

**Investment**  
**Cost Effectiveness Analysis**  
(for the 5 years ending December 31, 2017)

**New Zealand Superannuation Fund**



# Key takeaways

## Returns

- Differences in total returns reflect in large part home-market biases and the relative performance of currencies. So they are not the primary focus of this report.
- Your 5-year net total return was 15.7%. This was above the Global median of 9.0% and above the peer median of 9.1%.
- Your 5-year policy return was 12.8%. This was above the Global median of 8.7% and above the peer median of 8.2%.

## Value added

- Your 5-year net value added was 2.9%. This was above the Global median of 0.2% and above the peer median of 0.4%.

## \$ Contribution versus median performance

Your fund is approximately \$5.2 billion better off than if it had earned the Global median value added of 0.2%

## Cost

- Your investment cost of 36.6 bps was below your benchmark cost of 38.0 bps. This suggests that your fund was low cost compared to your peers.
- Your fund was low cost because you had a lower cost implementation style. These savings were mostly offset because you paid more than peers for some services.

## Risk

- Your asset risk of 15.7% was above the Global median of 8.5%.

# This benchmarking report compares your cost and return performance to the 278 funds in CEM's extensive pension database.

- 156 U.S. pension funds participate. The median U.S. fund had assets of \$15.7 billion and the average U.S. fund had assets of \$33.4 billion. Total participating U.S. assets were \$5.2 trillion.

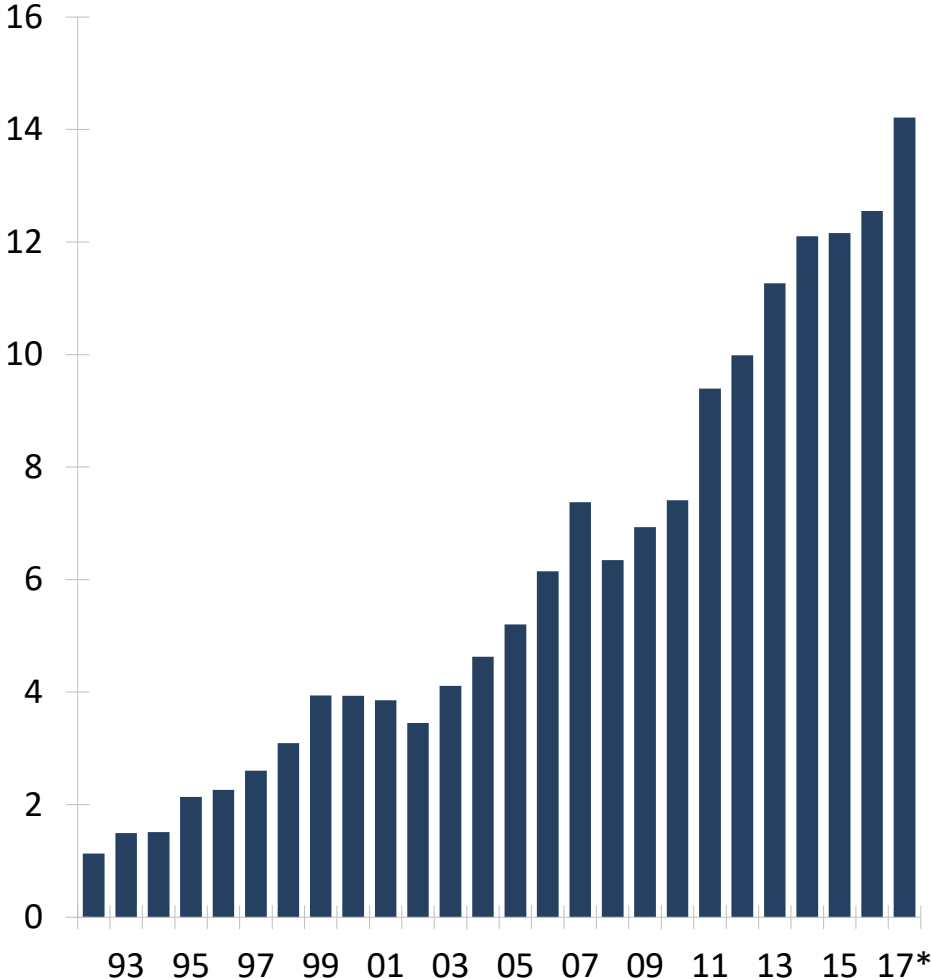
- 74 Canadian funds participate with assets totaling \$2,004.0 billion.

- 37 European funds participate with aggregate assets of \$4.0 trillion. Included are funds from the Netherlands, Norway, Sweden, Finland, Ireland, Denmark and the U.K.

- 8 Asia-Pacific funds participate with aggregate assets of \$1,538.6 billion. Included are funds from Australia, New Zealand, China and South Korea.

The most meaningful comparisons for your returns and value added are to the Global universe.

Participating assets (\$ trillions)

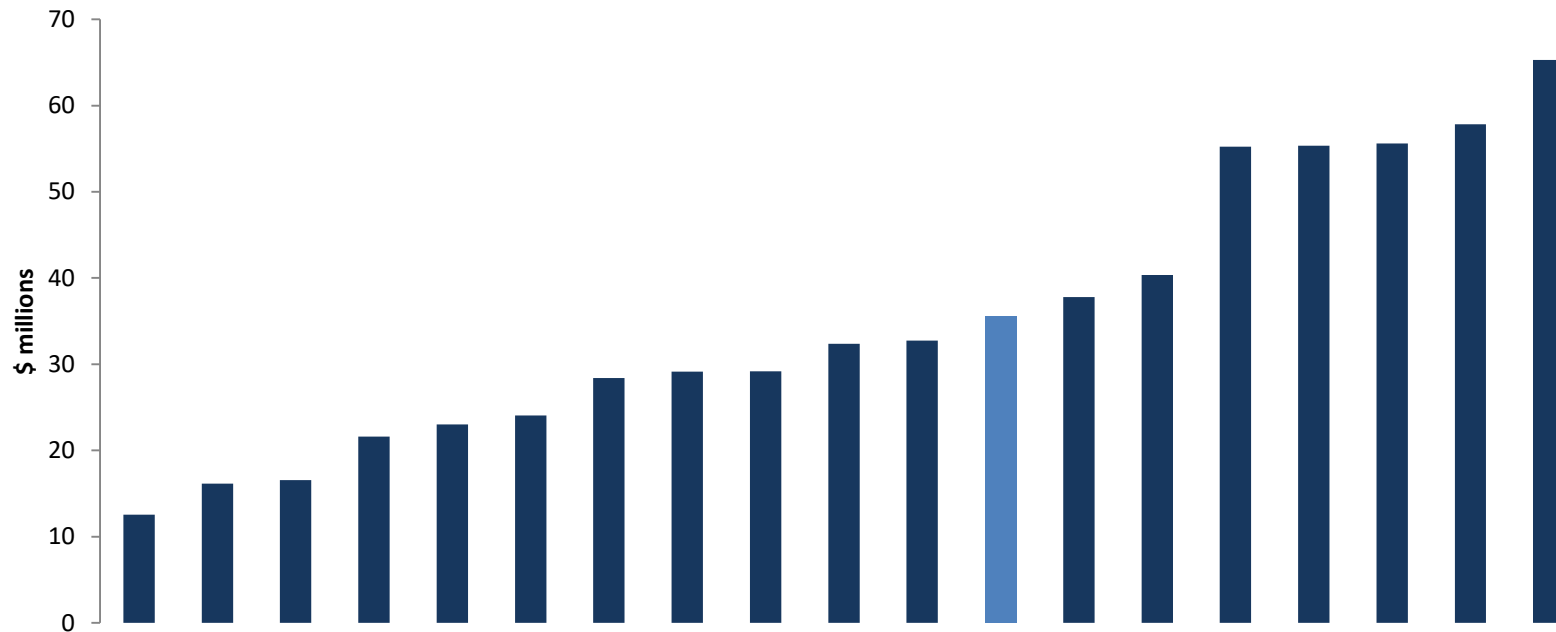


\*2017 assets includes both received and expected data.

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

## Peer group for New Zealand Superannuation Fund

- 19 Global sponsors from \$12.6 billion to \$65.3 billion
- Median size of \$32.4 billion versus your \$35.5 billion



## Your 5-year net total return of 15.7% was the highest in our Global universe.

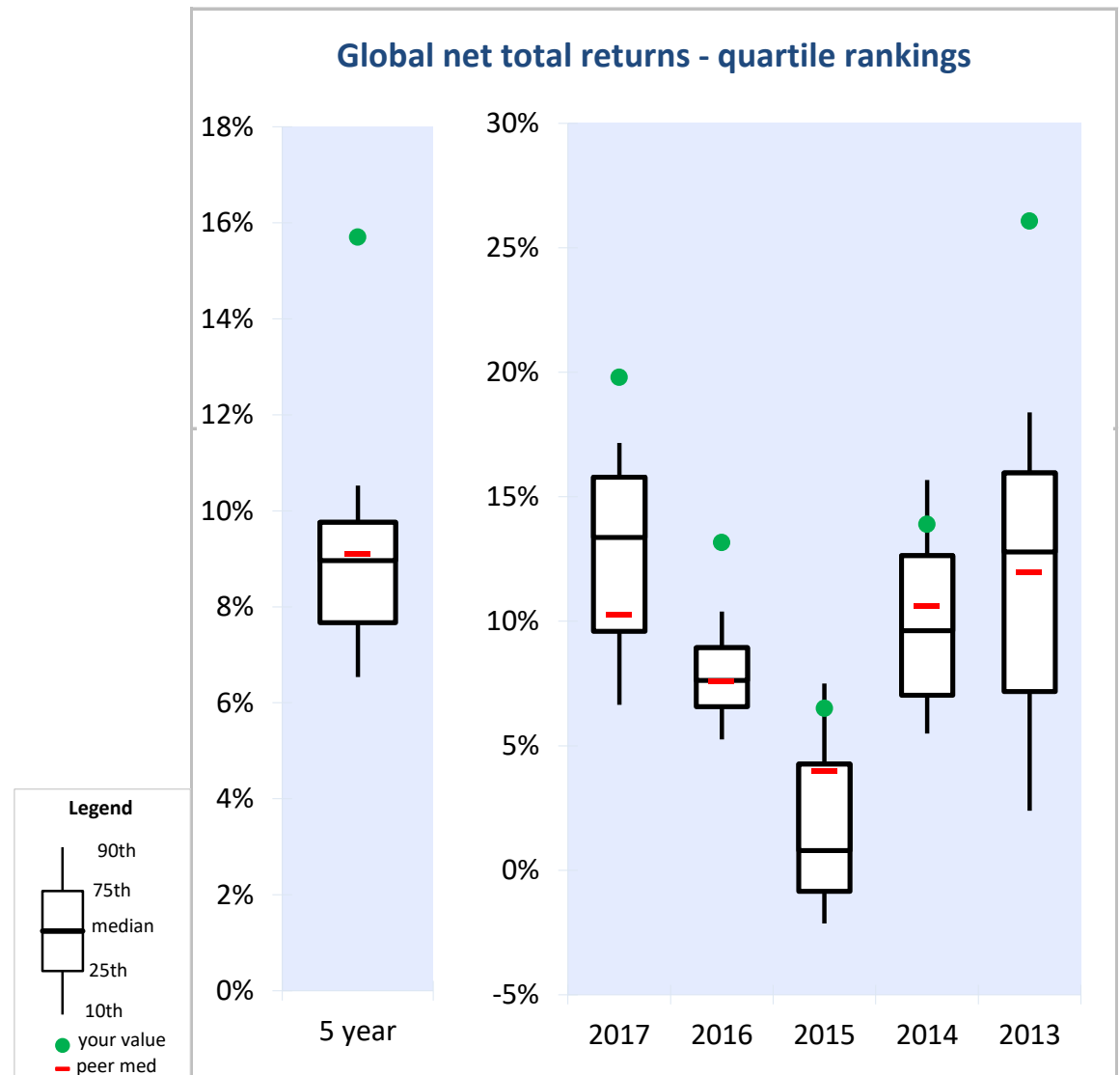
Total returns, by themselves, provide little insight into the reasons behind relative performance. Therefore, we separate total return into its more meaningful components: policy return and value added.

	Your 5-year
Net total fund return	15.7%
- Policy return	12.8%
= Net value added	2.9%

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).

The 5-year Global median was 9.0% and the peer median was 9.1%.

*Returns are reported in local currency.*



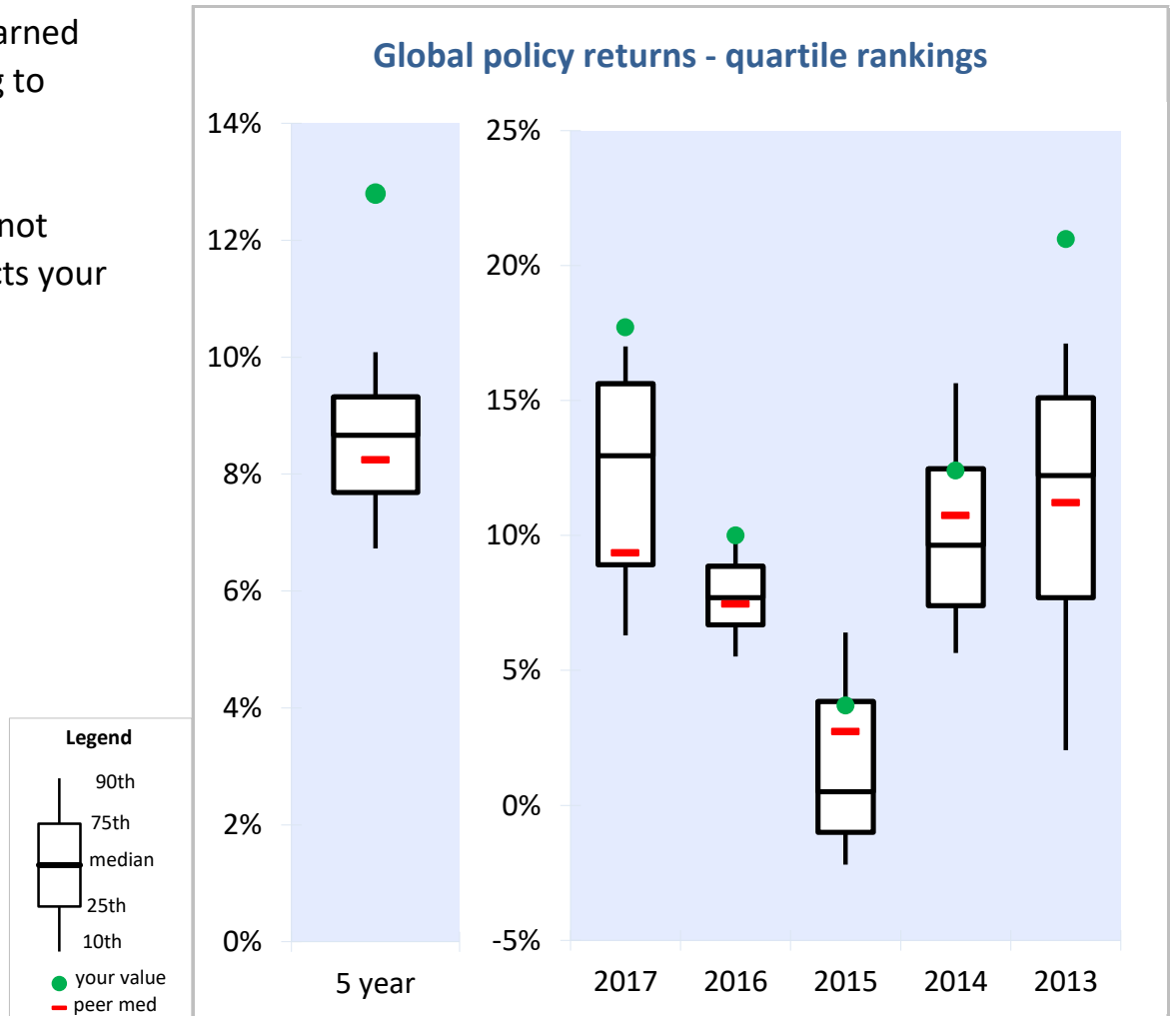
# Your 5-year policy return of 12.8% was above both the Global median of 8.7% and the peer median of 8.2%.

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

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

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

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



To enable fairer comparisons, the policy returns of all participants 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 2017 your policy mix compared to your peers and the Global universe as follows:

- Your fund had more stock than the peer and Global averages (your 80% versus a Global average of 41% and peer average of 42%).

### Policy asset mix

Asset class	Your fund	Peer avg.	Global avg.
Europe & Far East Stock	5%	7%	5%
U.S. Stock	0%	7%	12%
Emerging Market Stock	10%	4%	3%
Global Stock	65%	15%	13%
Other Stock <sup>1</sup>	0%	7%	8%
<b>Total Stock</b>	<b>80%</b>	<b>42%</b>	<b>41%</b>
Long Bonds	0%	11%	14%
Global Bonds	20%	7%	2%
Cash	0%	-2%	1%
Other Fixed Income <sup>1</sup>	0%	22%	24%
<b>Total Fixed Income</b>	<b>20%</b>	<b>37%</b>	<b>41%</b>
Hedge Funds	0%	5%	3%
Real Assets <sup>1</sup>	0%	10%	9%
Private Equity	0%	6%	5%
<b>Total</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>

1. Other stock includes Canadian and ACWIxUS stock. Other fixed income includes Canada, U.S., Capital Indexed, High Yield and Emerging bonds. Real assets includes commodities, natural resources, infrastructure, REITS and real estate.

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

For the purposes of comparing your costs and value added to other participants, CEM looks at investments before the impact of derivatives. This allows us to compare, for example, the cost of the global stock assets in your plan to similar assets in your peers' plans. Our report will reflect your assets as they appear in the middle column - before derivatives.

### Asset mix

Asset class	Policy mix	Actual asset mix	
		excluding derivatives	including derivatives
Europe & Far East Stock	5%	4%	4%
Emerging Market Stock	10%	6%	11%
Global Stock	65%	42%	55%
<b>Total Stock</b>	<b>80%</b>	<b>52%</b>	<b>70%</b>
U.S. Bonds	0%	0%	0%
Global Bonds	20%	11%	11%
Cash	0%	18%	-1%
<b>Total Fixed Income</b>	<b>20%</b>	<b>29%</b>	<b>10%</b>
Hedge Funds	0%	5%	5%
Natural Resources	0%	6%	6%
Infrastructure	0%	3%	3%
Real Estate ex-REITs	0%	0%	0%
Diversified Private Equity	0%	1%	1%
Other Private Equity	0%	5%	6%
<b>Total</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>



# Net value added is the component of total return from active management. Your 5-year net value added of 2.9% was the highest in our Global universe.

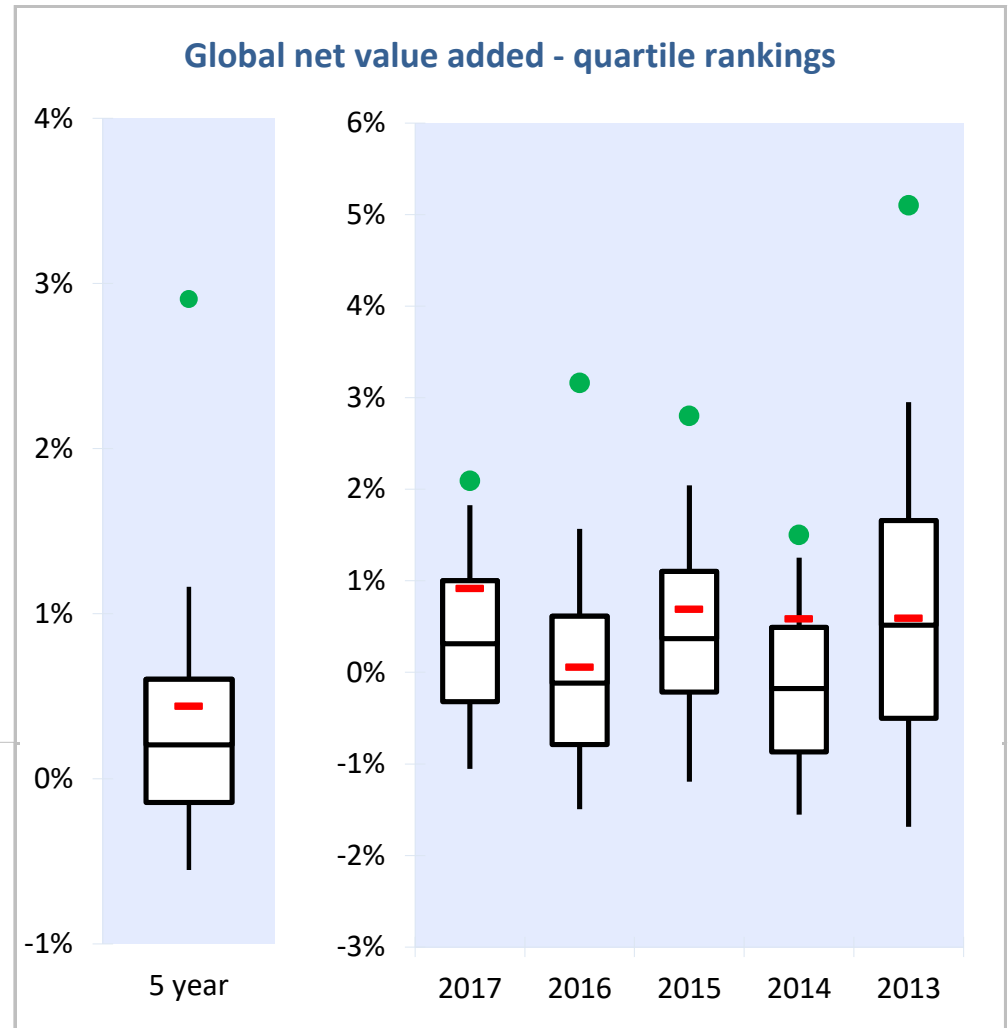
Net value added equals total net return minus policy return.

## Value added for New Zealand Superannuation Fund

Year	Net Return	Policy Return	Net value Added
2017	19.8%	17.7%	2.1%
2016	13.2%	10.0%	3.2%
2015	6.5%	3.7%	2.8%
2014	13.9%	12.4%	1.5%
2013	26.1%	21.0%	5.1%
5-Year	15.7%	12.8%	2.9%

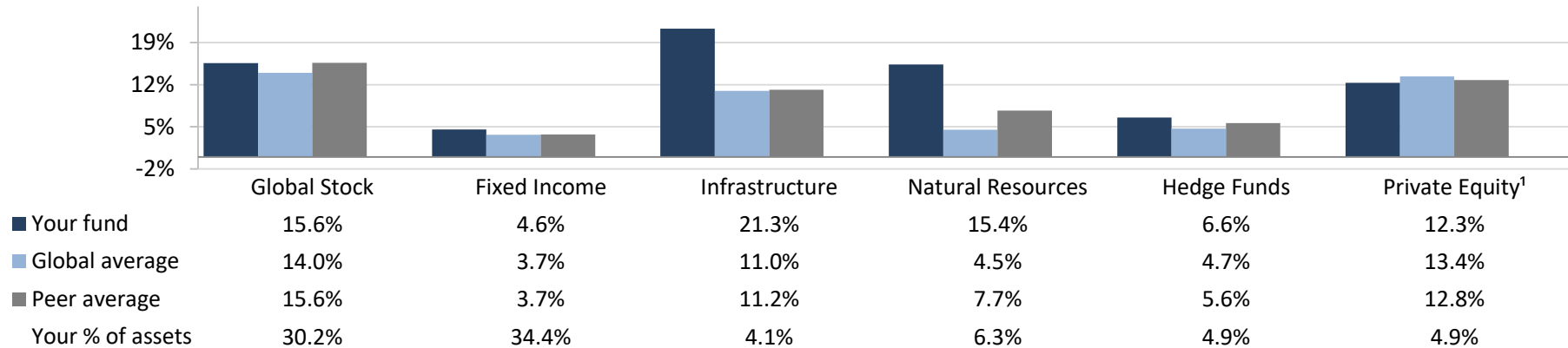
Your 5-year net value added of 2.9% compares to a median of 0.4% for your peers and 0.2% for the Global universe.

Your 2.9% 5-year value added translates into approximately \$5.5 billion of cumulative value added over 5 years, or \$5.2 billion more than if you had earned the Global median of 0.2%.

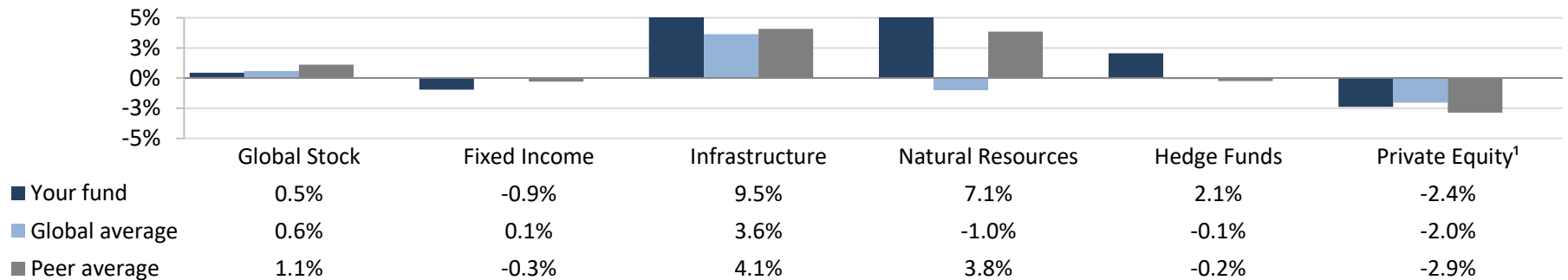


# Comparisons of your 5-year net return and net value added by major asset class.

## 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 were \$130.1 million or 36.6 basis points in 2017.

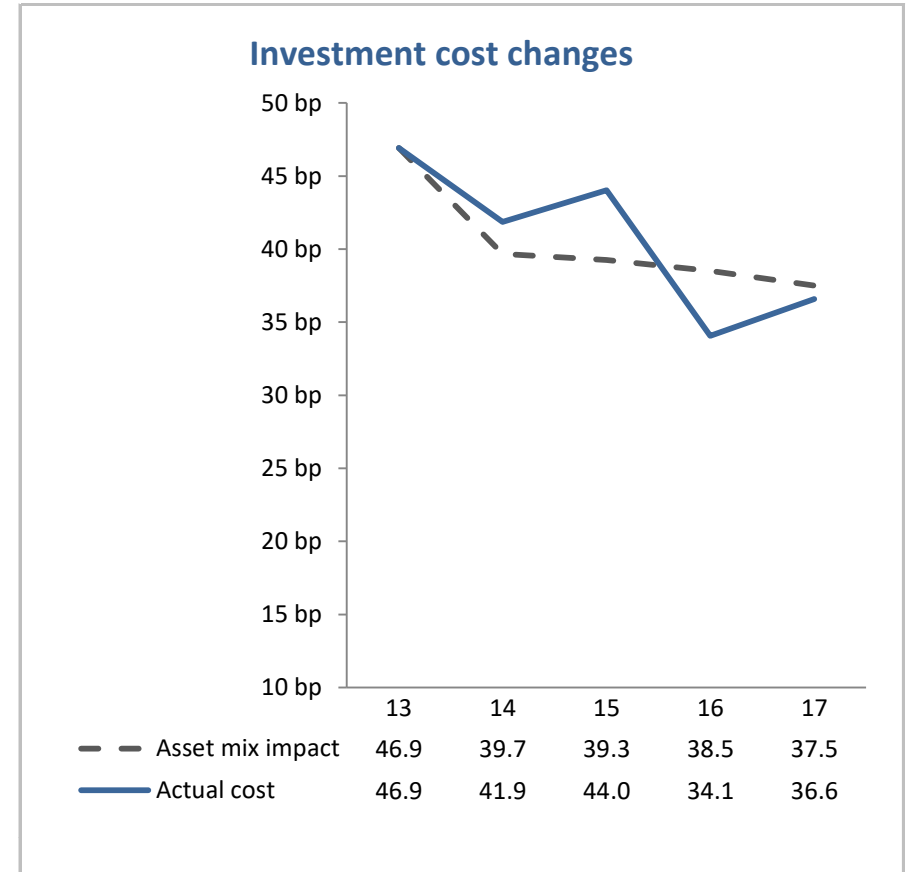
Asset management costs by asset class and style (\$000s)	Internal Management			External Management			Total
	Passive	Active	Overseeing of external	Passive fees	Active base fees	Perform. fees <sup>2</sup>	
Stock - Europe, Asia & Far-East	104	2,496	515		2,865		5,980
Stock - Emerging			1,058	924	3,930		5,912
Stock - Global			3,626	4,947			8,573
Fixed Income - U.S.	81						81
Fixed Income - Global			748	1,880			2,628
Cash		4,779					4,779
Hedge Fund - External Not Fund of Fund			1,934		15,802	13,928	31,664
Real Estate - LPs <sup>2</sup>			647		227	126	874
Infrastructure <sup>2</sup>		1,084	1,506		4,840	12,311	7,430
Infrastructure - LPs <sup>2</sup>			788		3,183	598	3,971
Natural Resources <sup>2</sup>		1,731	2,330		5,297	5,086	9,358
Diversified Private Equity - LPs <sup>2</sup>			1,088		5,933	2,775	7,021
Diversified Private Equity - FoFs <sup>1 2</sup>			71		1,132	564	1,203
Other Private Equity - LPs <sup>2</sup>		3,594	704		5,756	-48	10,054
Derivatives/Overlays	2,394	6,188					8,582
<b>Total excluding private asset performance fees</b>							<b>108,110 30.4bp</b>
<b>Oversight, custodial and other costs <sup>3</sup></b>							
Oversight of the fund							15,508
Trustee & custodial							6,019
Consulting and performance measurement							0
Audit							424
Other							0
<b>Total oversight, custodial &amp; other costs</b>							<b>21,951 6.2bp</b>
<b>Total investment costs (excl. transaction costs &amp; private asset performance fees)</b>							<b>130,061 36.6bp</b>

### Footnotes

1. Default underlying costs were added: Diversified Private Equity - FoFs 157 bp. Refer to Appendix A for full details regarding defaults.
2. 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.
3. Excludes non-investment costs, such as benefit insurance premiums and preparing cheques for retirees.

## Your cost decreased from 46.9 bps in 2013 to 36.6 bps in 2017.

	Bps
Investment cost reported in 2013	46.7 bp
Impact of methodology changes <sup>1</sup>	
• Inclusion of hedge fund performance fees	0.3 bp
Restated costs for 2013 <sup>1</sup>	46.9 bp
Impact of changes in assets and asset mix	
• Increase in assets <sup>2</sup>	n/a
• Lower cost asset mix	(9.6) bp
• Increased use of overlays	0.2 bp
Cost after asset mix impact	37.5 bp
Impact of changes within the same asset classes	
• More passive (less active)	(3.0) bp
• Less external management (vs. internal)	(2.5) bp
• Less fund-of-funds management	(0.0) bp
Higher/-lower fees for:	
• Stock and fixed Income	1.9 bp
• Private markets and hedge funds:	
Lower base fees	(0.5) bp
Higher performance fees	3.7 bp
• Lower oversight and other changes	(0.5) bp
Total changes within the same asset classes	(0.9) bp
Investment cost in 2017	<u>36.6 bp</u>



1. To enable a meaningful comparison, we have adjusted your reported 2013 cost to allow for the fact that we started to collect more costs at a later date. The reported cost is increased as if you were paying the same amount in bps in 2013 for each asset class. For example, we started to collect hedge fund performance fees in 2014. If your hedge fund performance fees were 50 bps at that time, then we assume you were paying 50 bps in 2013 and that your 'implementation style' was unchanged.

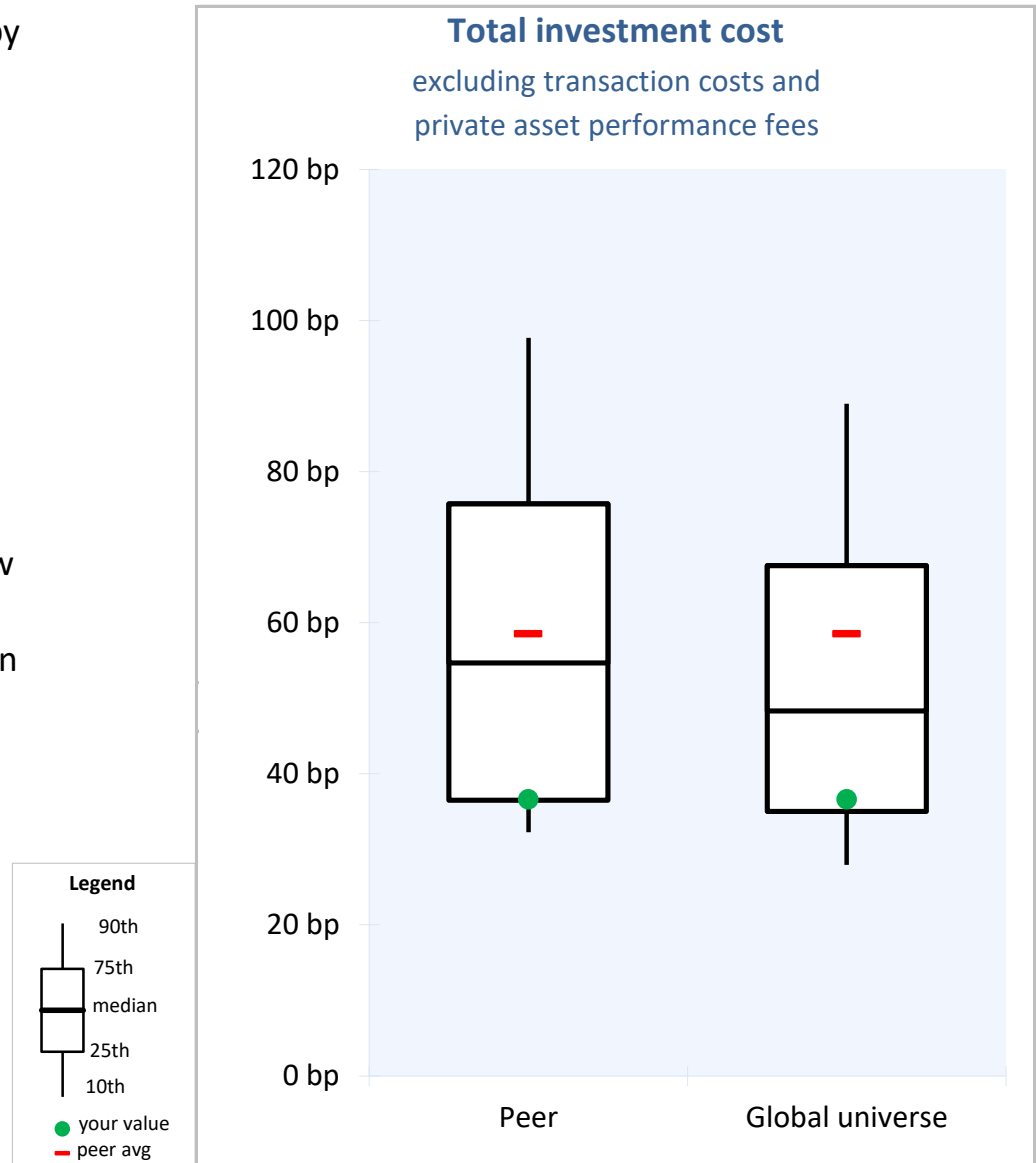
2. Assumes all costs increase in line with the value of assets.

## Your total investment cost of 36.6 bps was below the peer median of 54.7 bps.

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

- Asset mix, particularly holdings of the highest cost asset classes: real estate (excl REITS), infrastructure, hedge funds and private equity. These high cost assets equaled 20% of your funds assets at the end of 2017 versus a peer average of 22%.
- 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 1.4 basis points in 2017.

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 36.6 bp was below your benchmark cost of 38.0 bp. Thus, your cost savings was 1.4 bp.

### Your cost versus benchmark

	\$000s	basis points
Your total investment cost	130,061	36.6 bp
Your benchmark cost	134,984	38.0 bp
Your excess cost	(4,924)	(1.4) bp

**Your fund was low cost because you had a lower cost implementation style. These savings were mostly offset because you paid more than peers for some services.**

### Reasons for your low cost status

	Excess Cost/ (Savings)	
	\$000s	bps
1. Lower cost implementation style		
• Less external active management (more lower cost passive and internal)	(32,033)	(9.0)
• Less partnerships as a percentage of external	(2,117)	(0.6)
• Less fund of funds	(4,652)	(1.3)
• More overlays	5,308	1.5
• Other style differences	(513)	(0.1)
	<u>(34,007)</u>	<u>(9.6)</u>
2. Paying more than peers for some services		
• External investment management costs	17,087	4.8
• Internal investment management costs	(577)	(0.2)
• Oversight, custodial & other costs	12,573	3.5
	<u>32,543</u>	<u>8.2</u>
<b>Total savings</b>	<b>(4,924)</b>	<b>(1.4)</b>

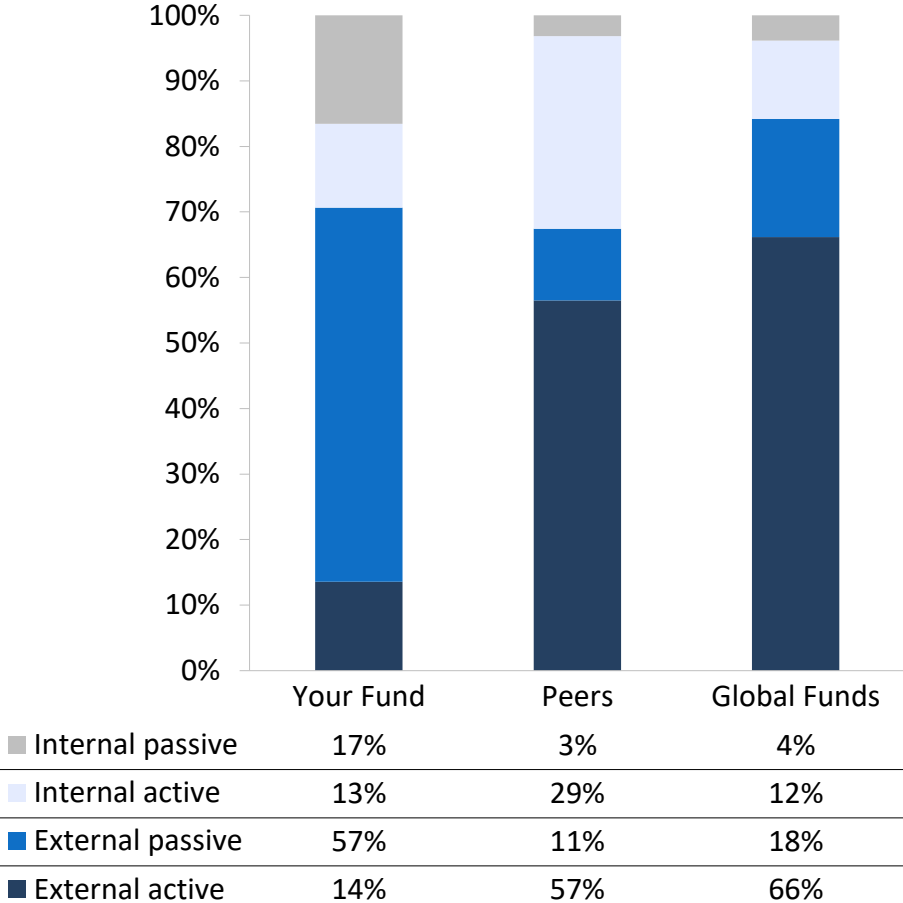
# Differences in cost performance are often caused by differences in implementation style.

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

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

- External active management because it tends to be much more expensive than internal or passive management. You used less external active management than your peers (your 14% versus 57% for your peers).
- Within external active holdings, fund of funds usage because it is more expensive than direct fund investment. You had less in fund of funds. Your 0% of hedge funds, real estate and private equity in fund of funds compared to 12% for your peers.

Implementation style<sup>1</sup>



1. The graph includes the impact of derivatives for your fund.



# Differences in implementation style saved you 9.6 bp relative to your peers.

## Calculation of the cost impact of differences in implementation style

Asset class*	Your avg holdings in \$mils (A)	% External active			Premium vs passive & internal <sup>1</sup> (C)	Cost/ (savings)	
		You	Peer average	More/ (less) (B)		\$000s (A X B X C)	bps
Stock - EAFE	1,486	41.7%	44.1%	(2.5%)	48.4 bp	(177)	
Stock - Emerging	1,986	21.7%	70.5%	(48.7%)	59.9 bp	(5,797)	
Stock - Global	14,865	0.0%	38.9%	(38.9%)	35.2 bp	(20,348)	
Fixed Income - U.S.	30	0.0%	56.2%	(56.2%)	15.4 bp	(26)	
Fixed Income - Global	3,868	0.0%	13.1%	(13.1%)	18.6 bp	(940)	
Real Estate ex-REITs	21	100.0%	69.0%	31.0%	75.2 bp	49	
Infrastructure	1,212	59.8%	85.4%	(25.5%)	85.7 bp	(2,652)	
Natural Resources	2,239	27.2%	40.3%	(13.1%)	73.3 bp	(2,143)	
Impact of more/less external active vs. lower cost styles						(32,033)	(9.0) bp
		<u>LPs % of external active</u>			<u>Premium vs. ea<sup>1</sup></u>		
Real Estate ex-REITs	21	100.0%	43.6%	56.4%	44.1 bp	52	
Infrastructure	725	28.3%	59.4%	(31.1%)	43.5 bp	(981)	
Natural Resources	609	0.0%	79.5%	(79.5%)	24.5 bp	(1,189)	
Impact of more/less partnerships as a percentage of external active						(2,117)	(0.6) bp
		<u>Fund of funds % of LPs</u>			<u>Premium vs. direct LP<sup>1</sup></u>		
Real Estate ex-REITs	21	0.0%	1.3%	(1.3%)	26.4 bp	(1)	
Infrastructure	205	0.0%	4.2%	(4.2%)	54.8 bp	(47)	
Hedge Funds	1,612	0.0%	28.2%	(28.2%)	82.2 bp	(3,740)	
Top layer perf. fees (on NAV)	1,612	0.0%	28.2%	(28.2%)	16.1 bp	(735)	
Diversified Private Equity	226	13.7%	20.2%	(6.4%)	88.8 bp	(129)	
Impact of more/less fund of funds vs. direct LPs						(4,652)	(1.3) bp
Impact of higher use of portfolio level overlays						5,308	1.5 bp
Impact of mix of internal passive, internal active, and external passive <sup>2</sup>						(513)	(0.1) bp
Total impact of differences in implementation style						(34,007)	(9.6) bp

Footnotes  
\*Asset classes where you are implemented the same as peers (i.e. style impact is zero) are not shown.  
1. The cost premium is the additional cost of external active management relative to the average of other lower cost implementation styles - internal passive, internal active and external passive.  
2. The 'Impact of mix of internal passive, internal active and external passive' quantifies the net cost impact of differences in cost between, and your relative use of, these 'low-cost' styles.

## The net impact of paying more/less for external asset management costs added 4.8 bps.

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

	Style	Your avg holdings in \$mils (A)	Cost in bps			Cost/(savings) \$000s (A X B)
			Your Fund	Peer median	More/(less) (B)	
<b>External asset management</b>						
Stock - EAFE	active	619	54.6	54.4	0.2	12
Stock - Emerging	passive	1,554	10.6	13.2	(2.6)	(398)
Stock - Emerging	active	432	98.7	69.4	29.3	1,264
Stock - Global	passive	14,865	5.8	3.3	2.5	3,683
Fixed Income - Global*	passive	3,868	6.8	6.8	0.0	0
Real Estate ex-REITs	LP	21	416.2	128.6	287.6	604
Infrastructure	active	520	122.0	76.5	45.5	2,368
Infrastructure	LP	205	193.7	117.7	76.0	1,558
Natural Resources*	active	609	125.2	82.6	42.7	2,599
Hedge Funds	active	1,612	110.0	124.6	(14.6)	(2,353)
Top layer perf. fees (on NAV)	active	1,612	86.4	64.9	21.5	3,460
Diversified Private Equity	FoF	31	231.0	93.7	137.3	426
Underlying base fees	FoF	31	157.0	157.0	0.0	0
Diversified Private Equity	LP	195	360.1	161.8	198.2	3,865
Other Private Equity	LP	850	76.0 <sup>1</sup>	Excluded	--	--
Total impact of paying more/less for external management						17,087
Total in bps						4.8 bp

#### Footnotes:

1. You paid performance fees in this asset class.

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

\*Database median used as peer data was insufficient.

## The net impact of paying more/less for internal asset management costs saved 0.2 bps.

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

	Style	Your avg holdings in \$mils	Cost in bps			Cost/ (savings) \$000s
			Your Fund	Peer median	More/ (less)	
<b><i>Internal asset management</i></b>		(A)			(B)	(A X B)
Stock - EAFE	passive	133	7.8	10.6	(2.7)	(36)
Stock - EAFE	active	734	34.0	5.8	28.2	2,068
Fixed Income - U.S.*	passive	30	27.2	1.1	26.1	78
Infrastructure	active	487	22.3	16.6	5.6	274
Natural Resources*	active	1,630	10.6	28.8	(18.2)	(2,961)
Other Private Equity	active	1,314	27.4	Excluded	--	--
<b>Total for internal management</b>						<b>(577)</b>
<b>Total in bps</b>						<b>(0.2) bp</b>

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

\*Universe median used as peer data was insufficient.

## The net impact of differences in oversight, custodial & other costs added 3.5 bps.

### Cost impact of differences in oversight, custodial & other costs

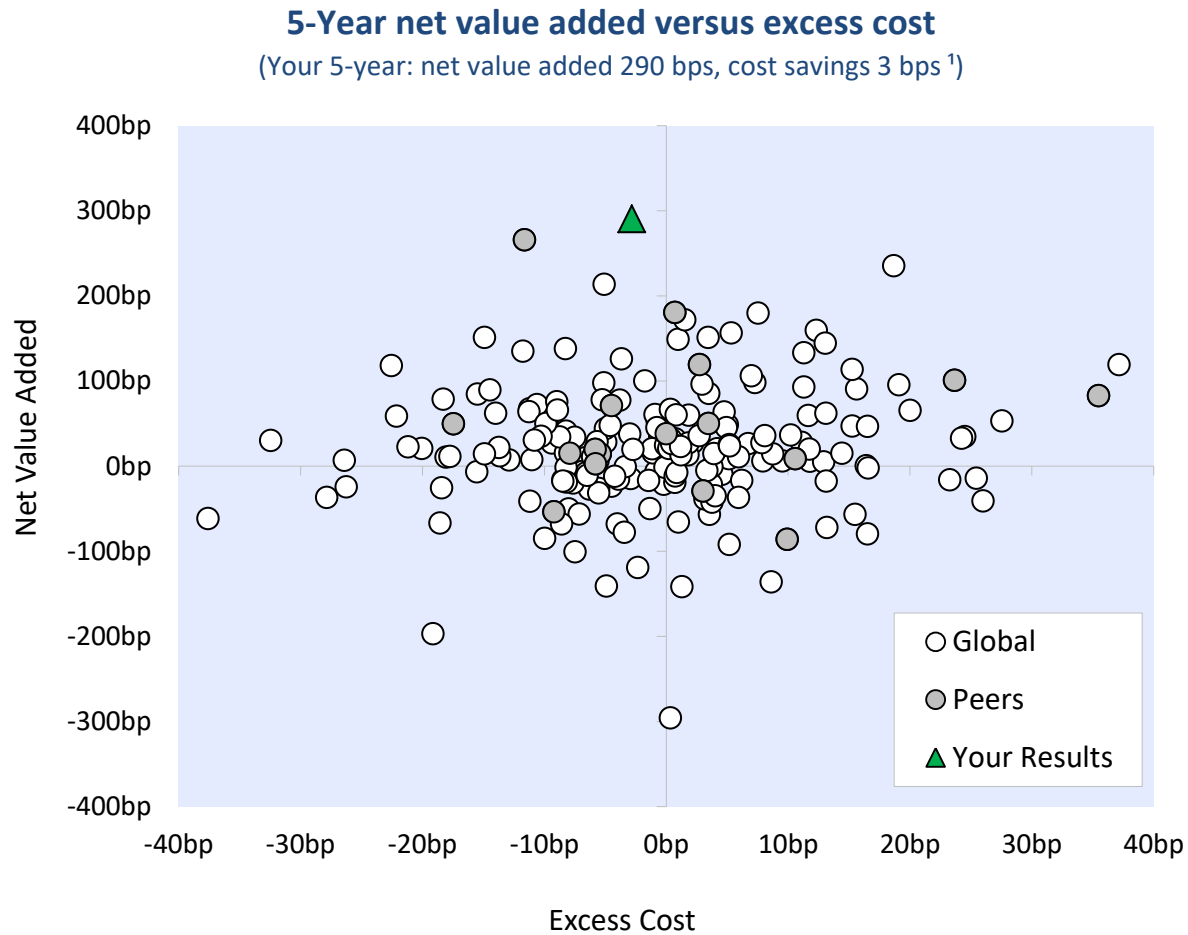
	Your avg holdings in \$mils (A)	Cost in bps			Cost/ (savings) \$000s (A X B)
		Your Fund	Peer median	More/ (less) (B)	
Oversight	35,543	4.4	1.3	3.0	10,732
Consulting	35,543	0.0	0.3	(0.3)	(902)
Custodial	35,543	1.7	0.8	0.9	3,040
Audit	35,543	0.1	0.0	0.1	247
Other	35,543	0.0	0.2	(0.2)	(545)
Total for oversight, custodial, other					12,573
Total in bps					3.5 bp

**In summary, your fund was low cost because you had a lower cost implementation style. These savings were mostly offset because you paid more than peers for some services.**

### Reasons for your low cost status

	Excess Cost/ (Savings)	
	\$000s	bps
<b>1. Lower cost implementation style</b>		
• Less fund of funds	(4,652)	(1.3)
• Less external active management (more lower cost passive and internal)	(32,033)	(9.0)
• Less partnerships as a percentage of external	(2,117)	(0.6)
• More overlays	5,308	1.5
• Other style differences	(513)	(0.1)
	<u>(34,007)</u>	<u>(9.6)</u>
<b>2. Paying more than peers for some services</b>		
• External investment management costs	17,087	4.8
• Internal investment management costs	(577)	(0.2)
• Oversight, custodial & other costs	12,573	3.5
	<u>32,543</u>	<u>8.2</u>
<b>Total savings</b>	<u>(4,924)</u>	<u>(1.4)</u>

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



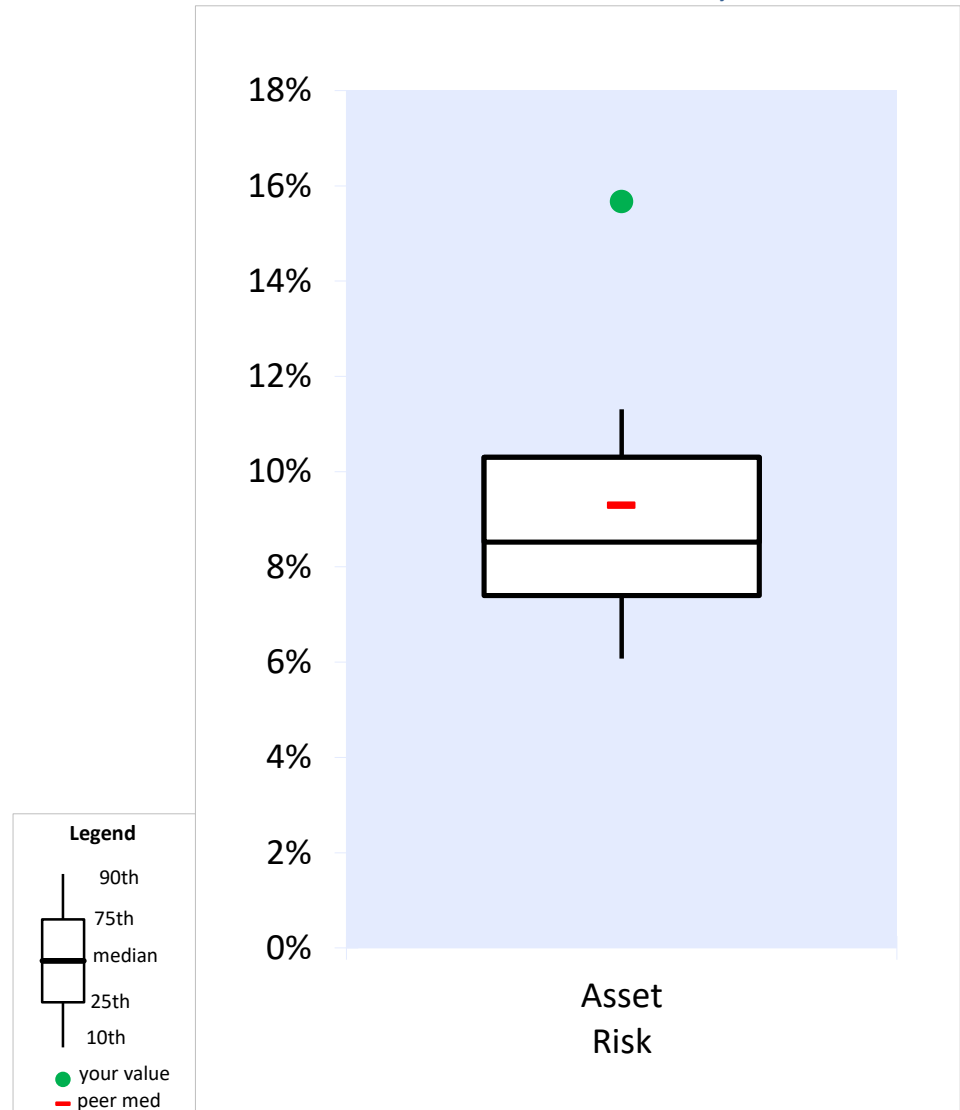
1. Your 5-year cost savings of 3 basis points is the average of your cost savings for the past 5 years.

	2017	2016	2015	2014	2013	5-year
Net value added	209.0bp	316.0bp	280.0bp	150.0bp	510.0bp	290.4bp
Excess Cost	-1.4bp	-3.8bp	-6.2bp	-5.4bp	2.7bp	-2.8bp

## Comparison of risk levels

Your asset risk of 15.7% was above the Global median of 8.5%. 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, 2017



# Summary of key takeaways

## Returns

- Differences in total returns reflect in large part home-market biases and the relative performance of currencies. So they are not the primary focus of this report.
- Your 5-year net total return was 15.7%. This was above the Global median of 9.0% and above the peer median of 9.1%.
- Your 5-year policy return was 12.8%. This was above the Global median of 8.7% and above the peer median of 8.2%.

## Value added

- Your 5-year net value added was 2.9%. This was above the Global median of 0.2% and above the peer median of 0.4%.

## \$ Contribution versus median performance

Your fund is approximately \$5.2 billion better off than if it had earned the Global median value added of 0.2%

## Cost and cost effectiveness

- Your investment cost of 36.6 bps was below your benchmark cost of 38.0 bps. This suggests that your fund was low cost compared to your peers.
- Your fund was low cost because you had a lower cost implementation style. These savings were mostly offset because you paid more than peers for some services.

## Risk

- Your asset risk of 15.7% was above the Global median of 8.5%.