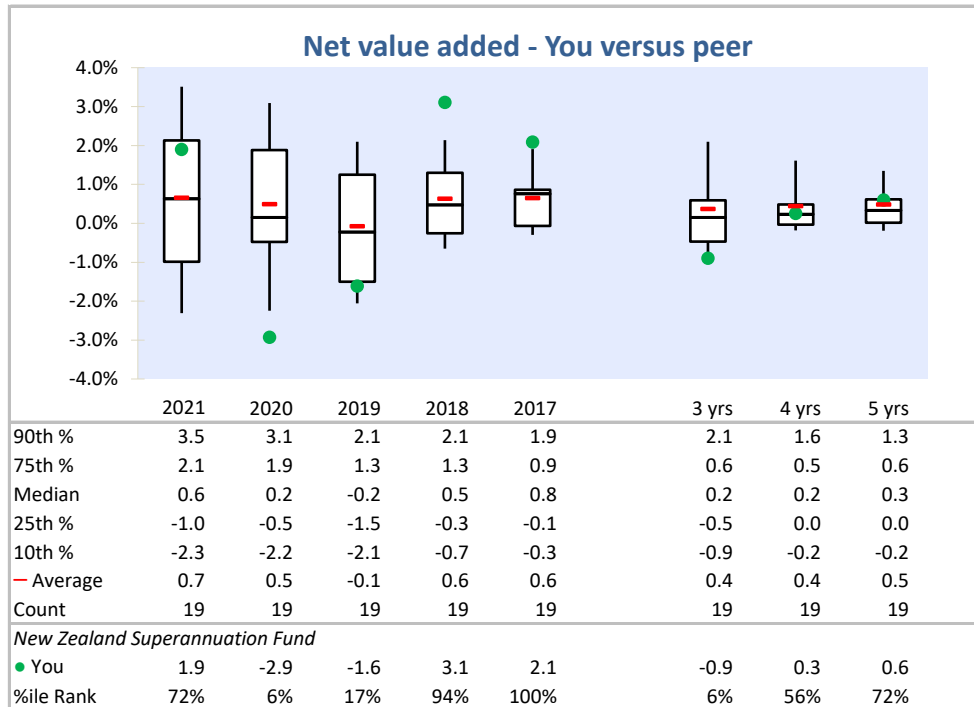
Your 5-year policy return of 12.0% was among the highest in your peer group and among the highest in the Global universe. Policy return is the return you would have earned had you passively implemented your policy asset mix decision through your benchmark portfolios.



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. The correlation between your private equity returns and the benchmark based on investable, public market indices lagged by 82 business days is 0.63 versus a correlation of 0.54 using your reported benchmarks. Refer to the appendix of this section for details.

Net value added

Your 5-year net value added of 0.6% was above the peer median and above the median of the Global universe. Net value added is the difference between your net total return and your policy return.



Net returns by asset class

Asset class	Your fund %						Peer average %						Global average %					
	2021	2020	2019	2018	2017	5-yr ¹	2021	2020	2019	2018	2017	5-yr ¹	2021	2020	2019	2018	2017	5-yr ¹
Stock - U.S.							28.3	18.1	30.1	-2.4	13.5	17.2	26.2	17.7	28.8	-4.1	17.3	16.8
Stock - Europe & Far East	-0.6	16.6	32.5	5.5	20.0	14.3	16.0	8.6	24.2	-9.7	16.4	11.0	12.8	9.3	20.7	-11.8	20.6	10.1
Stock - Global	24.7	12.1	28.5	-5.4	19.7	15.3	20.9	9.8	24.8	-5.8	17.5	13.1	18.7	14.4	23.4	-5.0	19.8	13.6
Stock - other							11.9	86.6	10.9	-0.2	7.3	15.5	17.3	9.3	17.8	-8.8	10.4	8.6
Stock - Emerging	-3.2	22.4	17.1	-11.2	30.5	10.0	0.8	12.8	19.8	-10.3	26.9	9.1	0.1	16.8	19.3	-12.5	29.7	9.5
Stock - ACWI x U.S.							11.1	13.6	23.6	-13.5	28.8	11.5	9.2	13.9	22.9	-15.0	29.1	11.0
Stock - Aggregate	21.1	13.4	27.7	-5.2	20.9	15.0	20.2	10.9	24.6	-7.0	18.0	12.6	18.7	13.7	24.0	-7.4	19.6	13.2
Fixed income - U.S.	6.0	11.2	10.0	4.1	16.1	9.4	3.3	6.7	10.7	2.0	2.3	5.3	-0.8	9.9	10.4	-0.1	4.1	4.6
Fixed income - EAFE							-2.0	4.1	5.3	-0.1	0.6	1.5	-2.8	8.6	6.3	0.3	2.1	2.1
Fixed income - Global	-1.0	5.2	6.9	1.4	3.3	3.1	-2.0	7.2	6.3	1.9	1.7	3.2	-0.7	8.5	4.0	-0.4	4.6	3.5
Fixed income - other							3.4	2.8	7.4	5.0	3.6	3.9	0.5	7.2	6.9	1.4	6.4	3.8
Fixed income - Long bonds							-3.5	17.3	17.3	-2.6	9.4	7.2	-2.9	15.5	17.9	-3.5	10.1	7.2
Fixed income - Emerging							0.5	3.6	13.9	-1.7	4.0	2.4	-2.9	3.3	12.5	-4.4	9.1	3.1
Fixed income - Inflation indexed							5.3	10.1	9.4	-0.3	1.8	5.2	4.3	9.6	8.7	-1.1	2.5	4.9
Fixed income - High yield							4.3	4.6	12.1	-1.3	3.3	4.4	6.5	5.0	11.1	-1.2	5.9	5.2
Fixed income - Absolute return bonds								17.0					-0.6	10.7	-2.1	-1.0	1.0	
Fixed income - Bundled LDI							-10.1	13.5	9.3	2.6			-5.2	22.1	17.0	-0.8	6.5	8.4
Fixed income - Public mortgages							0.4						1.5	5.3	11.2	2.8	7.1	6.2
Fixed income - Convertibles							4.5	9.6	4.4	-0.3	7.8	3.9	5.0	20.4	15.2	-2.0	8.1	9.6
Cash	1.9	2.5	3.0	3.8	5.5	3.3	-0.1	0.5	1.4	0.8	1.0	0.9	-0.4	0.4	1.3	1.2	0.8	0.2
Fixed income - Aggregate	0.8	3.3	4.7	2.7	4.6	3.2	-0.9	9.8	10.6	0.2	4.1	4.5	-1.5	11.7	11.8	-1.1	5.4	5.2
Commodities								-6.1	9.3	-13.2	2.1		22.7	-2.7	7.7	-10.6	2.2	2.4
Infrastructure	14.0	-2.0	9.9	-0.4	13.9	6.9	14.0	2.8	10.6	9.7	15.0	9.6	13.2	6.2	8.7	9.4	13.1	10.3
Natural resources	8.6	3.3	2.0	15.6	21.5	10.0	14.7	1.3	6.6	6.8	4.8	6.3	14.9	-4.1	2.9	5.0	5.0	3.8
REITs							34.0	-3.2	28.5	-3.8	7.4	12.3	31.8	-7.1	22.9	-3.0	7.7	9.9
Real estate ex-REITs	32.6	-5.4	-5.9	53.8	40.7	20.6	20.4	1.8	9.2	13.8	12.8	11.6	17.7	0.5	6.2	10.5	8.3	7.8
Other real assets								3.6	20.5	-2.4	3.5		14.4	0.3	3.5	-3.6	0.8	-2.6
Real assets - Aggregate	12.6	1.4	3.5	10.8	19.4	9.4	19.8	1.9	10.3	9.2	11.0	10.3	18.4	1.3	7.2	7.0	7.9	8.0
Hedge funds	6.7	-2.1	3.5	4.4	3.8	3.2	6.0	0.6	7.1	0.3	1.9	2.7	8.5	3.5	5.3	-1.1	4.5	4.2
Global TAA							18.5	-5.4	12.2	-3.5	5.0	6.2	7.7	3.5	10.9	-4.1	7.4	5.1
Risk parity							7.6	6.7	22.6	-7.1	12.8	7.6	10.1	8.7	18.0	-6.5	12.7	8.3
Mortgages							7.0	1.1	4.8	1.6	3.1	3.1	3.9	4.4	6.0	3.1	3.6	4.2
Private credit							12.3	4.3	6.3	7.9	6.0	6.1	12.8	3.5	8.3	6.3	7.0	6.8
Private equity - Diversified	<i>13.5</i>	<i>24.3</i>	<i>16.8</i>	<i>15.0</i>	<i>17.6</i>	<i>17.4</i>	37.3	8.5	10.7	16.5	14.9	17.1	44.3	14.0	8.3	16.4	14.3	19.2
Venture capital	<i>-11.2</i>						43.8	29.7	10.1	21.1	9.7	23.4	58.0	24.3	8.2	19.8	12.6	21.8
LBO							46.2	12.3	11.6	18.1	12.0	20.0	46.0	13.5	11.8	15.2	15.5	20.2
Private equity - Other	13.7	-1.6	11.1	15.7	6.2	8.9	20.7	-2.1	3.3	10.4	6.5	4.9	26.9	13.2	7.7	11.8	10.7	17.2
Private equity - Aggregate	<i>13.7</i>	<i>0.7</i>	<i>11.6</i>	<i>15.7</i>	<i>7.3</i>	<i>9.6</i>	38.5	10.5	10.7	16.7	13.3	17.3	45.4	14.7	8.1	16.4	14.0	19.2
Total Fund Return	16.3	9.7	21.1	-2.2	19.8	12.6	13.1	9.6	16.0	-1.6	11.7	9.6	10.8	11.8	16.3	-2.3	12.4	9.7

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

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

Benchmark returns by asset class

Asset class	Your fund %						Peer average %						Global average %					
	2021	2020	2019	2018	2017	5-yr ¹	2021	2020	2019	2018	2017	5-yr ¹	2021	2020	2019	2018	2017	5-yr ¹
Stock - U.S.							27.3	18.9	30.3	-3.0	13.7	17.1	26.0	18.5	29.0	-3.8	17.3	16.9
Stock - Europe & Far East	-0.2	13.7	30.5	4.8	22.1	13.6	16.2	6.0	23.9	-9.6	16.2	10.4	12.8	5.7	20.8	-11.0	19.9	9.5
Stock - Global	20.3	13.7	28.4	-6.0	19.6	14.6	22.1	10.4	25.5	-5.7	16.0	13.3	19.6	13.5	23.9	-5.6	17.9	13.4
Stock - other							22.7	4.7	17.8	-6.1	12.3	10.1	18.4	6.7	21.2	-8.3	11.3	9.4
Stock - Emerging	20.3	17.9	16.4	-12.4	28.3	13.2	3.2	12.1	18.4	-10.0	26.6	9.4	0.0	15.9	17.3	-11.5	30.5	9.5
Stock - ACWI x U.S.							10.9	11.8	22.5	-12.7	26.7	11.0	8.9	11.1	21.9	-14.3	27.7	10.1
Stock - Aggregate	19.0	14.2	27.0	-6.1	20.8	14.4	20.9	11.8	25.2	-7.1	17.4	13.1	18.9	13.2	24.1	-7.2	18.9	13.2
Fixed income - U.S.	-1.2	5.4	7.5	1.6	3.5	3.3	0.9	5.1	9.3	2.1	1.4	3.7	-1.3	9.1	9.6	-0.1	3.8	4.0
Fixed income - EAFE							-2.3	4.1	4.3	0.5	0.2	1.2	-3.2	8.4	6.0	0.4	1.8	1.9
Fixed income - Global	-1.2	5.4	7.5	1.6	3.5	3.3	-1.6	4.8	6.5	2.9	1.5	2.7	-0.8	7.1	5.9	0.3	3.3	3.3
Fixed income - other							1.8	3.2	7.7	3.2	2.6	3.4	0.0	6.5	7.2	1.3	3.6	3.5
Fixed income - Long bonds							-4.0	15.3	16.9	-2.5	9.3	7.0	-2.9	14.1	17.9	-3.4	9.8	6.9
Fixed income - Emerging							0.6	2.0	13.7	-0.3	4.0	2.7	-2.5	2.8	12.9	-3.2	8.0	3.2
Fixed income - Inflation indexed							4.0	11.6	7.9	-0.4	2.2	5.0	4.0	10.1	7.9	-1.1	2.6	4.9
Fixed income - High yield							2.7	5.5	9.4	-0.2	3.6	4.3	5.4	4.7	12.4	-1.4	6.0	5.2
Fixed income - Absolute return bonds								4.8					3.1	3.0	1.3	1.2	1.7	
Fixed income - Bundled LDI							-8.8	9.3	11.2	1.2			-4.5	21.7	17.4	-0.9	6.1	8.5
Fixed income - Public mortgages													-0.1	2.5	8.5	2.8	5.8	4.9
Fixed income - Convertibles							5.3	5.3	28.1	-3.1	16.5	9.5	8.4	23.3	17.3	-1.7	12.6	13.2
Cash	1.9	0.7	1.7	2.0	2.0	1.7	0.2	0.5	1.4	1.2	0.6	0.7	0.1	0.6	1.5	1.3	0.7	0.9
Fixed income - Aggregate	-1.2	5.4	7.5	1.6	3.5	3.3	-1.7	8.5	10.8	0.1	4.0	4.0	-1.9	11.0	11.6	-1.1	5.3	5.0
Commodities							14.4	-6.0	10.2	-10.0	2.4	-0.4	26.1	-5.5	10.6	-10.1	1.8	3.1
Infrastructure	12.0	12.8	20.6	-3.9	15.1	11.0	14.1	4.8	12.0	2.5	8.0	7.5	10.8	6.3	8.9	4.4	9.0	7.2
Natural resources	4.8	9.0	12.7	-0.6	8.3	6.7	13.9	4.7	10.5	5.7	4.3	7.3	17.5	-0.8	7.7	2.4	4.5	4.8
REITs							31.2	-6.3	28.4	-4.9	10.4	7.9	30.4	-8.2	21.6	-2.9	7.7	8.6
Real estate ex-REITs	12.7	14.8	20.6	-3.1	11.2	11.0	15.7	3.9	11.7	6.9	9.2	9.3	15.4	1.6	6.9	7.3	7.0	7.5
Other real assets							5.3	5.3	36.7	-3.5	7.3	9.5	14.4	4.0	11.1	-0.3	2.8	7.2
Real assets - Aggregate	7.2	10.3	14.9	-1.7	10.3	8.0	15.5	2.5	11.4	4.8	8.3	8.3	15.8	1.9	8.0	5.2	6.9	7.2
Hedge funds	1.8	6.1	7.8	0.8	4.5	4.2	4.7	4.6	10.0	-1.1	4.7	4.2	5.7	4.6	7.9	-0.1	5.3	4.6
Global TAA							12.7	7.3	15.5	-0.7	8.6	8.5	8.7	5.9	13.4	-2.1	10.0	8.5
Risk parity							9.2	6.6	17.5	-4.2	11.2	8.5	10.6	8.2	15.7	-2.5	11.3	8.6
Mortgages							0.5	1.5	3.4	1.9	0.3	1.1	0.3	5.5	5.5	1.7	2.1	3.0
Private credit							6.1	3.2	10.0	1.4	6.3	5.3	7.1	2.2	11.4	2.3	5.7	5.2
Private equity - Diversified	21.0	16.9	28.5	-7.2	23.1	15.7	42.2	-3.1	-3.4	15.4	17.5	12.2	48.5	-2.7	-8.4	19.5	19.3	13.6
Venture capital	21.0						36.0	5.1	-7.9	21.8	17.2	12.1	44.7	-1.0	-8.6	20.5	18.9	13.5
LBO							46.4	1.7	-10.5	22.5	15.7	12.0	47.1	-0.7	-8.8	21.3	18.1	13.7
Private equity - Other	15.7	13.2	24.4	-5.6	15.4	12.2	42.3	-3.2	0.2	12.2	18.4	10.7	45.4	-2.9	-8.0	18.1	19.0	12.7
Private equity - Aggregate	16.2	13.5	24.7	-5.7	16.1	12.5	42.0	-1.8	-4.0	16.1	17.1	12.0	48.2	-2.5	-8.6	19.7	19.2	13.6
Total Policy Return	14.4	12.6	22.7	-5.3	17.7	12.0	12.4	9.1	16.1	-2.2	11.1	9.1	10.8	10.5	15.6	-2.0	12.1	9.3

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. The correlation between your private equity returns and the benchmark based on investable, public market indices lagged by 82 business days is 0.63 versus a correlation of 0.54 using your reported benchmarks. Refer to the appendix of this section for details.

Net value added by asset class

Asset class	Your fund %						Peer average %						Global average %					
	2021	2020	2019	2018	2017	5-yr ¹	2021	2020	2019	2018	2017	5-yr ¹	2021	2020	2019	2018	2017	5-yr ¹
Stock - U.S.							1.0	-0.8	-0.1	0.5	-0.2	0.2	0.2	-0.7	-0.2	-0.3	0.1	-0.2
Stock - Europe & Far East	-0.4	2.9	2.0	0.7	-2.1	0.6	-0.2	2.6	0.3	-0.1	0.1	0.6	-0.1	3.6	-0.1	-0.8	0.7	0.5
Stock - Global	4.4	-1.6	0.1	0.6	0.1	0.7	-1.2	-0.5	-0.8	0.2	1.3	0.0	-0.9	0.8	-0.5	0.6	1.8	0.2
Stock - other							-11.6	82.0	-6.9	5.9	-5.0	6.4	-1.0	5.5	-3.8	-0.6	-0.7	-0.8
Stock - Emerging	-23.5	4.5	0.7	1.2	2.2	-3.2	-2.4	0.6	1.4	-0.4	0.3	-0.2	0.1	1.0	1.9	-0.9	-0.9	0.1
Stock - ACWI x U.S.							0.2	1.8	1.1	-0.8	2.1	0.5	0.2	2.8	1.0	-0.7	1.3	0.8
Stock - Aggregate	2.1	-0.8	0.6	0.9	0.1	0.6	-0.7	-1.0	-0.6	0.0	0.6	-0.5	-0.3	0.5	0.0	-0.2	0.6	0.0
Fixed income - U.S.	7.2	5.8	2.5	2.5	12.6	6.1	2.4	1.6	1.4	0.0	0.9	1.7	0.5	0.7	0.7	0.0	0.4	0.6
Fixed income - EAFE							0.3	0.0	1.0	-0.6	0.4	0.2	0.3	0.2	0.9	-0.1	0.4	0.4
Fixed income - Global	0.2	-0.2	-0.6	-0.2	-0.2	-0.2	-0.7	2.2	-0.3	-1.0	0.1	0.2	0.1	0.8	-1.8	-0.8	1.3	0.3
Fixed income - other							2.3	-0.1	-0.4	1.7	1.0	0.4	0.9	0.5	-0.2	0.3	2.7	0.4
Fixed income - Long bonds							0.5	2.0	0.7	0.0	0.2	0.2	0.0	1.3	0.2	-0.1	0.3	0.3
Fixed income - Emerging							-0.1	1.6	0.2	-1.5	0.0	-0.2	-0.2	0.7	-0.4	-1.2	1.1	-0.1
Fixed income - Inflation indexed							1.3	-1.5	1.5	0.1	-0.4	0.2	0.6	-0.5	0.8	-0.1	-0.1	0.1
Fixed income - High yield							1.7	-0.9	0.0	-1.1	-0.3	0.3	1.0	0.4	-1.4	0.2	-0.3	0.0
Fixed income - Absolute return bonds								12.2					-3.7	8.3	-3.9	-2.2	-0.3	
Fixed income - Bundled LDI							-1.3	4.2	-1.9	1.5			-0.1	0.6	0.2	0.0	0.0	-0.1
Fixed income - Public mortgages													1.0	2.8	0.5	0.0	1.3	1.3
Fixed income - Convertibles							-0.8	4.4	-23.7	2.8	-8.6	-5.5	-3.4	-2.8	-5.0	-0.4	-4.5	-3.6
Cash	0.0	1.8	1.3	1.8	3.5	1.7	-0.3	0.1	-0.1	-0.5	0.3	0.1	-0.6	-0.2	-0.3	0.0	0.0	-0.7
Fixed income - Aggregate	2.1	-2.1	-2.8	1.1	1.1	-0.1	0.8	1.3	-0.3	0.1	0.1	0.4	0.4	0.6	0.1	0.0	0.1	0.2
Commodities							0.0	-2.0	-0.7	0.4			-5.4	2.1	-3.4	-0.9	0.0	-1.0
Infrastructure	2.0	-14.8	-10.7	3.5	-1.2	-4.1	0.0	-2.0	-1.4	7.2	6.9	2.1	2.3	0.1	-0.1	4.9	4.1	2.9
Natural resources	3.9	-5.7	-10.7	16.2	13.2	3.2	0.8	-1.5	-3.9	1.1	0.5	-1.0	-1.7	-3.6	-4.6	2.5	0.5	-1.3
REITs							2.8	3.0	0.1	1.1	-3.0	4.4	1.3	1.7	1.2	-0.3	0.0	1.3
Real estate ex-REITs	19.9	-20.2	-26.5	56.9	29.5	9.7	4.7	-2.1	-2.5	6.9	3.7	2.3	2.2	-1.1	-0.7	3.1	0.8	0.3
Other real assets							-1.7	-16.1	1.1	-3.7			-1.1	-4.7	-8.4	-3.1	-2.0	-9.6
Real assets - Aggregate	5.4	-8.8	-11.3	12.5	9.2	1.3	4.3	-0.7	-1.1	4.4	2.6	2.0	2.5	-0.6	-0.8	1.9	0.9	0.7
Hedge funds	4.9	-8.2	-4.3	3.6	-0.7	-1.0	1.3	-4.0	-2.9	1.5	-2.9	-1.5	2.8	-1.5	-2.8	-1.0	-0.9	-0.3
Global TAA							5.8	-12.7	-3.3	-2.8	-3.6	-2.2	-0.9	-3.2	-2.9	-2.2	-2.3	-2.4
Risk parity							-1.7	0.0	5.1	-3.0	1.6	-0.9	-0.5	-1.1	2.0	-4.0	1.3	-0.4
Mortgages							6.6	-0.4	1.5	-0.3	3.6	2.0	3.6	-1.1	0.5	1.3	1.4	1.3
Private credit							6.2	1.2	-3.7	6.6	-0.1	1.0	4.8	0.8	-2.8	4.0	1.3	1.7
Private equity - Diversified	-7.4	7.4	-11.7	22.2	-5.5	1.7	-5.0	11.8	13.3	1.4	-2.5	4.7	-4.1	16.6	16.4	-3.1	-5.0	5.5
Venture capital	-32.2						8.9	22.2	18.2	-0.7	-8.7	10.9	12.6	24.1	16.7	-0.7	-6.3	8.3
LBO							-1.8	8.4	22.9	-4.5	-4.8	7.4	-3.3	13.6	20.8	-6.1	-2.9	6.6
Private equity - Other	-2.0	-14.8	-13.3	21.3	-9.2	-3.3	-22.0	-0.1	1.7	-0.2	-14.6	-6.1	-18.9	14.3	15.0	-6.6	-8.4	4.0
Private equity - Aggregate	-2.5	-12.8	-13.2	21.4	-8.8	-2.8	-3.5	11.9	14.6	1.0	-4.1	5.2	-2.7	17.0	16.4	-3.3	-5.2	5.6
Total Fund Return	1.9	-2.9	-1.6	3.1	2.1	0.6	0.7	0.5	-0.1	0.6	0.6	0.5	0.0	1.3	0.7	-0.3	0.3	0.4

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

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

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

2. To enable fairer comparisons, the policy returns of all participants except your fund were adjusted to reflect private equity benchmarks based on lagged, investable, public-market indices. The correlation between your private equity returns and the benchmark based on investable, public market indices lagged by 82 business days is 0.63 versus a correlation of 0.54 using your reported benchmarks. Refer to the appendix of this section for details.

Your policy return and value added calculation - 2021

2021 Policy Return and Value Added

Asset class	Policy weight	Benchmark Description	Return	Net return	Value added
Stock - Europe & Far East	5.0%	NZX 50 Custom	-0.2%	-0.6%	-0.4%
Stock - Global	75.0%	MSCI All Countries World Index Custom	20.3%	24.7%	4.4%
Stock - Emerging		MSCI All Countries World Index Custom	20.3%	-3.2%	-23.5%
Fixed income - U.S.		Barclays Global Aggregate	-1.2%	6.0%	7.2%
Fixed income - Global	20.0%	Barclays Global Aggregate	-1.2%	-1.0%	0.2%
Cash		NZD Cash Benchmark	1.9%	1.9%	0.0%
Infrastructure		Infrastructure BM	12.0%	14.0%	2.0%
Natural resources		Natural Resources Benchmark	4.8%	8.6%	3.9%
Real estate ex-REITs		Property BM	12.7%	32.6%	19.9%
Hedge funds		Hedge Fund BM	1.8%	6.7%	4.9%
Private equity - Diversified		Private Equity BM	21.0%	13.5%	-7.4%
Venture capital		Private Equity BM	21.0%	-11.2%	-32.2%
Private equity - Other		Other Private Equity BM	15.7%	13.7%	-2.0%
Total	100.0%				
Net Actual Return (reported by you)					16.3%
Calculated Policy Return = sum of (policy weights X benchmark returns)				15.0%	
Adjustment to reflect rebalancing and overlay impacts				<u>-0.6%</u>	
Policy Return (reported by you)					<u>14.4%</u>
Net Value Added (Net Return - Policy Return)					1.9%

Your policy return and value added calculations - 2017 to 2020

2020 Policy Return and Value Added

Asset class	Policy	Benchmark		Net return	Value added
	weight	Description	Return		
Stock - Europe & Far East	5.0%	NZX 50	13.7%	16.6%	2.9%
Stock - Global	65.0%	MSCI Developoc	13.7%	12.1%	-1.6%
Stock - Emerging	10.0%	MSCI Emerging	17.9%	22.4%	4.5%
Fixed income - U.S.		Barclays Global	5.4%	11.2%	5.8%
Fixed income - Global	20.0%	Barclays Global	5.4%	5.2%	-0.2%
Cash		NZD Cash Bench	0.7%	2.5%	1.8%
Infrastructure		Infrastructure B	12.8%	-2.0%	-14.8%
Natural resources		Timber Benchm	9.0%	3.3%	-5.7%
Real estate ex-REITs		NZ Property Ber	14.8%	-5.4%	-20.2%
Hedge funds		Custom	6.1%	-2.1%	-8.2%
Private equity - Diversified		Private Equity B	16.9%	24.3%	7.4%
Private equity - Other		Private Equity B	13.2%	-1.6%	-14.8%
Total	100.0%				
Net Return (reported by you)					9.7%
Calculated policy return (sum: Policy weights x benchmarks)				12.5%	
Adjustment to reflect rebalancing and overlay impacts				<u>0.1%</u>	
Policy return (reported by you)					<u>12.6%</u>
Net Value Added (Net Return - Policy Return)					-2.9%

2018 Policy Return and Value Added

Asset class	Policy	Benchmark		Net return	Value added
	weight	Description	Return		
Stock - Europe & Far East	5.0%	NZX 50	4.8%	5.5%	0.7%
Stock - Global	65.0%	MSCI Developoc	-6.0%	-5.4%	0.6%
Stock - Emerging	10.0%	MSCI Emerging	-12.4%	-11.2%	1.2%
Fixed income - U.S.		BC Custom (NZS	1.6%	4.1%	2.5%
Fixed income - Global	20.0%	Barclays Global	1.6%	1.4%	-0.2%
Cash		NZD Cash Bench	2.0%	3.8%	1.8%
Infrastructure		Infrastructure B	-3.9%	-0.4%	3.5%
Natural resources		Timber Benchm	-0.6%	15.6%	16.2%
Real estate ex-REITs		NZ Property Ber	-3.1%	53.8%	56.9%
Hedge funds		Custom	0.8%	4.4%	3.6%
Private equity - Diversified		Private Equity B	-7.2%	15.0%	22.2%
Private equity - Other		Private Equity B	-5.6%	15.7%	21.3%
Total	100.0%				
Net Return (reported by you)					-2.2%
Calculated policy return (sum: Policy weights x benchmarks)				-4.6%	
Adjustment to reflect rebalancing and overlay impacts				<u>-0.7%</u>	
Policy return (reported by you)					<u>-5.3%</u>
Net Value Added (Net Return - Policy Return)					3.1%

2019 Policy Return and Value Added

Asset class	Policy	Benchmark		Net return	Value added
	weight	Description	Return		
Stock - Europe & Far East	5.0%	NZX 50	30.5%	32.5%	2.0%
Stock - Global	65.0%	MSCI Developoc	28.4%	28.5%	0.1%
Stock - Emerging	10.0%	MSCI Emerging	16.4%	17.1%	0.7%
Fixed income - U.S.		BC Custom (NZS	7.5%	10.0%	2.5%
Fixed income - Global	20.0%	Barclays Global	7.5%	6.9%	-0.6%
Cash		NZD Cash Bench	1.7%	3.0%	1.3%
Infrastructure		Infrastructure B	20.6%	9.9%	-10.7%
Natural resources		Timber Benchm	12.7%	2.0%	-10.7%
Real estate ex-REITs		NZ Property Ber	20.6%	-5.9%	-26.5%
Hedge funds		Custom	7.8%	3.5%	-4.3%
Private equity - Diversified		Private Equity B	28.5%	16.8%	-11.7%
Private equity - Other		Private Equity B	24.4%	11.1%	-13.3%
Total	100.0%				
Net Return (reported by you)					21.1%
Calculated policy return (sum: Policy weights x benchmarks)				23.1%	
Adjustment to reflect rebalancing and overlay impacts				<u>-0.4%</u>	
Policy return (reported by you)					<u>22.7%</u>
Net Value Added (Net Return - Policy Return)					-1.6%

2017 Policy Return and Value Added

Asset class	Policy	Benchmark		Net return	Value added
	weight	Description	Return		
Stock - Europe & Far East	5.0%	NZX 50	22.1%	20.0%	-2.1%
Stock - Global	65.0%	MSCI Developoc	19.6%	19.7%	0.1%
Stock - Emerging	10.0%	MSCI Emerging	28.3%	30.5%	2.2%
Fixed income - U.S.		BC Custom (NZS	3.5%	16.1%	12.6%
Fixed income - Global	20.0%	Barclays Global	3.5%	3.3%	-0.2%
Cash		NZD Cash Bench	2.0%	5.5%	3.5%
Infrastructure		Infrastructure B	15.1%	13.9%	-1.2%
Natural resources		Timber Benchm	8.3%	21.5%	13.2%
Real estate ex-REITs		NZ Property Ber	11.2%	40.7%	29.5%
Hedge funds		Custom	4.5%	3.8%	-0.7%
Private equity - Diversified		Private Equity B	23.1%	17.6%	-5.5%
Private equity - Other		Private Equity B	15.4%	6.2%	-9.2%
Total	100.0%				
Net Return (reported by you)					19.8%
Calculated policy return (sum: Policy weights x benchmarks)				17.4%	
Adjustment to reflect rebalancing and overlay impacts				<u>0.3%</u>	
Policy return (reported by you)					<u>17.7%</u>
Net Value Added (Net Return - Policy Return)					2.1%

Profit/Loss on overlay programs

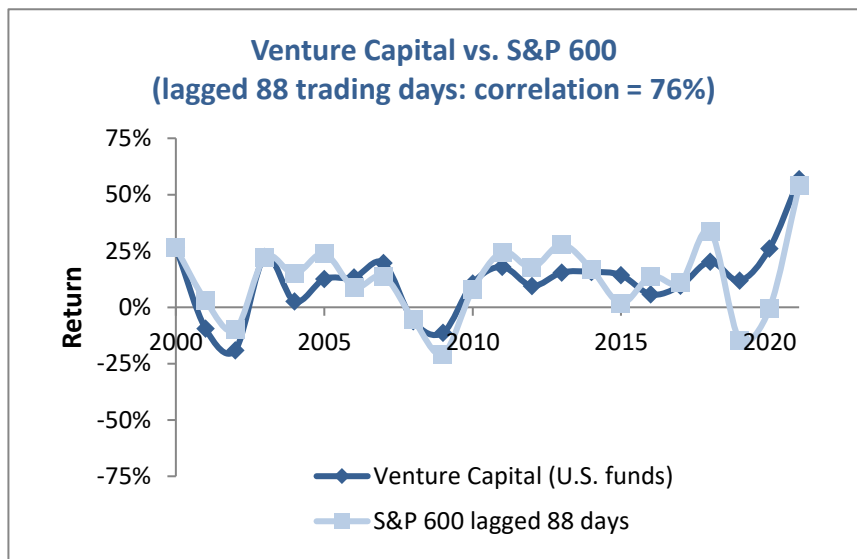
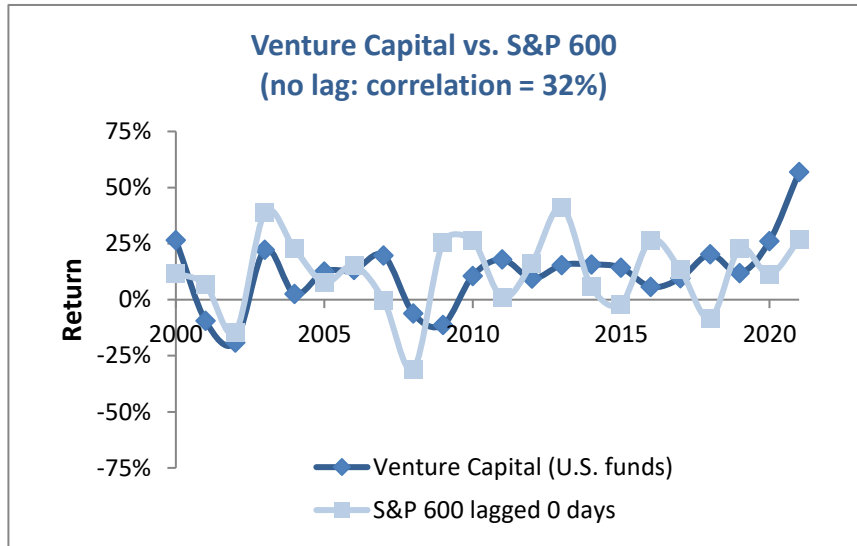
Overlay type	Your fund		Peer median				Global median			
	2021	2020	2021		2020		2021		2020	
	bps	bps	bps	#	bps	#	bps	#	bps	#
Int. Discretionary Currency			7.3	4	-0.7	4	2.6	9	0.0	8
Ext. Discretionary Currency							0.5	9	-0.2	8
Internal Global TAA			34.3	2	14.7	2	18.9	5	19.5	6
External Global TAA			58.7	1			16.2	3		
Internal PolicyTilt TAA	6.5	46.9	5.4	4	27.1	3	3.9	8	14.8	7
External PolicyTilt TAA			11.3	1			11.3	1	14.6	1
Internal Commodities							0.0	1	14.0	2
External Commodities			72.4	1	-0.1	1	38.0	2	-1.7	2
Internal Long/Short	6.0	7.7	6.5	4	4.1	4	6.0	7	1.1	8
External Long/Short			-2.2	1	3.0	1	-2.2	1	3.0	1
Internal Other	5.7	-28.0	5.7	3	1.6	3	15.0	7	19.6	8
External Other			-3.9	3	0.0	3	0.0	7	10.2	8

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

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

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

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



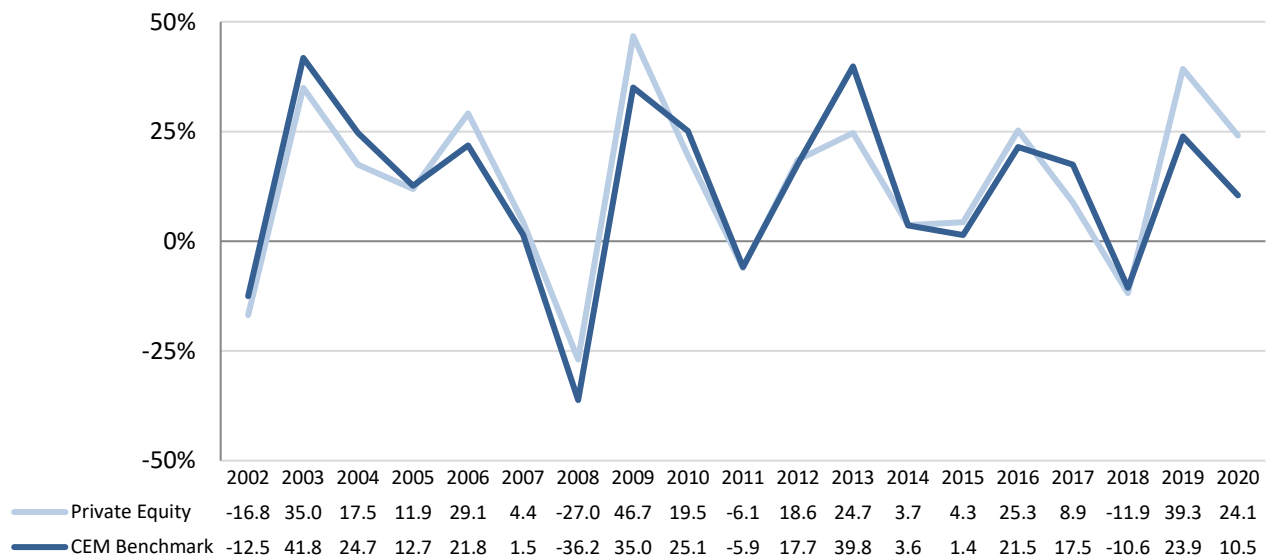
- Un-investable peer-based benchmarks. Peer based benchmarks reflect the reporting lags in peer portfolios so they have much better correlations than un-lagged investable benchmarks. But their relationship statistics are not as good as for lagged investable benchmarks.
- Aspirational premiums (i.e.,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

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

Benchmarks used for private equity by most participants in the CEM universe are flawed (see previous page). So to enable fairer comparisons, CEM replaced 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. Your default benchmark had a lag of 82 trading days. Different portfolios had different lags. CEM estimated the lag on private equity portfolios with multi-year histories by comparing annual private equity returns to public market proxies with 1 day of lag, 2 days of lag, 3 days of lag, etc. At 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 default benchmark returns - Global median



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

4

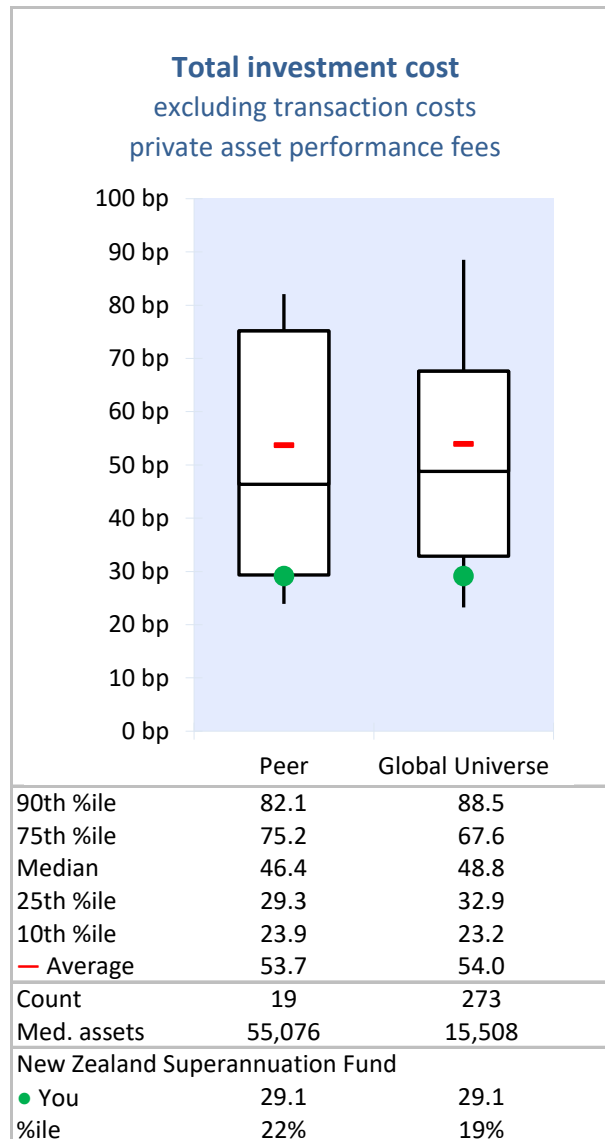
Cost: total, benchmark, trend

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Comparisons of total investment cost

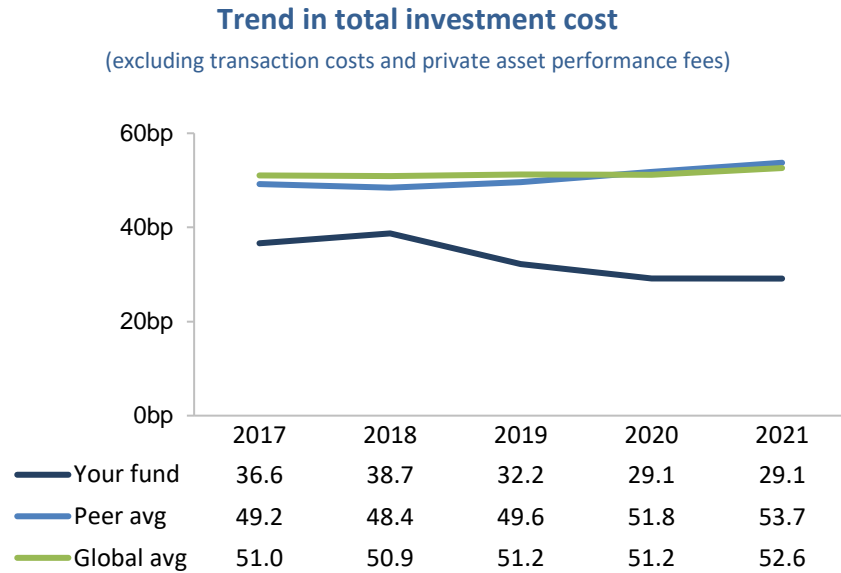
Your total investment cost, excluding transaction costs and private asset performance fees, of 29.1 bps was below the peer median of 46.4 bps.

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



Trend in total investment cost, you versus peers and universe

Your total investment cost, excluding transaction costs and private asset performance fees, decreased from 36.6 bps in 2017 to 29.1 bps in 2021.



Trend analysis is based on 222 Global funds and 19 peer funds with 5 or more consecutive years of data.

Types of costs included in your total investment cost

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

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

*External manager base fees represent gross contractual management fees.

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

Detailed breakdown of your total investment cost

Your 2021 total investment cost, excluding transaction costs and private asset performance fees, was 29.1 bp or \$168.5 million.

	Internal		External passive		External active			Total ¹		
	Passive	Active	Fees	Monitoring & Other	Base Fees	Perform. Fees	Monitor. & Other	\$000s	bps	% of Total
Asset management										
Stock - Europe & Far East	967	2,649			4,006		707	8,329		5%
Stock - Emerging			958	707				1,665		1%
Stock - Global			9,335	4,418				13,753		8%
Fixed income - U.S.	314							314		0%
Fixed income - Global	808		1,275	515				2,598		2%
Cash		3,454						3,454		2%
Real estate ex-REITs ¹		1,023						1,023		1%
Real estate ex-REITs - LP ¹					1,101	6,209	2,960	4,061		2%
Real estate ex-REITs - Co-invest. ¹					1,579		1,977	3,556		2%
Infrastructure ¹²		683			1,564	1,660	328	2,575		2%
Infrastructure - LP ¹					1,869	256	662	2,531		2%
Natural resources ¹²		1,608			2,441	2,080	1,824	5,873		3%
Hedge funds					20,099	23,895	3,130	47,124		28%
Private equity - Diversified - LP ¹					7,762	3,913	4,999	12,761		8%
Private equity - Diversified - FoFs ¹²					107	108	881	988		1%
Underlying FoF fees ¹²					169	275		169		0%
Private equity - Diversified - Co-invest. ¹							620	620		0%
Venture capital - LP ¹²					11	16	304	315		0%
Venture capital - Co-invest. ¹							317	317		0%
Private equity - Other - LP ¹		5,022						5,022		3%
Private equity - Other - Co-invest. ¹					15,013		3,631	18,644		11%
Derivatives/Overlays	3,641	9,028						12,669		8%
Total asset management costs excluding private asset performance fees								148,361	25.6bp	88%
Oversight, custodial & other asset related costs										
Oversight of the fund								14,014		8%
Trustee & custodial								5,510		3%
Audit								612		0%
Other										
Total oversight, custodial & other costs								20,136	3.5bp	12%
Total investment costs excluding transaction costs and private asset performance fees								168,497	29.1bp	100%

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

2. Default costs added. Refer to Appendix A.

Changes in your investment costs

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

Change in your investment costs (2021 - 2017)

	Investment costs (\$000s)					Change (\$000s)				Change (%)			
	2021	2020	2019	2018	2017	2021	2020	2019	2018	2021	2020	2019	2018
Asset management													
Stock - Europe & Far East	8,329	7,036	7,701	6,279	5,980	1,293	-665	1,422	299	18%	-9%	23%	5%
Stock - Emerging	1,665	2,181	6,589	6,019	5,912	-516	-4,408	570	107	-24%	-67%	9%	2%
Stock - Global	13,753	11,734	13,421	10,549	8,573	2,019	-1,687	2,872	1,976	17%	-13%	27%	23%
Fixed income - U.S.	314	262	91	72	81	52	171	19	-9	20%	188%	26%	-11%
Fixed income - Global	2,598	2,473	2,532	2,646	2,628	125	-59	-114	18	5%	-2%	-4%	1%
Cash	3,454	3,296	3,009	3,193	4,779	158	287	-184	-1,586	5%	10%	-6%	-33%
Real estate ex-REITs ¹	1,023	459	783	397	0	564	-324	386	397	123%	-41%	97%	
Real estate ex-REITs - LP ¹	4,061	736	102	336	874	3,325	634	-234	-538	452%	621%	-70%	-62%
Real estate ex-REITs - Co-invest. ¹	3,556	2,436				1,120				46%			
Infrastructure ¹²	2,575	2,018	2,014	9,114	7,430	557	4	-7,100	1,684	28%	0%	-78%	23%
Infrastructure - LP ¹	2,531	2,519	3,045	3,299	3,971	12	-526	-254	-672	0%	-17%	-8%	-17%
Natural resources ¹²	5,873	5,843	6,544	9,889	9,358	30	-701	-3,345	531	1%	-11%	-34%	6%
Hedge funds	47,124	28,515	28,121	46,133	31,664	18,609	394	-18,012	14,469	65%	1%	-39%	46%
Private equity - Diversified - LP ¹	12,761	11,019	7,927	7,445	7,021	1,743	3,092	482	424	16%	39%	6%	6%
Private equity - Diversified - FoFs ¹²	988	1,066	667	750	716	-78	399	-83	34	-7%	60%	-11%	5%
Underlying FoF fees ¹²	169	217	0	374	487	-47	217	-374	-112	-22%		-100%	-23%
Private equity - Diversified - Co-invest. ¹	620												
Venture capital - LP ¹²	315												
Venture capital - Co-invest. ¹	317												
Private equity - Other - LP ¹	5,022	6,219	4,422	12,469	10,054	-1,197	1,797	-8,047	2,415	-19%	41%	-65%	24%
Private equity - Other - Co-invest. ¹	18,644	14,977	16,046			3,667	-1,069			24%	-7%		
Derivatives/Overlays	12,669	11,365	10,584	9,503	8,582	1,304	781	1,081	921	11%	7%	11%	11%
Total excl. private asset perf. fees	148,361	114,370	113,598	128,467	108,110	33,991	772	-14,869	20,357	30%	1%	-12%	19%
Oversight, custodial & other asset related costs													
Oversight of the fund	14,014	12,307	18,511	16,626	15,508	1,707	-6,204	1,885	1,118	14%	-34%	11%	7%
Trustee & custodial	5,510	6,980	6,234	6,465	6,019	-1,470	746	-231	446	-21%	12%	-4%	7%
Audit	612	596	487	488	424	16	109	-1	64	3%	22%	0%	15%
Other													
Total oversight, custodial & other	20,136	19,883	25,232	23,579	21,951	253	-5,349	1,653	1,628	1%	-21%	7%	7%
Total investment costs ¹	168,497	134,253	138,830	152,046	130,061	34,244	-4,577	-13,216	21,985	26%	-3%	-9%	17%
Total in basis points	29.1bp	29.1bp	32.2bp	38.7bp	36.6bp								

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

2. Default costs added. Refer to Appendix A.

Total cost versus benchmark cost

Your fund's total investment cost, excluding transaction costs and private asset performance fees, was 12.0 bps below your benchmark cost of 41.1 bps. This implies that your fund was low cost by 12.0 bps compared to the peer median, after adjusting for your fund's asset mix.

Your cost versus benchmark

	\$000s	bps
Your fund's total investment costs excluding transaction costs and private asset performance fees	168,497	29.1 bp
- Your fund's benchmark	237,742	41.1 bp
= Your fund's cost savings	-69,245	-12.0 bp

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

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

Reasons why your fund was low cost

	Cost/-Savings impact	
	\$000s	bps
<u>Differences in implementation style:</u>		
More passive	-35,731	-6.2 bp
More int. pass. % of total passive	-257	0.0 bp
More int. active % of total active	-10,778	-1.9 bp
More evergreen % of external	-1,710	-0.3 bp
Less fund of funds	-705	-0.1 bp
More co-investment	-2,492	-0.4 bp
More overlays and unfunded strategies	1,350	0.2 bp
Total style impact	-50,324	-8.7 bp
<u>Paying more/-less for similar services:</u>		
External investment management	-25,752	-4.5 bp
Internal investment management	-197	0.0 bp
Oversight, custodial and other	7,028	1.2 bp
Total impact of paying more /-less	-18,921	-3.3 bp
Total savings	-69,245	-12.0 bp

Benchmark cost calculation

Your 2021 benchmark cost was 41.1 basis points or 237.7 million. It equals your holdings for each asset class multiplied by the peer median cost for the asset class. The peer median cost is the style weighted average for all implementation styles (i.e., internal passive, internal active, external passive, external active).

Asset class	Your average assets	Weighted peer median cost ¹	Benchmark \$000s
	(A)	(B)	(A X B)
Asset management costs			
Stock - Europe & Far East	2,515	23.2 bp	5,843
Stock - Emerging	1,565	49.2 bp	7,702
Stock - Global	25,756	16.2 bp	41,654
Fixed income - U.S.	23	11.4 bp	27
Fixed income - Global	5,450	10.3 bp	5,604
Cash	9,391	3.7 bp	3,454
Real estate ex-REITs	569	77.4 bp	4,404
Infrastructure	903	86.9 bp	7,843
Natural resources	2,999	56.9 bp	17,072
Hedge funds	3,217	133.7 bp	43,013
Perf. fees	3,217	136.1 bp	43,790
Private equity - Diversified	474	168.2 bp	7,973
Venture capital	3	3639.3 bp	1,270
Private equity - Other	3,572	66.3 bp	23,666
Overlay Programs ²	57,852	2.0 bp	11,319
Benchmark for asset management	57,852	38.8 bp	224,634
Oversight, custody and other costs³			
Oversight	57,852	1.0 bp	
Trustee & custodial	57,852	0.5 bp	
Consulting	57,852	0.0 bp	
Audit	57,852	0.0 bp	
Other	57,852	0.1 bp	
Benchmark for oversight, custody, other	57,852	2.3 bp	13,108
Total benchmark cost		41.1 bp	237,742

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.

Cost impact of differences in implementation style

Differences in implementation style (passive vs. active, internal vs. external, etc.) relative to your peers saved you 8.7 bps.

Implementation choices	Assets by style	Peer benchmark cost			Style 1 %			Cost/ -Savings \$000s	bps
		Style 1	Style 2	Style 1 -Savings	Your	Peer average	More/ -Less		
	a	b	c	d = b - c	e			a x d x e	
<u>Passive vs active</u>	Total assets	Passive	Active		Passive % of total assets				
Stock - Europe & Far East	2,515	4 bp	31 bp	-28 bp	15%	29%	-13%	910	
Stock - Emerging	1,565	11 bp	59 bp	-47 bp	100%	20%	80%	-5,915	
Stock - Global	25,756	5 bp	28 bp	-22 bp	100%	51%	49%	-28,197	
Fixed income - U.S.	23	2 bp	11 bp	-10 bp	100%	0%	100%	-22	
Fixed income - Global	5,450	6 bp	12 bp	-6 bp	100%	29%	71%	-2,507	
More passive								-35,731	-6.2 bp
<u>Internal passive vs external passive</u>	Passive assets	Internal passive	External passive		Internal passive % of passive				
Stock - Europe & Far East	388	3 bp	4 bp	-1 bp	100%	3%	97%	-31	
Stock - Emerging	1,565	5 bp	12 bp	-7 bp	0%	12%	-12%	131	
Stock - Global	25,756	3 bp	5 bp	-2 bp	0%	5%	-5%	296	
Fixed income - Global	5,450	2 bp	7 bp	-4 bp	50%	21%	29%	-654	
More int. pass. % of total passive								-257	0.0 bp
<u>Internal active vs external active</u>	Active assets	Internal active	External active		Internal active % of active				
Stock - Europe & Far East	2,127	3 bp	55 bp	-52 bp	55%	46%	9%	-1,012	
Real estate ex-REITs	569	34 bp	106 bp	-72 bp	20%	39%	-19%	790	
Infrastructure	903	19 bp	99 bp	-79 bp	45%	15%	30%	-2,159	
Natural resources	2,999	22 bp	104 bp	-82 bp	91%	57%	34%	-8,397	
Private equity - Diversified	474	39 bp	168 bp	-130 bp	0%	0%	0%	1	
More int. active % of total active								-10,778	-1.9 bp
<u>Evergreen vs LP/Co & fund of funds</u>	External assets	Ever-green	LP/Co & FoF		Evergreen fund % of external				
Real estate ex-REITs	455	78 bp	124 bp	-45 bp	0%	40%	-40%	824	
Infrastructure	494	80 bp	107 bp	-27 bp	56%	30%	26%	-342	
Natural resources	263	90 bp	107 bp	-17 bp	100%	16%	84%	-370	
Hedge funds	3,217	130 bp	191 bp	-61 bp	100%	94%	6%	-1,273	
Perf. fees	3,217	134 bp	161 bp	-26 bp	100%	94%	6%	-549	
More evergreen % of external								-1,710	-0.3 bp
<u>LP/Co vs fund of funds</u>	LP/Co & Fund of F.	LP/Co	Fund of funds		LP/Co % of LP/Co & Fund of F.				
Real estate ex-REITs	455	120 bp	197 bp	-77 bp	100%	95%	5%	-178	
Infrastructure	217	106 bp	202 bp	-96 bp	100%	99%	1%	-15	
Private equity - Diversified	474	148 bp	240 bp	-92 bp	98%	78%	19%	-846	
Venture capital	3	4598 bp	200 bp	4398 bp	100%	78%	22%	335	
Less fund of funds								-705	-0.1 bp
<u>Co-investment vs LP</u>	LP/Co	Co-invest	LP		Co-invest % of LP/Co				
Real estate ex-REITs	455	64 bp	126 bp	-62 bp	72%	10%	63%	-1,773	
Infrastructure	217	21 bp	122 bp	-100 bp	0%	15%	-15%	327	
Private equity - Diversified	463	8 bp	158 bp	-150 bp	3%	6%	-3%	240	
Venture capital	3	13 bp	4915 bp	-4902 bp	82%	6%	75%	-1,286	
More co-investment								-2,492	-0.4 bp
More overlays and unfunded strategies								1,350	0.2 bp
Total impact of differences in implementation style								-50,324	-8.7 bp

Cost impact of overlays

As summarized on the previous page, the style impact of overlays cost you 0.2 bps. If you use more overlays than your peers, or more expensive types of overlays, then it increases your relative cost.

	Your average total holdings (mils) (A)	Cost as % of total holdings		Cost/-Savings Impact (000s) A X (B - C)
		You (B)	Peer avg. (C)	
Internal Overlays				
Currency - Hedge	57,852	0.07 bp	0.03 bp	212
Currency - Discretionary	57,852	NA	0.08 bp	-440
Rebalancing / Passive beta - Hedge	57,852	0.56 bp	0.06 bp	2,931
Duration management - Hedge	57,852	NA	0.01 bp	-61
Global TAA - Discretionary	57,852	NA	0.07 bp	-426
Policy tilt TAA - Discretionary	57,852	1.10 bp	0.08 bp	5,928
Long/Short - Discretionary	57,852	0.18 bp	0.08 bp	564
Other overlay - Discretionary	57,852	0.28 bp	0.04 bp	1,397
External Overlays				
Currency - Hedge	57,852	NA	0.05 bp	-283
Currency - Discretionary	57,852	NA	0.03 bp	-161
Rebalancing / Passive beta - Hedge	57,852	NA	0.05 bp	-282
Duration management - Hedge	57,852	NA	0.03 bp	-159
Global TAA - Discretionary	57,852	NA	0.89 bp	-5,128
Policy tilt TAA - Discretionary	57,852	NA	0.02 bp	-97
Commodity futures - Discretionary	57,852	NA	0.32 bp	-1,860
Long/Short - Discretionary	57,852	NA	0.02 bp	-112
Other overlay - Discretionary	57,852	NA	0.12 bp	-676
Total impact in 000s				1,350
Total impact in basis points				0.2 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 3.3 bps.

Style	Your avg holdings (mils)	Cost in bps			Cost/-Savings		
		Your	Peer median	More/-less	\$000s	bps	
External asset management		(A)			(B)	(A X B)	
Stock - Europe & Far East	active	957	49.3	54.8	-5.5	-526	
Stock - Emerging	passive	1,565	10.6	12.3	-1.6	-254	
Stock - Global	passive	25,756	5.3	5.3	0.0	0	
Fixed income - Global	passive	2,728	6.6	6.6	0.0	0	
Real estate ex-REITs	CO	329	108.1	63.7	44.4	1,460	
Real estate ex-REITs	LP	126	322.3	126.0	196.4	2,474	
Infrastructure	active	277	68.4	80.1	-11.7	-325	
Infrastructure	LP	217	116.5	121.5	-5.0	-110	
Natural resources	active	263	162.2	89.9	72.3	1,902	
Hedge funds	active	3,217	72.2	129.7	-57.5	-18,511	
Top layer perf. fees	active	3,217	74.3	134.4	-60.1	-19,346	
Private equity - Diversified	CO	14	446.0	8.3	437.7	608	
Private equity - Diversified	LP	449	284.2	158.0	126.3	5,669	
Private equity - Diversified	FoF	11	898.2	86.0	812.2	893	
Underlying base fees ²	FoF	11	154.0	154.0	0.0	0	
Venture capital ¹	CO	3	1112.3	13.5	1098.8	313	
Venture capital ²	LP	1	4915.0	4915.0	0.0	0	
Private equity - Other ²	CO	1,783	104.6	104.6	0.0	0	
Total for external management						-25,752	-4.5 bp
Internal asset management		(A)			(B)	(A X B)	
Stock - Europe & Far East ¹	passive	388	24.9	2.7	22.2	861	
Stock - Europe & Far East	active	1,170	22.6	3.1	19.5	2,283	
Fixed income - U.S. ¹	passive	23	134.2	1.8	132.4	310	
Fixed income - Global ¹	passive	2,722	3.0	2.4	0.6	155	
Cash ²	active	9,391	3.7	3.7	0.0	0	
Real estate	active	114	89.7	33.6	56.1	640	
Infrastructure	active	409	16.7	19.5	-2.8	-114	
Natural resources ¹	active	2,736	5.9	21.7	-15.8	-4,333	
Private equity - Other ²	active	1,789	28.1	28.1	0.0	0	
Total for internal management						-197	0.0 bp
Oversight, custody and other costs³							
Oversight			2.4	1.0	1.4		
Trustee & custodial			1.0	0.5	0.4		
Consulting			0.0	0.0	0.0		
Audit			0.1	0.0	0.1		
Other			0.0	0.1	-0.1		
Benchmark for oversight, custody, other		57,852	3.5	2.3	1.2	7,028	1.2 bp
Total						-18,921	-3.3 bp

1. Universe median used because peer data was insufficient.

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

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

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

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

	Your cost	Benchmark = peer	More/-less	Your average assets (or fee basis)	More/-less in \$000s		
		weighted median cost ¹			Total More/-less	Due to Impl. style	Due to paying more/less
Asset management costs	(A)	(B)	(C = A - B)	(D)	(C X D)		
Stock - Europe & Far East	33.1 bp	23.2 bp	9.9 bp	2,515	2,486	-132	2,618
Stock - Emerging	10.6 bp	49.2 bp	-38.6 bp	1,565	-6,037	-5,783	-254
Stock - Global	5.3 bp	16.2 bp	-10.8 bp	25,756	-27,901	-27,901	0
Fixed income - U.S.	134.2 bp	11.4 bp	122.8 bp	23	287	-22	310
Fixed income - Global	4.8 bp	10.3 bp	-5.5 bp	5,450	-3,006	-3,161	155
Cash	3.7 bp	3.7 bp	0.0 bp	9,391	0	0	0
Real estate ex-REITs	151.8 bp	77.4 bp	74.4 bp	569	4,236	-337	4,574
Infrastructure	56.6 bp	86.9 bp	-30.3 bp	903	-2,737	-2,189	-548
Natural resources	19.6 bp	56.9 bp	-37.3 bp	2,999	-11,199	-8,767	-2,431
Hedge funds	72.2 bp	133.7 bp	-61.5 bp	3,217	-19,784	-1,273	-18,511
Perf. fees	74.3 bp	136.1 bp	-61.8 bp	3,217	-19,895	-549	-19,346
Private equity - Diversified	306.8 bp	168.2 bp	138.5 bp	474	6,565	-605	7,171
Venture capital	1809.6 bp	3639.3 bp	-1829.6 bp	3	-639	-952	313
Private equity - Other	66.3 bp	66.3 bp	0.0 bp	3,572	0	0	0
Overlay Programs ²	2.2 bp	2.0 bp	0.2 bp	57,852	1,350	1,350	0
Total asset management	25.6 bp	38.8 bp	-13.2 bp	57,852	-76,273	-50,324	-25,950
Oversight, custody and other costs³							
Oversight of the fund	2.4 bp	1.0 bp	1.4 bp				
Trustee & custodial	1.0 bp	0.5 bp	0.4 bp				
Consulting	0.0 bp	0.0 bp	0.0 bp				
Audit	0.1 bp	0.0 bp	0.1 bp				
Other	0.0 bp	0.1 bp	-0.1 bp				
Total oversight, custody & other	3.5 bp	2.3 bp	1.2 bp	57,852	7,028	n/a	7,028
Total	29.1 bp	41.1 bp	-12.0 bp	57,852	-69,245	-50,324	-18,921

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.

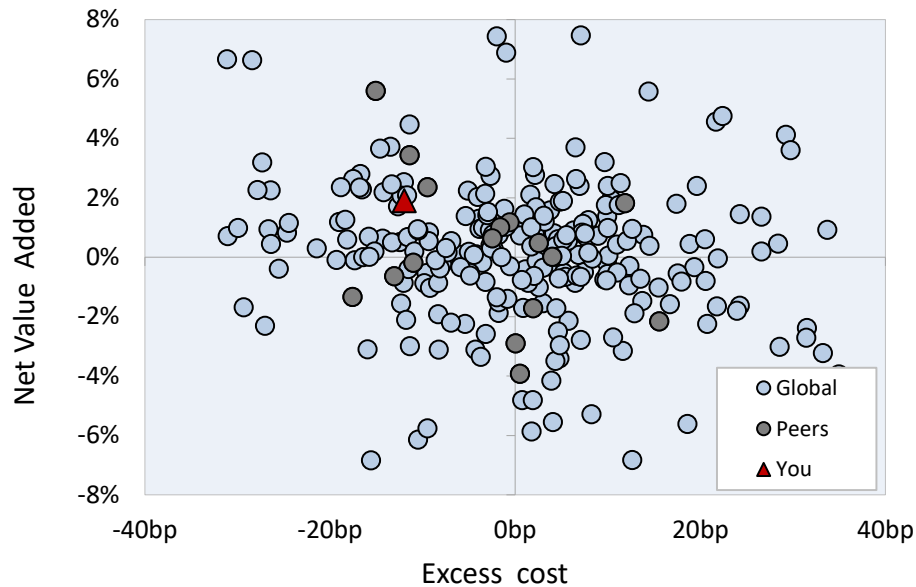
2. Total fund average holdings is used as the base when calculating the relative cost impact of the overlay programs.

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

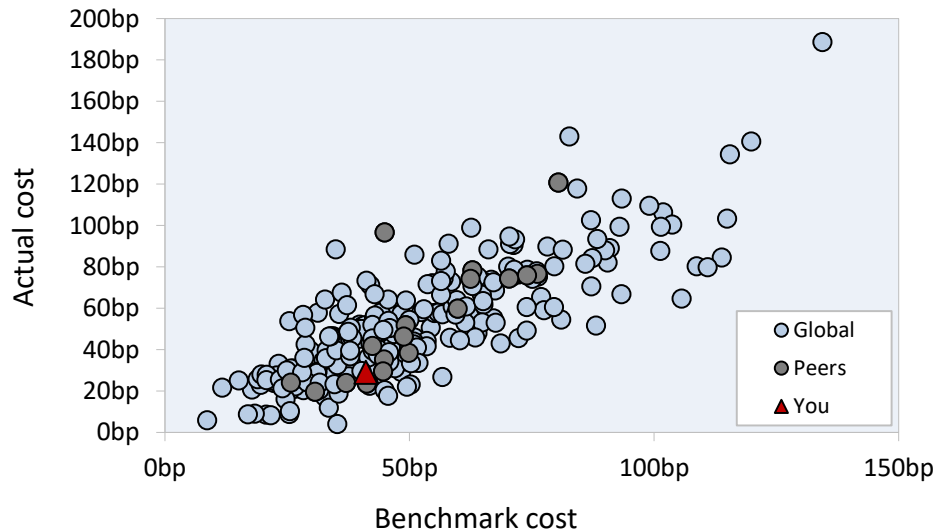
Your cost effectiveness ranking

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 2021, your fund ranked in the positive value added, low cost quadrant.

Your 2021 Net value added 1.9%, Excess cost -12 bps



Your 2021 Actual cost 29.1 bps, Benchmark cost 41.1 bps



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

Benchmarking methodology formulas and data

a) Formulas

Example calculations for 'Stock - Europe & Far East'

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

$$= (1\% \times 2.7 \text{ bp}) + (33\% \times 3.1 \text{ bp}) + (28\% \times 3.5 \text{ bp}) + (39\% \times 54.8 \text{ bp}) = 23.2 \text{ bp}$$

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

$$= 33.1 \text{ bp} - 23.2 \text{ bp} = 9.9 \text{ bp}$$

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

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

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

$$= 3.6 \text{ bp} + -0.1 \text{ bp} + -4.0 \text{ bp} = -0.5 \text{ bp}$$

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

$$= (\text{peer average passive cost} - \text{peer average active cost}) \times (\text{passive \% of asset, you} - \text{passive \% of asset, peer average}) \\ = (3.5 \text{ bp} - 31.1 \text{ bp}) \times (15\% - 29\%) = 3.6 \text{ bp}$$

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

$$= [(1\% \times 2.7 \text{ bp}) + (28\% \times 3.5 \text{ bp})] / (1\% + 28\%) = 3.5 \text{ bp}$$

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

$$= [(33\% \times 3.1 \text{ bp}) + (39\% \times 54.8 \text{ bp})] / (33\% + 39\%) = 31.1 \text{ bp}$$

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

$$= (\text{peer average internal passive cost} - \text{peer average external passive cost}) \times (\text{internal passive \% of passive, you} - \text{internal passive \% of passive, peer average}) \times \text{passive \% of asset, you} \\ = (2.7 \text{ bp} - 3.5 \text{ bp}) \times (100\% - 3\%) \times 15\% = -0.1 \text{ bp}$$

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

$$= (\text{peer average internal active cost} - \text{peer average external active cost}) \times (\text{internal active \% of active, you} - \text{internal active \% of active, peer avg}) \times \text{active \% of asset, you} \\ = (3.1 \text{ bp} - 54.8 \text{ bp}) \times (55\% - 46\%) \times 85\% = -4.0 \text{ bp}$$

Cost impact of paying more/-less

$$= (\text{cost internal passive, you} - \text{cost internal passive, peer}) \times \text{internal passive \% of asset, you} + (\text{cost internal active, you} - \text{cost internal active, peer}) \times \text{internal active \% of asset, you} + (\text{cost external passive, you} - \text{cost external passive, peer}) \times \text{external passive \% of asset, you} + (\text{cost external active, you} - \text{cost external active, peer}) \times \text{external active \% of asset, you} \\ = (24.9 \text{ bp} - 2.7 \text{ bp}) \times 15\% + (22.6 \text{ bp} - 3.1 \text{ bp}) \times 47\% + (0.0 \text{ bp} - 3.5 \text{ bp}) \times 0\% + (49.3 \text{ bp} - 54.8 \text{ bp}) \times 38\% = 10.4 \text{ bp}$$

Your cost versus benchmark (-savings/+excess)

$$= \text{cost impact of differences in implementation style} + \text{cost impact of paying more/-less} \\ = -0.5 \text{ bp} + 10.4 \text{ bp} = 9.9 \text{ bp}$$

Benchmarking methodology formulas and data

b) 2021 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 - Europe & Far East	24.9	22.6		49.3				2.7	3.1	3.5	54.8				23.2
Stock - Emerging			10.6					5.0	14.6	12.3	66.0				49.2
Stock - Global			5.3					3.1	9.7	5.3	37.9				16.2
Fixed income - U.S.	134.2							1.8	2.7		17.1				11.4
Fixed income - Global	3.0		6.6					2.4	10.0	6.6	22.2				10.3
Cash		3.7							3.7						3.7
Real estate ex-REITs		89.7			108.1	322.3			33.6		78.5	63.7	126.0	63.1	74.9
Underlying base fees														134.0	2.5
Infrastructure		16.7		68.4		116.5			19.5		80.1	21.1	121.5	73.3	86.3
Underlying base fees														129.0	0.5
Natural resources		5.9		162.2					21.7		89.9		106.7		56.9
Underlying base fees															0.0
Hedge funds				72.2							129.7			64.7	125.5
Top layer perf. fees				74.3							134.4			20.7	127.0
Underlying base fees														126.0	8.2
Underlying perf. fees														140.0	9.1
Private equity - Diversified					446.0	284.2	898.2		38.8			8.3	158.0	86.0	134.7
Underlying base fees							154.0							154.0	33.6
Venture capital					1112.3	4915.0						13.5	4915.0	34.5	3603.3
Underlying base fees														165.0	36.0
Private equity - Other		28.1			104.6				28.1			104.6			66.3
Underlying base fees															0.0

Benchmarking methodology formulas and data

c) 2021 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 - Europe & Far East	15.4%	46.5%	0.0%	38.0%				0.8%	32.7%	27.7%	38.7%			
Stock - Emerging	0.0%	0.0%	100.0%	0.0%				2.3%	11.7%	17.5%	68.5%			
Stock - Global	0.0%	0.0%	100.0%	0.0%				2.6%	18.0%	48.4%	31.0%			
Fixed income - U.S.	100.0%	0.0%		0.0%				0.1%	39.3%		60.6%			
Fixed income - Global	49.9%	0.0%	50.1%	0.0%				6.2%	58.2%	23.0%	12.6%			
Cash		100.0%		0.0%					100.0%		0.0%			
Real estate ex-REITs		20.0%		0.0%	57.8%	22.1%	0.0%		39.3%		24.3%	3.4%	31.3%	1.9%
Underlying base fees		20.0%		0.0%	57.8%	22.1%	0.0%		39.3%		24.3%	3.4%	31.3%	1.9%
Infrastructure		45.3%		30.6%	0.0%	24.1%	0.0%		15.2%		25.8%	8.8%	49.8%	0.4%
Underlying base fees		45.3%		30.6%	0.0%	24.1%	0.0%		15.2%		25.8%	8.8%	49.8%	0.4%
Natural resources		91.2%		8.8%		0.0%			57.2%		6.9%		35.9%	
Underlying base fees		91.2%		8.8%		0.0%			57.2%		6.9%		35.9%	
Hedge funds				100.0%			0.0%				93.5%			6.5%
Top layer perf. fees				100.0%			0.0%				93.5%			6.5%
Underlying base fees				100.0%			0.0%				93.5%			6.5%
Underlying perf. fees				100.0%			0.0%				93.5%			6.5%
Private equity - Diversified		0.0%			2.9%	94.7%	2.3%		0.0%			5.1%	73.1%	21.8%
Underlying base fees		0.0%			2.9%	94.7%	2.3%		0.0%			5.1%	73.1%	21.8%
Venture capital					81.7%	18.3%	0.0%					5.1%	73.1%	21.8%
Underlying base fees					81.7%	18.3%	0.0%					5.1%	73.1%	21.8%
Private equity - Other		50.1%			49.9%	0.0%			50.1%			49.9%	0.0%	
Underlying base fees		50.1%			49.9%	0.0%			50.1%			49.9%	0.0%	

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

Methodology of the cost trend model

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

Factors affecting the cost differences

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

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

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

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

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

Attribution of the cost differences and other assumptions

Change in the cost amount for one asset =

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

Change in the basis point costs for one asset =

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

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

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

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

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

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

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

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

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

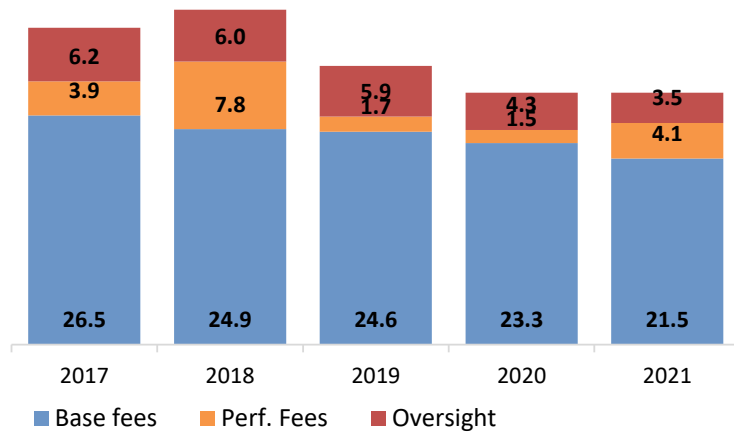
Further, cost difference for style & paying impacts (CostBpsH - CostBpsL) for one style =

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

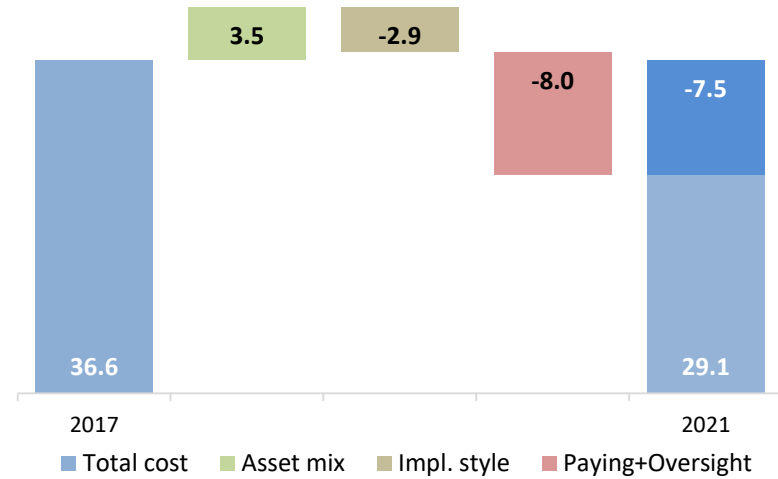
where CostStyleBps is the style cost in basis points; Wg is the weight for that style within the asset class.

Total plan cost and cost changes

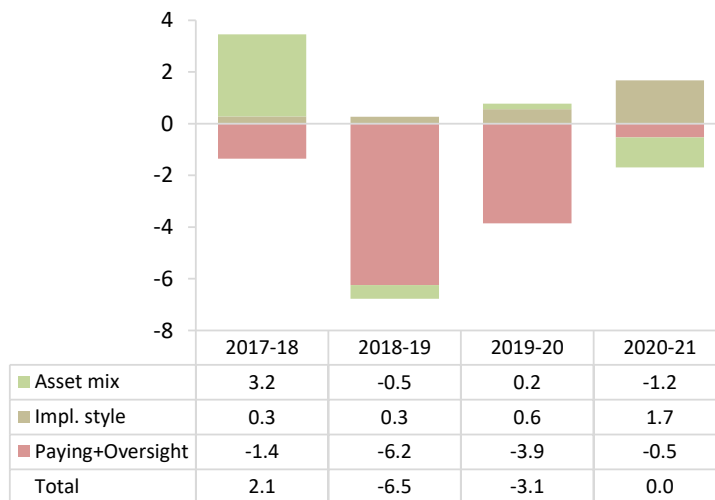
Total plan cost over time, bps



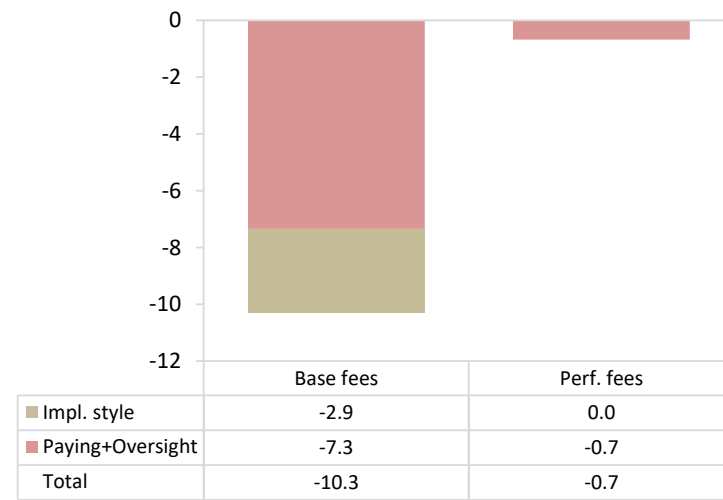
Cost differences, 2021 versus 2017, bps



Reasons for cost differences over time, bps



Impact of base and performance fees, 2021 vs. 2017, bps



Summary of cost differences, 2021 versus 2017

Your total cost decreased by 7.5 bps between 2017 and 2021 because of changes in: asset mix (3.5 bps), implementation style (-2.9 bps), and paying more/less for similar services (-8.0 bps).

	bps	\$000s
Starting total cost, 2017	36.6	130,061
Growth in asset value		81,811
Asset mix	<u>3.5</u>	<u>19,963</u>
Stock	-0.6	-3,701
Fixed income	-0.1	-313
Real estate ex-REITs	3.8	22,262
Real assets ex real estate	-2.2	-12,789
Hedge funds & multi-asset	2.0	11,622
Private equity	0.5	2,882
Implementation style (less expensive vs. more)	<u>-2.9</u>	<u>-16,944</u>
More passive, less active	-0.6	-3,577
More int. pass. % of total passive	-0.2	-1,042
More int. active % of total active	-1.4	-7,811
Less evergreen % of external	0.1	556
More LP, less fund of funds	0.0	-151
More co-investment	-0.9	-4,920
Paying more/-less for	<u>-5.3</u>	<u>-30,771</u>
Stock	-0.4	-2,278
Fixed income	-0.8	-4,478
Real estate ex-REITs	-0.2	-1,183
Real assets ex real estate	-0.6	-3,717
Hedge funds & multi-asset	-2.1	-12,173
Performance fees	-0.7	-3,906
Private equity	-0.3	-1,724
Overlays and unfunded strategies	-0.2	-1,311
Oversight, custodial, other (pay more/-less)	<u>-2.7</u>	<u>-15,623</u>
Total difference	-7.5	38,436
Ending total cost, 2021	29.1	168,497

Summary of cost differences, year over year

	bps	\$000s	bps	\$000s	bps	\$000s	bps	\$000s	bps	\$000s
	2017		2018		2019		2020		2021	
Starting total cost	36.6	130,061	38.7	152,046	32.2	138,830	29.1	134,253	36.6	130,061
Growth in asset value		13,743		14,827		9,606		34,310		81,811
Asset mix	3.2	12,445	-0.5	-2,264	0.2	997	-1.2	-6,672	3.5	19,963
Stock	0.3	1,069	-0.1	-273	-1.2	-5,522	0.5	3,153	-0.6	-3,701
Fixed income	-0.4	-1,546	0.0	-200	0.5	2,319	-0.1	-658	-0.1	-313
Real estate ex-REITs	0.3	1,294	0.3	1,229	0.2	1,098	0.2	1,379	3.8	22,262
Real assets ex real estate	0.1	568	-1.3	-5,653	-0.1	-410	-0.4	-2,512	-2.2	-12,789
Hedge funds & multi-asset	1.1	4,170	1.0	4,478	0.5	2,320	-0.4	-2,367	2.0	11,622
Private equity	1.8	6,891	-0.4	-1,846	0.3	1,192	-1.0	-5,666	0.5	2,882
Implementation style (less expensive vs. more)	0.3	1,111	0.3	1,144	0.6	2,573	1.7	9,699	-2.9	-16,944
Passive vs. active	0.0	126	0.0	69	-0.5	-2,103	1.6	9,002	-0.6	-3,577
Internal passive vs. external passive	0.0	15	0.0	185	-0.1	-474	0.0	-53	-0.2	-1,042
Internal active vs. external active	0.3	1,201	-1.7	-7,245	3.2	14,947	0.1	742	-1.4	-7,811
Evergreen vs. LP/Co & fund of funds	0.0	-137	0.0	186	0.0	8	0.0	-128	0.1	556
LP/Co vs. fund of funds	0.0	-94	0.0	-99	0.0	-114	0.0	-232	0.0	-151
Co-investment vs. LP	0.0	0	1.9	8,048	-2.1	-9,691	0.1	368	-0.9	-4,920
Paying more/-less for	-1.2	-4,623	-6.1	-26,276	-2.3	-10,659	0.3	1,736	-5.3	-30,771
Stock	-0.2	-878	0.6	2,730	-0.2	-1,043	-2.5	-14,661	-0.4	-2,278
Fixed income	-0.2	-857	-0.2	-815	-0.4	-1,836	-0.1	-495	-0.8	-4,478
Real estate ex-REITs	0.0	120	-0.1	-440	-0.5	-2,111	0.5	2,626	-0.2	-1,183
Real assets ex real estate	-0.8	-3,004	-0.2	-964	-0.3	-1,483	0.2	984	-0.6	-3,717
Hedge funds & multi-asset	1.8	6,953	-6.3	-26,989	-0.8	-3,872	2.4	13,689	-2.8	-16,079
Private equity	-1.8	-6,970	0.0	49	-0.1	-362	0.2	1,192	-0.3	-1,724
Overlays and unfunded strategies	0.0	14	0.0	154	0.0	49	-0.3	-1,600	-0.2	-1,311
Oversight, custodial, other (pay more/-less)	-0.2	-691	-0.1	-646	-1.5	-7,095	-0.8	-4,829	-2.7	-15,623
Total difference	2.1	21,985	-6.5	-13,216	-3.1	-4,577	0.0	34,244	-7.5	38,436
Ending total cost	38.7	152,046	32.2	138,830	29.1	134,253	29.1	168,497	29.1	168,497
	2018		2019		2020		2021		2021	

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

Reasons by asset class and cost type, \$000

Your total cost has increased by \$38 million in 2021 compared to 2017. An increase of \$82 million was due to the \$22 billion rise in plan total average nav holdings. The remaining decrease of \$43 million is explained by the changes in the asset mix (\$20 million), implementation style (-\$17 million), and paying more/less for similar services (-\$46 million).

Asset class ¹	2017 cost \$000s	Asset mix \$000s	Implement. style \$000s	Paying more/-less \$000s	Total ex asset gr. \$000s	Total difference \$000s	Growth in asset value \$000s	2021 cost \$000s
	A	B	C	D	E=B+C+D	F=G-A	F-E	G
Stock - Europe & Far East	5,980	381	-616	-1,177	-1,413	2,349	3,762	8,329
Stock - Emerging	5,912	-4,970	-2,995	0	-7,966	-4,247	3,719	1,665
Stock - Global	8,573	888	0	-1,101	-213	5,180	5,393	13,753
Fixed income - U.S.	81	-68	0	250	182	233	51	314
Fixed income - Global	2,628	-578	-1,042	-64	-1,683	-30	1,653	2,598
Cash	4,779	333	0	-4,664	-4,331	-1,325	3,006	3,454
Real estate ex-REITs	874	22,262	-13,862	-1,183	7,216	7,766	550	8,640
Infrastructure	11,401	-10,077	2	-3,391	-13,466	-6,295	7,171	5,106
Natural resources	9,358	-2,712	-6,334	-326	-9,371	-3,485	5,886	5,873
Hedge funds	17,736	6,510	0	-12,173	-5,663	5,493	11,156	23,229
Top layer perf. fees	13,928	5,112	0	-3,906	1,206	9,967	8,761	23,895
Private equity - Diversified	7,737	3,620	817	-2,671	1,765	6,632	4,867	14,369
Underlying base fees	487	228	-848	-3	-623	-317	306	169
Venture capital	n/a	632	0	0	632	632	0	632
Private equity - Other	10,054	-1,597	7,934	951	7,288	13,612	6,324	23,666
Total for asset management	99,528	19,963	-16,944	-29,459	-26,441	36,164	62,605	135,692
Overlays and unfunded strategies ²	8,582	0		-1,311	-1,311	4,087	5,398	12,669
Oversight	15,508			-11,249	-11,249	-1,494	9,755	14,014
Trustee & custodial	0			0	0	0	0	0
Consulting	6,019			-4,295	-4,295	-509	3,786	5,510
Audit	424			-79	-79	188	267	612
Other	0			0	0	0	0	0
Total for fund oversight ³	21,951			-15,623	-15,623	-1,815	13,808	20,136
Total	130,061	19,963	-16,944	-46,393	-43,375	38,436	81,811	168,497

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

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

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

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

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

Reasons by asset class and cost type, basis points

Your total cost has decreased by 7.5 bps in 2021 vs. 2017. It was driven by the changes in the asset mix (3.5 bps), implementation style (-2.9 bps), and paying more/less for similar services (-8.0 bps).

Asset class	Asset mix bps	Implement. style bps	Paying more/-less bps	Total difference bps	Total ¹ ex asset gr. \$000s
	B	C	D	B+C+D	
Stock - Europe & Far East	0.1	-0.1	-0.2	-0.2	-1,413
Stock - Emerging	-0.9	-0.5	0.0	-1.4	-7,966
Stock - Global	0.2	0.0	-0.2	0.0	-213
Fixed income - U.S.	0.0	0.0	0.0	0.0	182
Fixed income - Global	-0.1	-0.2	0.0	-0.3	-1,683
Cash	0.1	0.0	-0.8	-0.7	-4,331
Real estate ex-REITs	3.8	-2.4	-0.2	1.2	7,216
Infrastructure	-1.7	0.0	-0.6	-2.3	-13,466
Natural resources	-0.5	-1.1	-0.1	-1.6	-9,371
Hedge funds	1.1	0.0	-2.1	-1.0	-5,663
Top layer perf. fees	0.9	0.0	-0.7	0.2	1,206
Private equity - Diversified	0.6	0.1	-0.5	0.3	1,765
Underlying base fees	0.0	-0.1	0.0	-0.1	-623
Venture capital	0.1	0.0	0.0	0.1	632
Private equity - Other	-0.3	1.4	0.2	1.3	7,288
Total for asset management	3.5	-2.9	-5.1	-4.6	-26,441
Overlays and unfunded strategies	0.00		-0.23	-0.23	-1,311
Oversight			-1.9	-1.9	-11,249
Trustee & custodial			0.0	0.0	0
Consulting			-0.7	-0.7	-4,295
Audit			0.0	0.0	-79
Other			0.0	0.0	0
Total for fund oversight			-2.7	-2.7	-15,623
Total	3.5	-2.9	-8.0	-7.5	-43,375
Total basis point costs in years 2021 and 2017		29.1	36.6	-7.5	

1. Calculated by multiplying total difference in bps by plan total nav average holdings for year 2021, \$58 billion. Similarly, basis point costs on this page are converted from the amounts on the previous page using the same total nav holdings as the fee basis.

Impact of changes in asset mix

Changes in the asset mix increased your total cost by \$20 million or 3.5 bps.

Asset class	2017 Cost bps	2021 Cost bps	2017 asset ¹ weight %	2021 asset ¹ weight %	Change in asset weight	Asset mix changes ² bps	Asset mix changes ³ \$000s
	A	B	C	D	E=D-C	A (or B) x E	
Stock - Europe & Far East	40.3	33.1	4%	4%	0%	0.1	381
Stock - Emerging	29.8	10.6	6%	3%	-3%	-0.9	-4,970
Stock - Global	5.8	5.3	42%	45%	3%	0.2	888
Fixed income - U.S.	27.2	134.2	0%	0%	0%	0.0	-68
Fixed income - Global	6.8	4.8	11%	9%	-1%	-0.1	-578
Cash	8.6	3.7	16%	16%	1%	0.1	333
Real estate ex-REITs	416.2	151.8	0%	1%	1%	3.8	22,262
Infrastructure	94.1	56.6	3%	2%	-2%	-1.7	-10,077
Natural resources	41.8	19.6	6%	5%	-1%	-0.5	-2,712
Hedge funds	110.0	72.2	5%	6%	1%	1.1	6,510
Top layer perf. fees	86.4	74.3	5%	6%	1%	0.9	5,112
Private equity - Diversified	342.3	303.2	1%	1%	0%	0.6	3,620
Underlying base fees	21.5	3.6	1%	1%	0%	0.0	228
Venture capital	n/a	1,809.6	0%	0%	0%	0.1	632
Private equity - Other	41.4	66.3	7%	6%	-1%	-0.3	-1,597
Total for asset management						3.5	19,963

1. Weight % = asset's average (NAV for performance lines) holdings / plan total nav average holdings.
2. If asset is not available in one of the years, the entire weighted cost difference in bps is attributed to the asset mix.
3. Calculated by multiplying asset mix changes in bps by plan total nav average holdings for year 2021, \$58 billion.

Impact of changes in implementation style

Changes in implementation style (passive vs. active, internal vs. external, etc.) in 2021 vs. 2017 saved you \$17 million.

Implementation choices	2021	Cost, 2017			Style 1 %			Cost/ \$000s
	avg. assets \$mils	Style 1	Style 2	Style 1 -Savings	2021	2017	More/ -Less	
	A	B	C	D = B - C	E			A x D x E
<u>Passive vs active</u>	Total assets	Passive	Active		Passive % of total assets			
Stock - Europe & Far East	2,515	8 bp	43 bp	-36 bp	15%	9%	6%	-581
Stock - Emerging	1,565	11 bp	99 bp	-88 bp	100%	78%	22%	-2,995
More passive, less active								-3,577
<u>Internal passive vs external passive</u>	Passive assets	Internal passive	External passive		Internal passive % of passive			
Fixed income - Global	5,450	3 bp	7 bp	-4 bp	50%	0%	50%	-1,042
More int. pass. % of total passive								-1,042
<u>Internal active vs external active</u>	Active assets	Internal active	External active		Internal active % of active			
Stock - Europe & Far East	2,127	34 bp	55 bp	-21 bp	55%	54%	1%	-35
Real estate ex-REITs	569	90 bp	416 bp	-327 bp	20%	0%	20%	-3,726
Infrastructure	903	22 bp	142 bp	-120 bp	45%	40%	5%	-554
Natural resources	2,999	11 bp	125 bp	-115 bp	91%	73%	18%	-6,334
Private equity - Other	3,572	23 bp	76 bp	-53 bp	50%	65%	-15%	2,837
More int. active % of total active								-7,811
<u>Evergreen vs LP/Co & fund of funds</u>	External assets	Ever- green	LP/Co & FoF		Evergreen fund % of external			
Infrastructure	494	122 bp	194 bp	-72 bp	56%	72%	-16%	556
Less evergreen % of external								556
<u>LP/Co-investment vs fund of funds</u>	LP/Co & FoFs	LP/Co	Fund of funds		LP/Co % of LP/Co + FoFs			
Private equity - Diversified	474	360 bp	388 bp	-28 bp	98%	86%	11%	-151
More LP, less fund of funds								-151
<u>Co-investment vs LP</u>	LP/Co	Co-invest	LP		Co-invest % of LP/Co			
Real estate ex-REITs	455	108 bp	416 bp	-308 bp	72%	0%	72%	-10,137
Private equity - Diversified	463	446 bp	360 bp	86 bp	3%	0%	3%	120
Private equity - Other	1,783	105 bp	76 bp	29 bp	100%	0%	100%	5,097
More co-investment								-4,920
Total								-16,944

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

Impact of paying more/-less for similar services

In 2021, you paid \$46 million less for similar asset management and oversight / support services vs. 2017.

Asset class styles where you had assets in both 2021 and 2017 ¹	Style	2021 avg. assets \$mils	Cost in bps		More/ -less	Cost/ -Savings \$000s
			2021	2017		
<u>External asset management</u>		A			B	A x B
Stock - Europe & Far East	active	957	49.3	54.6	-5.3	-509
Stock - Emerging	passive	1,565	10.6	10.6	0.0	0
Stock - Global	passive	25,756	5.3	5.8	-0.4	-1,101
Fixed income - Global	passive	2,728	6.6	6.8	-0.2	-64
Real estate ex-REITs	LP	126	322.3	416.2	-93.9	-1,183
Infrastructure	active	277	68.4	122.0	-53.7	-1,485
Infrastructure	LP	217	116.5	193.7	-77.3	-1,679
Natural resources	active	263	162.2	125.2	36.9	971
Hedge funds	active	3,217	72.2	110.0	-37.8	-12,173
Top layer perf. fees	active	3,217	74.3	86.4	-12.1	-3,906
Private equity - Diversified	LP	449	284.2	360.1	-75.8	-3,405
Private equity - Diversified	FoF	11	898.2	231.0	667.2	734
Underlying base fees	FoF	11	154.0	157.0	-3.0	-3
Total for external management						-23,803
<u>Internal asset management</u>		A			B	A x B
Stock - Europe & Far East	passive	388	24.9	7.8	17.1	663
Stock - Europe & Far East	active	1,170	22.6	34.0	-11.4	-1,332
Fixed income - U.S.	passive	23	134.2	27.2	107.0	250
Cash	active	9,391	3.7	8.6	-5.0	-4,664
Infrastructure	active	409	16.7	22.3	-5.6	-228
Natural resources	active	2,736	5.9	10.6	-4.7	-1,297
Private equity - Other	active	1,789	28.1	22.8	5.3	951
Total for internal management						-5,657
Overlays and unfunded strategies		57,852	2.2	2.4	-0.2	-1,311
Oversight		57,852	2.4	4.4	-1.9	-11,248.9
Trustee & custodial		57,852	0.0	0.0	0.0	0
Consulting		57,852	1.0	1.7	-0.7	-4,295
Audit		57,852	0.1	0.1	0.0	-79
Other		57,852	0.0	0.0	0.0	0
Total for fund oversight						-15,623
Total						-46,393

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

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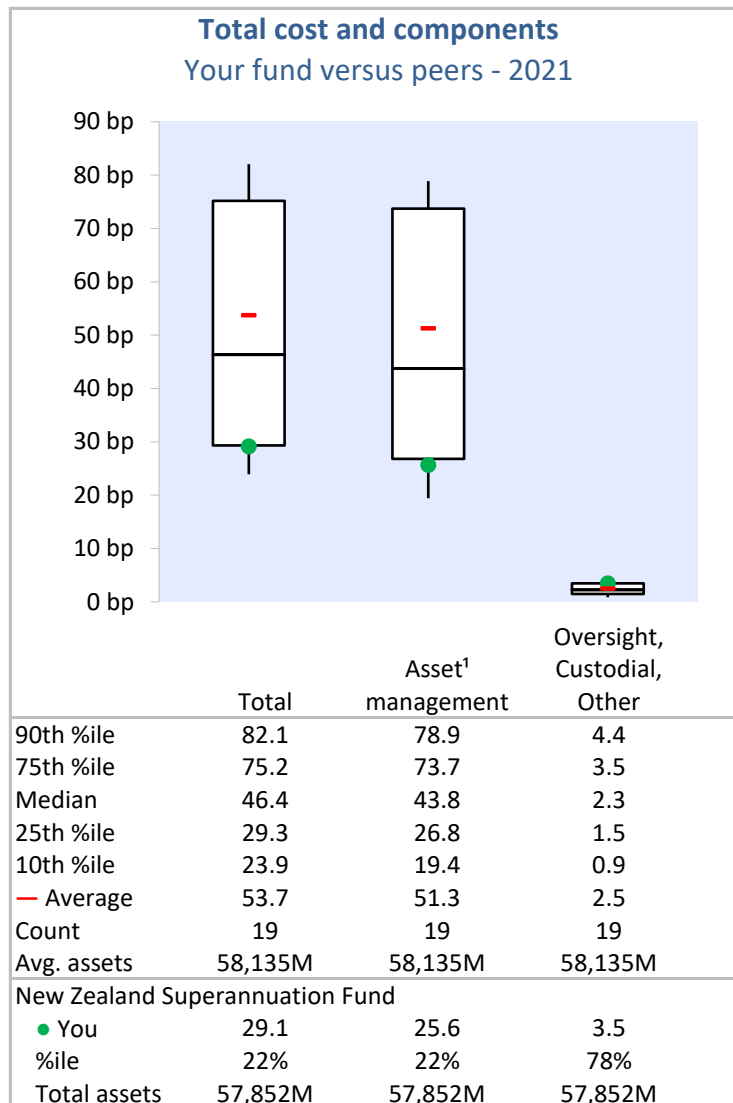
Cost comparisons

Total fund cost	2
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Total fund cost

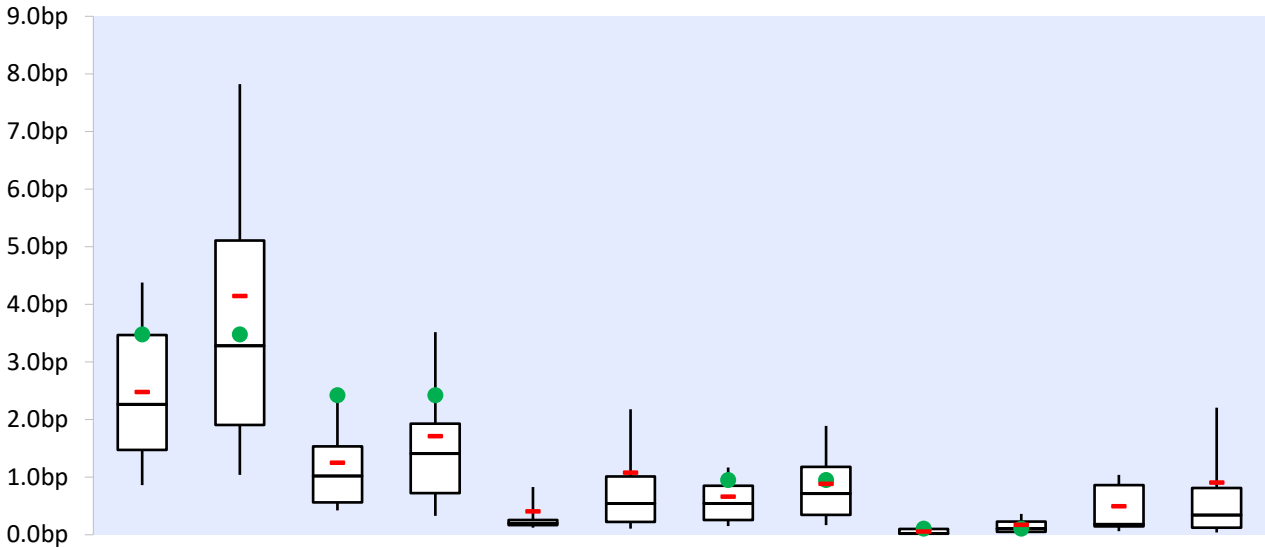
Total costs are benchmarked in the previous section. In this section, your fund's costs are compared on a line-item basis to your peers. This enables you to understand better why you may be a high or low cost fund and it also identifies and quantifies major cost differences that may warrant further investigation.

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



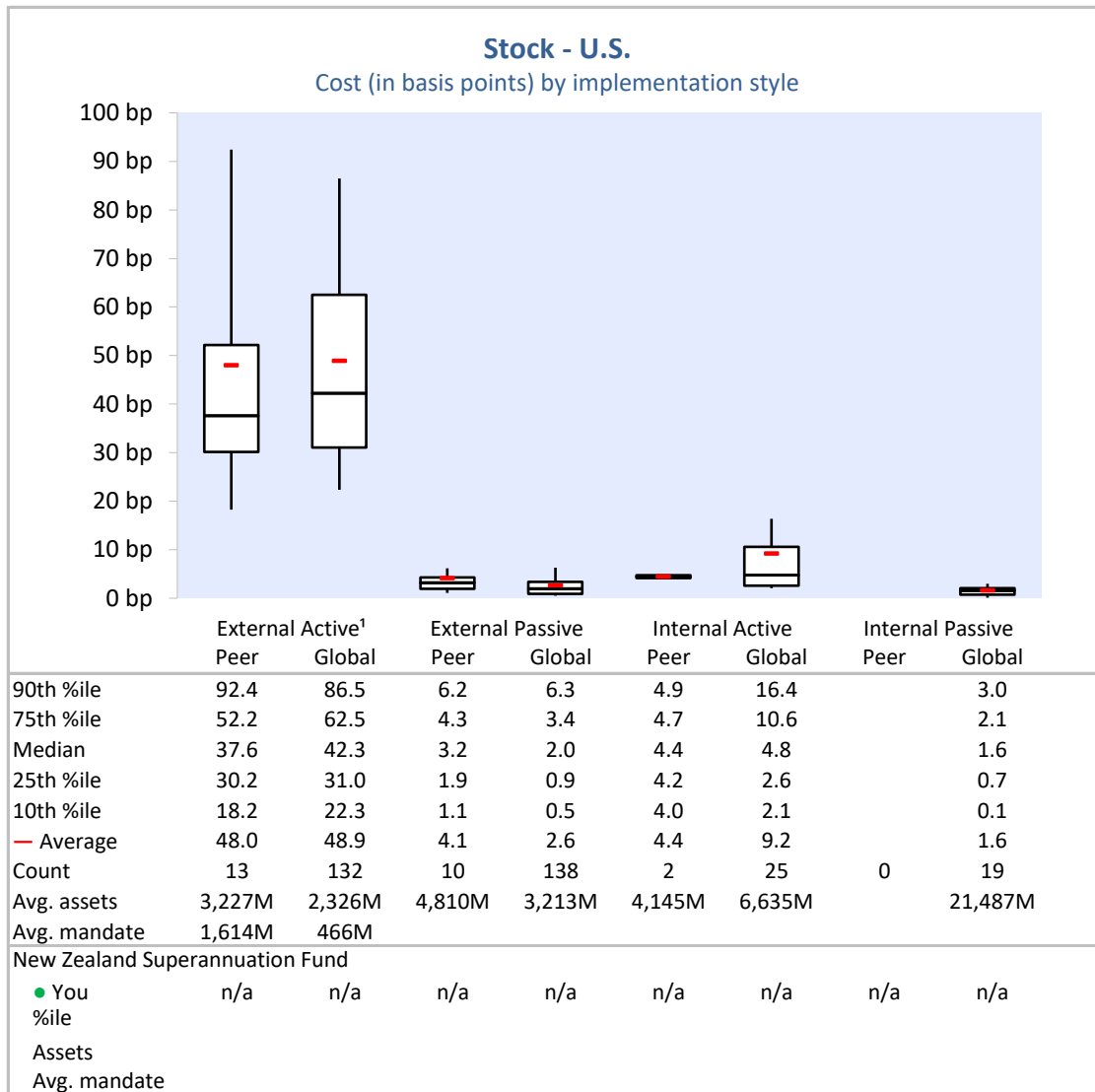
Governance, operations & support

Cost as a % of total plan assets



	Total		Oversight ¹		Consulting & Perf. Meas.		Custody		Audit		Other	
	Peer	Global	Peer	Global	Peer	Global	Peer	Global	Peer	Global	Peer	Global
90th %ile	4.4	7.8	2.5	3.5	0.8	2.2	1.2	1.9	0.1	0.4	1.0	2.2
75th %ile	3.5	5.1	1.5	1.9	0.3	1.0	0.8	1.2	0.1	0.2	0.9	0.8
Median	2.3	3.3	1.0	1.4	0.2	0.5	0.5	0.7	0.0	0.1	0.2	0.3
25th %ile	1.5	1.9	0.6	0.7	0.2	0.2	0.3	0.3	0.0	0.1	0.1	0.1
10th %ile	0.9	1.0	0.4	0.3	0.1	0.1	0.2	0.2	0.0	0.0	0.1	0.0
— Average	2.5	4.1	1.2	1.7	0.4	1.1	0.7	0.9	0.1	0.2	0.5	0.9
Count	19	273	19	273	9	213	19	262	13	234	13	179
Avg. assets	58,135M	61,864M	58,135M	61,864M	58,135M	61,864M	58,135M	61,864M	58,135M	61,864M	58,135M	61,864M
New Zealand Superannuation Fund												
● You	3.5	3.5	2.4	2.4	n/a	n/a	1.0	1.0	0.1	0.1	n/a	n/a
%ile	78%	53%	83%	82%			78%	62%	83%	49%		
Plan assets	57,852M	57,852M	57,852M	57,852M	57,852M	57,852M	57,852M	57,852M	57,852M	57,852M	57,852M	57,852M

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.

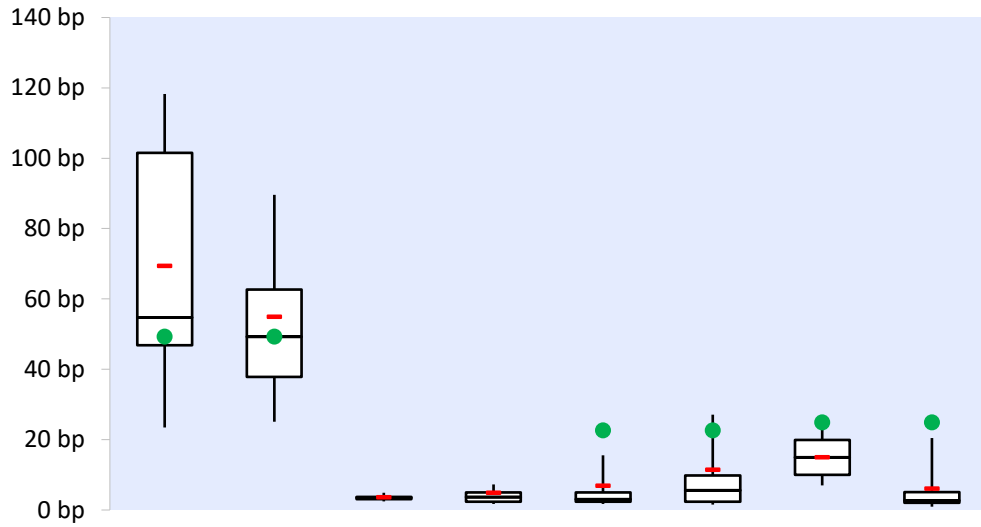


1. Breakdown of external active fees

	You	Peer Average	Global Average
Base fees	n/a	26.7	41.6
Performance fees*	n/a	19.3	6.5
Internal and other	<u>n/a</u>	<u>2.0</u>	<u>0.8</u>
Total	n/a	48.0	48.9

* 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 35.8 bps for peers (7 funds) and 21.6 bps for Global participants (40 funds).

Stock - Europe & Far East Cost by implementation style

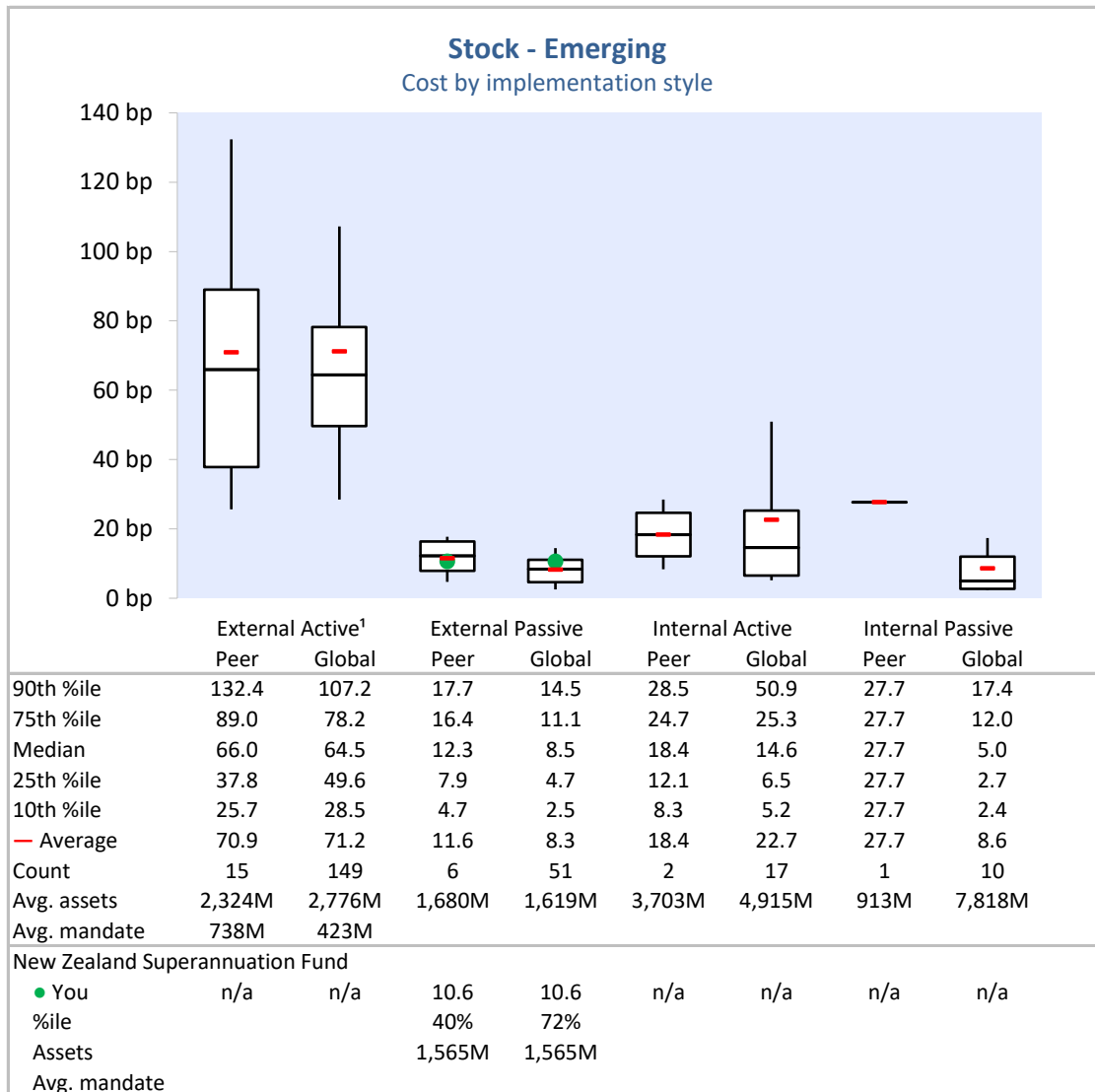


	External Active ¹		External Passive		Internal Active		Internal Passive	
	Peer	Global	Peer	Global	Peer	Global	Peer	Global
90th %ile	118.3	89.6	4.9	7.2	15.6	27.1	22.9	20.4
75th %ile	101.5	62.7	3.7	5.0	5.0	9.8	19.9	5.0
Median	54.8	49.3	3.5	3.7	3.1	5.7	15.0	2.7
25th %ile	46.8	37.8	3.0	2.4	2.3	2.3	10.0	2.0
10th %ile	23.4	25.1	2.5	1.7	1.7	1.6	7.0	0.9
— Average	69.4	54.9	3.6	4.9	6.9	11.4	15.0	6.1
Count	10	121	5	73	5	25	2	12
Avg. assets	2,450M	2,736M	4,400M	1,673M	5,381M	9,848M	323M	6,159M
Avg. mandate	602M	496M						
New Zealand Superannuation Fund								
● You	49.3	49.3	n/a	n/a	22.6	22.6	24.9	24.9
%ile	33%	50%			100%	88%	100%	100%
Assets	957M	957M			1,170M	1,170M	388M	388M
Avg. mandate	478M	478M						

1. Breakdown of external active fees

	You	Peer Average	Global Average
Base fees	41.9	37.9	44.6
Performance fees*	n/a	28.0	9.6
Internal and other	<u>7.4</u>	<u>3.4</u>	<u>0.7</u>
Total	49.3	69.4	54.9

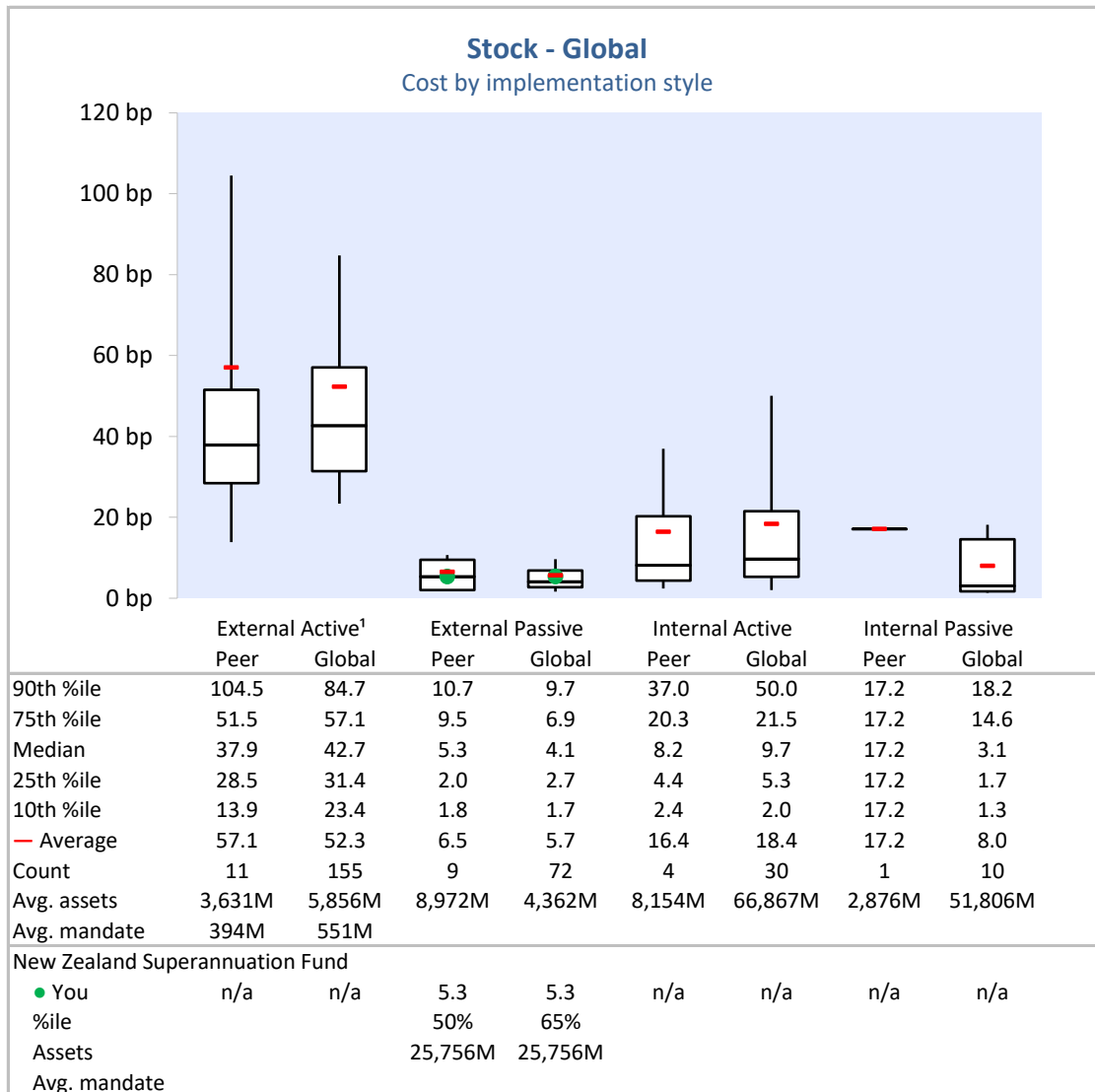
* For funds that did not report a performance fee, a value of 'zero' was used. The average performance fee for those funds that reported a performance fee is 46.7 bps for peers (6 funds) and 29.0 bps for Global participants (40 funds).



1. Breakdown of external active fees

	You	Peer Average	Global Average
Base fees	n/a	50.9	55.9
Performance fees*	n/a	17.1	13.7
Internal and other	<u>n/a</u>	<u>2.9</u>	<u>1.6</u>
Total	n/a	70.9	71.2

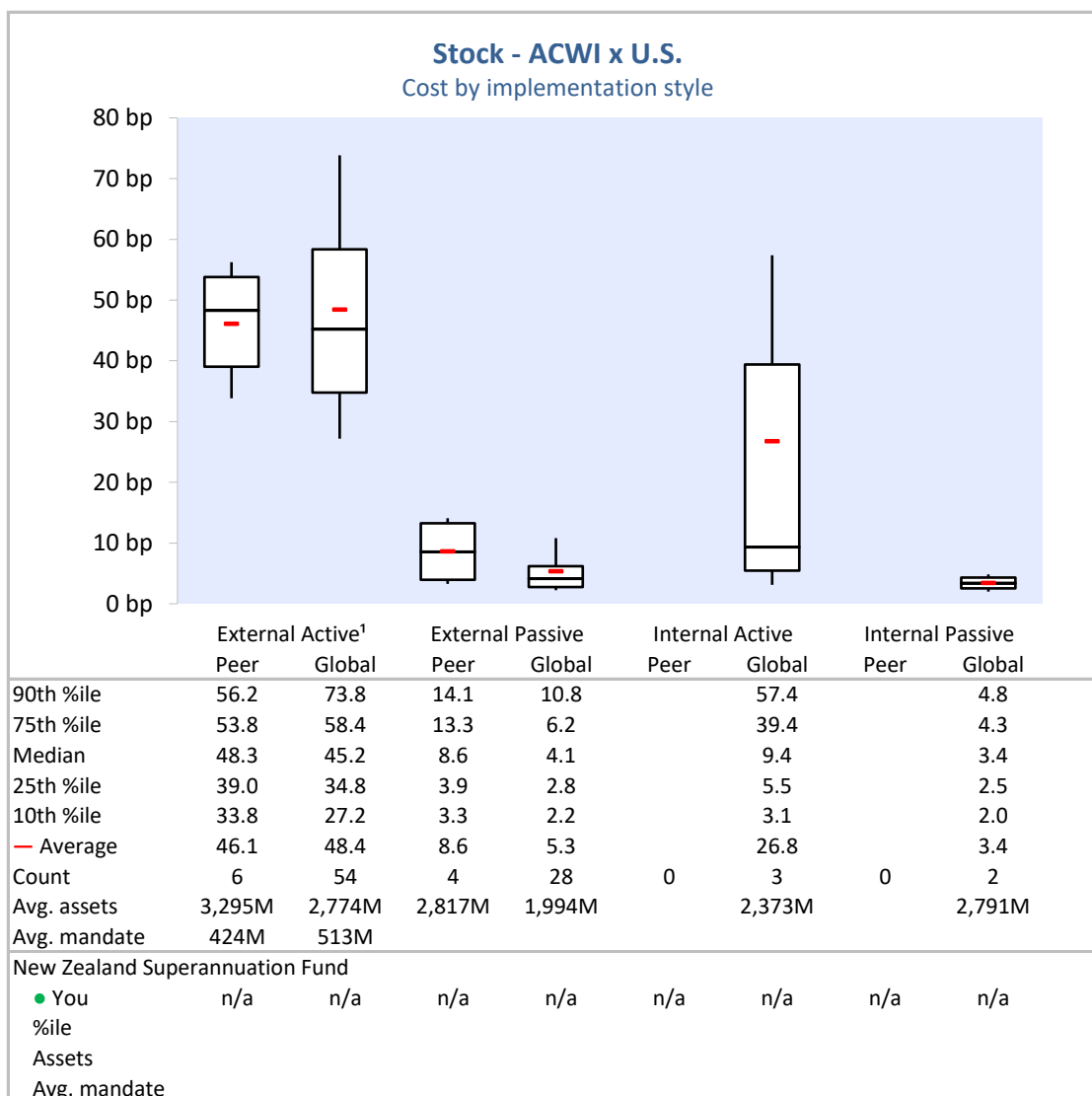
* For funds that did not report a performance fee, a value of 'zero' was used. The average performance fee for those funds that reported a performance fee is 32.0 bps for peers (8 funds) and 45.4 bps for Global participants (45 funds).



1. Breakdown of external active fees

	You	Peer Average	Global Average
Base fees	n/a	31.1	41.6
Performance fees*	n/a	23.9	9.7
Internal and other	<u>n/a</u>	<u>2.0</u>	<u>1.0</u>
Total	n/a	57.1	52.3

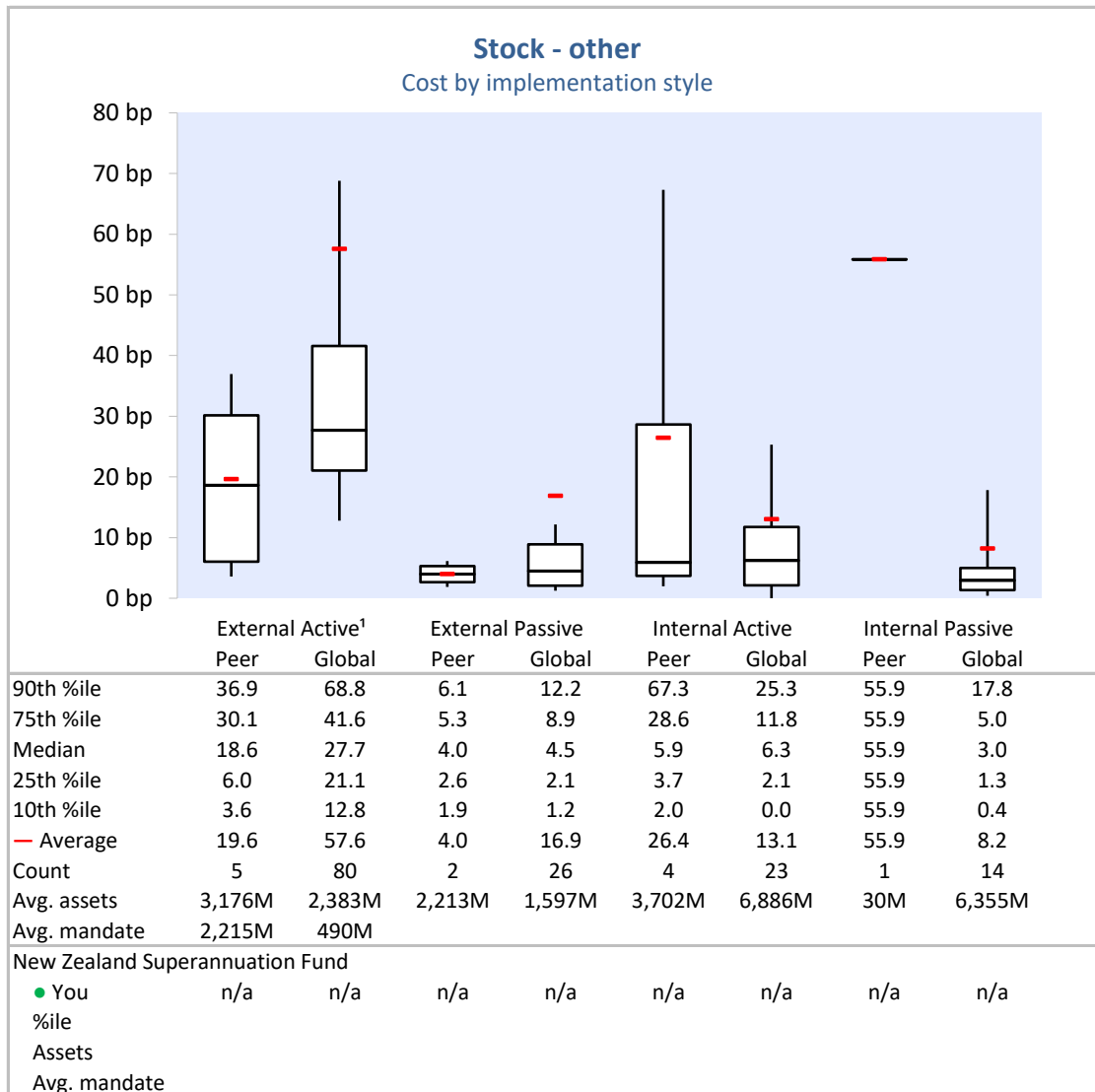
* For funds that did not report a performance fee, a value of 'zero' was used. The average performance fee for those funds that reported a performance fee is 43.9 bps for peers (6 funds) and 25.0 bps for Global participants (60 funds).



1. Breakdown of external active fees

	You	Peer Average	Global Average
Base fees	n/a	39.1	44.9
Performance fees*	n/a	5.1	3.1
Internal and other	<u>n/a</u>	<u>1.9</u>	<u>0.4</u>
Total	n/a	46.1	48.4

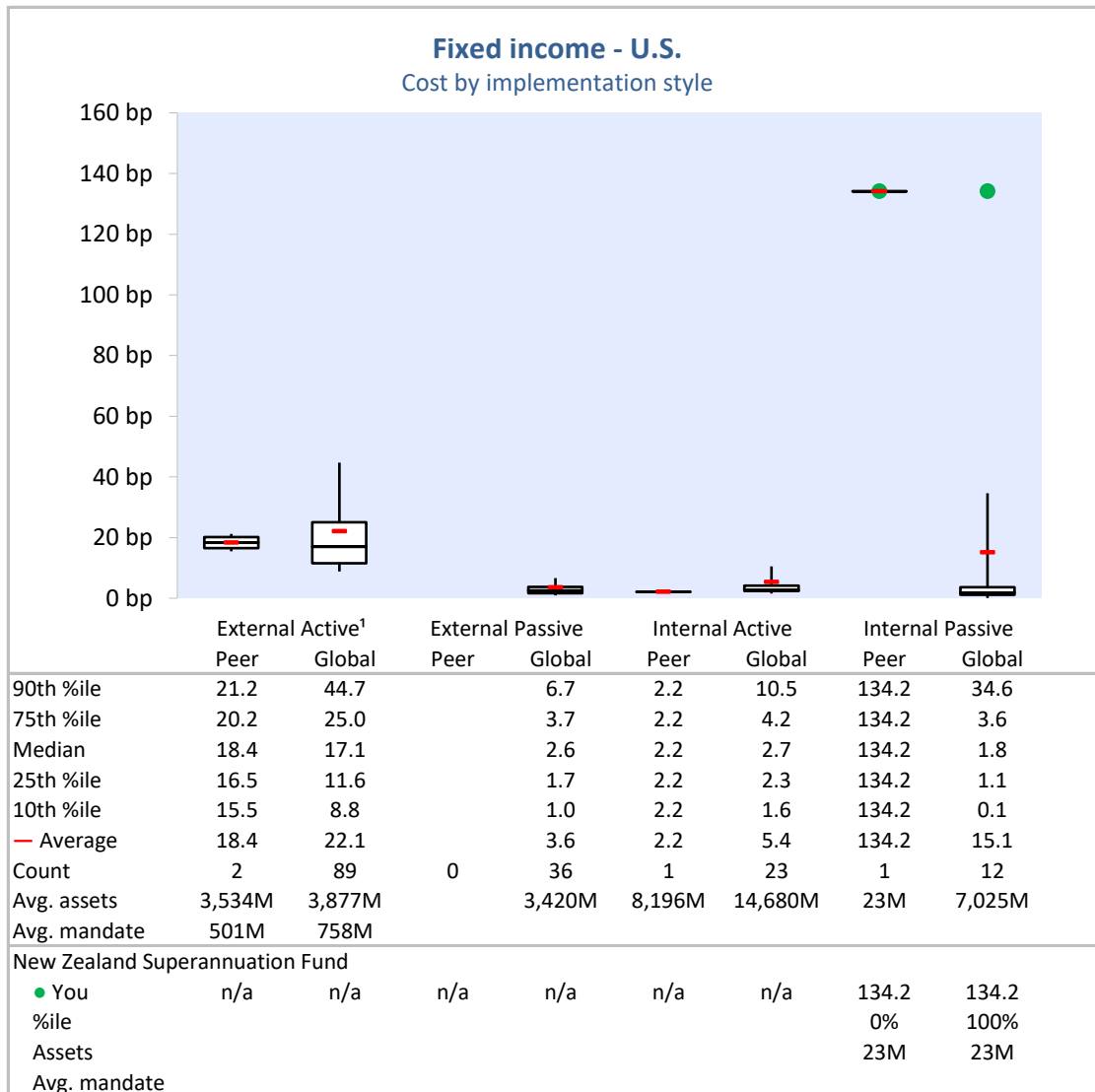
* For funds that did not report a performance fee, a value of 'zero' was used. The average performance fee for those funds that reported a performance fee is 10.1 bps for peers (3 funds) and 23.9 bps for Global participants (7 funds).



1. Breakdown of external active fees

	You	Peer Average	Global Average
Base fees	n/a	11.8	54.2
Performance fees*	n/a	0.6	2.4
Internal and other	<u>n/a</u>	<u>7.3</u>	<u>1.1</u>
Total	n/a	19.6	57.6

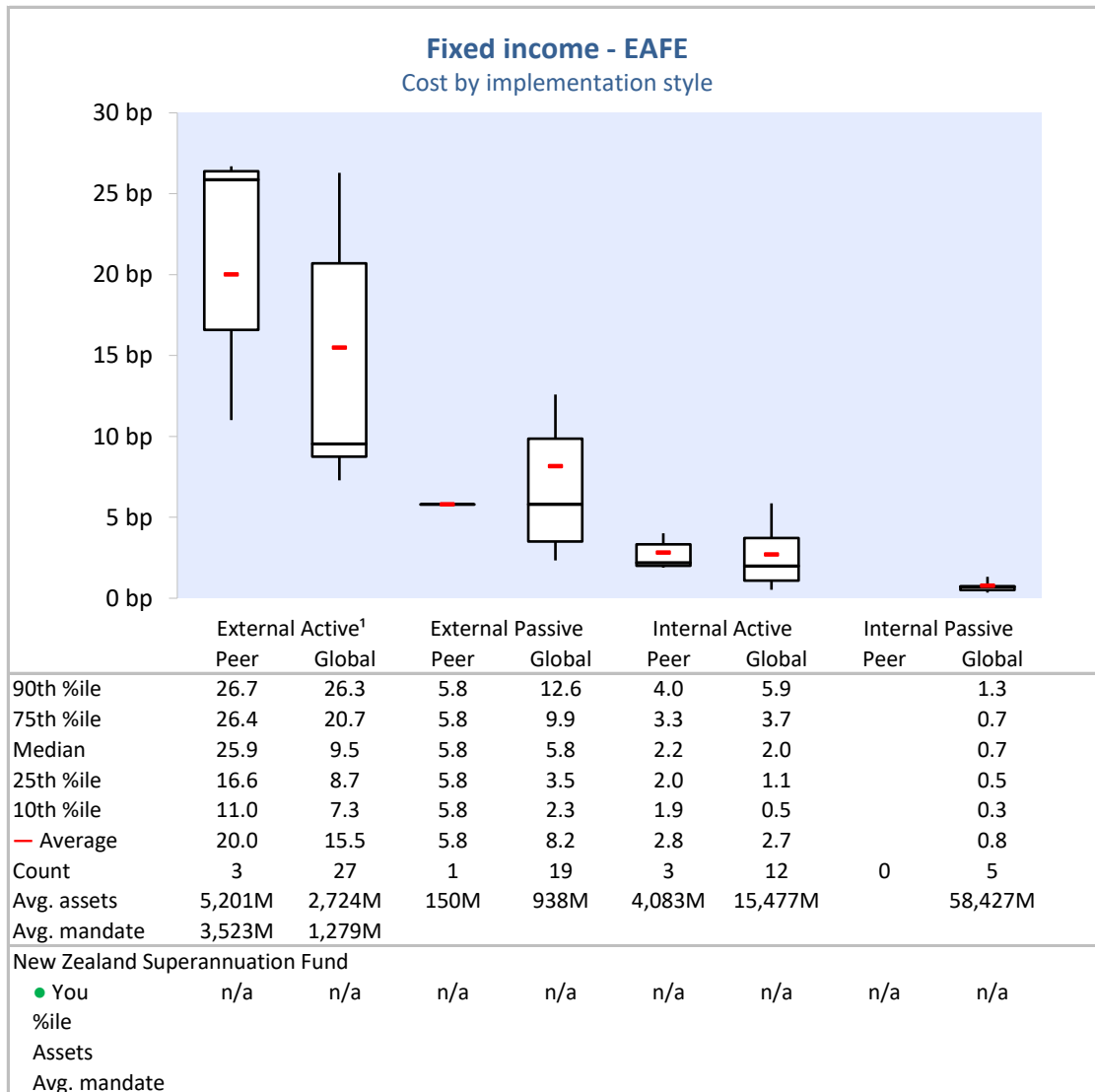
* For funds that did not report a performance fee, a value of 'zero' was used. The average performance fee for those funds that reported a performance fee is 2.8 bps for peers (1 fund) and 10.0 bps for Global participants (19 funds).



1. Breakdown of external active fees

	You	Peer Average	Global Average
Base fees	n/a	18.4	20.4
Performance fees*	n/a	0.0	1.4
Internal and other	<u>n/a</u>	<u>n/a</u>	<u>0.3</u>
Total	n/a	18.4	22.1

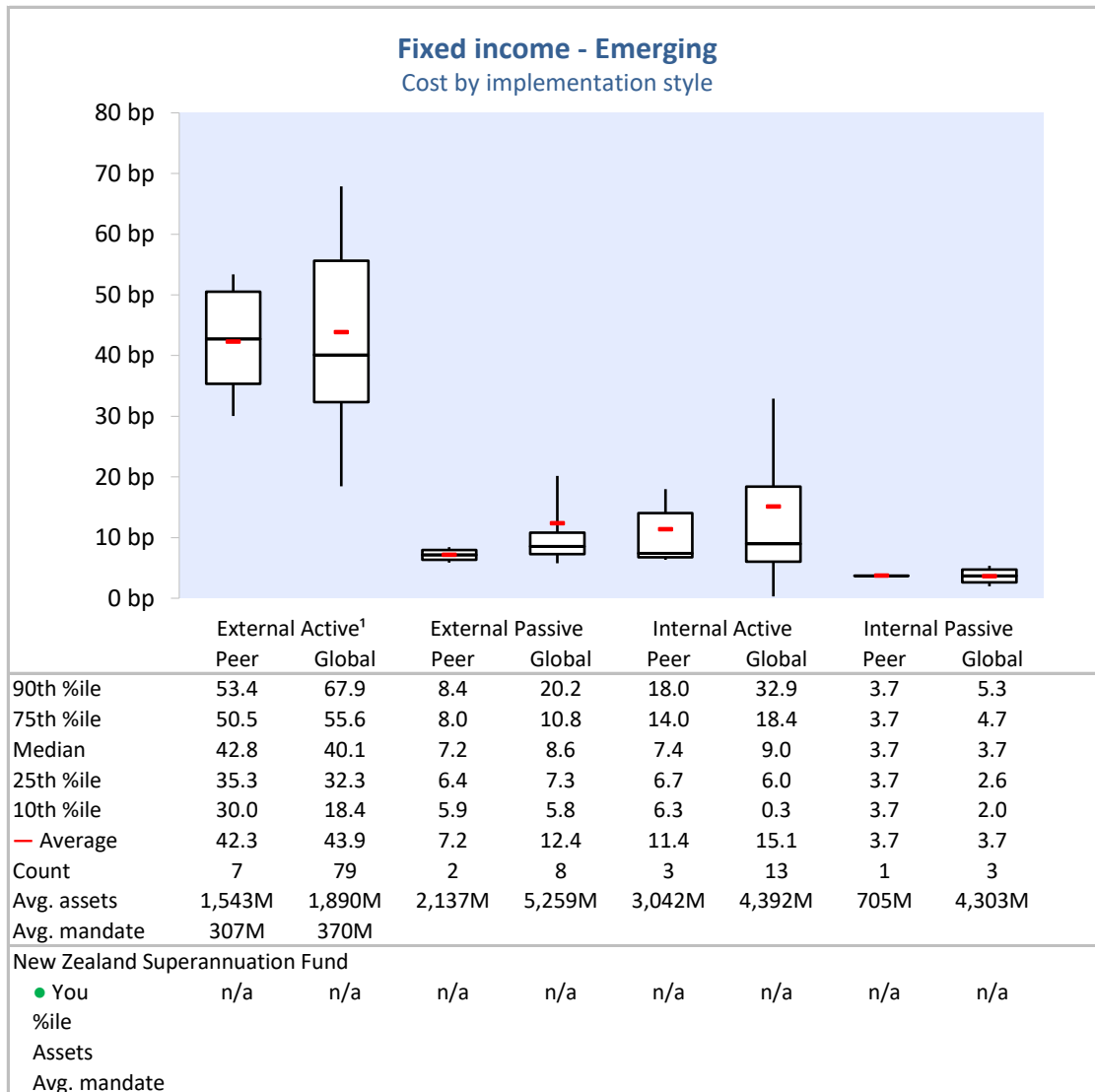
* For funds that did not report a performance fee, a value of 'zero' was used. The average performance fee for those funds that reported a performance fee is 0.0 bps for peers (1 fund) and 6.0 bps for Global participants (21 funds).



1. Breakdown of external active fees

	You	Peer Average	Global Average
Base fees	n/a	19.6	14.1
Performance fees*	n/a	n/a	0.5
Internal and other	<u>n/a</u>	<u>0.4</u>	<u>0.9</u>
Total	n/a	20.0	15.5

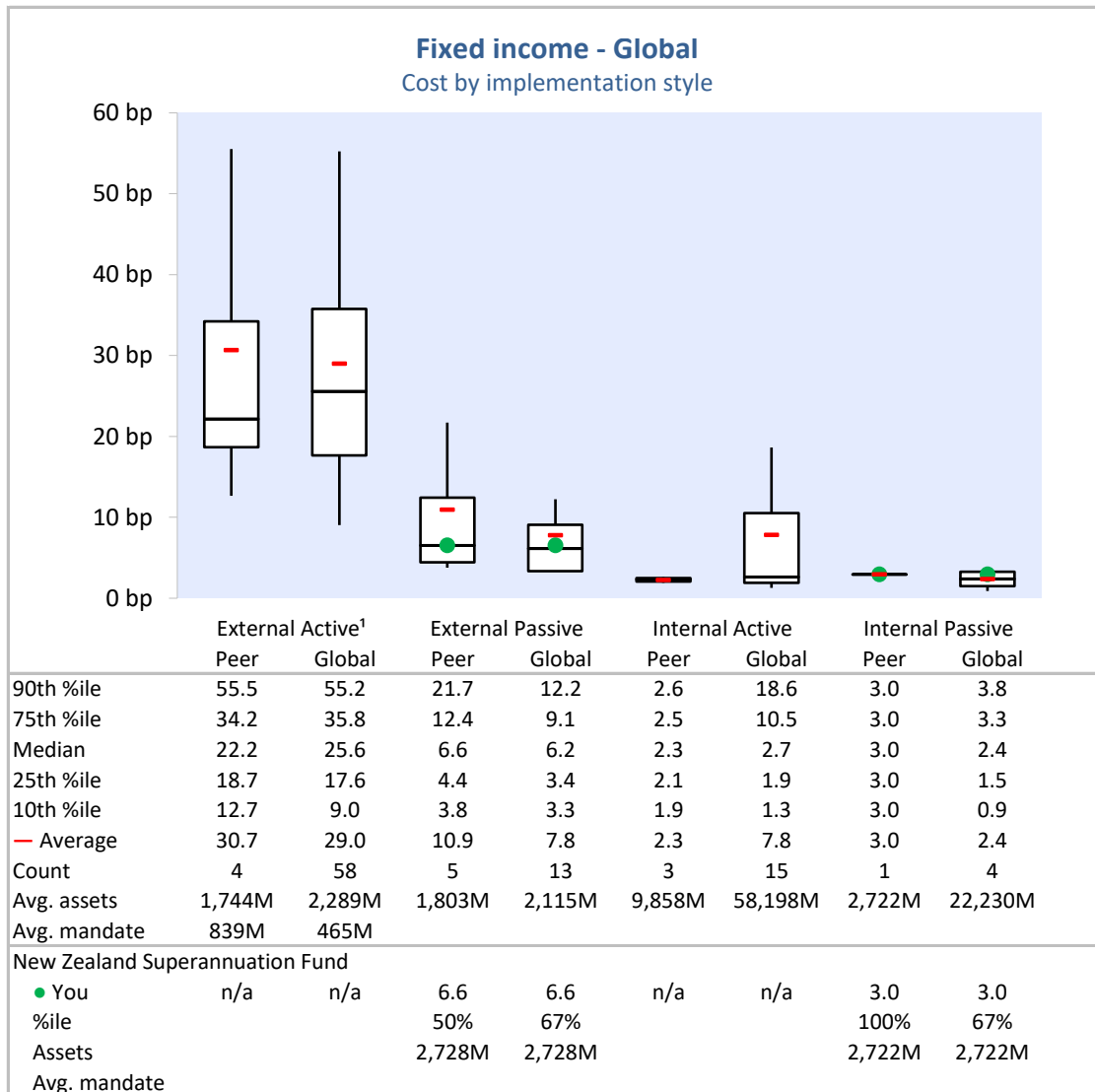
* For funds that did not report a performance fee, a value of 'zero' was used. The average performance fee for those funds that reported a performance fee is 0.9 bps for Global participants (15 funds).



1. Breakdown of external active fees

	You	Peer Average	Global Average
Base fees	n/a	38.8	39.5
Performance fees*	n/a	0.6	1.4
Internal and other	<u>n/a</u>	<u>3.0</u>	<u>3.0</u>
Total	n/a	42.3	43.9

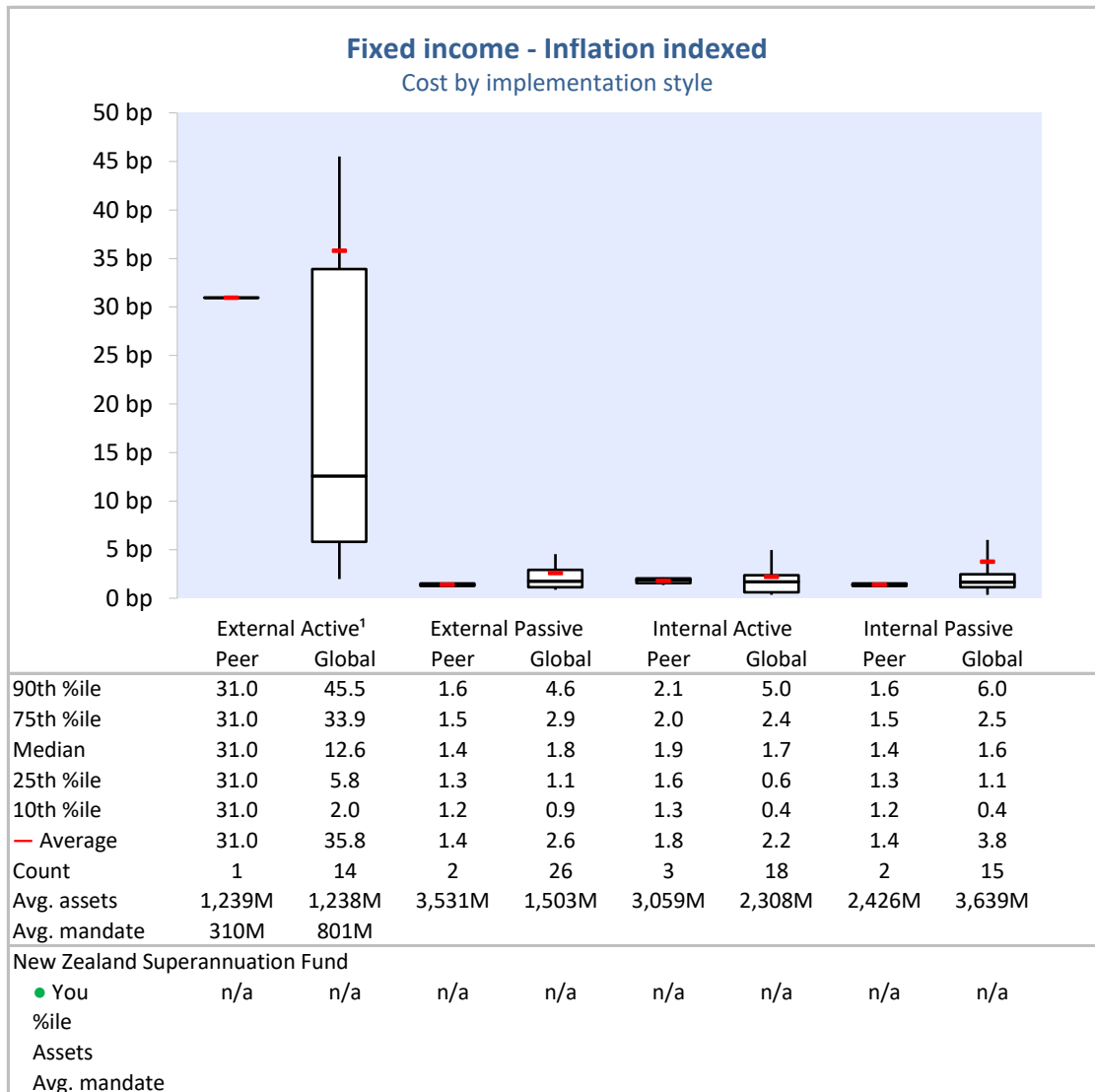
* For funds that did not report a performance fee, a value of 'zero' was used. The average performance fee for those funds that reported a performance fee is 1.0 bps for peers (4 funds) and 4.3 bps for Global participants (25 funds).



1. Breakdown of external active fees

	You	Peer Average	Global Average
Base fees	n/a	23.5	26.0
Performance fees*	n/a	3.7	0.9
Internal and other	<u>n/a</u>	<u>3.5</u>	<u>2.1</u>
Total	n/a	30.7	29.0

* 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 4.9 bps for peers (3 funds) and 2.9 bps for Global participants (18 funds).

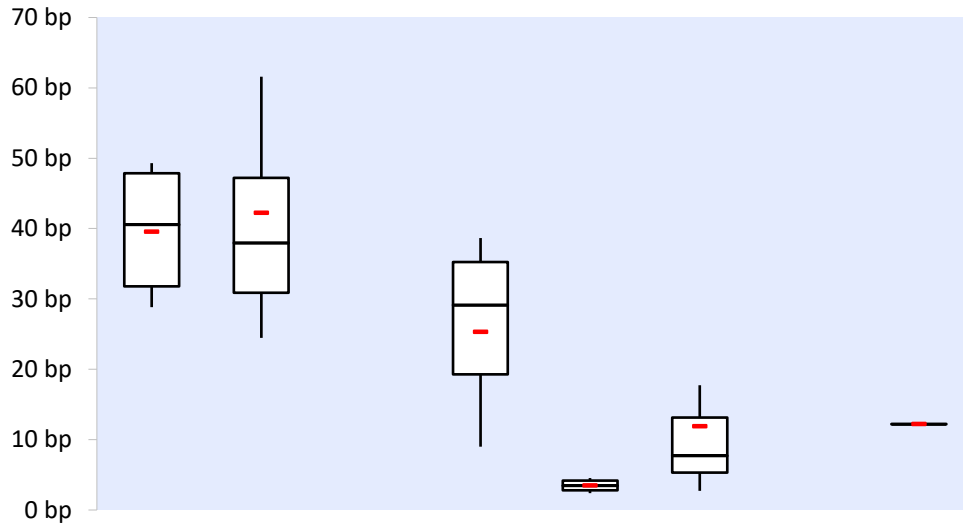


1. Breakdown of external active fees

	You	Peer Average	Global Average
Base fees	n/a	26.3	34.2
Performance fees*	n/a	4.3	1.5
Internal and other	<u>n/a</u>	<u>0.4</u>	<u>0.1</u>
Total	n/a	31.0	35.8

* 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 4.3 bps for peers (1 fund) and 10.4 bps for Global participants (2 funds).

Fixed income - High yield
Cost by implementation style



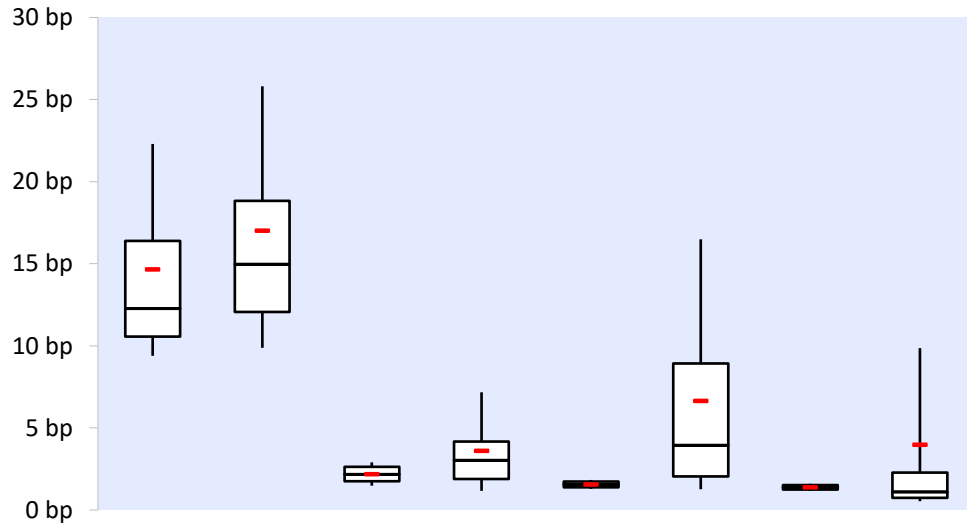
	External Active ¹		External Passive		Internal Active		Internal Passive	
	Peer	Global	Peer	Global	Peer	Global	Peer	Global
90th %ile	49.3	61.6		38.7	4.6	17.7		12.2
75th %ile	47.9	47.2		35.2	4.2	13.1		12.2
Median	40.6	38.0		29.2	3.5	7.7		12.2
25th %ile	31.8	30.9		19.3	2.8	5.3		12.2
10th %ile	28.8	24.5		9.0	2.4	2.7		12.2
— Average	39.6	42.3		25.4	3.5	11.9		12.2
Count	6	89	0	4	2	14	0	1
Avg. assets	1,067M	1,486M		1,468M	163M	3,218M		2,081M
Avg. mandate	665M	359M						
New Zealand Superannuation Fund								
● 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	34.7	36.8
Performance fees*	n/a	1.4	3.3
Internal and other	<u>n/a</u>	<u>3.5</u>	<u>2.2</u>
Total	n/a	39.6	42.3

* 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 4.1 bps for peers (2 funds) and 12.9 bps for Global participants (23 funds).

Fixed income - Long bonds Cost by implementation style



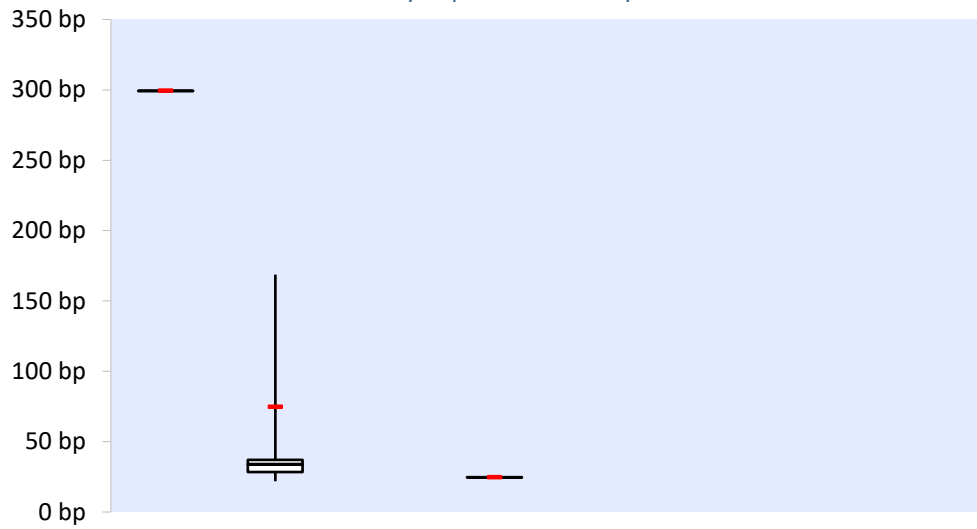
	External Active ¹		External Passive		Internal Active		Internal Passive	
	Peer	Global	Peer	Global	Peer	Global	Peer	Global
90th %ile	22.3	25.8	2.9	7.2	1.8	16.5	1.6	9.9
75th %ile	16.4	18.8	2.6	4.2	1.7	8.9	1.5	2.3
Median	12.3	15.0	2.2	3.0	1.6	4.0	1.4	1.1
25th %ile	10.6	12.1	1.7	1.9	1.4	2.0	1.2	0.7
10th %ile	9.4	9.9	1.5	1.2	1.3	1.3	1.2	0.5
— Average	14.7	17.0	2.2	3.6	1.6	6.6	1.4	4.0
Count	6	90	2	36	2	14	2	9
Avg. assets	16,289M	6,898M	458M	565M	4,751M	4,374M	11,728M	10,152M
Avg. mandate	2,038M	1,167M						
New Zealand Superannuation Fund								
● 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	10.0	15.8
Performance fees*	n/a	1.9	0.9
Internal and other	<u>n/a</u>	<u>2.7</u>	<u>0.3</u>
Total	n/a	14.7	17.0

* 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 3.9 bps for peers (3 funds) and 5.8 bps for Global participants (14 funds).

Fixed income - Absolute return bonds Cost by implementation style



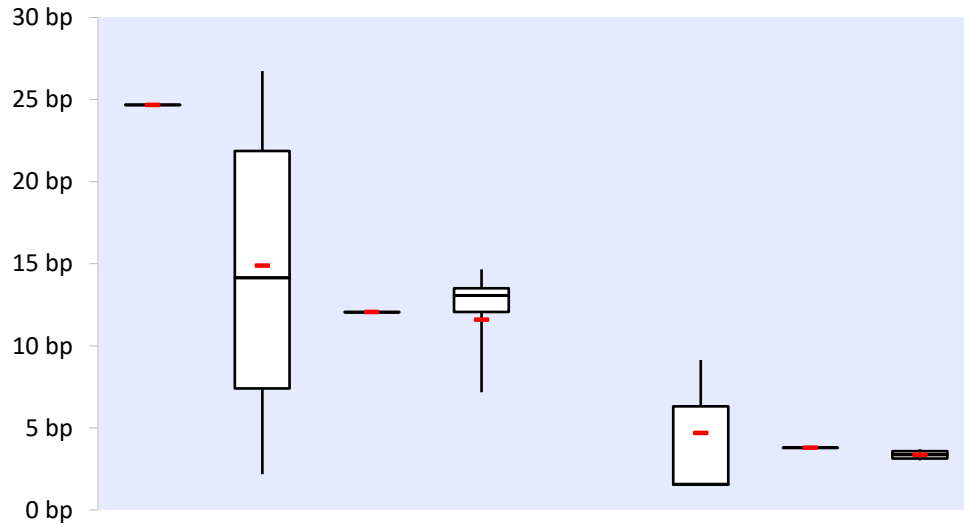
	External Active ¹		External Passive		Internal Active		Internal Passive	
	Peer	Global	Peer	Global	Peer	Global	Peer	Global
90th %ile	299.4	168.7		24.8				
75th %ile	299.4	37.1		24.8				
Median	299.4	34.1		24.8				
25th %ile	299.4	28.4		24.8				
10th %ile	299.4	21.9		24.8				
— Average	299.4	74.9		24.8				
Count	1	6	0	1	0	0	0	0
Avg. assets	2,540M	767M		238M				
Avg. mandate								
New Zealand Superannuation Fund								
● 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	39.6	29.6
Performance fees*	n/a	259.8	43.3
Internal and other	<u>n/a</u>	<u>n/a</u>	<u>2.0</u>
Total	n/a	299.4	74.9

* 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 259.8 bps for peers (1 fund) and 129.9 bps for Global participants (2 funds).

Fixed income - Bundled LDI Cost by implementation style



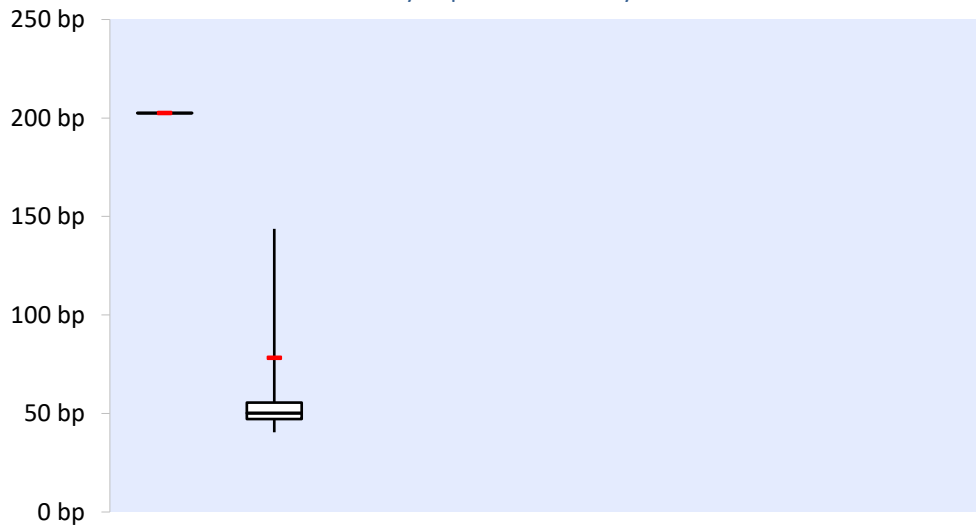
	External Active ¹		External Passive		Internal Active		Internal Passive	
	Peer	Global	Peer	Global	Peer	Global	Peer	Global
90th %ile	24.7	26.7	12.1	14.7		9.1	3.8	3.7
75th %ile	24.7	21.9	12.1	13.5		6.3	3.8	3.6
Median	24.7	14.1	12.1	13.1		1.6	3.8	3.4
25th %ile	24.7	7.4	12.1	12.1		1.5	3.8	3.1
10th %ile	24.7	2.2	12.1	7.2		1.5	3.8	3.0
— Average	24.7	14.9	12.1	11.6		4.7	3.8	3.4
Count	1	16	1	5	0	3	1	2
Avg. assets	3,957M	6,952M	1,457M	11,618M		68,451M	23,129M	13,510M
Avg. mandate	989M	924M						
New Zealand Superannuation Fund								
● 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	20.6	14.3
Performance fees*	n/a	0.0	0.0
Internal and other	<u>n/a</u>	<u>4.1</u>	<u>0.6</u>
Total	n/a	24.7	14.9

* 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 0.0 bps for peers (1 fund) and 0.0 bps for Global participants (2 funds).

Fixed income - Convertibles Cost by implementation style

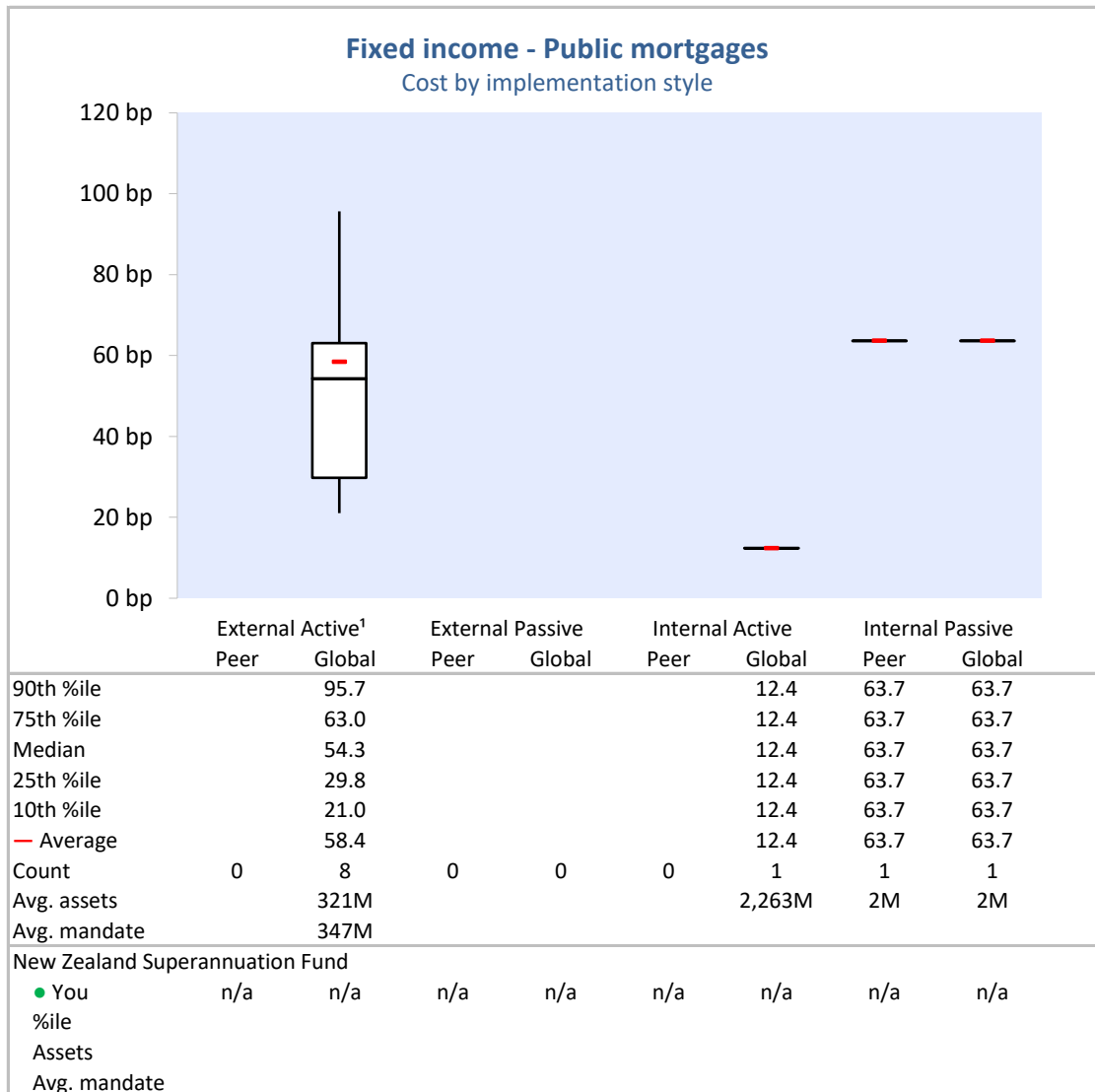


	External Active ¹		External Passive		Internal Active		Internal Passive	
	Peer	Global	Peer	Global	Peer	Global	Peer	Global
90th %ile	202.6	143.7						
75th %ile	202.6	55.5						
Median	202.6	50.3						
25th %ile	202.6	47.2						
10th %ile	202.6	40.5						
— Average	202.6	78.3						
Count	1	5	0	0	0	0	0	0
Avg. assets	111M	966M						
Avg. mandate		183M						
New Zealand Superannuation Fund								
● 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	55.2	48.8
Performance fees*	n/a	146.6	29.3
Internal and other	<u>n/a</u>	<u>0.8</u>	<u>0.2</u>
Total	n/a	202.6	78.3

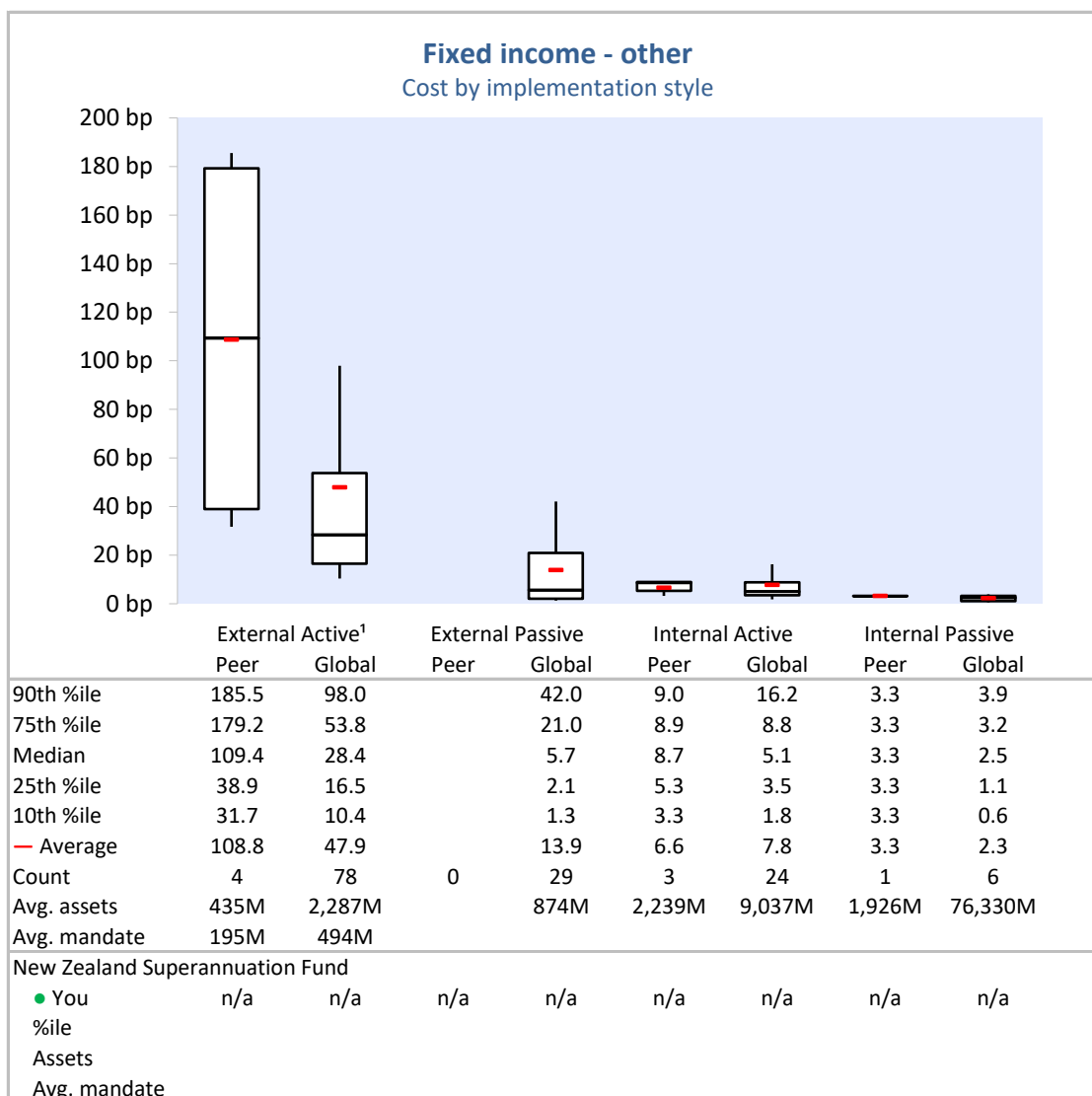
* For funds that did not report a performance fee, a value of 'zero' was used. The average performance fee for those funds that reported a performance fee is 146.6 bps for peers (1 fund) and 146.6 bps for Global participants (1 fund).



1. Breakdown of external active fees

	You	Peer Average	Global Average
Base fees	n/a	n/a	58.3
Performance fees*	n/a	n/a	0.0
Internal and other	<u>n/a</u>	<u>n/a</u>	<u>0.2</u>
Total	n/a	n/a	58.4

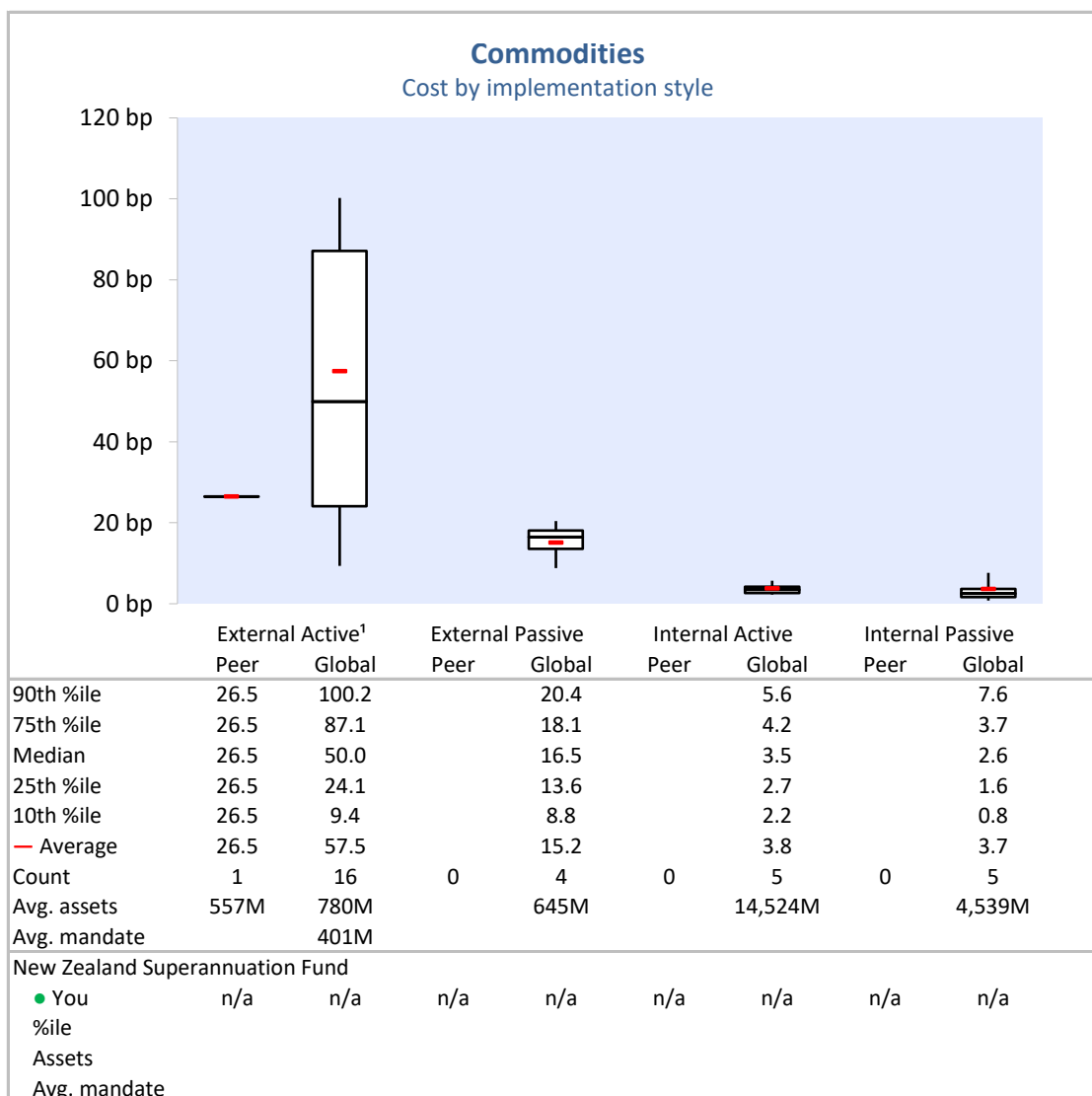
* For funds that did not report a performance fee, a value of 'zero' was used. The average performance fee for those funds that reported a performance fee is 0.0 bps for Global participants (1 fund).



1. Breakdown of external active fees

	You	Peer Average	Global Average
Base fees	n/a	79.9	39.7
Performance fees*	n/a	27.2	7.5
Internal and other	<u>n/a</u>	<u>1.6</u>	<u>0.8</u>
Total	n/a	108.8	47.9

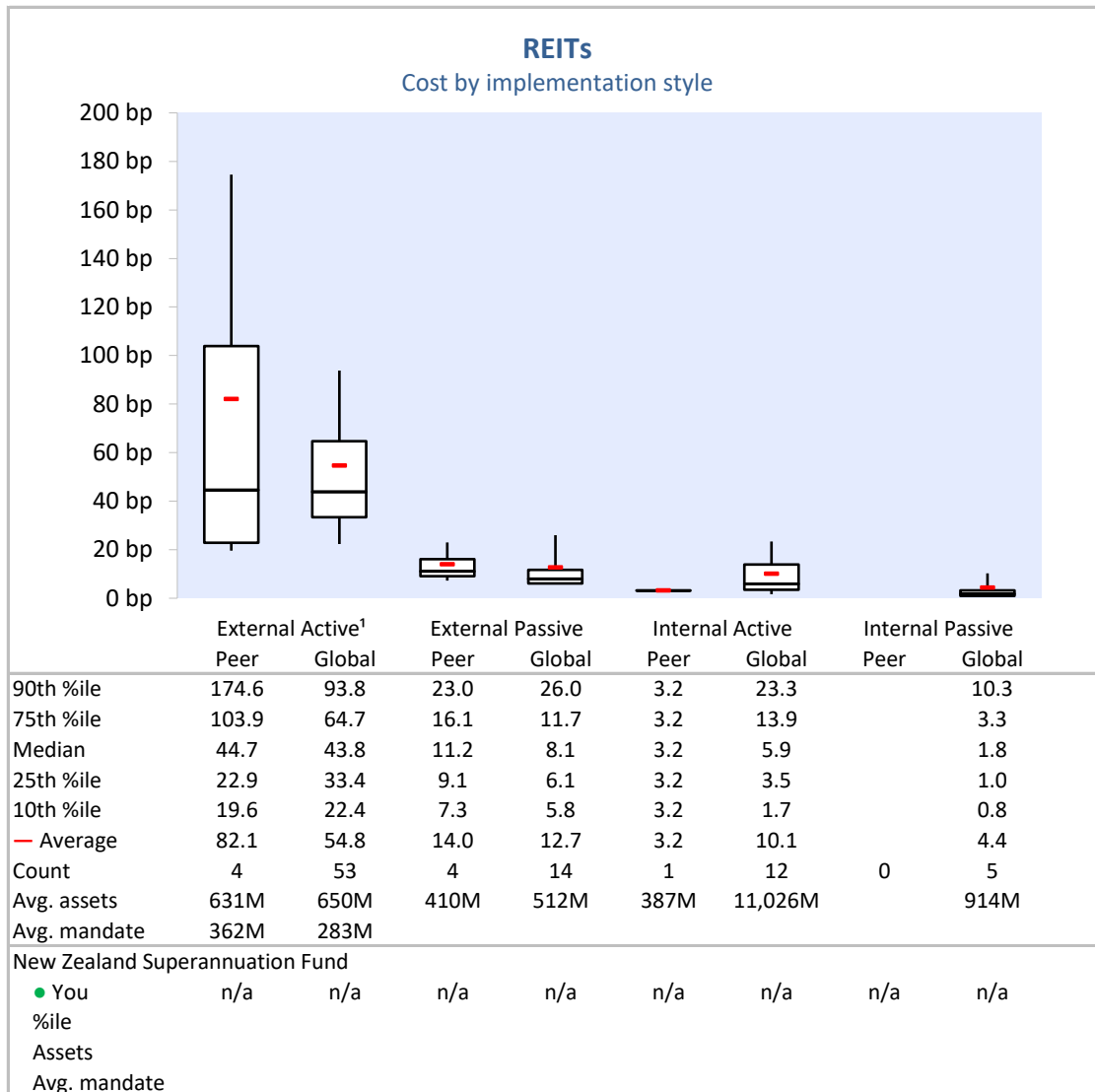
* For funds that did not report a performance fee, a value of 'zero' was used. The average performance fee for those funds that reported a performance fee is 36.3 bps for peers (3 funds) and 32.4 bps for Global participants (18 funds).



1. Breakdown of external active fees

	You	Peer Average	Global Average
Base fees	n/a	26.5	53.6
Performance fees*	n/a	n/a	3.3
Internal and other	<u>n/a</u>	<u>n/a</u>	<u>0.6</u>
Total	n/a	26.5	57.5

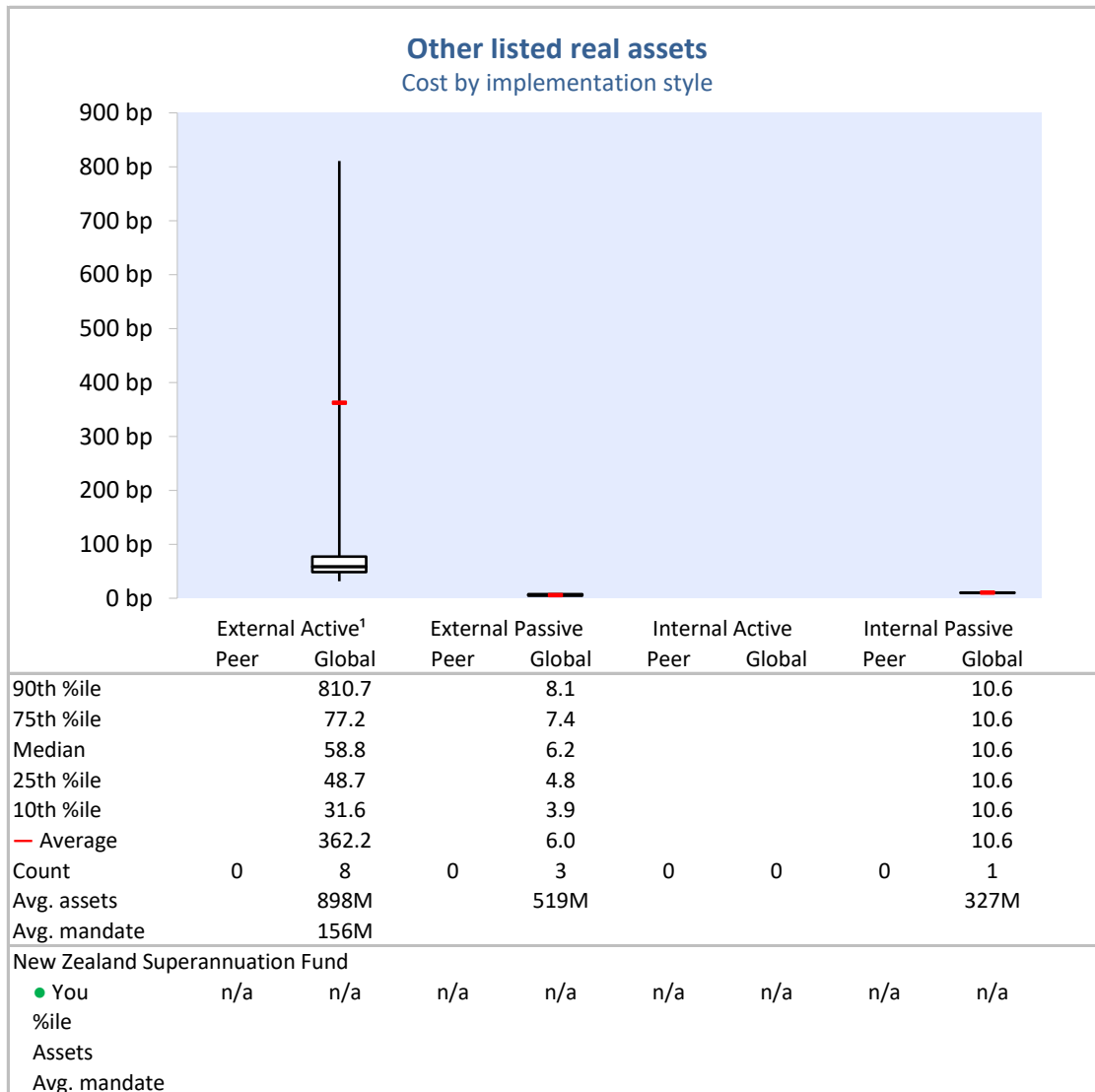
* For funds that did not report a performance fee, a value of 'zero' was used. The average performance fee for those funds that reported a performance fee is 8.7 bps for Global participants (6 funds).



1. Breakdown of external active fees

	You	Peer Average	Global Average
Base fees	n/a	25.1	42.6
Performance fees*	n/a	55.8	10.1
Internal and other	<u>n/a</u>	<u>1.1</u>	<u>2.0</u>
Total	n/a	82.1	54.8

* 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 74.4 bps for peers (3 funds) and 25.6 bps for Global participants (21 funds).



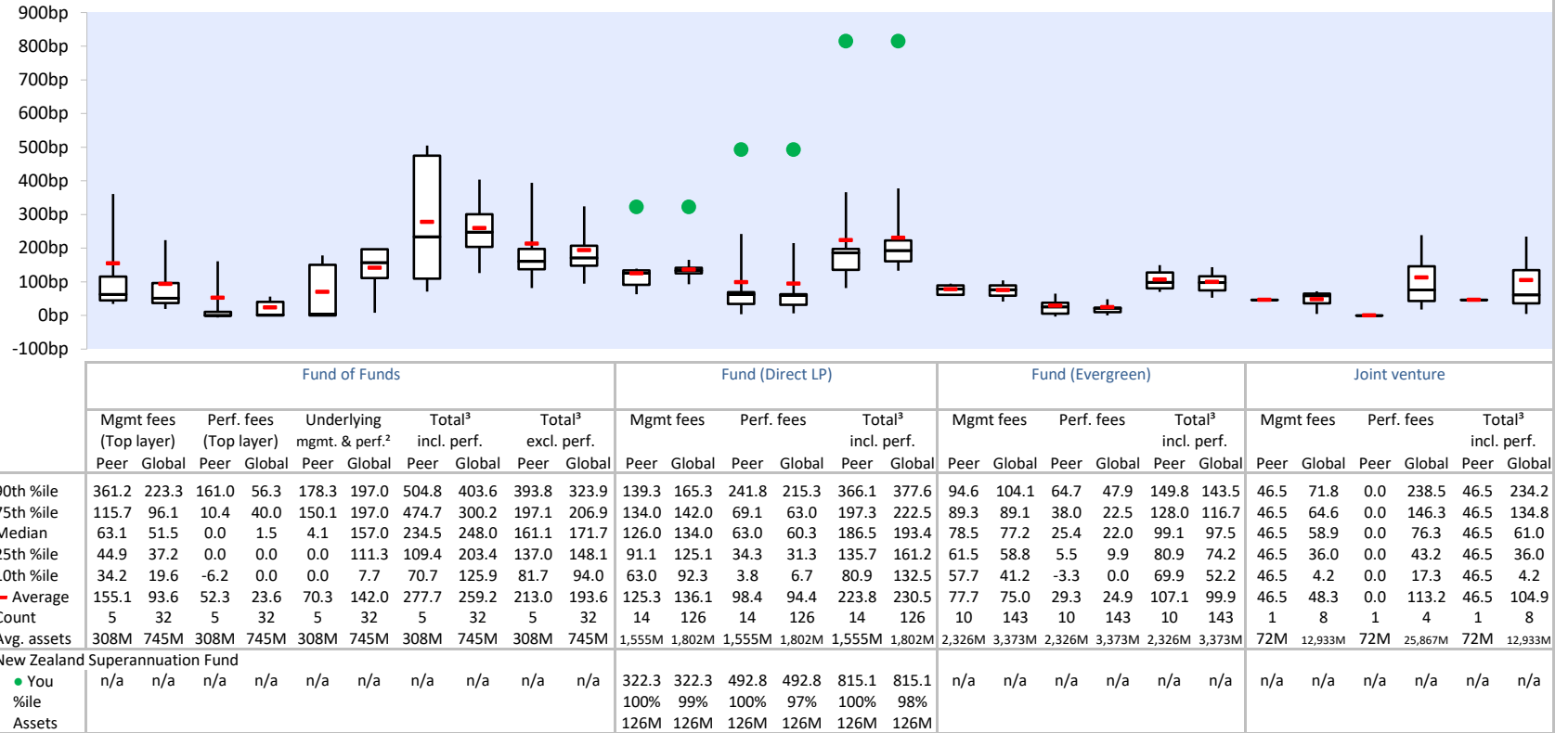
1. Breakdown of external active fees

	You	Peer Average	Global Average
Base fees	n/a	n/a	72.1
Performance fees*	n/a	n/a	288.5
Internal and other	<u>n/a</u>	<u>n/a</u>	<u>1.7</u>
Total	n/a	n/a	362.2

* 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 769.3 bps for Global participants (3 funds).

Real estate ex-REITs

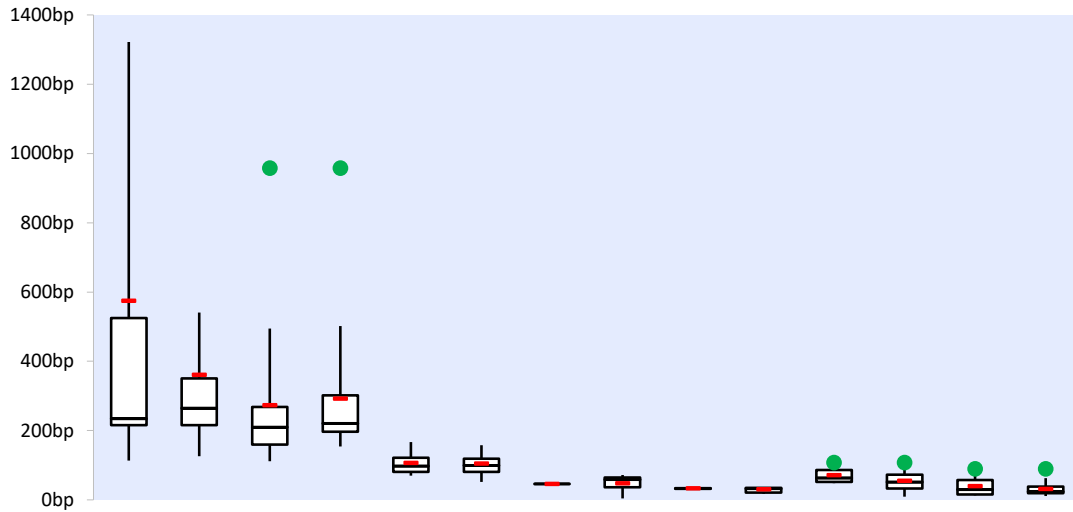
Cost as a % of the amount fees are based on¹



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 21 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. Your cost of monitoring and selecting was 234.9 bps for LPs. The peer average cost of monitoring and selecting was 1.0 bps for fund of funds, 27.0 bps for LPs and 5.3 bps for external (not LPs).

Real estate ex-REITs - contd.

Cost as a % of NAV



	Fund of Funds		Fund (Direct LP)		Fund (Evergreen)		Joint venture		Oper. Sub.		Co-Inv.		Internal	
	Total ¹ incl. perf.		Total ¹ incl. perf.		Total ¹ incl. perf.		Total ¹ incl. perf.		Total ¹ incl. perf.		Total ¹ incl. perf.		Total	
	Peer	Global	Peer	Global	Peer	Global	Peer	Global	Peer	Global	Peer	Global	Peer	Global
90th %ile	1321.9	540.3	494.4	502.0	166.9	157.7	46.5	71.8	33.9	35.7	99.5	88.3	76.6	62.6
75th %ile	524.9	350.9	268.6	301.7	121.5	118.9	46.5	64.6	33.6	34.6	86.6	73.1	57.3	38.1
Median	234.5	265.2	210.0	220.8	97.9	100.0	46.5	58.9	33.0	33.0	63.7	51.7	30.2	23.9
25th %ile	215.9	215.6	159.3	197.0	80.9	80.5	46.5	36.0	33.0	21.3	51.4	33.2	15.6	19.2
10th %ile	113.3	125.9	111.6	153.9	69.9	52.2	46.5	4.2	33.0	17.3	48.6	9.6	12.5	10.9
— Average	574.7	361.7	273.6	292.8	107.0	104.9	46.5	48.3	33.4	30.8	71.3	55.8	39.8	32.2
Count	5	32	14	124	10	143	1	8	3	12	5	30	6	32
Avg. assets	156M	566M	1,272M	1,450M	2,336M	2,920M	72M	12,933M	9,263M	13,479M	404M	1,206M	1,322M	5,580M
New Zealand Superannuation Fund														
● You	n/a	n/a	958.0	958.0	n/a	n/a	n/a	n/a	n/a	n/a	108.1	108.1	89.7	89.7
%ile			100%	97%							100%	97%	100%	97%
Assets			107M	107M							306M	306M	114M	114M

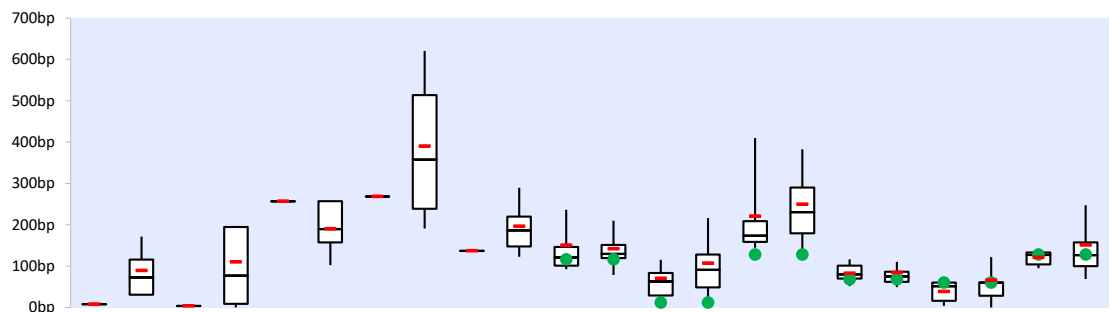
1. The total cost also includes the internal cost of monitoring and selecting real estate investments.

2. Co-investment is included with direct LPs because it can only be done alongside direct LPs. Co-investment is done by 4 of your peers and 23 of the Global funds.

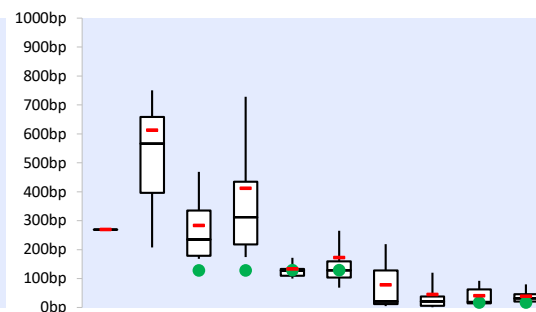
3. The total cost also includes the internal cost of monitoring and selecting real estate investments. Internal and other - FoFs The peer average cost of monitoring and selecting was 1.0 bps for fund of funds, 27.0 bps for LPs and 5.3 bps for external (not LPs).

Infrastructure

Cost as a % of the amount fees are based on¹



Cost as a % of NAV



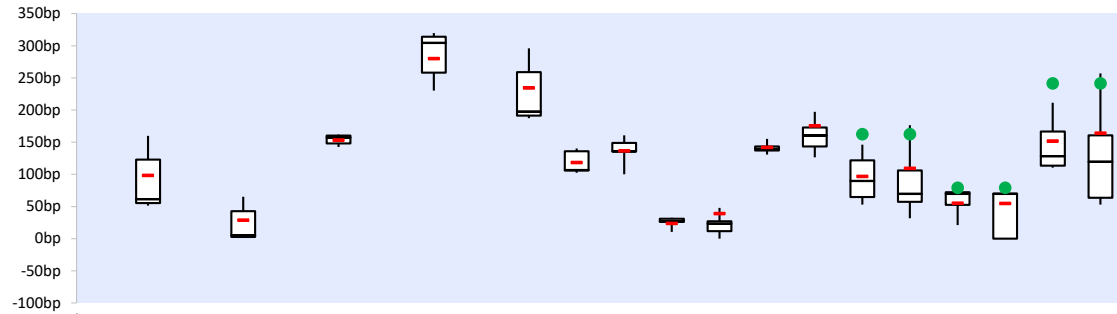
	Fund of Funds										Fund (Direct LP)						Fund (Evergreen)						Co-Inv.		Internal									
	Mgmt fees (Top layer)		Perf. fees (Top layer)		Underlying mgmt. & perf. ²		Total ³ incl. perf.		Total ³ excl. perf.		Mgmt fees		Perf. fees		Total ³ incl. perf.		Mgmt fees		Perf. fees		Total ³ incl. perf.		Total		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								
90th %ile	8.0	171.6	4.0	195.0	257.0	257.0	269.1	620.7	137.0	289.7	236.5	210.1	115.2	216.3	410.0	382.8	116.4	110.4	60.8	122.3	141.6	247.4	269.1	750.4	469.0	728.5	171.3	265.2	218.8	120.0	92.2	80.3		
75th %ile	8.0	115.8	4.0	195.0	257.0	257.0	269.1	513.7	137.0	220.1	146.5	151.3	83.2	128.0	209.0	290.2	101.0	86.5	60.0	60.0	132.8	157.4	269.1	658.4	335.2	435.0	132.8	159.7	127.9	38.1	62.7	45.6		
Median	8.0	73.3	4.0	77.4	257.0	189.6	269.1	357.9	137.0	186.8	121.5	129.6	63.1	91.3	174.2	230.7	80.1	75.6	51.4	60.0	127.5	126.7	269.1	566.7	235.5	311.9	127.5	128.4	21.1	21.1	19.5	31.5		
25th %ile	8.0	30.6	4.0	8.9	257.0	157.3	269.1	238.7	137.0	148.0	101.4	119.3	28.7	48.8	158.9	179.8	69.8	61.8	16.2	28.6	104.0	100.2	269.1	395.8	178.9	218.2	109.4	103.6	11.4	5.8	14.6	20.2		
10th %ile	8.0	29.9	4.0	0.0	257.0	102.5	269.1	190.8	137.0	122.5	92.8	78.6	6.2	17.2	144.5	129.0	51.6	49.0	3.7	0.0	94.9	68.8	269.1	207.3	168.4	174.4	100.0	68.8	5.1	0.8	9.8	7.8		
— Average	8.0	89.8	4.0	110.2	257.0	190.4	269.1	390.3	137.0	196.5	150.5	142.3	70.7	107.4	221.2	249.7	82.7	84.6	38.6	66.6	121.3	151.2	269.1	613.2	283.8	411.6	132.9	172.7	78.5	45.3	40.5	38.6		
Count	1	24	1	24	1	24	1	24	1	24	10	110	10	110	10	110	6	57	6	57	6	57	1	24	10	108	6	57	7	35	6	29		
Avg. assets	103M	143M	103M	143M	103M	143M	103M	143M	103M	143M	1,269M	1,087M	1,269M	1,087M	1,269M	1,087M	1,768M	1,501M	1,768M	1,501M	1,768M	1,501M	103M	101M	958M	834M	1,740M	1,367M	369M	772M	746M	9,304M		
New Zealand Superannuation Fund																																		
● You	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	116.5	116.5	11.8	11.8	128.2	128.2	68.4	68.4	60.0	60.0	128.4	128.4	n/a	n/a	n/a	n/a	128.2	128.2	128.4	128.4	16.7	16.7		
%ile											44%	22%	11%	8%		8%	20%	34%	60%	43%	60%	54%			0%	6%	60%	50%	n/a	n/a	40%	21%		
Assets											217M	217M	217M	217M	217M	217M	277M	277M	277M	277M	277M	277M	0M	0M	0M	0M	217M	217M	277M	277M	0M	0M	409M	409M

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 129 bps (on amount fees are based on) for underlying management fees and 128 bps (on NAV) for underlying performance fees were used.
3. The total cost also includes the internal cost of monitoring and selecting infrastructure investments. Your cost of monitoring and selecting was 30.5 bps for LPs and 11.9 bps for external (not LPs). The peer average cost of monitoring and selecting was 10.1 bps for LPs and 4.9 bps for external (not LPs).

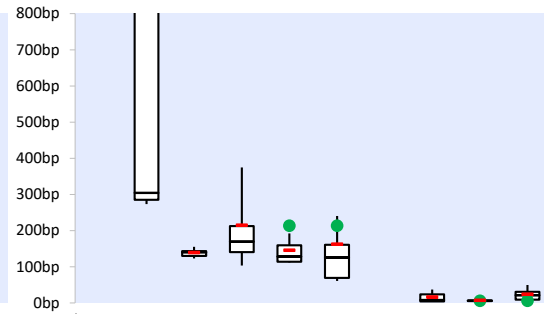
Some averages on the right chart may be off the chart where there is outlier data resulting from large base or performance fees divided by small NAV. A default of 60 bps (on NAV) was applied to the evergreen performance fee to enable comparisons of the total cost of different implementation styles. This default is not included in your total fund cost or in benchmark analysis.

Natural resources

Cost as a % of the amount fees are based on¹



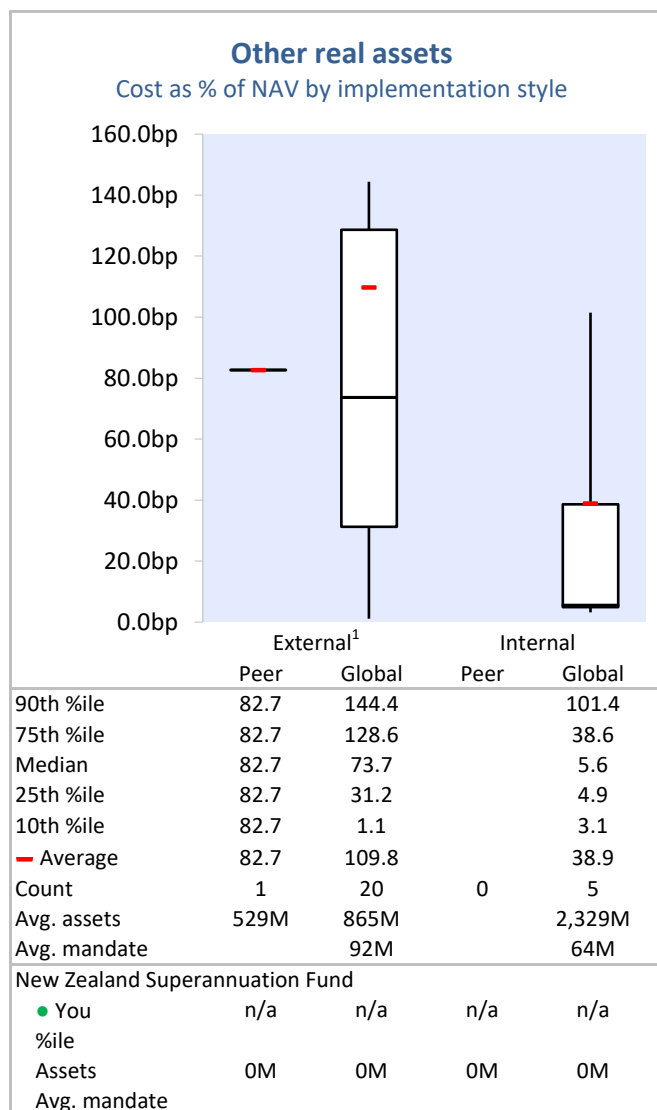
Cost as a % of NAV



	Fund of Funds										Fund (Direct LP)						Fund (Evergreen)						Co-Inv.		Internal							
	Mgmt fees (Top layer)		Perf. fees (Top layer)		Underlying mgmt. & perf. ²		Total ³ incl. perf.		Total ³ excl. perf.		Mgmt fees		Perf. fees		Total ³ incl. perf.		Mgmt fees		Perf. fees		Total ³ incl. perf.		Total incl. perf.		Total							
	Peer	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	160.0	65.1	161.9	319.7	296.0	140.4	160.8	32.4	47.9	155.1	197.3	146.0	176.3	76.4	70.0	211.3	257.0	2493.0	155.1	374.8	191.9	240.4	37.3	7.9	49.8							
75th %ile	123.1	42.6	160.3	314.0	259.1	136.0	149.1	31.1	27.0	143.4	173.1	121.7	106.1	72.3	70.0	166.5	160.5	1672.4	143.4	212.3	159.5	161.0	23.8	7.2	30.9							
Median	61.7	5.3	157.5	304.7	197.7	106.7	136.0	27.0	23.6	139.9	160.8	89.9	69.9	70.0	70.0	128.4	120.0	304.7	140.4	169.9	128.4	126.2	8.7	5.9	21.7							
25th %ile	55.2	2.6	148.2	258.1	191.2	106.0	136.0	26.3	11.6	137.1	143.4	65.0	57.1	52.5	0.0	113.5	63.7	284.9	129.8	140.4	113.9	69.3	4.2	5.9	9.1							
10th %ile	51.3	1.1	142.6	230.2	187.3	102.5	100.1	10.5	0.0	130.7	126.4	53.1	31.7	21.0	0.0	110.3	53.1	273.0	123.4	103.6	111.7	60.9	3.1	5.9	5.9							
Average	98.3	28.4	153.1	279.9	234.3	118.4	136.4	23.5	38.7	141.9	175.1	96.8	109.4	54.8	54.6	151.5	163.9	1203.3	139.1	214.6	145.1	162.5	16.4	6.7	23.6							
Count	0	3	0	3	0	3	0	3	0	3	0	3	5	41	5	41	5	41	4	27	4	27	4	27	0	7	3	10				
Avg. assets	260M		260M		260M		260M		260M		753M		1,013M		753M		1,013M		168M		368M		168M		368M		1,593M		1,940M		3,853M	
New Zealand Superannuation Fund																																
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	162.2	162.2	79.1	79.1	241.2	241.2	n/a	n/a	5.9	5.9					
%ile																		100%	88%	100%	96%	100%	88%	n/a	n/a	0	0					
Assets																		263M	263M	263M	263M	263M	263M	297M	297M	0M	0M	2,736M	2,736M			

1. The base for fees is usually the committed amount during the commitment period, and unreturned invested capital afterwards.
2. The fees of fund of funds include both the top layer fees paid to the fund of funds manager and the underlying fees paid to the 'underlying partnerships' held by the fund of funds. Most funds were unable to provide the underlying fees so defaults of n/a bps (on amount fees are based on) for underlying management fees and n/a bps (on NAV) for underlying performance fees were used.
3. The total cost also includes the internal cost of monitoring and selecting natural resource investments. Your cost of monitoring and selecting was 69.4 bps for external (not LPs). The peer average cost of monitoring and selecting was 10.7 bps for LPs and 39.8 bps for external (not LPs).

A default of 70 bps (on NAV) was applied to the evergreen performance fee to enable comparisons of the total cost of different implementation styles. This default is not included in your total fund cost or in benchmark analysis.



1. Breakdown of external fees

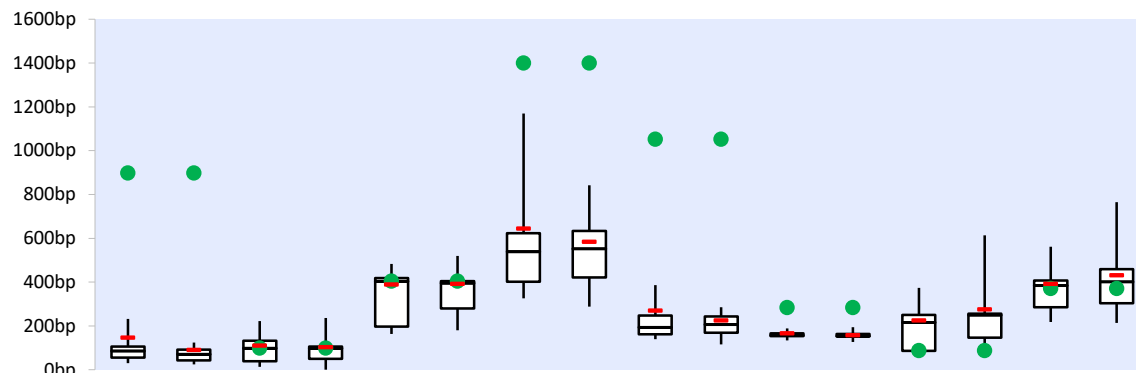
	Your Plan	Peer Average	Global Average
Base fees	n/a	79.2	102.3
Internal and other	n/a	3.5	7.5
Total*	n/a	82.7	109.8
Performance fees**	n/a	19.0	40.9

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

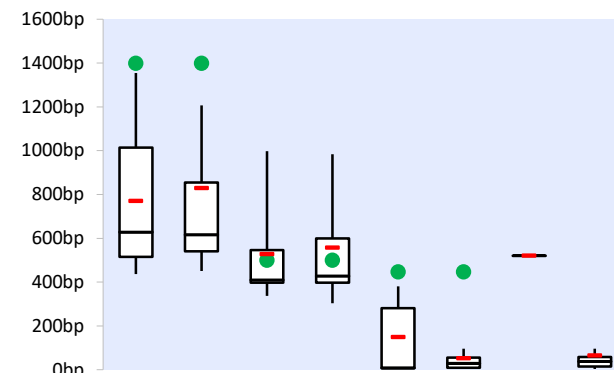
** For funds that did not report a performance fee, a default value of 25 bps was applied. The average performance fee for only those funds that reported a performance fee is 19.0 bps for peers (1 funds) and 47.7 bps for Global participants (14 funds).

Private equity - Diversified

Cost as a % of the amount fees are based on¹



Cost as a % of NAV



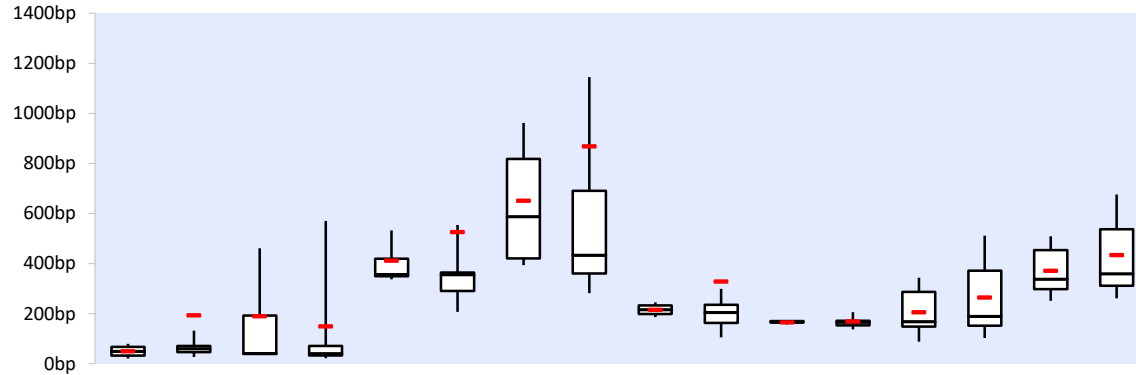
	Fund of Funds										Direct LP						Fund of Funds		Direct LP		Co-Investment		Internal	
	Mgmt fees (Top layer)		Perf. fees (Top layer)		Underlying mgmt. & perf. ²		Total ³ incl. perf.		Total ³ excl. perf.		Mgmt fees		Perf. fees		Total ³ incl. perf.		Total ³ incl. perf.		Total incl. perf.		Total			
	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	Peer	Global	Peer	Global	Peer	Global	Peer	Global	Peer	Global	Peer	Global	Peer	Global		
90th %ile	231.7	123.9	222.4	236.5	482.9	519.4	1169.5	841.4	385.7	285.4	188.2	194.2	373.2	613.0	561.4	764.5	1354.4	1206.3	997.6	983.1	380.1	96.1	521.2	96.0
75th %ile	105.7	91.6	132.0	105.0	418.2	404.0	622.5	633.4	247.6	243.4	166.4	163.8	250.0	255.4	407.2	458.5	1013.9	854.6	546.3	599.2	281.1	54.8	521.2	57.6
Median	86.0	71.1	99.3	98.0	404.0	396.5	539.2	552.3	194.3	206.4	158.0	154.0	216.9	250.0	384.1	401.9	628.7	616.5	410.5	428.4	8.3	30.5	521.2	38.8
25th %ile	55.2	42.4	38.6	49.8	196.6	279.0	401.4	421.3	162.3	168.2	152.6	153.7	86.1	146.8	284.5	303.1	514.9	540.7	398.0	397.9	7.3	8.2	521.2	14.2
10th %ile	30.3	24.4	12.8	0.0	163.4	180.6	326.0	287.9	139.5	115.2	133.2	127.1	70.4	56.1	217.2	213.3	435.9	449.9	336.9	304.0	4.3	5.2	521.2	3.3
Average	146.6	89.9	109.2	102.3	388.5	391.4	644.3	583.5	269.5	225.3	166.0	156.8	225.1	274.7	391.2	431.5	771.0	829.3	527.7	557.0	149.0	52.0	521.2	64.3
Count	14	110	14	110	14	110	14	110	14	110	12	157	12	157	12	157	14	110	12	155	5	36	1	20
Avg. assets	1,112M	1,157M	1,112M	1,157M	1,112M	1,157M	1,112M	1,157M	1,112M	1,157M	2,690M	4,517M	2,690M	4,517M	2,690M	4,517M	957M	1,124M	2,450M	3,977M	285M	2,859M	9M	7,733M
New Zealand Superannuation Fund																								
● You	898.2	898.2	98.1	98.1	404.2	404.2	1400.5	1400.5	1052.2	1052.2	284.2	284.2	87.1	87.1	371.4	371.4	1399.2	1399.2	499.2	499.2	446.0	446.0	n/a	n/a
%ile	100%	100%	46%	70%	69%	77%	92%	98%	100%	100%	100%	99%	27%	15%	45%	42%	92%	96%	73%	65%	100%	100%		
Assets	11M	11M	11M	11M	11M	11M	11M	11M	11M	11M	449M	449M	449M	449M	449M	449M	11M	11M	334M	334M	14M	14M	0M	0M

- The base for fees is usually the committed amount during the commitment period, and unreturned invested capital afterwards.
- The fees of fund of funds include both the top layer fees paid to the fund of funds manager and the underlying fees paid to the 'underlying partnerships' held by the fund of funds. Most funds were unable to provide the underlying fees so defaults of 154 bps (on amount fees are based on) for underlying management fees and 250 bps (on NAV) for underlying performance fees were used.
- The total cost also includes the internal cost of monitoring and selecting private equity investments. Your cost of monitoring and selecting was 800.9 bps for fund of funds. The peer average cost of monitoring and selecting was 86.5 bps for fund of funds.

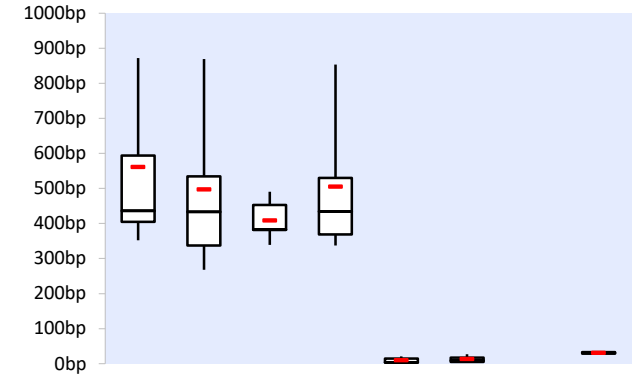
A default of 98 bps (on NAV) was applied to the fund of funds performance fee to enable comparisons of the total cost of different implementation styles. This default is not included in your total fund cost or in benchmark analysis.

LBO

Cost as a % of the amount fees are based on¹



Cost as a % of NAV



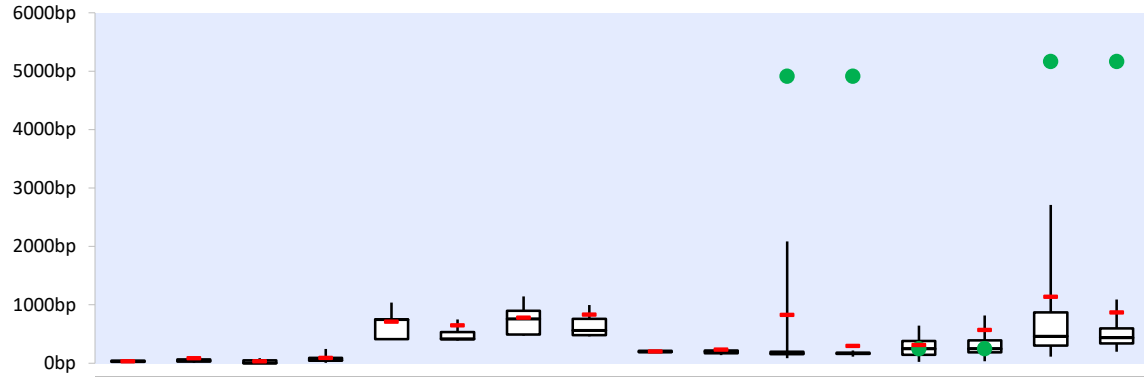
	Fund of Funds										Direct LP					
	Mgmt fees (Top layer)		Perf. fees (Top layer)		Underlying mgmt. & perf. ²		Total ³ incl. perf.		Total ³ excl. perf.		Mgmt fees		Perf. fees		Total ³ incl. perf.	
	Peer	Global	Peer	Global	Peer	Global	Peer	Global	Peer	Global	Peer	Global	Peer	Global	Peer	Global
	Peer	Global	Peer	Global	Peer	Global	Peer	Global	Peer	Global	Peer	Global	Peer	Global	Peer	Global
90th %ile	79.6	132.7	461.6	570.7	532.5	554.0	961.7	1144.8	245.6	298.7	171.3	206.4	343.3	511.5	509.1	675.4
75th %ile	67.2	70.8	192.2	70.3	419.8	363.6	817.9	690.1	233.2	234.9	170.6	171.8	287.2	371.3	453.2	537.3
Median	49.6	60.3	41.4	40.0	356.6	356.0	587.2	434.4	215.6	204.9	166.0	166.0	168.0	190.0	338.6	359.0
25th %ile	32.4	46.9	38.7	33.3	349.1	290.1	421.1	360.4	198.4	162.6	165.6	152.6	148.5	152.0	298.3	311.7
10th %ile	20.7	26.4	36.0	21.9	336.6	207.4	393.7	282.1	186.7	104.9	156.2	136.5	87.7	102.4	250.8	261.1
— Average	50.0	193.3	189.5	149.6	412.3	526.2	651.8	869.1	216.0	328.0	164.8	168.8	206.3	265.2	371.1	433.9
Count	4	15	4	15	4	15	4	15	4	15	5	33	5	33	5	33
Avg. assets	173M	738M	173M	738M	173M	738M	173M	738M	173M	738M	2,750M	6,891M	2,750M	6,891M	2,750M	6,891M
New Zealand Superannuation Fund																
● You	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
%ile																
Assets	0M	0M	0M	0M	0M	0M	0M	0M	0M	0M	0M	0M	0M	0M	0M	0M

Fund of Funds		Direct LP		Co-Investment		Internal	
Total ³ incl. perf.		Total ³ incl. perf.		Total incl. perf.		Total	
Peer	Global	Peer	Global	Peer	Global	Peer	Global
872.1	869.1	490.9	853.7	20.7	27.3		34.2
593.9	534.4	453.2	529.7	14.5	17.1		33.0
436.5	433.7	383.0	434.8	4.2	9.4		31.0
404.6	337.1	381.8	368.9	3.2	4.7		29.0
352.4	267.6	338.9	336.9	2.7	2.1		27.7
562.0	497.4	408.9	505.4	10.5	13.9		31.0
4	15	5	33	3	10	0	2
186M	673M	2,495M	5,274M	392M	2,286M		387M
n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
0M	0M	0M	0M	0M	0M	0M	0M

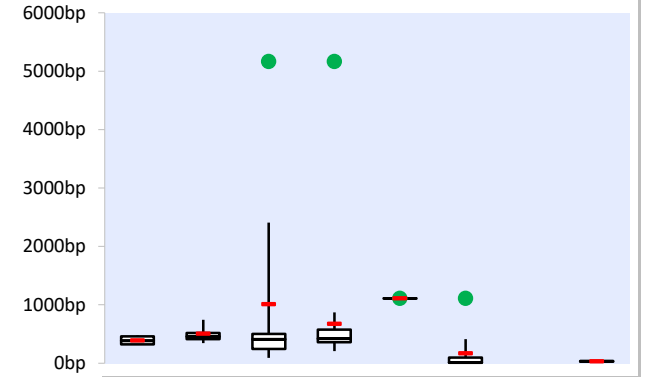
- The base for fees is usually the committed amount during the commitment period, and unreturned invested capital afterwards.
- The fees of fund of funds include both the top layer fees paid to the fund of funds manager and the underlying fees paid to the 'underlying partnerships' held by the fund of funds. Most funds were unable to provide the underlying fees so defaults of 166 bps (on amount fees are based on) for underlying management fees and 190 bps (on NAV) for underlying performance fees were used.
- The total cost also includes the internal cost of monitoring and selecting private equity investments. The peer average cost of monitoring and selecting was 7.4 bps for fund of funds.

Venture capital

Cost as a % of the amount fees are based on¹



Cost as a % of NAV



	Fund of Funds										Direct LP					
	Mgmt fees (Top layer)		Perf. fees (Top layer)		Underlying mgmt. & perf. ²		Total ³ incl. perf.		Total ³ excl. perf.		Mgmt fees		Perf. fees		Total ³ incl. perf.	
	Peer	Global	Peer	Global	Peer	Global	Peer	Global	Peer	Global	Peer	Global	Peer	Global	Peer	Global
90th %ile	57.2	111.4	88.3	243.3	1040.9	749.1	1144.0	996.1	222.2	247.9	2085.9	219.9	646.7	819.1	2710.4	1090.2
75th %ile	45.6	66.0	49.0	92.0	749.3	532.5	898.3	761.1	210.6	220.6	198.3	183.6	382.7	393.7	868.9	595.7
Median	34.5	46.3	7.4	51.9	748.7	416.0	761.1	563.2	199.5	202.9	168.6	167.1	250.0	250.0	467.1	436.7
25th %ile	26.3	29.2	0.0	49.0	415.0	415.0	490.3	483.7	191.3	173.6	155.7	164.8	145.9	187.1	301.5	337.6
10th %ile	18.0	10.6	0.0	9.9	415.0	388.5	472.5	460.8	183.0	141.3	87.8	113.1	25.0	32.6	112.8	197.4
— Average	36.7	88.2	34.2	93.6	712.7	651.0	783.6	832.8	201.7	236.7	827.4	297.2	311.6	571.4	1139.0	868.6
Count	5	24	5	24	5	24	5	24	5	24	7	36	7	36	7	36
Avg. assets	332M	504M	332M	504M	332M	504M	332M	504M	332M	504M	638M	1,176M	638M	1,176M	638M	1,176M
New Zealand Superannuation Fund																
● You %ile	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	4915.0	4915.0	250.0	250.0	5165.0	5165.0
Assets	0M	0M	0M	0M	0M	0M	0M	0M	0M	0M	1M	1M	1M	1M	1M	1M

Fund of Funds		Direct LP		Co-Investment		Internal	
Total ³ incl. perf.		Total ³ incl. perf.		Total incl. perf.		Total	
Peer	Global	Peer	Global	Peer	Global	Peer	Global
478.4	746.4	2408.0	871.0	1112.3	411.3		46.0
460.6	518.0	500.9	576.8	1112.3	98.3		41.9
384.4	462.9	415.0	422.0	1112.3	13.5		34.9
326.0	413.4	246.4	360.7	1112.3	9.7		28.0
313.7	343.7	94.6	205.7	1112.3	5.5		23.8
393.3	507.2	1010.7	674.3	1112.3	170.6		34.9
5	24	7	36	1	8	0	2
332M	504M	832M	1,219M	3M	186M		2,070M
n/a	n/a	5165.0	5165.0	1112.3	1112.3	n/a	n/a
0M	0M	1M	1M	3M	3M	0M	0M

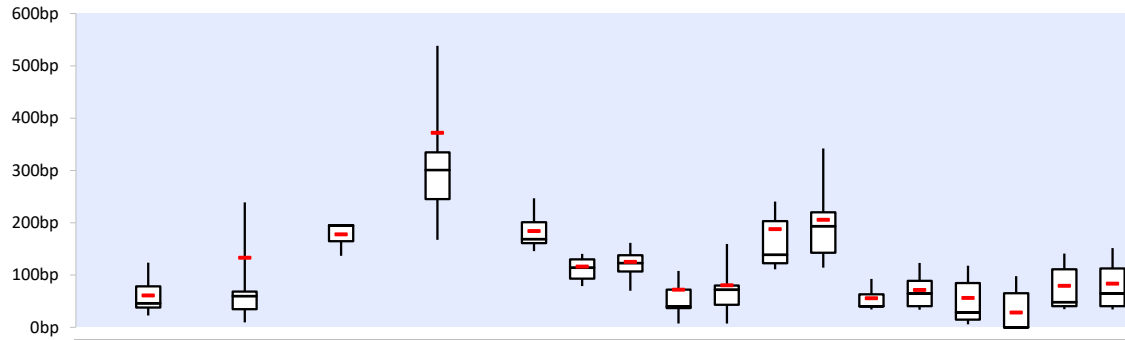
1. The base for fees is usually the committed amount during the commitment period, and unreturned invested capital afterwards.

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 165 bps (on amount fees are based on) for underlying management fees and 250 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 11.4 bps for fund of funds.

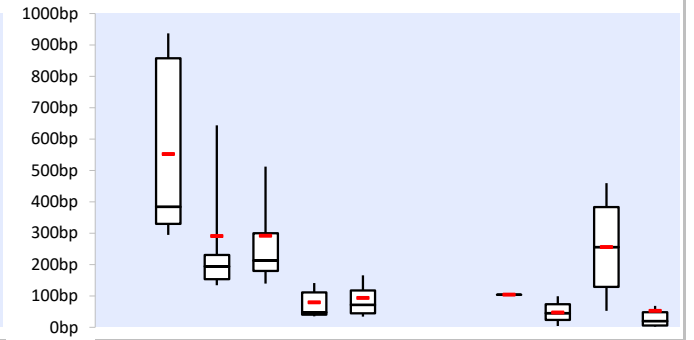
Private credit

Cost as a % of the amount fees are based on¹



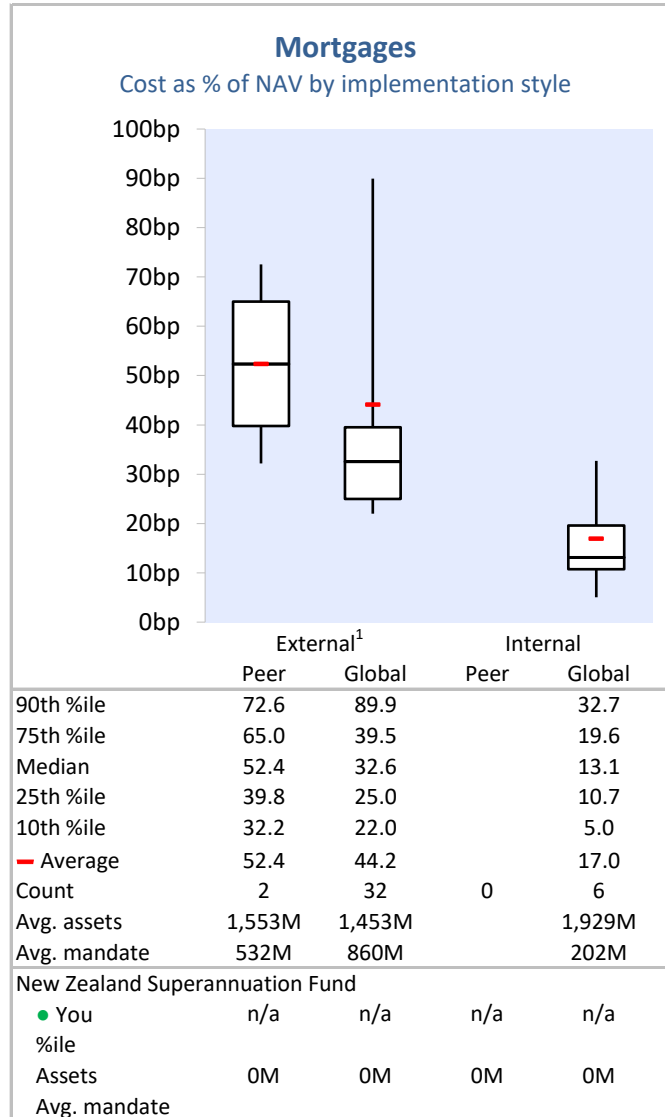
	Fund of Funds						Direct LP						Evergreen											
	Mgmt fees (Top layer)		Perf. fees (Top layer)		Underlying mgmt. & perf. ²		Total ³ incl. perf.		Total ³ excl. perf.		Mgmt fees		Perf. fees		Total ³ incl. perf.		Mgmt fees		Perf. fees		Total ³ incl. perf.			
	Peer	Global	Peer	Global	Peer	Global	Peer	Global	Peer	Global	Peer	Global	Peer	Global	Peer	Global	Peer	Global	Peer	Global	Peer	Global	Peer	Global
	90th %ile	123.5	238.6	195.0	538.2	246.5	140.6	161.6	108.0	159.2	240.6	342.0	92.6	123.1	117.6	98.0	141.2	151.5	62.9	89.1	84.4	65.4	111.0	112.4
75th %ile	78.2	68.3	195.0	334.5	201.2	129.8	138.0	72.0	80.0	203.2	220.0	62.9	89.1	84.4	65.4	111.0	112.4	62.9	89.1	84.4	65.4	111.0	112.4	
Median	46.0	60.0	195.0	301.0	169.0	113.9	123.0	40.0	72.0	138.7	193.7	40.5	64.8	29.1	0.0	48.5	65.1	40.5	64.8	29.1	0.0	48.5	65.1	
25th %ile	37.8	34.5	164.4	244.9	160.8	93.0	106.8	36.8	43.3	122.4	142.7	40.2	40.2	14.5	0.0	40.5	40.5	40.2	40.2	14.5	0.0	40.5	40.5	
10th %ile	22.6	9.5	137.0	167.4	145.6	79.1	69.7	7.4	7.2	110.7	114.2	34.4	33.6	5.8	0.0	34.6	34.1	34.4	33.6	5.8	0.0	34.6	34.1	
— Average	61.0	133.1	177.9	371.9	184.0	116.0	125.3	72.0	80.3	188.0	205.6	55.5	71.3	56.3	28.2	79.6	83.7	55.5	71.3	56.3	28.2	79.6	83.7	
Count	0	9	0	9	0	9	0	9	0	9	0	9	10	109	10	109	10	109	7	55	3	24	7	55
Avg. assets	118M	118M	118M	118M	118M	1,024M	1,285M	1,024M	1,285M	1,024M	1,285M	1,687M	1,095M	3,936M	2,509M	1,687M	1,095M	1,687M	1,095M	3,936M	2,509M	1,687M	1,095M	
New Zealand Superannuation Fund	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	
● 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	
%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	n/a	n/a	n/a	n/a	n/a	n/a	n/a	
Assets	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	

Cost as a % of NAV



	Fund of Funds		Direct LP		Evergreen		Oper. Sub.		Co-Inv.		Internal		
	Total ³ incl. perf.		Total ³ incl. perf.		Total ³ incl. perf.		Total		Total incl. perf.		Total		
	Peer	Global	Peer	Global	Peer	Global	Peer	Global	Peer	Global	Peer	Global	
	90th %ile	936.8	643.3	511.7	141.2	165.5	104.4	98.8	459.1	68.6	104.4	73.8	382.9
75th %ile	857.4	230.8	299.7	111.0	117.0	104.4	73.8	382.9	48.0	104.4	45.7	256.0	20.2
Median	384.4	194.6	213.4	48.4	72.2	104.4	45.7	256.0	20.2	104.4	23.3	129.1	5.8
25th %ile	329.8	153.3	179.5	40.5	44.5	104.4	4.4	53.0	2.1	104.4	4.4	53.0	2.1
10th %ile	294.9	134.2	139.7	34.6	34.1	104.4	4.4	53.0	2.1	104.4	4.4	53.0	2.1
— Average	552.8	290.9	292.3	79.6	93.5	104.4	47.5	256.0	52.4	104.4	47.5	256.0	52.4
Count	0	9	10	109	7	55	0	0	1	14	2	20	20
Avg. assets	63M	784M	1,077M	1,687M	1,097M	48M	496M	14M	3,328M	48M	496M	14M	3,328M
n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a

1. The base for fees is usually the committed amount during the commitment period, and unreturned invested capital afterwards.
2. The fees of fund of funds include both the top layer fees paid to the fund of funds manager and the underlying fees paid to the 'underlying partnerships' held by the fund of funds. Most funds were unable to provide the underlying fees so defaults of n/a bps (on amount fees are based on) for underlying management fees and n/a bps (on NAV) for underlying performance fees were used.
3. The total cost also includes the internal cost of monitoring and selecting real estate investments. The peer average cost of monitoring and selecting was 7.4 bps for LPs and 17.5 bps for external (not LPs).

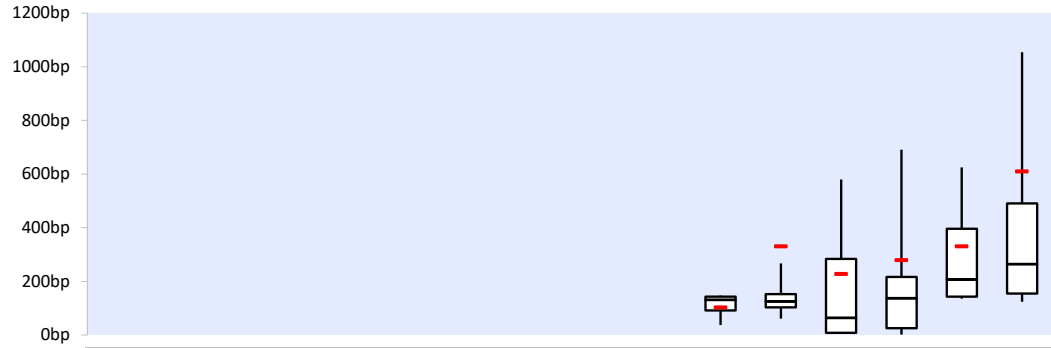


1. Breakdown of external fees

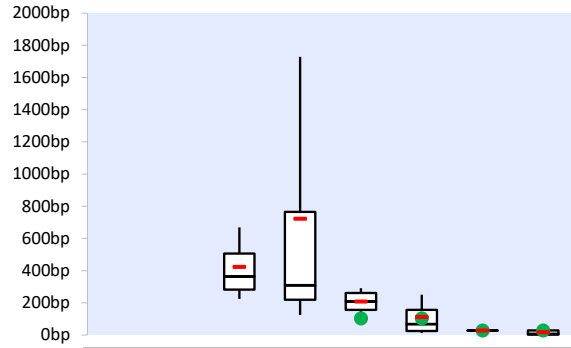
	Your Plan	Peer Average	Global Average
Base fees	n/a	50.8	42.0
Internal and other	n/a	1.5	2.2
Performance fees	<u>n/a</u>	<u>0.0</u>	<u>2.5</u>
Total	n/a	52.4	44.2

Private equity - Other

Cost as a % of the amount fees are based on¹

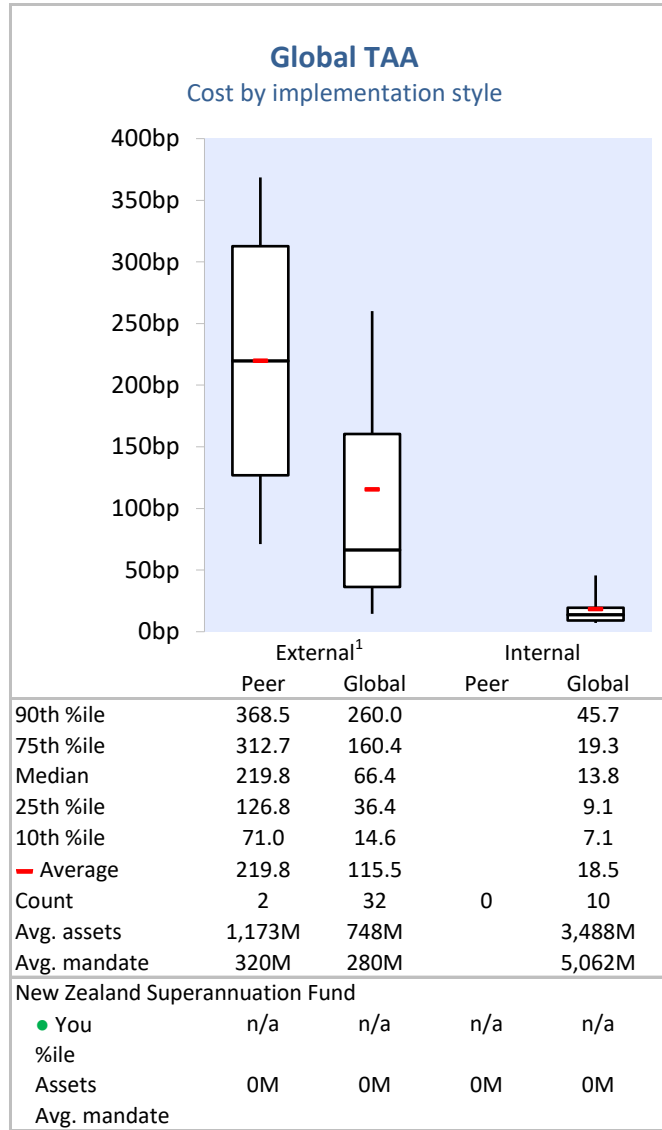


Cost as a % of NAV



	Fund of Funds										Direct LP						Fund of Funds		Direct LP		Co-Investment		Internal	
	Mgmt fees (Top layer)		Perf. fees (Top layer)		Underlying mgmt. & perf. ²		Total ³ incl. perf.		Total ³ excl. perf.		Mgmt fees		Perf. fees		Total ³ incl. perf.		Total ³ 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
90th %ile										147.1	267.1	580.2	690.7	625.1	1054.4			669.1	1728.4	291.7	250.1	28.1	45.4	
75th %ile										143.5	153.0	284.0	217.0	396.0	490.6			506.0	765.1	260.5	156.6	28.1	28.1	
Median										132.0	126.4	64.4	137.7	207.8	265.0			365.3	310.4	208.5	68.4	28.1	7.8	
25th %ile										91.8	103.5	8.4	25.2	143.1	155.0			283.0	220.2	156.6	25.1	28.1	2.7	
10th %ile										36.7	61.8	6.5	1.6	136.3	124.0			225.0	124.8	125.4	12.3	28.1	0.6	
Average										103.3	331.0	228.0	279.6	331.3	610.5			423.7	722.7	208.5	113.2	28.1	18.1	
Count	0	0	0	0	0	0	0	0	0	4	24	4	24	4	24	0	0	4	24	2	4	1	9	
Avg. assets										1,393M	1,905M	1,393M	1,905M	1,393M	1,905M			1,053M	1,372M	900M	725M	1,789M	2,019M	
New Zealand Superannuation Fund																								
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	n/a	n/a	n/a	104.6	104.6	28.1	28.1	
Assets	0M	0M	0M	0M	0M	0M	0M	0M	0M	0M	0M	0M	0M	0M	0M	0M	0M	0M	0M	0%	67%	100%	75%	

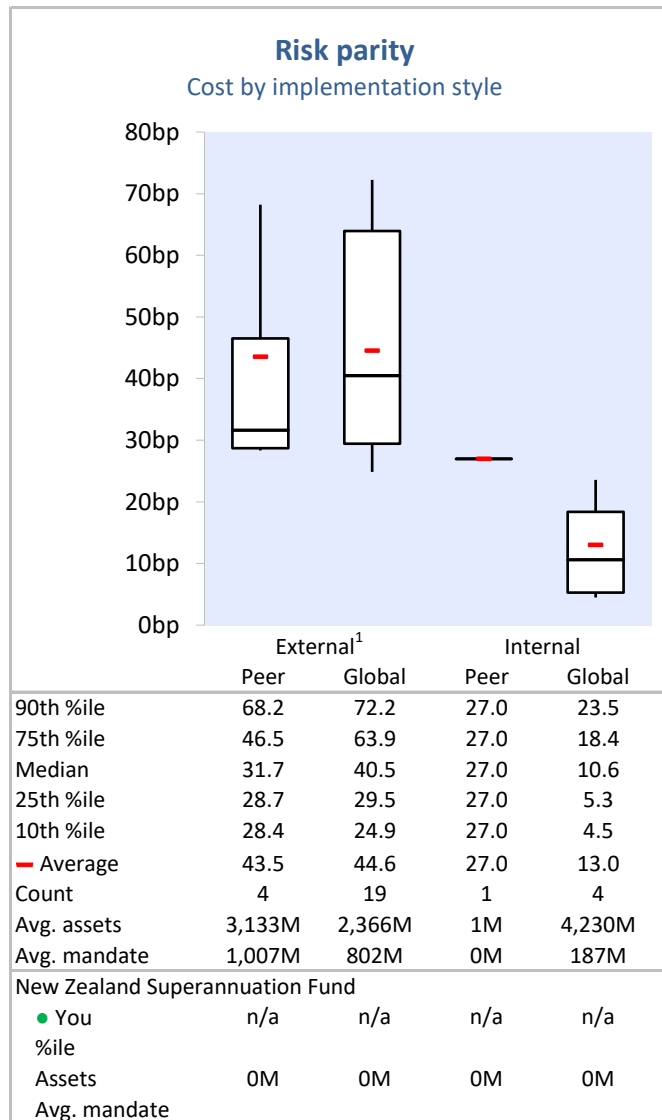
1. The base for fees is usually the committed amount during the commitment period, and unreturned invested capital afterwards.
 2. The fees of fund of funds include both the top layer fees paid to the fund of funds manager and the underlying fees paid to the 'underlying partnerships' held by the fund of funds. Most funds were unable to provide the underlying fees so defaults of n/a bps (on amount fees are based on) for underlying management fees and n/a bps (on NAV) for underlying performance fees were used.



1. Breakdown of external fees

	Your Plan	Peer Average	Global Average
Base fees	n/a	91.8	81.1
Internal and other	n/a	2.8	9.2
Performance fees	<u>n/a</u>	<u>126.5</u>	<u>45.0</u>
Total*	n/a	219.8	115.5

* 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 126.5 bps for peers (2 funds) and 45.0 bps for Global participants (22 funds).



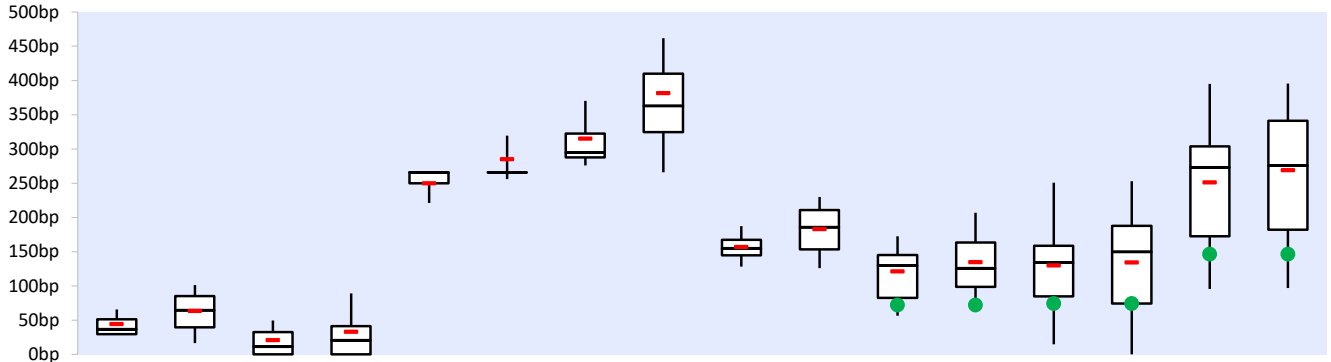
1. Breakdown of external fees

	Your Plan	Peer Average	Global Average
Base fees	n/a	28.5	39.7
Internal and other	n/a	4.1	2.8
Performance fees	<u>n/a</u>	<u>23.9</u>	<u>6.7</u>
Total*	n/a	43.5	44.6

* For funds that did not report a performance fee, a value of 'zero' was used. The average performance fee for those funds that reported a performance fee is 23.9 bps for peers (2 funds) and 6.7 bps for Global participants (10 funds).

Hedge funds

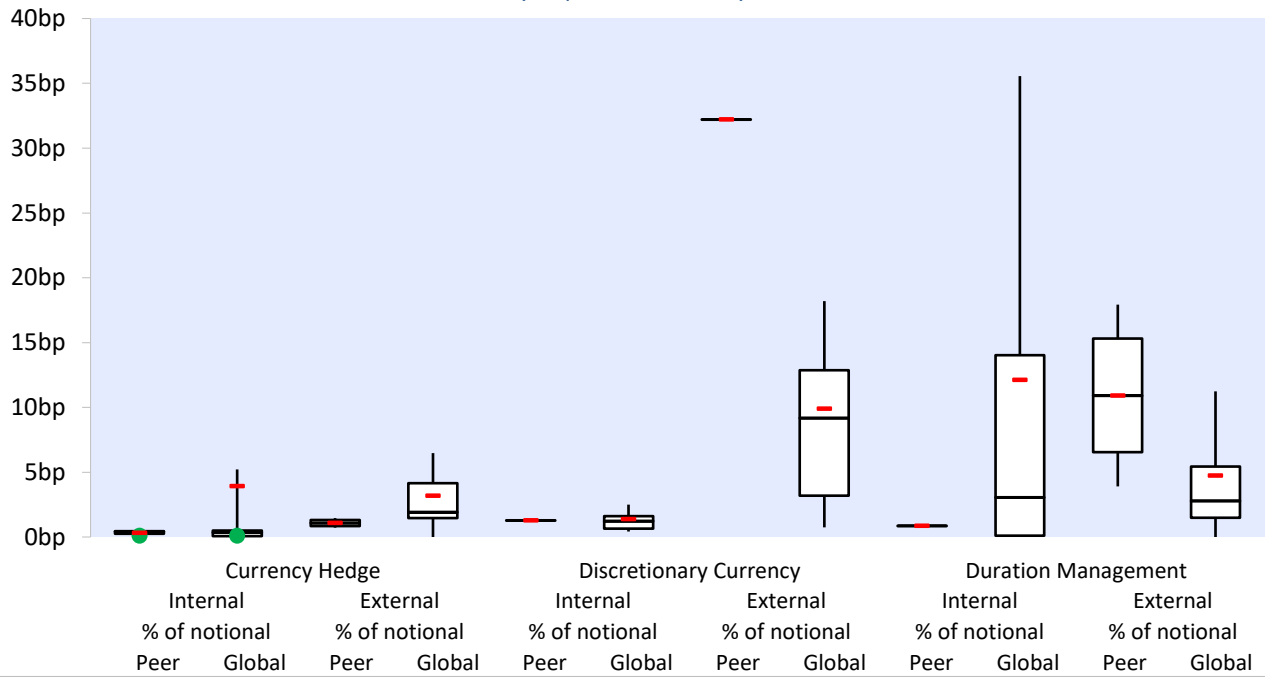
Cost by implementation style



	Fund of Funds										External Direct						
	Mgmt fees (Top layer)		Perf. fees (Top layer)		Underlying mgmt. and perf. ¹		Total ² incl. perf.		Total ² excl. perf.		Mgmt fees		Perf. fees		Total ² incl. perf.		
	Peer	Global	Peer	Global	Peer	Global	Peer	Global	Peer	Global	Peer	Global	Peer	Global	Peer	Global	
90th %ile	65.4	101.4	49.5	89.0	266.0	319.4	370.1	461.8	187.4	229.7	172.3	206.9	250.6	252.8	395.1	395.3	
75th %ile	51.4	85.2	32.3	41.0	266.0	266.0	322.5	409.9	167.3	210.5	145.2	163.4	158.4	187.7	303.6	341.3	
Median	36.9	64.7	11.4	20.7	266.0	266.0	295.0	363.0	155.0	185.8	129.7	126.0	134.4	150.0	273.4	276.0	
25th %ile	29.5	39.3	0.0	0.0	250.0	266.0	287.5	324.7	144.6	153.5	82.5	98.5	84.6	74.0	172.6	182.0	
10th %ile	28.5	16.5	0.0	0.0	221.2	255.8	276.0	266.0	128.0	126.0	56.2	63.1	14.9	0.0	95.3	96.8	
— Average	44.1	63.5	20.9	33.1	250.0	285.0	315.0	381.6	156.9	182.8	121.3	134.7	130.0	134.2	251.3	268.8	
Count	4	54	4	54	4	54	4	54	4	54	13	105	13	105	13	105	
Avg. assets	735M	1,301M	735M	1,301M	735M	1,301M	735M	1,301M	735M	1,301M	2,981M	3,726M	2,981M	3,726M	2,981M	3,726M	
New Zealand Superannuation Fund																	
● You	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	72.2	72.2	74.3	74.3	146.5	146.5	
%ile											17%	12%	17%	26%	17%	16%	
Assets	0M	0M	0M	0M	0M	0M	0M	0M	0M	0M	3,217M	3,217M	3,217M	3,217M	3,217M	3,217M	

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 126 bps (on NAV) for underlying management fees and 140 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 6.4 bps for fund of funds and 9.7 bps for LPs.

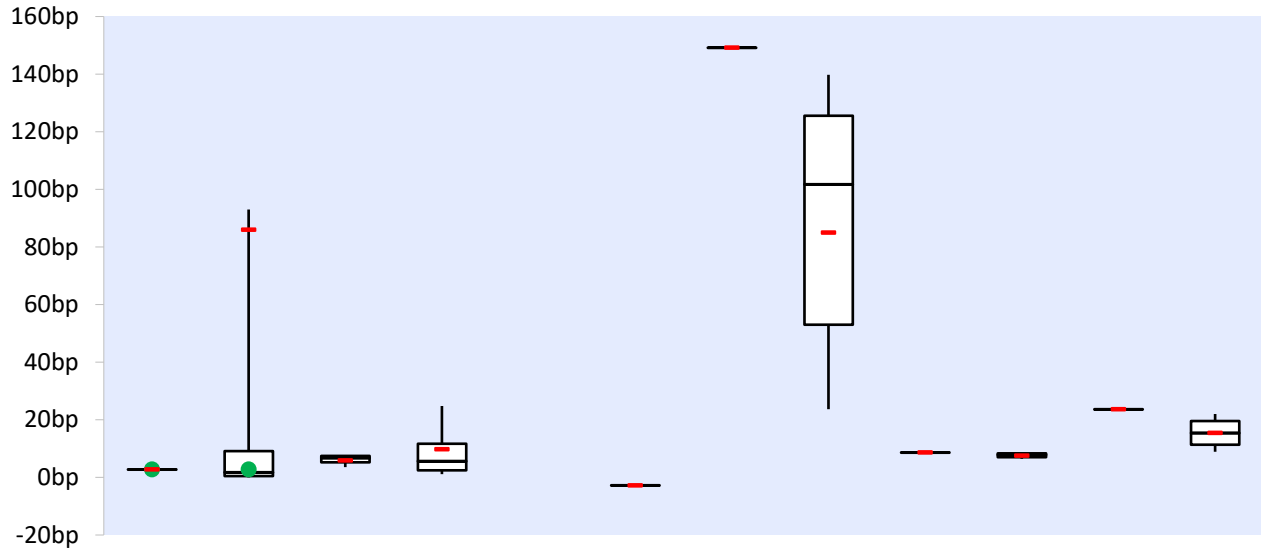
Overlays: currency, duration Cost by implementation style



	Currency Hedge		Discretionary Currency		Duration Management							
	Internal	External	Internal	External	Internal	External	Peer	Global	Peer	Global	Peer	Global
	% 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	0.5	5.2	1.5	6.5	1.3	2.5	32.2	18.2	0.9	35.6	17.9	11.2
75th %ile	0.5	0.5	1.3	4.2	1.3	1.6	32.2	12.9	0.9	14.0	15.3	5.4
Median	0.4	0.4	1.1	1.9	1.3	1.2	32.2	9.2	0.9	3.1	10.9	2.8
25th %ile	0.3	0.1	0.8	1.5	1.3	0.6	32.2	3.2	0.9	0.1	6.5	1.5
10th %ile	0.2	0.0	0.7	0.0	1.3	0.4	32.2	0.8	0.9	0.1	3.9	0.0
— Average	0.3	3.9	1.1	3.2	1.3	1.4	32.2	9.9	0.9	12.1	10.9	4.8
Count	3	17	2	29	1	6	1	16	1	8	2	22
Avg. notional	23,477M	36,615M	9,012M	5,998M	3,108M	24,755M	688M	7,014M	16,750M	10,190M	1,205M	9,390M
New Zealand Superannuation Fund												
● You	0.1	0.1	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
%ile	0%	31%										
Avg. notional	42,643M	42,643M										

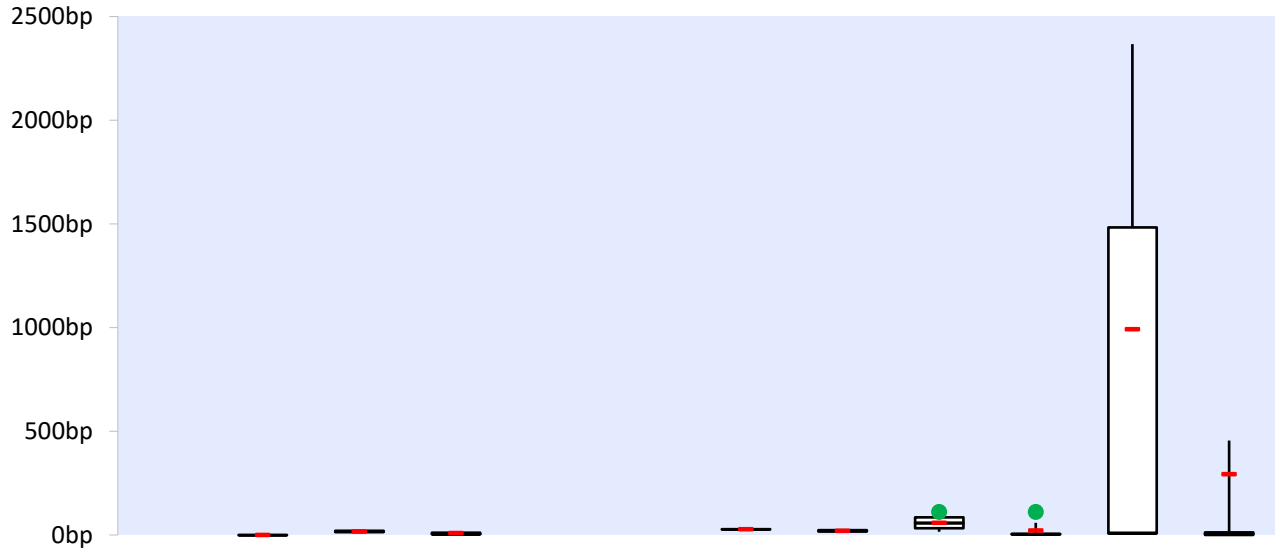
Overlays: passive beta/rebalancing, global TAA, policy tilt TAA

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	2.8	93.0	7.5	24.8	-2.7	149.2	139.7	8.6	8.5	23.6	22.0	
75th %ile	2.8	9.1	7.4	11.7	-2.7	149.2	125.5	8.6	8.3	23.6	19.5	
Median	2.8	1.8	6.7	5.6	-2.7	149.2	101.8	8.6	8.0	23.6	15.4	
25th %ile	2.8	0.4	5.2	2.4	-2.7	149.2	53.0	8.6	7.0	23.6	11.3	
10th %ile	2.8	0.0	3.6	1.1	-2.7	149.2	23.7	8.6	6.5	23.6	8.9	
— Average	2.8	86.0	5.9	9.7	-2.7	149.2	85.1	8.6	7.6	23.6	15.4	
Count	1	10	4	32	0	1	1	3	1	3	1	2
Avg. notional	11,604M	13,357M	2,115M	6,158M			2,967M	2,507M	1,357M	724M	373M	851M
New Zealand Superannuation Fund												
● You	2.8	2.8	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
%ile	100%	56%										
Avg. notional	11,604M	11,604M										

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		0.2	22.7	18.7			27.5	26.1	100.7	58.5	2366.9	454.9
75th %ile		0.2	20.7	10.8			27.5	24.1	84.8	5.5	1483.1	12.7
Median		0.2	17.4	5.4			27.5	20.6	58.5	4.8	10.0	6.8
25th %ile		0.2	14.1	4.2			27.5	17.1	32.1	2.7	9.4	1.0
10th %ile		0.2	12.1	2.1			27.5	15.0	16.3	1.5	9.1	0.0
— Average		0.2	17.4	9.0			27.5	20.6	58.5	21.6	991.7	293.1
Count	0	1	2	5	0	0	1	2	2	6	3	12
Avg. notional		4,543M	4,619M	2,306M			592M	336M	1,512M	1,860M	2,315M	8,406M
New Zealand Superannuation Fund												
● You	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	111.2	111.2	n/a	n/a
%ile									100%	100%		
Avg. notional									147M	147M		

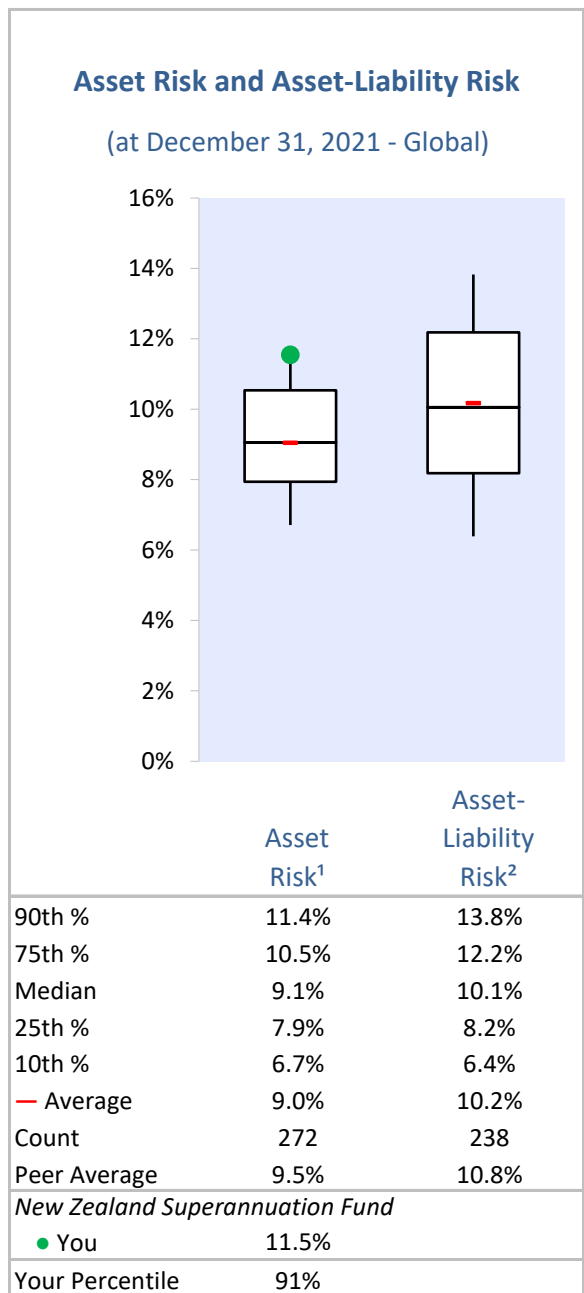
6

Risk

Comparison of your risk levels to the Global universe	2
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Reduction in asset risk due to diversification	4
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Historic worst case scenarios during the past 5 years	9
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Appendix C - Correlation Matrix	15

*Asset-liability risk is only calculated for DB or DB-like pension funds/pools.

Comparison of your risk levels to the Global universe



1. Asset risk is the expected volatility of your policy return. It is based on the historical variance of, and covariance between, the asset classes in your asset mix policy. It is expressed as an annual standard deviation.

2. Asset-liability risk is the expected volatility of surplus returns. Surplus returns are the changes in a plan's marked-to-market funded status caused by market factors. Asset liability risk is a function of the volatility of policy returns (asset risk), the volatility of surplus returns (surplus risk) and the correlation between policy returns and surplus returns.

Calculation of asset risk

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

Calculation of your weighted asset class risk

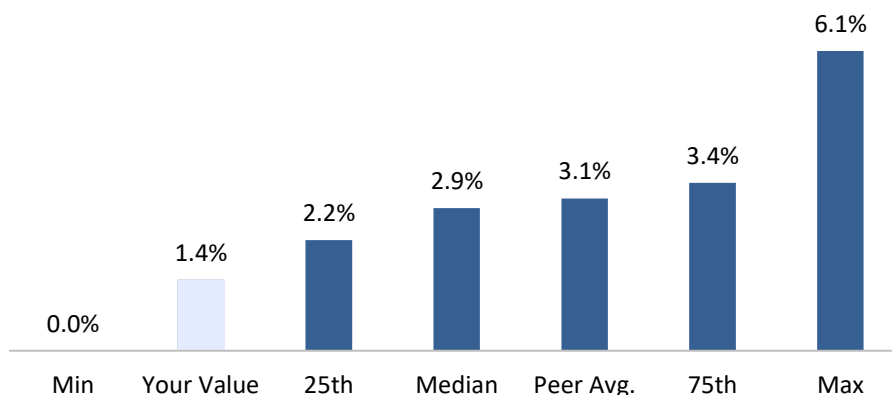
Asset Class	Policy weight (A)	Risk ¹ (B)	Weighted risk (A X B)
Stock: EAFE	5.0%	16%	0.8%
Stock: Global	75.0%	14%	10.1%
Bonds: Global	20.0%	10%	2.1%
Weighted Total			13.0%

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

Reduction in asset risk due to diversification

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

Diversification benefit: Global universe



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

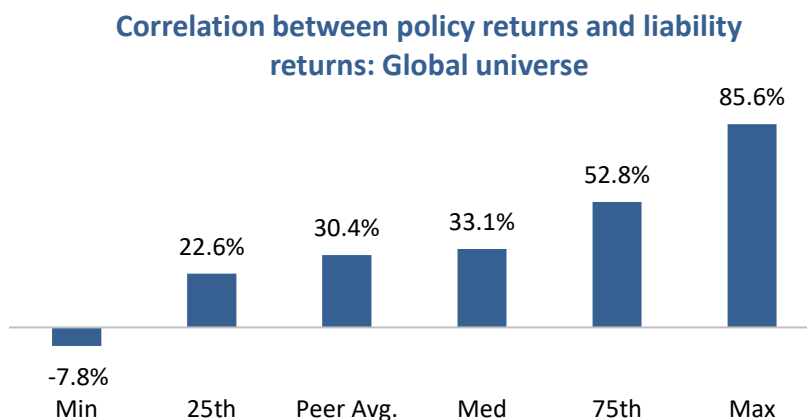
Components of asset risk

	You	Peer median*	Peer average	Global median*	Global average
Weighted asset risk	13.0%	12.7%	12.6%	12.1%	11.9%
Benefit of diversification	1.4%	3.1%	3.1%	2.9%	2.8%
Asset risk	11.5%	9.0%	9.5%	9.1%	9.0%

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

Asset-liability risk

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



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

Components of asset-liability risk

	You	Peer median	Peer average	Global median	Global average
Asset risk (R_A)	11.5%	9.0%	9.5%	9.1%	9.0%
Liability risk (R_L)		9.6%	8.9%	8.7%	8.7%
Correlation between policy returns and liability returns (ρ_{AL})		29.6%	30.4%	33.1%	36.2%
Asset-liability risk		11.0%	10.8%	10.1%	10.2%

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

Liability proxy portfolio

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

Comparisons of liability proxy portfolio

	Your fund		Peer average		Global average	
	Duration	% of Assets	Duration	% of Assets	Duration	% of Assets
Inflation Indexed Bonds	n/a	n/a	11.5	50%	11.8	58%
Nominal Bonds	n/a	n/a	15.3	50%	14.8	42%
Total		n/a		100%		100%

Your liability proxy portfolio is a tool that:

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

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

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

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

Liability risk

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

A plan's inflation sensitivity depends on:

a) The type of plan

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

Plan type	# of plans	% of Total
Flat Benefit	24	8%
Career Average	64	20%
Final/Highest/Best Avg	178	56%
Other	53	17%
Total	319	100%

b) Contractual inflation protection for retired members

Your retired members get n/a contractual inflation protection. Your retiree inflation protection is subject to a cap of n/a.

Retiree inflation protection	# of plans		
	Corporate	Public	Other
0%	99	34	19
>0% and <50%	4	1	1
50%	1	2	1
>50% and <100%	4	14	1
100%	14	49	6
Total	122	100	28

c) Member demographics

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

	Your fund	Peer Average	Global Average
Active Members	n/a	44%	43%
Retired Members	n/a	56%	57%
Total		100%	100%

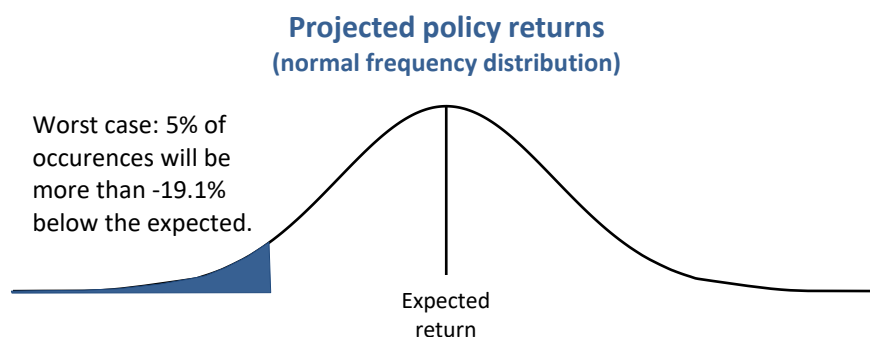
Projected worst case scenarios

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

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

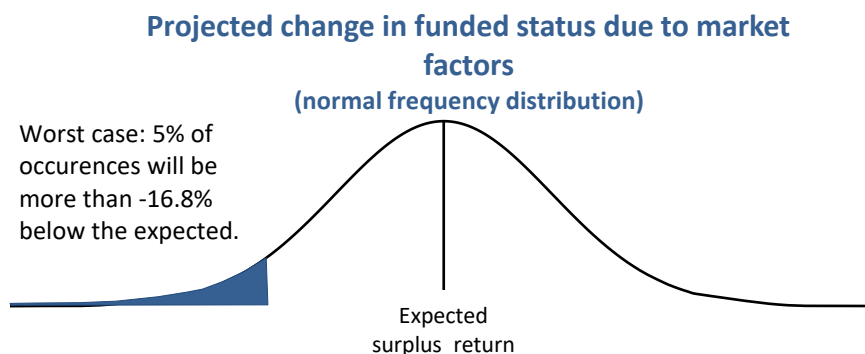
a) Worst case policy returns

Every year there is a 5% probability that your policy return will be worse than your expected policy return by more than -19.1% (-19.1% equals $-1.65 \times$ your asset risk of 11.5%). -19.1% is the starting point of worst case outcomes. They could be much worse.



b) Worst case impact on funded status

For the average Global fund, there is a 5% probability every year that changes in mark-to-market funded status caused by market factors ("Surplus Returns") will be worse than expected by more than -16.8%. (-16.8% equals $-1.65 \times$ the Global average asset-liability risk of 10.2%).



Historic worst case scenarios during the past 5 years

a) Historic worst case policy returns

During the past 5 years, your lowest policy return was -5.3% in 2018.

Historic policy returns - Global universe

	2021	2020	2019	2018	2017
90th %	16.9%	15.2%	21.4%	1.3%	17.0%
75th %	14.5%	13.0%	18.4%	-0.3%	15.4%
Median	11.0%	10.4%	15.7%	-2.1%	12.4%
25th %	7.1%	8.2%	12.6%	-3.8%	9.4%
10th %	3.3%	5.8%	10.2%	-5.4%	6.8%
Average	10.8%	10.5%	15.6%	-2.0%	12.1%
Count	273	308	313	339	352
Peer Avg	12.4%	9.1%	16.1%	-2.2%	11.1%
Your Value	14.4%	12.6%	22.7%	-5.3%	17.7%

b) Historic worst case changes in funded status

During the past 5 years, funds experienced the worst change in marked-to-market funded status caused by market factors ("Surplus Returns") in 2018, when the median fund experienced a -1.4% decline.

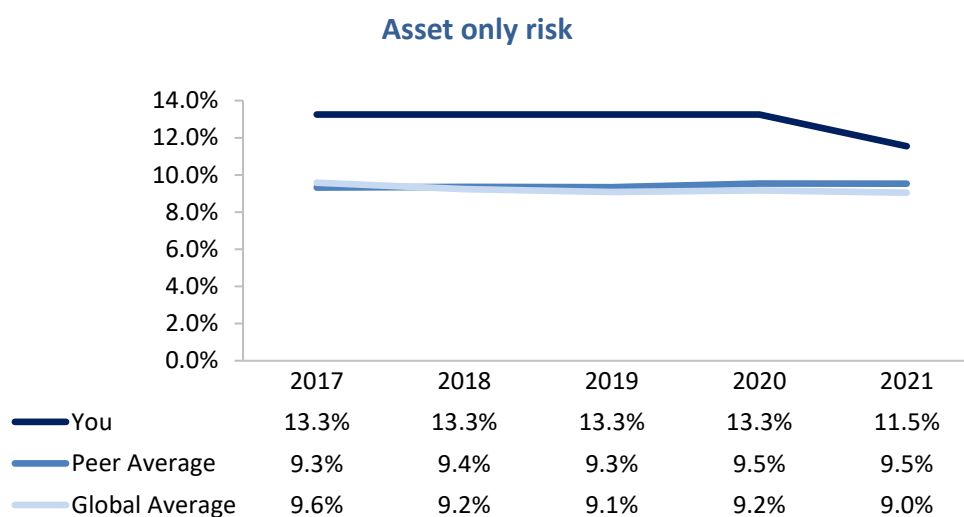
Historic changes in funded status caused by market factors - Global universe

	2021	2020	2019	2018	2017
90th %	18.5%	5.2%	11.0%	1.6%	9.0%
75th %	15.7%	2.7%	9.2%	0.1%	7.8%
Median	11.7%	-0.5%	7.1%	-1.4%	6.0%
25th %	8.5%	-4.0%	5.2%	-3.2%	4.3%
10th %	5.0%	-6.2%	3.3%	-4.4%	2.3%
Average	11.9%	-0.5%	7.1%	-1.5%	5.9%
Count	238	272	275	298	307
Peer Avg	13.4%	-0.4%	6.4%	-1.1%	5.4%
Your Value	n/a	n/a	n/a	n/a	n/a

Risk Trends - 2017 to 2021

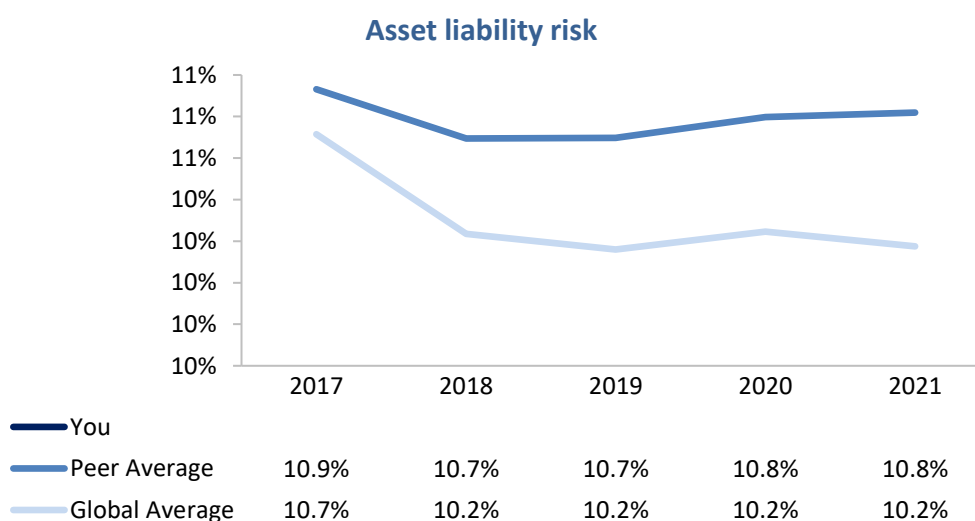
a) Asset risk trends

Asset risk will only change if policy asset mix changes. Between 2017 and 2021 the asset risk for your fund decreased from 13.3% to 11.5%.



b) Asset-liability risk trends

Asset-liability risk will change if policy asset mix changes, or if the nature of your liabilities changes. Between 2017 and 2021 the asset-liability risk for Global funds that have provided 5 consecutive years of data decreased from 10.7% to 10.2%.



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

Risk calculation descriptions

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

Step 1 - Inflation sensitivity

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

Total inflation sensitivity

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

Inflation protection for retirees

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

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

Inflation protection for active members

We inferred inflation protection for your active members to be 0% based on your plan type of n/a.

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

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

Step 2 - Proportion of liabilities relating to retirees

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

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

Equivalency Table

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

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

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

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

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

Percentage change in pension liability cost

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

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

Modified duration relative to changes in real yields

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

Modified duration relative to changes in nominal yields

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

Step 4 - Determining the liability proxy portfolio

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

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

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

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

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

Step 5 - Liability returns

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

Liability Return

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

	Long Nominal Bonds		Inflation Indexed Bonds		CPI
	Year end yield	Change in yield	Year end yield	Change in yield	
2021	1.50	0.59	-0.49	-0.05	4.70
2020	0.91	-1.00	-0.44	-1.01	1.23
2019	1.91	-0.78	0.57	-0.64	1.81
2018	2.69	0.28	1.21	0.51	2.44
2017	2.41	-0.65	0.71	-0.31	2.13

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

Asset mix

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

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

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

where

w_X = policy weight of asset class X

σ_X = standard deviation of monthly returns for asset class X

w_Y = policy weight of asset class Y

σ_Y = standard deviation of monthly returns for asset class Y

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

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

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

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

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

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

Asset-liability risk

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

Appendix C - Correlation Matrix

	Stock: EAFE	Stock: Global	Bonds: Global
Stock: EAFE	1.00	0.93	0.22
Stock: Global	0.93	1.00	0.27
Bonds: Global	0.22	0.27	1.00

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Appendices

Appendix A - Data Summary

Appendix B - Currency conversion

Appendix C - Data quality

Appendix D - Glossary of terms

Appendix A - Data Summary

New Zealand Superannuation Fund

Plan Info	2021	2020	2019	2018	2017
Survey Preparer	Ben Nott	Ben Nott	Ben Nott	Ben Nott	Ben Nott
Additional Contact	Gareth Ballantyne	Seyoung Chung	Seyoung Chung	Seyoung Chung	Seyoung Chung
Type of fund (corporate, public, other)	Other	Other	Other	Other	Other
Total fund size (\$mils) as at December 31	61,304.0	52,675.2	46,684.0	37,424.1	37,910.5
Asset-class level holdings provided on survey are: year end or average?	Average	Average	Average	Average	Average
Total return for year ended	16.30%	9.66%	21.13%	-2.18%	19.80%
Is the return net or gross?	Net of all investment costs	Net of all investment costs	Net of all investment costs	Net of all investment costs	Net of all investment costs
Total fund policy or benchmark return	14.40%	12.59%	22.74%	-5.29%	17.71%

Ancillary Data	2021	2020	2019	2018	2017
What is your hedging policy for:					
Foreign non-U.S. Holdings?		100%	100%	100%	100%
U.S. Holdings?		100%	100%	100%	100%
What were your actuarial fees in 000s?	0			0	0
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 %				0%	0%
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

New Zealand Superannuation Fund

Asset Class	Year	Policy Weight	Benchmark	
			Description	Return
Stock - EAFE	2021	5.0	NZX 50 Custom	-0.2
	2020	5.0	NZX 50	13.7
	2019	5.0	NZX 50	30.5
	2018	5.0	NZX 50	4.8
	2017	5.0	NZX 50	22.1
Stock - Emerging	2021		MSCI All Countries World Index Custom	20.3
	2020	10.0	MSCI Emerging Markets	17.9
	2019	10.0	MSCI Emerging Markets	16.4
	2018	10.0	MSCI Emerging Markets	-12.4
	2017	10.0	MSCI Emerging Markets	28.3
Stock - Global	2021	75.0	MSCI All Countries World Index Custom	20.3
	2020	65.0	MSCI Developed Markets	13.7
	2019	65.0	MSCI Developed Markets	28.4
	2018	65.0	MSCI Developed Markets	-6.0
	2017	65.0	MSCI Developed Markets	19.6
Fixed income - U.S.	2021		Barclays Global Aggregate	-1.2
	2020		Barclays Global Aggregate	5.4
	2019		BC Custom (NZSF) Index	7.5
	2018		BC Custom (NZSF) Index	1.6
	2017		BC Custom (NZSF) Index	3.5
Fixed income - Global	2021	20.0	Barclays Global Aggregate	-1.2
	2020	20.0	Barclays Global Aggregate	5.4
	2019	20.0	Barclays Global Aggregate	7.5
	2018	20.0	Barclays Global Aggregate	1.6
	2017	20.0	Barclays Global Aggregate	3.5
Cash	2021		NZD Cash Benchmark	1.9
	2020		NZD Cash Benchmark	0.7
	2019		NZD Cash Benchmark	1.7
	2018		NZD Cash Benchmark	2.0
	2017		NZD Cash Benchmark	2.0
Real estate ex-REITs	2021		Property BM	12.7
	2020		NZ Property Benchmark	14.8
	2019		NZ Property Benchmark	20.6
	2018		NZ Property Benchmark	-3.1
	2017		NZ Property Benchmark	11.2
Infrastructure	2021		Infrastructure BM	12.0
	2020		Infrastructure BM	12.8
	2019		Infrastructure BM	20.6
	2018		Infrastructure BM	-3.9
	2017		Infrastructure BM	15.1
Natural resources	2021		Natural Resources Benchmark	4.8
	2020		Timber Benchmark	9.0
	2019		Timber Benchmark	12.7
	2018		Timber Benchmark	-0.6
	2017		Timber Benchmark	8.3
Hedge funds	2021		Hedge Fund BM	1.8
	2020		Custom	6.1
	2019		Custom	7.8
	2018		Custom	0.8
	2017		Custom	4.5
Private equity - Diversified	2021		Private Equity BM	21.0
	2020		Private Equity Benchmark	16.9
	2019		Private Equity Benchmark	28.5
	2018		Private Equity Benchmark	-7.2
	2017		Private Equity Benchmark	23.1
Venture capital	2021		Private Equity BM	21.0
Private equity - Other	2021		Other Private Equity BM	15.7
	2020		Private Equity Benchmark	13.2
	2019		Private Equity Benchmark	24.4
	2018		Private Equity Benchmark	-5.6
	2017		Private Equity Benchmark	15.4

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

New Zealand Superannuation Fund

Asset Class/Style	Year	Asset (\$millions)	Return %	Cost (\$'000)				Cost (bps)				
				Internal & Other	Base Fees	Perf Fees	Total	Internal & Other	Base Fees	Perf Fees	Total	
Stock - EAFE	Internal passive	2021	388.1	-2.60	967.0			967.0	24.9			24.9
		2020	26.8	10.70	767.6			767.6	286.4			286.4
		2019										
		2018	60.7	11.40	94.0			94.0	15.5			15.5
		2017	132.8	21.60	104.0			104.0	7.8			7.8
	Internal active	2021	1,170.0	-0.50	2,649.0			2,649.0	22.6			22.6
		2020	1,057.0	17.00	1,957.3			1,957.3	18.5			18.5
		2019	961.5	34.20	3,645.0			3,645.0	37.9			37.9
		2018	891.9	4.50	2,852.0			2,852.0	32.0			32.0
		2017	733.6	20.70	2,496.0			2,496.0	34.0			34.0
	External active	2021	956.6	0.20	707.0	4,006.0		4,713.0	7.4	41.9		49.3
		2020	894.1	16.40	547.8	3,763.6		4,311.4	6.1	42.1		48.2
		2019	827.0	30.50	605.0	3,451.0	-	4,056.0	7.3	41.7	-	49.0
		2018	683.3	6.40	436.0	2,897.0		3,333.0	6.4	42.4		48.8
2017		619.2	18.90	515.0	2,865.0		3,380.0	8.3	46.3		54.6	
Stock - Emerging	External passive	2021	1,565.3	-3.20	707.0	958.0		1,665.0	4.5	6.1		10.6
		2020	1,612.3	22.40	905.5	1,275.6		2,181.1	5.6	7.9		13.5
		2019	1,888.9	18.40	816.0	1,203.0		2,019.0	4.3	6.4		10.7
		2018	1,775.7	-11.40	702.0	1,058.0		1,760.0	4.0	6.0		9.9
		2017	1,554.1	32.20	729.0	924.0		1,653.0	4.7	5.9		10.6
	External active	2021										
		2020										
		2019	483.3	11.90	252.0	4,318.0	-	4,570.0	5.2	89.3	-	94.6
		2018	467.3	-10.30	285.0	3,974.0		4,259.0	6.1	85.0		91.1
		2017	431.6	24.50	329.0	3,930.0		4,259.0	7.6	91.1		98.7
Stock - Global	Internal passive	2021										
		2020										
		2019										
		2018	298.3	0.30	152.0			152.0	5.1			5.1
	External passive	2021	25,755.6	24.70	4,418.0	9,335.0		13,753.0	1.7	3.6		5.3
		2020	16,429.2	12.10	3,721.4	8,012.6		11,734.0	2.3	4.9		7.1
		2019	19,843.4	28.50	5,036.0	8,385.0		13,421.0	2.5	4.2		6.8
		2018	17,791.9	-5.50	4,479.0	5,918.0		10,397.0	2.5	3.3		5.8
2017	14,865.1	19.70	3,626.0	4,947.0		8,573.0	2.4	3.3		5.8		
Fixed income - U.S.	Internal passive	2021	23.4	6.00	314.0			314.0	134.2			134.2
		2020	25.7	11.20	261.7			261.7	101.8			101.8
		2019	27.0	10.00	91.0			91.0	33.7			33.7
		2018	28.2	4.10	72.0			72.0	25.5			25.5
		2017	29.8	16.10	81.0			81.0	27.2			27.2
Fixed income - Global	Internal passive	2021	2,722.0	-1.20	808.0			808.0	3.0			3.0
		2020	1,765.1	5.30	871.7			871.7	4.9			4.9
		2019	427.4	6.40	142.0			142.0	3.3			3.3
		2018	76.6	3.80	87.0			87.0	11.4			11.4
	External passive	2021	2,728.2	-0.90	515.0	1,275.0		1,790.0	1.9	4.7		6.6
		2020	2,013.5	5.20	674.6	926.8		1,601.4	3.4	4.6		8.0
		2019	3,504.7	7.00	688.0	1,702.0		2,390.0	2.0	4.9		6.8
		2018	3,781.0	1.40	845.0	1,714.0		2,559.0	2.2	4.5		6.8
		2017	3,867.7	3.30	748.0	1,880.0		2,628.0	1.9	4.9		6.8
Cash	Internal active	2021	9,390.8	1.90	3,454.0			3,454.0	3.7			3.7

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

New Zealand Superannuation Fund

Asset Class/Style	Year	Asset (\$millions)	Return %	Cost (\$000)				Cost (bps)			
				Internal & Other	Base Fees	Perf Fees	Total	Internal & Other	Base Fees	Perf Fees	Total
Internal active (cont'd)	2020	9,957.4	2.50	3,295.9			3,295.9	3.3			3.3
	2019	5,147.2	3.00	3,009.0			3,009.0	5.8			5.8
	2018	4,667.8	3.80	3,193.0			3,193.0	6.8			6.8
	2017	5,528.0	5.49	4,779.0			4,779.0	8.6			8.6

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

New Zealand Superannuation Fund
(Default costs are highlighted with blue shading. See page 9 for more details)

Asset Class/Style	Year	Asset (\$millions)	Fee basis (\$millions)	Return %	Cost (\$000)							
					Internal & Other	Base Fees	Perf Fees	Underlying fees		Total		
							Base	Perf	excl. perf	incl. perf		
Hedge funds	External active	2021	3,217.4		6.70	3,130.0	20,099.0	23,895.0		23,229.0	47,124.0	
		2020	2,744.0		-2.10	2,678.6	18,816.4	7,019.7		21,495.0	28,514.7	
		2019	2,382.6		3.50	2,136.0	18,517.0	7,468.0		20,653.0	28,121.0	
		2018	1,994.5		4.40	1,590.0	13,986.0	30,557.0		15,576.0	46,133.0	
		2017	1,611.9		3.80	1,934.0	15,802.0	13,928.0		17,736.0	31,664.0	
Real estate ex-REITs	Internal active	2021	114.1		32.60	1,023.0				1,023.0	1,023.0	
		2020	67.1		-3.67	459.2				459.2	459.2	
		2019	148.7		-6.00	783.0				783.0	783.0	
		2018	49.1		29.70	397.0				397.0	397.0	
	Co-investment LP	2021	306.0	329.0	25.40	1,977.0	1,579.0			3,556.0	3,556.0	
		2020	225.9	225.9	-7.20	1,731.5	704.3			2,435.8	2,435.8	
		2021	107.2	126.0	53.20	2,960.0	1,101.0	6,209.0		4,061.0	10,270.0	
		2020	36.5	55.0	2.60	543.5	192.4	678.0		735.9	1,413.9	
		2019	1.9	1.9	0.00	95.0	7.0	15.0		102.0	117.0	
		2018	5.2	5.2	281.70	234.0	102.0	754.0		336.0	1,090.0	
2017	21.3	21.0	40.70	647.0	227.0	126.0		874.0	1,000.0			
Infrastructure	Internal active	2021	408.8		13.70	683.0				683.0	683.0	
		2020	404.6		-1.60	454.3				454.3	454.3	
		2019	407.0		10.60	549.0				549.0	549.0	
		2018	405.1		6.40	856.0				856.0	856.0	
		2017	486.6		14.30	1,084.0				1,084.0	1,084.0	
	External active LP	2021	276.7	276.7	22.90	328.0	1,564.0	1,660.0		1,892.0	3,552.0	
		2020	235.2	235.2	-12.80	318.4	1,245.5	1,905.1		1,563.9	3,469.0	
		2019	231.2	231.2	12.90	462.0	1,003.0	1,895.8		1,465.0	3,360.8	
		2018	690.4	690.4	-6.40	1,687.6	6,570.2	11,012.0		8,257.8	19,269.8	
		2017	224.4	520.0	18.10	1,506.0	4,840.0	12,311.0		6,346.0	18,657.0	
		2021	217.3	217.3	3.30	662.0	1,869.0	256.0		2,531.0	2,787.0	
		2020	261.5	261.5	7.00	506.6	2,012.6	2,536.6		2,519.2	5,055.8	
		2019	254.1	254.1	6.20	691.0	2,354.0	1,608.0		3,045.0	4,653.0	
		2018	245.6	245.6	5.40	806.0	2,492.9	1,256.0		3,298.9	4,554.9	
2017	206.9	205.0	8.60	788.0	3,183.0	598.0		3,971.0	4,569.0			
Natural resources	Internal active	2021	2,735.6		6.70	1,608.0				1,608.0	1,608.0	
		2020	2,649.6		2.70	1,558.6				1,558.6	1,558.6	
		2019	2,503.8		-0.01	2,667.0				2,667.0	2,667.0	
		2018	1,870.8		17.60	1,820.0				1,820.0	1,820.0	
		2017	1,630.0		24.80	1,731.0				1,731.0	1,731.0	
	External active	2021	297.1	263.0	26.40	1,824.0	2,441.0	2,079.7		4,265.0	6,344.7	
		2020	282.2	282.2	8.80	1,759.7	2,525.0	1,975.4		4,284.7	6,260.1	
		2019	282.6	282.6	19.90	1,312.0	2,565.0	1,978.2		3,877.0	5,855.2	
		2018	737.3	737.3	10.60	2,293.0	5,776.0	1,548.0		8,069.0	9,617.0	
		2017	612.8	609.0	12.70	2,330.0	5,297.0	5,086.2		7,627.0	12,713.2	
Private equity - Diversified	Co-investment LP	2021	13.9	13.9		620.0				620.0	620.0	
		2021	334.0	449.0	14.60	4,999.0	7,762.0	3,913.0		12,761.0	16,674.0	
		2020	304.8	439.7	26.20	4,614.5	6,404.0	1,302.8		11,018.5	12,321.3	
		2019	234.2	370.0	19.00	2,038.0	5,889.0	729.0		7,927.0	8,656.0	
		2018	209.1	397.4	14.10	1,292.0	6,153.0	3,868.4		7,445.0	11,313.4	
	2017	195.9	195.0	19.00	1,088.0	5,933.0	2,775.0		7,021.0	9,796.0		
	Fund of funds	2021	11.0	11.0	34.10	881.0	107.0	107.9	169.4	275.3	1,157.4	1,540.5
		2020	13.8	13.8	21.10	840.7	225.0	91.1	216.7	265.0	1,282.4	1,638.4
2019		18.9	18.6	2.30	300.0	367.0	-	-	-	667.0	667.0	

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

New Zealand Superannuation Fund

(Default costs are highlighted with blue shading. See page 9 for more details)

Asset Class/Style	Year	Asset (\$millions)	Fee basis (\$millions)	Return %	Cost (\$'000)						
					Internal & Other	Base Fees	Perf Fees	Underlying fees		Total	
							Base	Perf	excl. perf	incl. perf	
Fund of funds (cont'd)	2018	23.9	24.0	29.20	203.0	547.0	4.7	374.4	442.2	1,124.4	1,571.3
	2017	30.7	31.0	12.20	71.0	645.0	2.0	486.7	561.8	1,202.7	1,766.5
Venture capital											
Co-investment	2021	2.9	2.9	-0.10	317.0					317.0	317.0
LP	2021	0.6	0.6		304.0	10.6	16.0			314.6	330.6
Private equity - Other											
Internal active	2021	1,789.0		14.70	5,022.0					5,022.0	5,022.0
	2020	1,823.1		-4.30	6,218.9					6,218.9	6,218.9
	2019	1,824.3		14.70	4,422.0					4,422.0	4,422.0
	2018	1,660.0		12.20	4,699.0					4,699.0	4,699.0
	2017	1,579.3		7.10	3,594.0					3,594.0	3,594.0
Co-investment	2021	1,718.7	1,782.5	13.20	3,631.0	15,013.0				18,644.0	18,644.0
	2020	1,481.8	1,481.8	2.40	3,435.1	11,541.6				14,976.7	14,976.7
	2019	1,217.8	1,217.8	6.30	2,002.0	14,044.0				16,046.0	16,046.0
LP	2021										
	2020										
	2019										
	2018	706.8	1,183.1	24.80	783.8	6,986.2	1,652.0			7,770.0	9,422.0
	2017	579.0	850.0	4.60	704.0	5,756.0	(48.0)			6,460.0	6,412.0

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

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

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

New Zealand Superannuation Fund
(Default costs are highlighted with blue shading. See page 9 for more details)

Asset Class/Style	Year	Cost on NAV (bps)						Cost on fee basis (bps)									
		Internal & Other	Base Fees	Perf Fees	Underlying fees Base	Underlying fees Perf	Total excl. perf incl. perf	Internal & Other	Base Fees	Perf Fees	Underlying fees Base	Underlying fees Perf	Total excl. perf incl. perf				
Hedge funds	External active	2021	9.7	62.5	74.3			72.2	146.5	9.7	62.5	74.3			72.2	146.5	
		2020	9.8	68.6	25.6			78.3	103.9	9.8	68.6	25.6			78.3	103.9	
		2019	9.0	77.7	31.3			86.7	118.0	9.0	77.7	31.3			86.7	118.0	
		2018	8.0	70.1	153.2			78.1	231.3	8.0	70.1	153.2			78.1	231.3	
		2017	12.0	98.0	86.4			110.0	196.4	12.0	98.0	86.4			110.0	196.4	
Real estate ex-REITs	Internal active	2021	89.7					89.7	89.7	89.7					89.7	89.7	
		2020	68.4					68.4	68.4	68.4					68.4	68.4	
		2019	52.6					52.6	52.6	52.6					52.6	52.6	
		2018	80.9					80.9	80.9	80.9					80.9	80.9	
	Co-investment	2021	64.6	51.6				116.2	116.2	60.1	48.0				108.1	108.1	
		2020	76.6	31.2				107.8	107.8	76.6	31.2				107.8	107.8	
	LP	2021	276.1	102.7	579.2			378.8	958.0	234.9	87.4	492.8			322.3	815.1	
		2020	148.9	52.7	185.8			201.6	387.4	98.8	35.0	123.3			133.8	257.1	
		2019	500.0	36.8	79.0			536.8	615.8	500.0	36.8	79.0			536.8	615.8	
		2018	450.0	196.2	1,450.0			646.2	2,096.2	450.0	196.2	1,450.0			646.2	2,096.2	
2017	303.8	106.6	59.2			410.3	469.5	308.1	108.1	60.0			416.2	476.2			
Infrastructure	Internal active	2021	16.7					16.7	16.7	16.7					16.7	16.7	
		2020	11.2					11.2	11.2	11.2					11.2	11.2	
		2019	13.5					13.5	13.5	13.5					13.5	13.5	
		2018	21.1					21.1	21.1	21.1					21.1	21.1	
		2017	22.3					22.3	22.3	22.3					22.3	22.3	
	External active	2021	11.9	56.5	60.0			68.4	128.4	11.9	56.5	60.0			68.4	128.4	
		2020	13.5	53.0	81.0			66.5	147.5	13.5	53.0	81.0			66.5	147.5	
		2019	20.0	43.4	82.0			63.4	145.4	20.0	43.4	82.0			63.4	145.4	
		2018	24.4	95.2	159.5			119.6	279.1	24.4	95.2	159.5			119.6	279.1	
		2017	67.1	215.7	548.6			282.8	831.4	29.0	93.1	236.8			122.0	358.8	
	LP	2021	30.5	86.0	11.8			116.5	128.2	30.5	86.0	11.8			116.5	128.2	
		2020	19.4	77.0	97.0			96.3	193.3	19.4	77.0	97.0			96.3	193.3	
		2019	27.2	92.6	63.3			119.8	183.1	27.2	92.6	63.3			119.8	183.1	
		2018	32.8	101.5	51.1			134.3	185.5	32.8	101.5	51.1			134.3	185.5	
2017	38.1	153.8	28.9			191.9	220.8	38.4	155.3	29.2			193.7	222.9			
Natural resources	Internal active	2021	5.9					5.9	5.9	5.9					5.9	5.9	
		2020	5.9					5.9	5.9	5.9					5.9	5.9	
		2019	10.7					10.7	10.7	10.7					10.7	10.7	
		2018	9.7					9.7	9.7	9.7					9.7	9.7	
		2017	10.6					10.6	10.6	10.6					10.6	10.6	
	External active	2021	61.4	82.2	70.0			143.6	213.6	69.4	92.8	79.1			162.2	241.2	
		2020	62.4	89.5	70.0			151.8	221.8	62.4	89.5	70.0			151.8	221.8	
		2019	46.4	90.8	70.0			137.2	207.2	46.4	90.8	70.0			137.2	207.2	
		2018	31.1	78.3	21.0			109.4	130.4	31.1	78.3	21.0			109.4	130.4	
		2017	38.0	86.4	83.0			124.5	207.5	38.3	87.0	83.5			125.2	208.8	
Private equity - Diversified	Co-investment	2021	446.0					446.0	446.0	446.0					446.0	446.0	
		LP	2021	149.7	232.4	117.2			382.1	499.2	111.3	172.9	87.1			284.2	371.4
			2020	151.4	210.1	42.7			361.5	404.2	104.9	145.6	29.6			250.6	280.2
			2019	87.0	251.5	31.1			338.5	369.6	55.1	159.2	19.7			214.2	233.9
			2018	61.8	294.3	185.0			356.0	541.0	32.5	154.8	97.3			187.3	284.7
	2017	55.5	302.9	141.7			358.4	500.1	55.8	304.3	142.3			360.1	502.4		
	Fund of funds	2021	800.2	97.2	98.0	153.9	250.0	1,051.2	1,399.2	800.9	97.3	98.1	154.0	250.2	1,052.2	1,400.5	
		2020	609.2	163.0	66.0	157.0	192.0	929.2	1,187.2	609.2	163.0	66.0	157.0	192.0	929.2	1,187.2	
		2019	158.7	194.2	-	-	-	352.9	352.9	161.3	197.3	-	-	-	358.6	358.6	

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

New Zealand Superannuation Fund

(Default costs are highlighted with blue shading. See page 9 for more details)

Asset Class/Style	Year	Cost on NAV (bps)							Cost on fee basis (bps)						
		Internal & Other	Base Fees	Perf Fees	Underlying fees		Total		Internal & Other	Base Fees	Perf Fees	Underlying fees		Total	
					Base	Perf	excl. perf	incl. perf				Base	Perf	excl. perf	incl. perf
Fund of funds (cont'd)	2018	84.9	228.9	2.0	156.7	185.0	470.5	657.4	84.6	227.9	2.0	156.0	184.2	468.5	654.7
	2017	23.1	210.1	0.7	158.5	183.0	391.8	575.4	22.9	208.1	0.6	157.0	181.2	388.0	569.8
Venture capital															
Co-investment	2021	1,112.3					1,112.3	1,112.3	1,112.3					1,112.3	1,112.3
LP	2021	4,750.0	165.0	250.0			4,915.0	5,165.0	4,750.0	165.0	250.0			4,915.0	5,165.0
Private equity - Other															
Internal active	2021	28.1					28.1	28.1	28.1					28.1	28.1
	2020	34.1					34.1	34.1	34.1					34.1	34.1
	2019	24.2					24.2	24.2	24.2					24.2	24.2
	2018	28.3					28.3	28.3	28.3					28.3	28.3
	2017	22.8					22.8	22.8	22.8					22.8	22.8
Co-investment	2021	21.1	87.4				108.5	108.5	20.4	84.2				104.6	104.6
	2020	23.2	77.9				101.1	101.1	23.2	77.9				101.1	101.1
	2019	16.4	115.3				131.8	131.8	16.4	115.3				131.8	131.8
LP	2021														
	2020														
	2019														
	2018	11.1	98.8	23.4			109.9	133.3	6.6	59.0	14.0			65.7	79.6
	2017	12.2	99.4	(0.8)			111.6	110.7	8.3	67.7	(0.6)			76.0	75.4

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

New Zealand Superannuation Fund

Oversight, Custodial and Other Costs			
		000s	bps
Oversight of the fund assets ¹	2021	14,014.0	2.4bp
	2020	12,307.4	2.7bp
	2019	18,511.0	4.3bp
	2018	16,626.0	4.2bp
	2017	15,508.0	4.4bp
Custodial total	2021	5,510.0	1.0bp
	2020	6,979.8	1.5bp
	2019	6,234.0	1.4bp
	2018	6,465.0	1.6bp
	2017	6,019.0	1.7bp
Audit	2021	612.0	0.1bp
	2020	596.0	0.1bp
	2019	487.0	0.1bp
	2018	488.0	0.1bp
	2017	424.0	0.1bp
Total	2021	20,136.0	3.5bp
	2020	19,883.2	4.3bp
	2019	25,232.0	5.9bp
	2018	23,579.0	6.0bp
	2017	21,951.0	6.2bp

Summary of All Asset Management Costs			
		000s	bps
Investment Management Costs	2021	148,361.0	25.6bp
	2020	114,369.8	24.8bp
	2019	113,598.0	26.4bp
	2018	128,467.1	32.7bp
	2017	108,109.7	30.4bp
Oversight, Custodial & Other Costs	2021	20,136.0	3.5bp
	2020	19,883.2	4.3bp
	2019	25,232.0	5.9bp
	2018	23,579.0	6.0bp
	2017	21,951.0	6.2bp
Total	2021	168,497.0	29.1bp
	2020	134,252.9	29.1bp
	2019	138,830.0	32.2bp
	2018	152,046.1	38.7bp
	2017	130,060.7	36.6bp

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

Appendix A - Data Summary: Overlays

New Zealand Superannuation Fund

Overlays		Internal					External									
		Notional amount (mils)	Market value (mils)	Profit/Loss (000s)	Cost (000s)	% of Notion. (bps)	Duration (years)	Notional amount (mils)	Market value (mils)	Profit/Loss (000s)	Base fees (000s)	Perf. fees (000s)	Over-sight (000s)	Total Notion. (000s)	% of Notion. (bps)	Duration (years)
Currency Hedge	2021	42,643.1	479.5		389.0	0.1										
	2020	33,616.0	257.2		321.6	0.1										
Rebalancing/ Passive Beta	2021	11,604.3	476.9		3,252.0	2.8										
	2020	12,018.0	797.1		3,319.8	2.8										
Policy tilt TAA	2021		561.1	37,360.6	6,366.0											
	2020		656.4	215,916.0	5,108.6											
Long/Short	2021		156.1	34,800.7	1,032.0											
	2020		151.4	35,468.7	738.5											
Other Overlay	2021	146.6	-72.4	32,988.6	1,630.0	111.2										
	2020	250.0	-97.0	-128,990.9	1,876.4	75.1										

Appendix A - Data Summary: Comments and defaults

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

- 2021 - Infrastructure - Evergreen: A default of 60 bps (on NAV) was applied to the evergreen performance fee to enable comparisons of the total cost of different implementation styles. This default is not included in your total fund cost or in benchmark analysis.
- 2021 - Natural resources - Evergreen: A default of 70 bps (on NAV) was applied to the evergreen performance fee to enable comparisons of the total cost of different implementation styles. This default is not included in your total fund cost or in benchmark analysis.
- 2021 - Private equity - Diversified - FoFs: A default of 98 bps (on NAV) was applied to the fund of funds performance fee to enable comparisons of the total cost of different implementation styles. This default is not included in your total fund cost or in benchmark analysis.
- 2021 - Private equity - Diversified - FoFs: A default of 154 bps (on amount fees are based on) was applied to the fund of funds underlying base fee to enable comparisons of the total cost of different implementation styles.
- 2021 - Private equity - Diversified - FoFs: A default of 250 bps (on NAV) was applied to the fund of funds underlying performance fee to enable comparisons of the total cost of different implementation styles. This default is not included in your total fund cost or in benchmark analysis.
- 2021 - Venture capital - LP: A default of 165 bps was applied to the LP base fee because it was not provided.
- 2021 - Venture capital - LP: A default of 250 bps (on NAV) was applied to the LP performance fee to enable comparisons of the total cost of different implementation styles. This default is not included in your total fund cost or in benchmark analysis.
- 2020 - Infrastructure - Evergreen: A default of 81 bps (on NAV) was applied to the evergreen performance fee to enable comparisons of the total cost of different implementation styles. This default is not included in your total fund cost or in benchmark analysis.
- 2020 - Infrastructure - LP: A default of 97 bps (on NAV) was applied to the LP performance fee to enable comparisons of the total cost of different implementation styles. This default is not included in your total fund cost or in benchmark analysis.
- 2020 - Natural resources - Evergreen: A default of 70 bps (on NAV) was applied to the evergreen performance fee to enable comparisons of the total cost of different implementation styles. This default is not included in your total fund cost or in benchmark analysis.
- 2020 - Private equity - Diversified - FoFs: A default of 66 bps (on NAV) was applied to the fund of funds performance fee to enable comparisons of the total cost of different implementation styles. This default is not included in your total fund cost or in benchmark analysis.
- 2020 - Private equity - Diversified - FoFs: A default of 157 bps (on amount fees are based on) was applied to the fund of funds underlying base fee to enable comparisons of the total cost of different implementation styles.
- 2020 - Private equity - Diversified - FoFs: A default of 192 bps (on NAV) was applied to the fund of funds underlying performance fee to enable comparisons of the total cost of different implementation styles. This default is not included in your total fund cost or in benchmark analysis.
- 2019 - Real estate ex-REITs - LP: A default of 79 bps (on NAV) was applied to the LP performance fee to enable comparisons of the total cost of different implementation styles. This default is not included in your total fund cost or in benchmark analysis.
- 2019 - Infrastructure - Evergreen: A default of 82 bps (on NAV) was applied to the evergreen performance fee to enable comparisons of the total cost of different implementation styles. This default is not included in your total fund cost or in benchmark analysis.

- 2019 - Natural resources - Evergreen: A default of 70 bps (on NAV) was applied to the evergreen performance fee to enable comparisons of the total cost of different implementation styles. This default is not included in your total fund cost or in benchmark analysis.
- 2018 - Private equity - Diversified - LP: A default of 185 bps (on NAV) was applied to the LP performance fee to enable comparisons of the total cost of different implementation styles. This default is not included in your total fund cost or in benchmark analysis.
- 2018 - Private equity - Diversified - FoFs: A default of 156 bps (on amount fees are based on) was applied to the fund of funds underlying base fee to enable comparisons of the total cost of different implementation styles.
- 2018 - Private equity - Diversified - FoFs: A default of 185 bps (on NAV) was applied to the fund of funds underlying performance fee to enable comparisons of the total cost of different implementation styles. This default is not included in your total fund cost or in benchmark analysis.
- 2017 - Natural resources - Evergreen: A default of 83 bps (on NAV) was applied to the evergreen performance fee to enable comparisons of the total cost of different implementation styles. This default is not included in your total fund cost or in benchmark analysis.
- 2017 - Private equity - Diversified - FoFs: A default of 157 bps (on amount fees are based on) was applied to the fund of funds underlying base fee to enable comparisons of the total cost of different implementation styles.
- 2017 - Private equity - Diversified - FoFs: A default of 183 bps (on NAV) was applied to the fund of funds underlying performance fee to enable comparisons of the total cost of different implementation styles. This default is not included in your total fund cost or in benchmark analysis.

Appendix B - Currency conversion

New Zealand Superannuation Fund

All currency amounts have been converted to New Zealand dollar using Purchasing Power Parity figures per the OECD¹. The table below shows the foreign exchange rates for the past 5 years.

Currency conversion table					
	2021	2020	2019	2018	2017
United States Dollars - USD*	1.430	1.459	1.489	1.450	1.474
Canada Dollars - CAD	1.147	1.218	1.193	1.163	1.179
Euro - EUR*	2.072	2.052	2.084	2.007	1.972
Sweden Kronor - SEK	0.164	0.164	0.165	0.160	0.166
United Kingdom Pounds - GBP	2.104	2.037	2.115	2.033	2.068
Australia Dollars - AUD	0.956	0.998	1.026	0.995	0.986
New Zealand Dollars - NZD	1.000	1.000	1.000	1.000	1.000

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 31st 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.