

Investment
Cost Effectiveness Analysis
(for the 5 years ending December 31, 2016)

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 15.5%. This was above the Global median of 8.8% and above the peer median of 9.1%.
- Your 5-year policy return was 12.6%. This was above the Global median of 8.5% and above the peer median of 8.5%.

Value added

- Your 5-year net value added was 3.0%. This was above the Global median of 0.4% and above the peer median of 0.6%.

Cost

- Your investment cost of 33.8 bps was below your benchmark cost of 37.6 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 partly offset because you paid more than peers for some services.

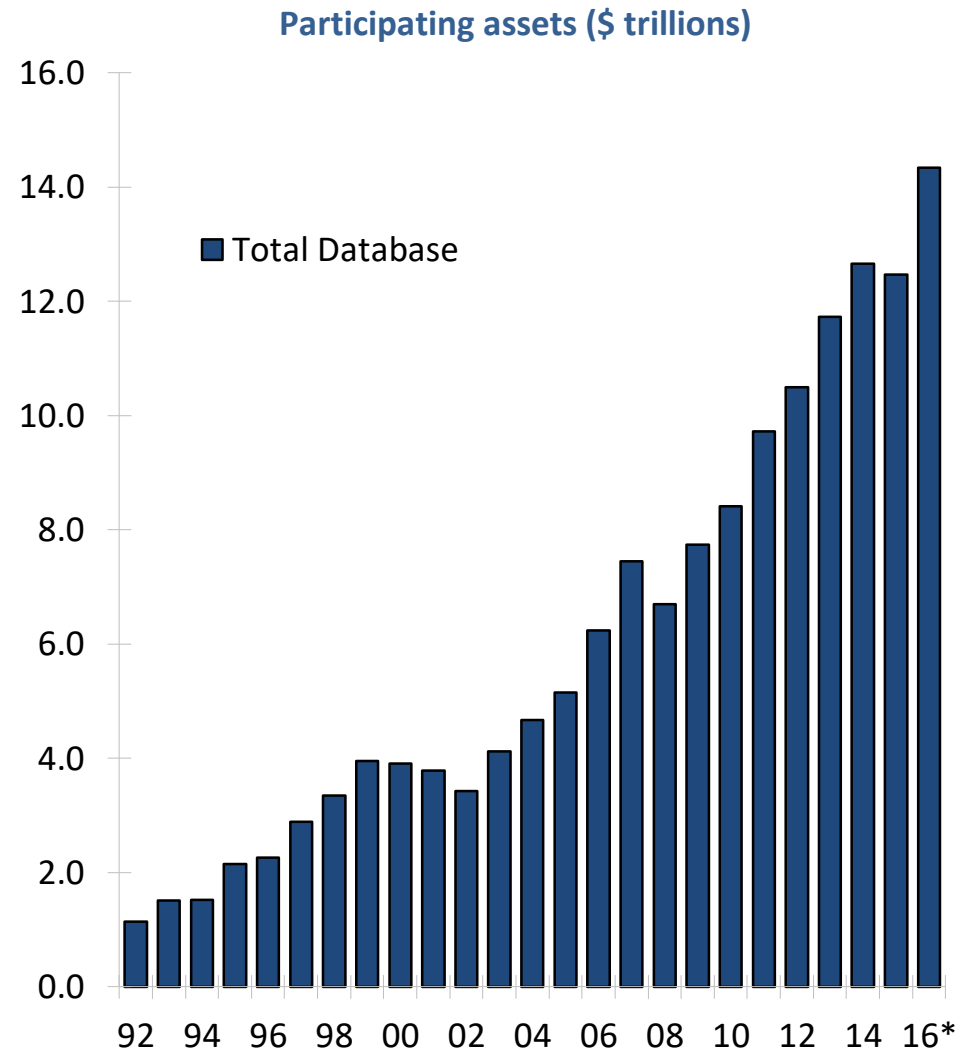
Risk

- Your asset risk of 12.7% was above the Global median of 8.4%.

This benchmarking report compares your cost and return performance to the 252 funds in CEM's extensive pension database.

- 145 U.S. pension funds participate. The median U.S. fund had assets of \$13.8 billion and the average U.S. fund had assets of \$26.9 billion. Total participating U.S. assets were \$3.9 trillion.
- 70 Canadian funds participate with assets totaling \$1,568 billion.
- 31 European funds participate with aggregate assets of \$2.9 trillion. Included are funds from the Netherlands, Norway, Sweden, Finland, Denmark, Switzerland and the U.K.
- 6 Asia-Pacific funds participate with aggregate assets of \$272 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.

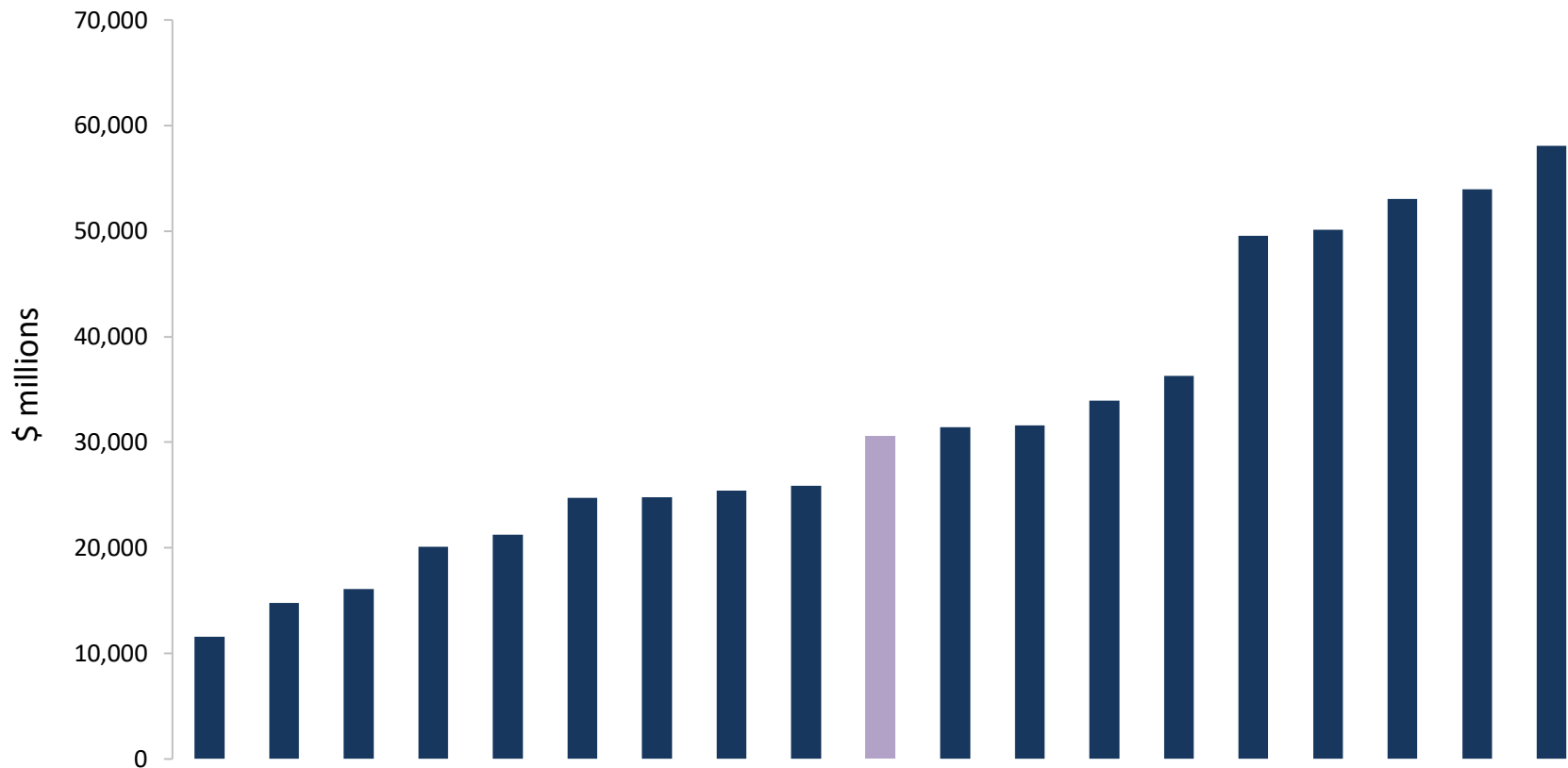


* 2016 reflects both received and expected data.

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

Peer group for New Zealand Superannuation Fund

- 19 global sponsors from \$12 billion to \$58 billion
- Median size of \$31 billion versus your \$31 billion



Your 5-year net total return of 15.5% was the highest in our Global universe.

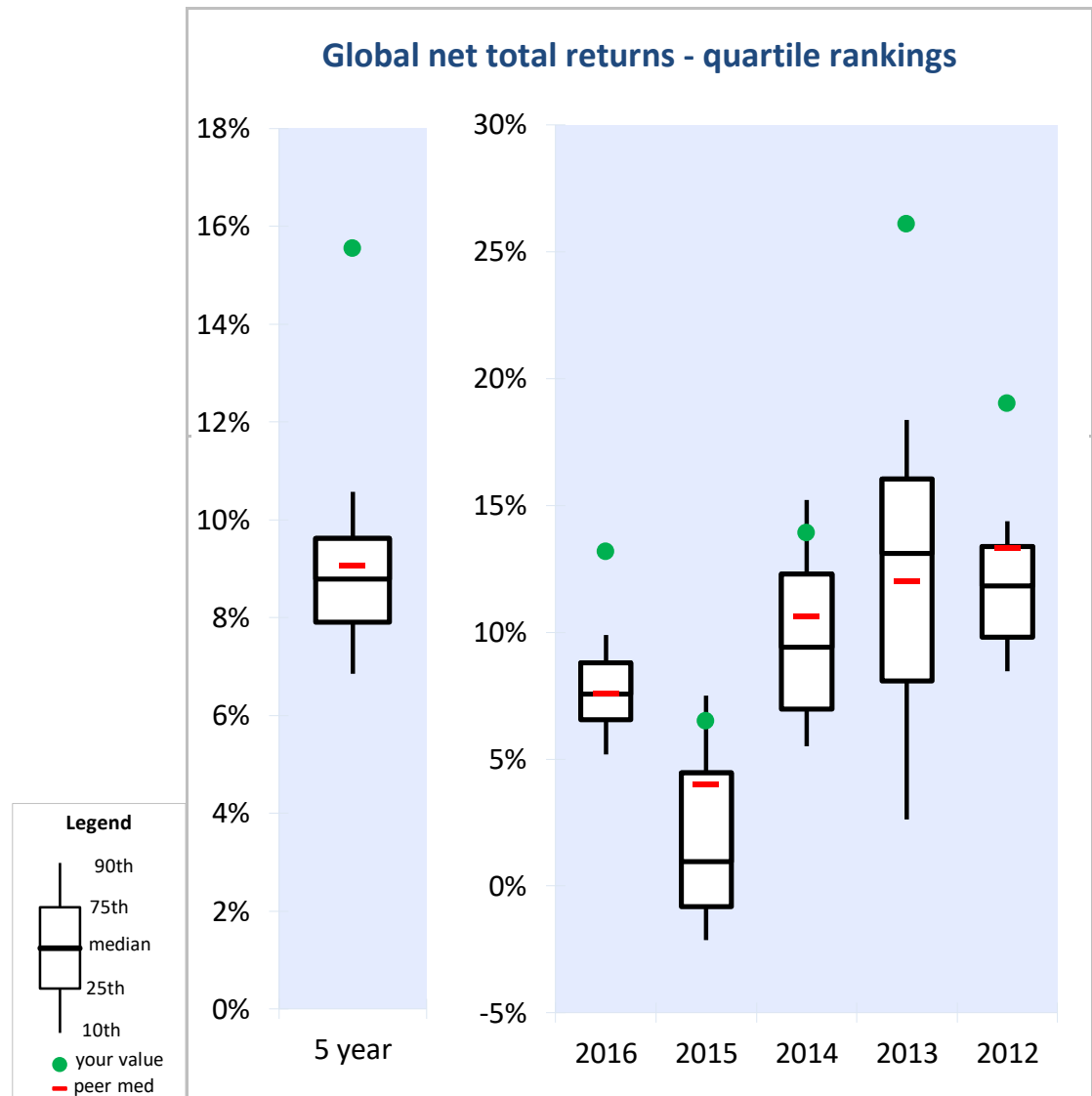
Total returns, by themselves, provide little insight into the reasons behind relative performance. Therefore, we separate total return into its more meaningful components: policy return and value added.

	Your 5-year
Net total fund return	15.5%
- Policy return	12.6%
= Net value added	3.0%

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 8.8% and the peer median was 9.1%.

Returns are reported in local currency.



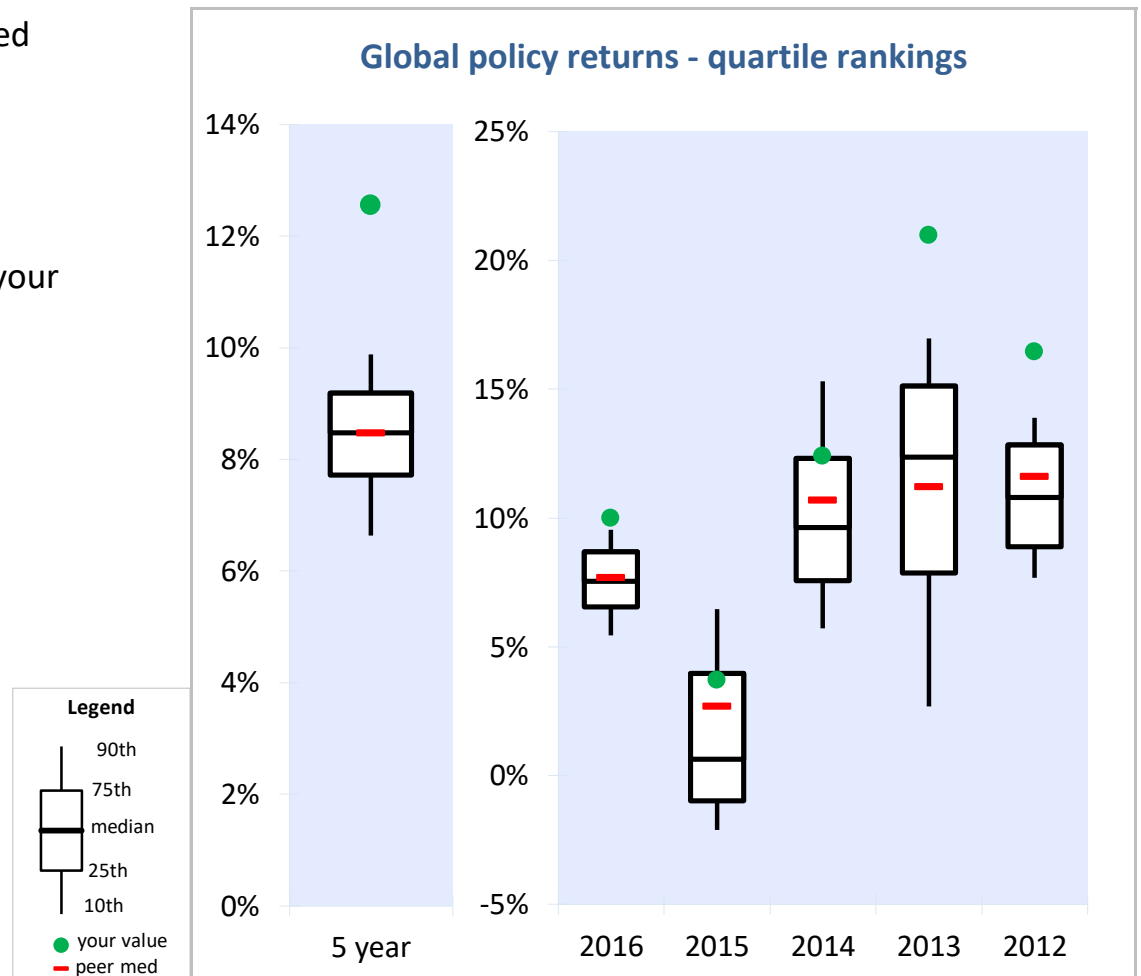
Your 5-year policy return of 12.6% was the highest in our Global universe and compares to the Global median of 8.5% and the peer median of 8.5%.

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. Refer to the Research section pages 6-7 for details.

Differences in policy return are caused by differences in policy mix and benchmarks. At the end of 2016 your policy mix compared to your peers and the Global universe as follows:

Policy asset mix

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

Asset class	Your fund	Peer avg.	Global avg.
Europe & Far East Stock	5%	4%	4%
U.S. Stock	0%	8%	13%
Emerging Market Stock	10%	4%	3%
Global Stock	65%	15%	12%
Other Stock ¹	0%	12%	11%
Total Stock	80%	43%	43%
Long Bonds	0%	9%	12%
Capital Indexed Bonds	0%	3%	1%
Global Bonds	20%	7%	2%
Cash	0%	-2%	1%
Other Fixed Income ¹	0%	19%	22%
Total Fixed Income	20%	36%	40%
Hedge Funds	0%	5%	3%
Real Assets ¹	0%	10%	9%
Private Equity	0%	6%	5%
Total	100%	100%	100%

1. Other stock includes Canadian, Europe, EAFE and ACWIXUS stock. Other fixed income includes Canada, Euro, U.S., High Yield, EAFE and Emerging bonds. Real assets includes commodities, natural resources, infrastructure, REITS and real estate.

Your fund uses derivatives, to adjust exposure to some asset classes.

Asset mix

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 class	Policy mix	Actual Weights	
		excluding derivatives	including derivatives
Europe & Far East Stock	5%	4%	4%
Emerging Market Stock	10%	5%	10%
Global Stock	65%	34%	54%
Total Stock	80%	43%	69%
U.S. Bonds	0%	0%	0%
Global Bonds	20%	11%	11%
Cash	0%	25%	-1%
Total Fixed Income	20%	36%	11%
Hedge Funds	0%	4%	4%
Natural Resources	0%	6%	6%
Infrastructure	0%	4%	4%
Real Estate ex-REITs	0%	0%	0%
Private Equity	0%	6%	6%
Total	100%	100%	100%

Net value added is the component of total return from active management. Your 5-year net value added of 3.0% was the highest in our Global universe.

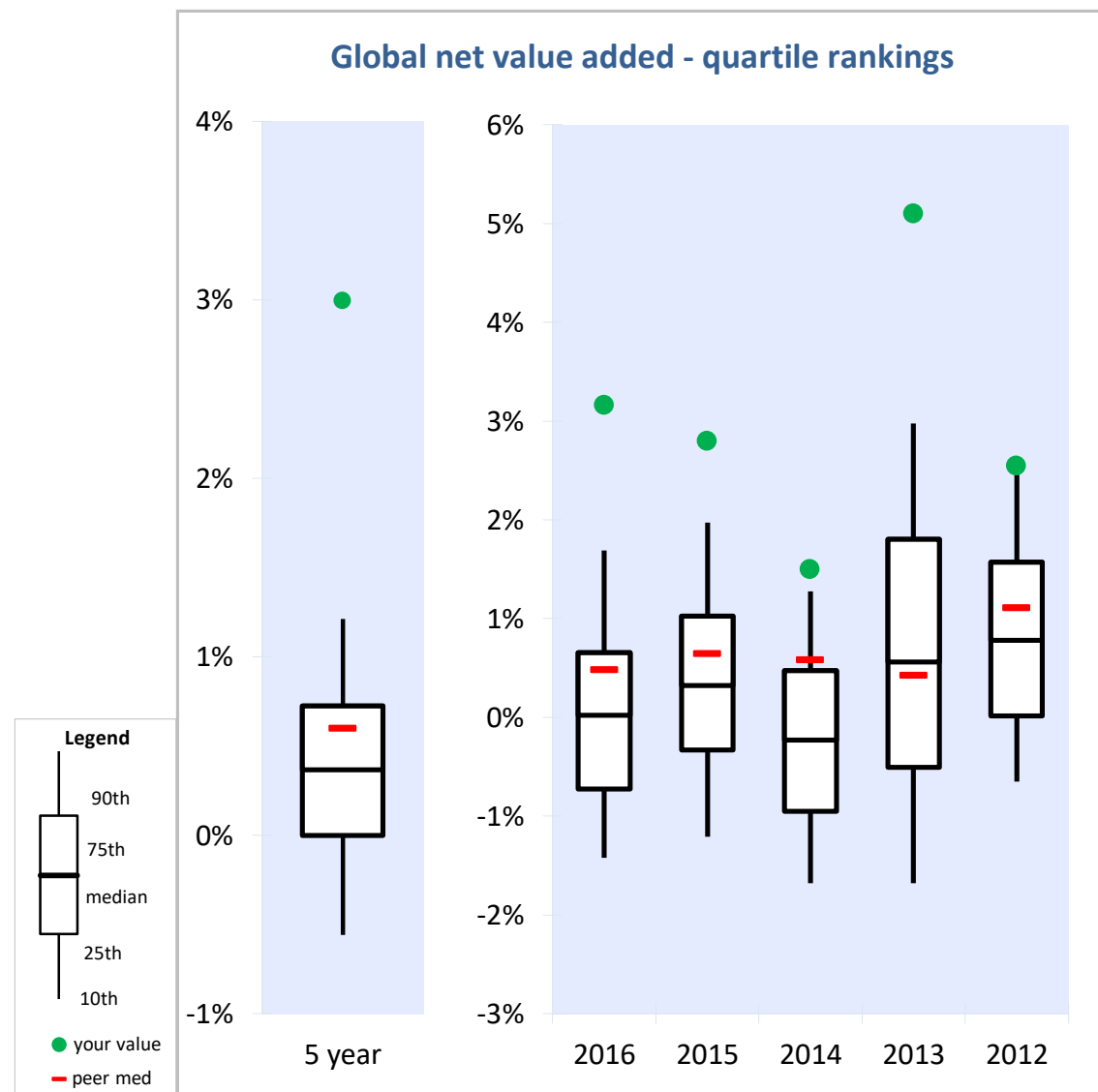
Net value added equals total net return minus policy return.

Value added for New Zealand Superannuation Fund

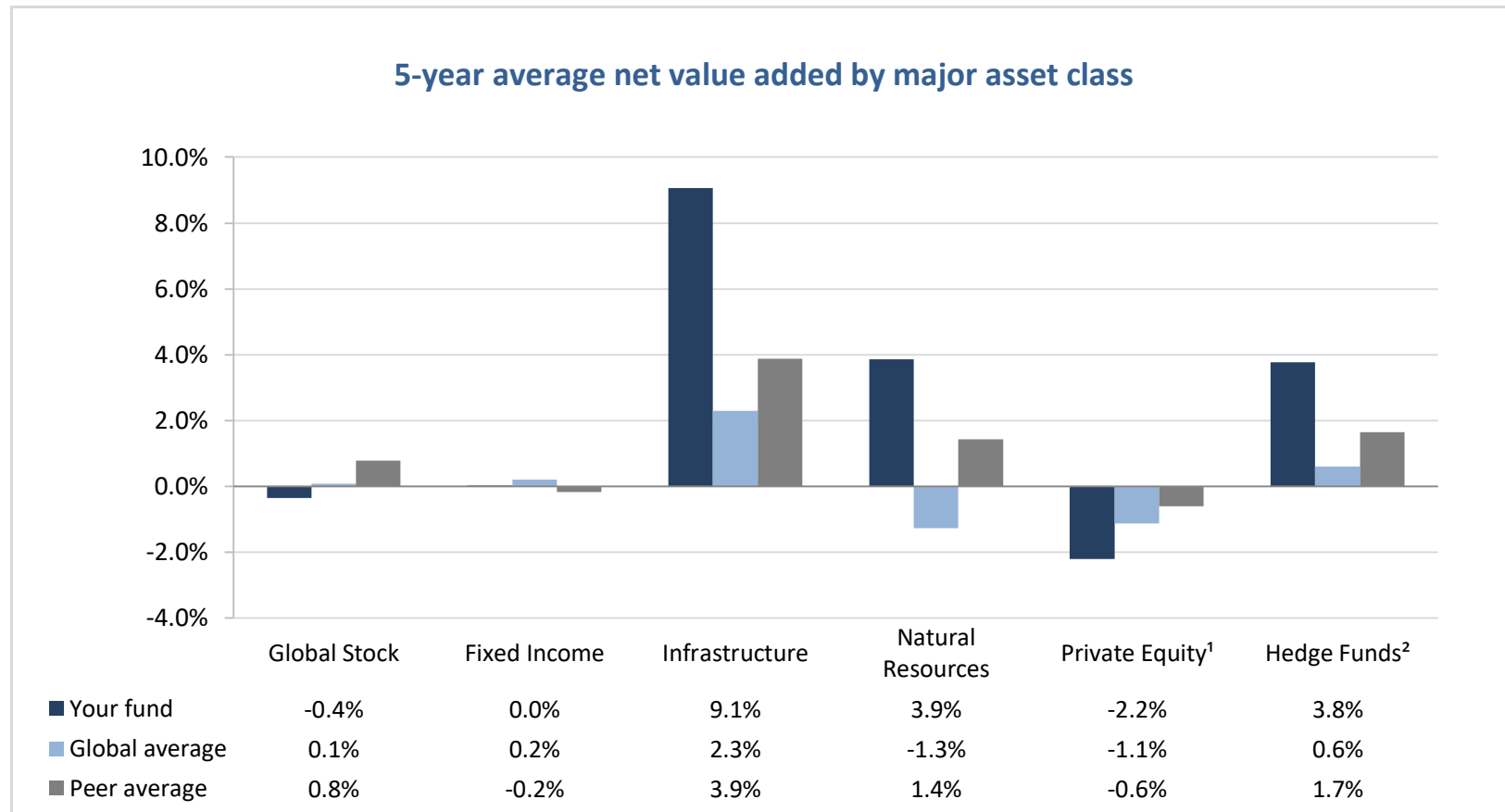
Year	Net Return	Policy Return	Net value Added
2016	13.2%	10.0%	3.2%
2015	6.5%	3.7%	2.8%
2014	13.9%	12.4%	1.5%
2013	26.1%	21.0%	5.1%
2012	19.0%	16.5%	2.5%
5-year	15.5%	12.6%	3.0%

Your 5-year net value added of 3.0% compares to a median of 0.6% for your peers and 0.4% for the Global universe.

Your 3.0% 5-year value added translates into approximately \$4.9 billion of cumulative value added over 5 years, or \$4.3 billion more than if you had earned the Global median of 0.4%.

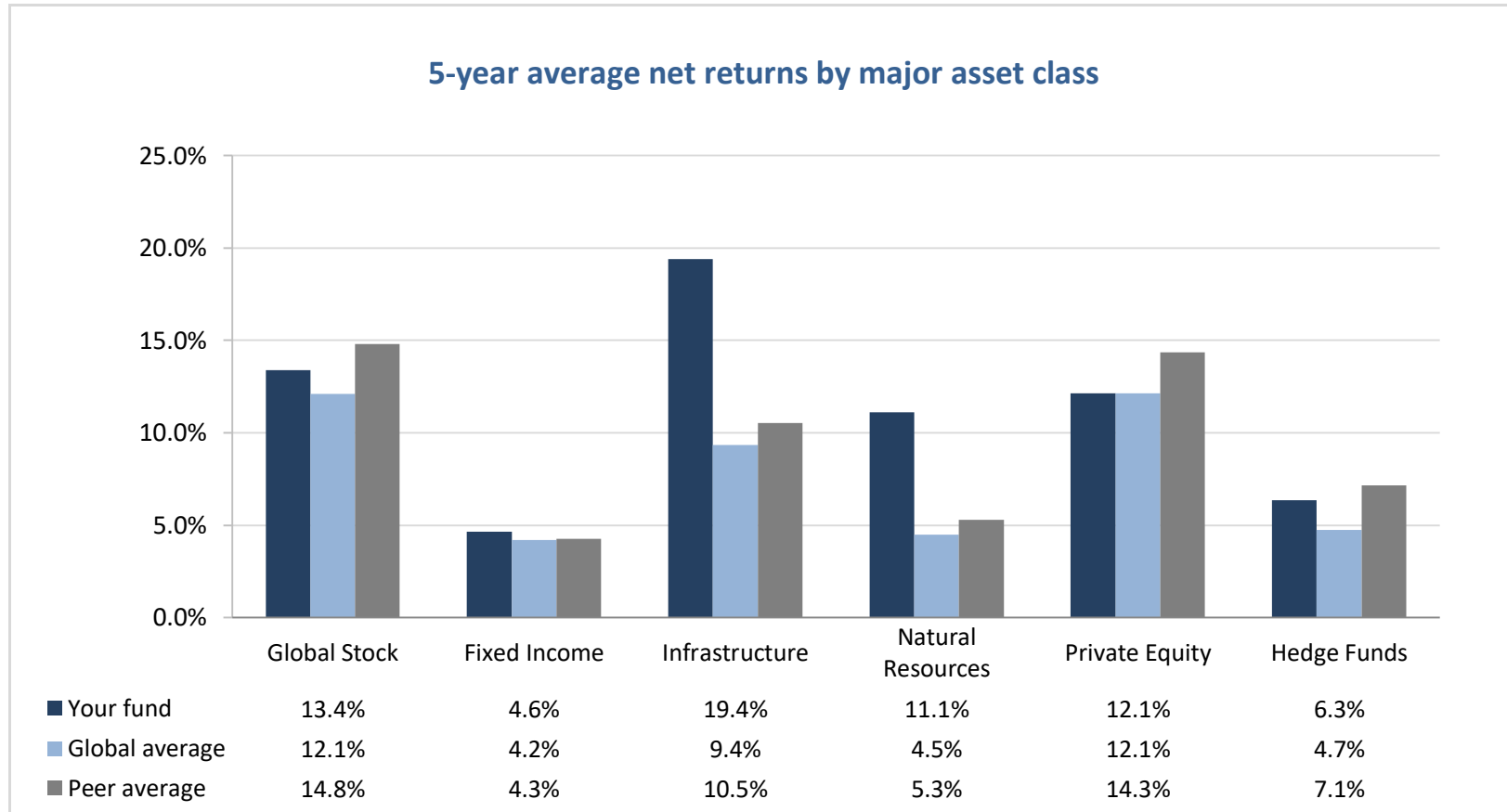


You had positive 5-year net value added in Fixed Income, Infrastructure, Natural Resources and Hedge Funds.



1. To enable fairer comparisons, the private equity benchmarks of all participants, except your fund, were adjusted to reflect lagged, investable, public-market indices. If your fund used the private equity benchmark suggested by CEM, your fund's 5-year private equity net value added would have been 0.9%. Refer to the Research section, pages 6-7, for details as to why this adjustment makes for better comparisons. It is also useful to compare total returns. Your 5-year total return of 12.1% for private equity was equal to the Global average of 12.1%.
2. It is also useful to compare total returns for hedge funds. Your 5-year return of 6.3% for hedge funds was above the Global average of 4.7%.

You had higher 5-year net returns in Global Stock, Fixed Income, Infrastructure, Natural Resources and Hedge Funds relative to the Global average.



Your investment costs were \$103.3 million or 33.8 basis points in 2016.

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 ²		
Stock - EAFE	132	2,189	266		2,627		5,213	
Stock - Emerging			700	726	3,388		4,814	
Global Stock			2,448	2,141	431		5,020	
Fixed Income - US	95						95	
Fixed Income - Global			820	1,441			2,261	
Cash		3,497					3,497	
Hedge Funds - Direct			1,039		15,494	4,525	21,057	
Real Estate - LPs			684		801	336 ²	1,485	
Infrastructure		948	1,166		4,369	16,272 ²	6,483	
Infrastructure - LPs			610		3,750	3,768 ²	4,360	
Natural Resources		1,434	1,857		4,508		7,799	
Diversified Private Equity			730		3,978	5,433 ²	4,709	
Diversified Priv.Eq. - Fund of Funds			133		1,822 ¹	123 ²	1,955	
Other Private Equity		2,827	612		3,801	3,833 ²	7,240	
Overlay Programs		8,509					8,509	
Total excluding private asset performance fees							84,495	27.6bp
Oversight, custodial and other costs ³								
Oversight of the fund							13,406	
Trustee & custodial							4,993	
Consulting and performance measurement								
Audit							420	
Total oversight, custodial & other costs							18,819	6.2bp
Total investment costs (excl. transaction costs & private asset performance fees)							103,314	33.8bp

Footnotes

¹ Default underlying costs were added to fund of funds.

The defaults added were: Diversified Priv.Eq. 165 bps base fees refer to Appendix A for full details.

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.

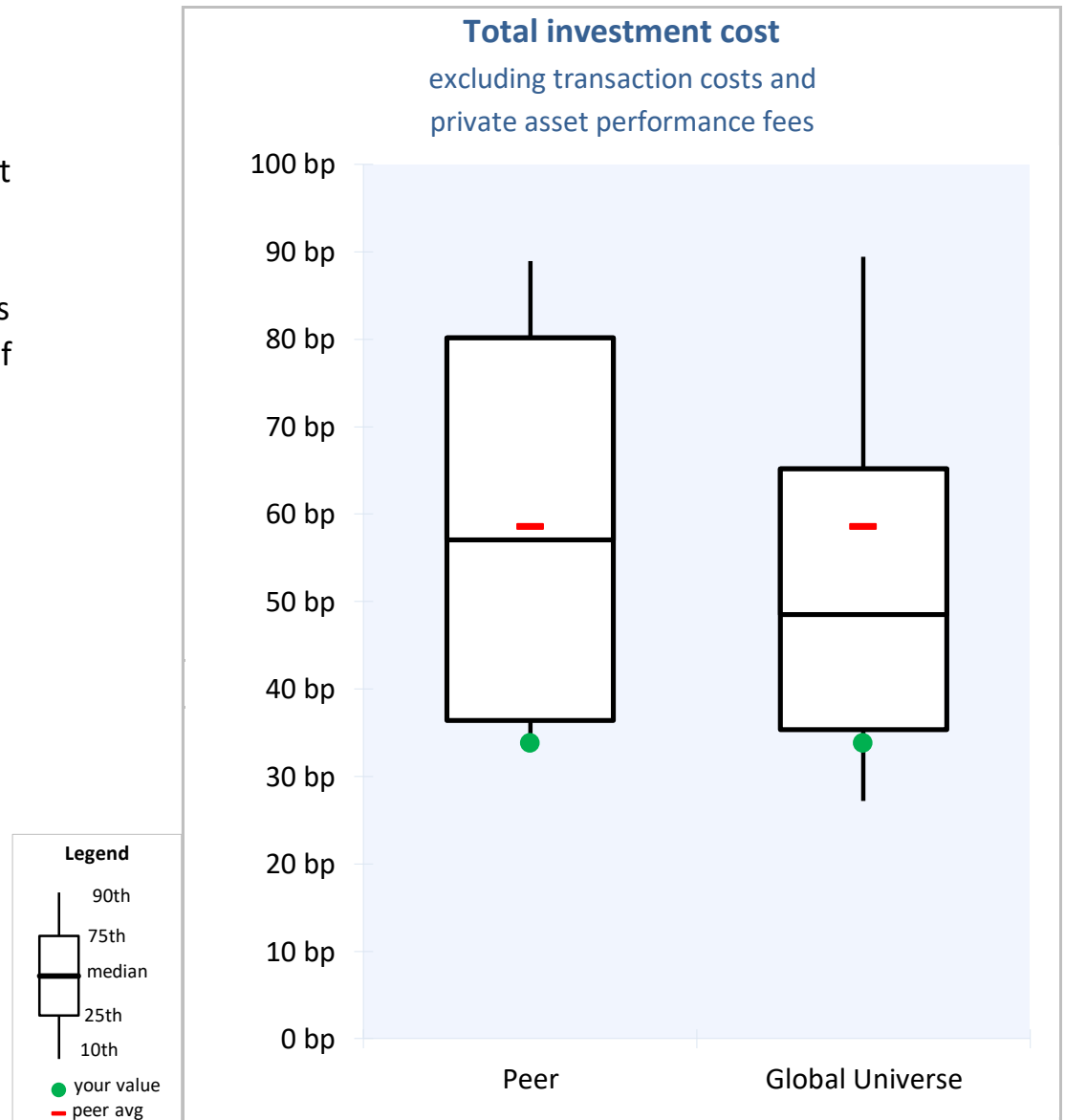
³ Excludes non-investment costs, such as benefit insurance premiums and preparing cheques for retirees.

Your total investment cost of 33.8 bps was below the peer median of 57.1 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 fund's assets at the end of 2016 versus a peer average of 23%.
- Fund size. Bigger funds have advantages of scale.

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



Benchmark cost analysis suggests that, after adjusting for fund size and asset mix, your fund was low cost by 3.8 basis points in 2016.

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 33.8 bp was below your benchmark cost of 37.6 bp. Thus, your cost savings was 3.8 bp.

Your cost versus benchmark

	\$000s	basis points
Your total investment cost	103,314	33.8 bp
Your benchmark cost	114,814	37.6 bp
Your excess cost	(11,501)	(3.8) bp

Your fund was low cost because you had a lower cost implementation style. These savings were partly 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 fund of funds	(2,678)	(0.9)
• Less external active management (more lower cost passive and internal)	(27,729)	(9.1)
• More overlays	4,925	1.6
• Other style differences	112	0.0
	<u>(25,370)</u>	<u>(8.3)</u>
2. Paying more than peers for some services		
• External investment management costs	162	0.1
• Internal investment management costs	2,677	0.9
• Oversight, custodial & other costs	11,030	3.6
	<u>13,869</u>	<u>4.5</u>
Total savings	(11,501)	(3.8)

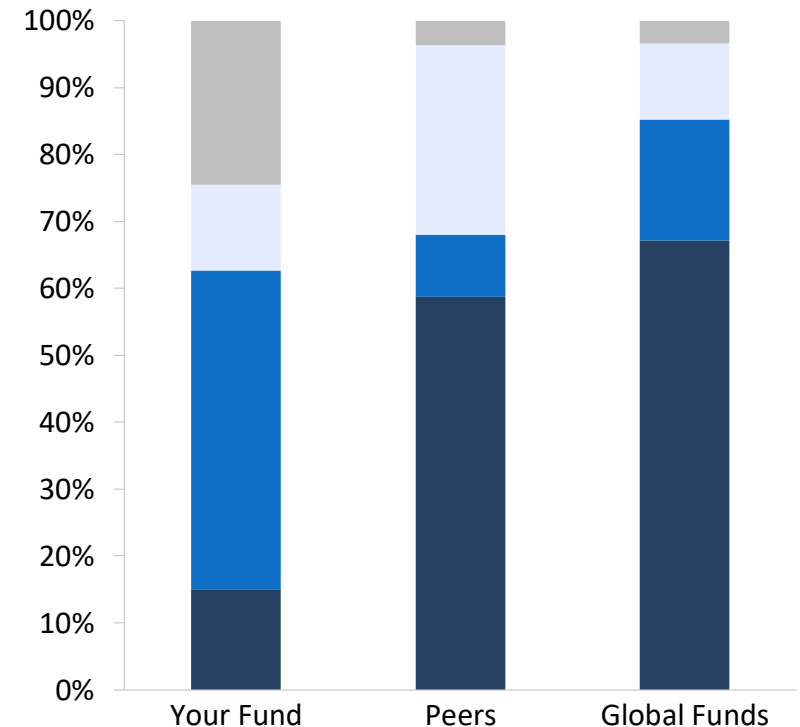
Differences in cost performance are often caused by differences in implementation style.

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 15% versus 59% 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 1% of hedge funds, real estate and private equity in fund of funds compared to 15% for your peers.

Implementation style¹



■ Internal passive	25%	4%	3%
■ Internal active	13%	28%	11%
■ External passive	48%	9%	18%
■ External active	15%	59%	67%

1. The graph above includes the impact of derivatives for your fund only. The values in the graph are calculated using average holdings.

Differences in implementation style saved you 8.3 bp relative to your peers.

Calculation of the cost impact of differences in implementation style

Asset class	Your avg holdings in \$mils (A)	% External active			Premium vs passive & internal ¹ (C)	Cost/ (savings)	
		You	Peer average	More/ (less) (B)		\$000s (A X B X C)	bps
Stock - EAFE	1,354	41.3%	46.9%	(5.6%)	41.6 bp	(315)	
Stock - Emerging	1,522	22.2%	70.1%	(47.9%)	58.7 bp	(4,281)	
Global Stock	10,323	2.3%	47.8%	(45.6%)	36.4 bp	(17,135)	
Fixed Income - US	31	0.0%	56.9%	(56.9%)	14.7 bp	(26)	
Fixed Income - Global	3,334	0.0%	14.2%	(14.2%)	13.9 bp	(657)	
Infrastructure	1,203	66.0%	86.0%	(20.0%)	100.0 bp	(2,412)	
Partnerships, as a proportion of external:	794	30.8%	50.6%	(19.8%)	20.8 bp	(326)	
Real Estate ex-REITs	51	100.0%	74.3%	25.7%	75.1 bp	99	
Partnerships, as a proportion of external:	51	100.0%	43.0%	57.0%	23.0 bp	67	
Natural Resources	2,025	28.0%	41.9%	(13.9%)	83.0 bp	(2,344)	
Partnerships, as a proportion of external:	566	0.0%	79.9%	(79.9%)	8.8 bp	(399)	
Diversified Private Equity	388	100.0%	100.0%	0.0%		0	
Other private equity	1,537	36.5%	Excluded		49.6 bp	0	
Impact of less/more external active vs. lower cost styles						(27,729)	(9.1) bp
		<u>Fund of funds % of LPs</u>			<u>vs. direct LP¹</u>		
Hedge Funds	1,361	0.0%	27.2%	(27.2%)	66.3 bp	(2,453)	
Performance Fee Impact:	1,361	0.0%	27.2%	(27.2%)	-0.0 bp	0	
Infrastructure - LPs	245	0.0%	5.7%	(5.7%)	N/A ²	0	
Performance Fee Impact (on NAV):	166	0.0%	9.7%	(9.7%)		0	
Real Estate ex-REITs - LPs	51	0.0%	1.8%	(1.8%)	N/A ²	0	
Diversified Private Equity - LPs	388	19.5%	25.7%	(6.2%)	93.0 bp	(225)	
Impact of less/more fund of funds vs. direct LPs						(2,678)	(0.9) bp
<u>Overlays and other</u>							
Impact of higher use of portfolio level overlays						4,925	1.6 bp
Impact of mix of internal passive, internal active, and external passive ³						112	0.0 bp
Total impact of differences in implementation style						(25,370)	(8.3) bp

Footnotes

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

The net impact of paying more/less for external asset management costs added 0.1 bps.

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

	Your avg holdings in \$mils (A)	Cost in bps			Cost/ (savings) in \$000s (A X B)
		Your Fund	Peer median	More/ (less) (B)	
Stock - EAFE - Active	559	51.7	49.8	1.9	104
Stock - Emerging - Passive	1,185	10.4	12.7	(2.2)	(264)
Stock - Emerging - Active	338	106.0	70.9	35.1	1,185
Global Stock - Passive	10,090	4.4	3.5	0.9	881
Global Stock - Active	233	24.1	42.1	(18.1)	(422)
Fixed Income - Global - Passive	3,334	6.8	9.8*	(3.0)	(1,016)
Hedge Funds - Active	1,361	121.5 ¹	127.1	(5.7)	(774)
Performance Fees:	1,361	33.2	56.0*	(22.7)	(3,096)
Infrastructure - Active	549	100.8 ¹	100.8	0.0	0
Infrastructure - Limited Partnership	245	178.2 ¹	121.6	56.6	1,385
Real Estate ex-REITs - Limited Partnership	51	288.8	108.0	180.8	929
Natural Resources - Active	566	112.4	81.8*	30.6	1,733
Diversified Private Equity - Active	312	150.8 ¹	166.3	(15.5)	(484)
Diversified Private Equity - Fund of Fund	75	259.3 ¹	259.3	0.0	0
Other Private Equity - Active	562	78.6 ¹	Excluded		
Total impact of paying more/less for external management					162
Total in bps					0.1 bp

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

*Universe median used as peer data was insufficient.

¹ You paid performance fees in these asset classes.

The net impact of paying more/less for internal asset management costs added 0.9 bps.

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

	Your avg holdings in \$mils	Cost in bps			Cost/ (savings) in \$000s
		Your Fund	Peer median	More/ (less)	
	(A)			(B)	(A X B)
Stock - EAFE - Passive	141	9.3	12.9	(3.5)	(50)
Stock - EAFE - Active	654	33.5	8.6	24.9	1,630
Fixed Income - US - Passive	31	30.7	0.6*	30.1	93
Infrastructure - Active	410	23.1	11.3	11.8	485
Natural Resources - Active	1,459	9.8	5.8	4.0	586
Other Private Equity - Active	975	29.0	Excluded		
	<i>Notional</i>				
Derivatives/Overlays - Currency - Hedge	17,287	0.2	0.2	(0.0)	(54)
Derivatives/Overlays - Passive Beta	7,956	3.2	3.2	0.0	0
Derivatives/Overlays - Other	342	3.7	4.1	(0.4)	(13)
Total impact of paying more/less for internal management					2,677
Total in bps					0.9 bp

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

*Universe median used as peer data was insufficient.

The net impact of differences in oversight, custodial & other costs added 3.6 bps.

Cost impact of differences in oversight, custodial & other costs

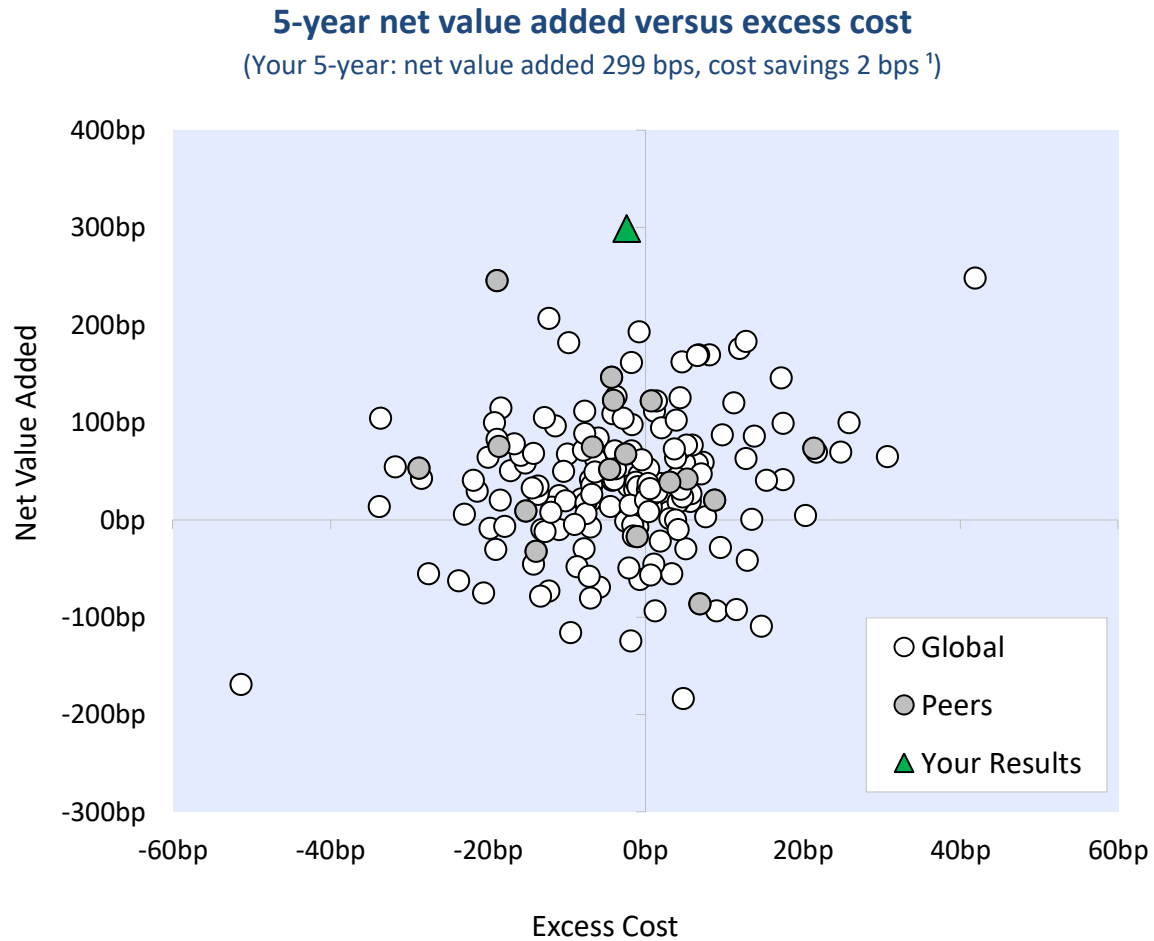
	Your avg holdings in \$mils (A)	Cost in bps			Cost/ (savings) in \$000s (A X B)
		Your fund	Peer median	More/ (less) (B)	
Oversight	30,574	4.4	1.2	3.2	9,675
Consulting	30,574	0.0	0.3	(0.3)	(956)
Custodial	30,574	1.6	0.7	0.9	2,718
Audit	30,574	0.1	0.1	0.1	240
Other	30,574	0.0	0.2	(0.2)	(647)
Total					11,030
Total in bps					3.6 bp

In summary, your fund was low cost because you had a lower cost implementation style. These savings were partly 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		
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	<u>(25,370)</u>	<u>(8.3)</u>
2. Paying more than peers for similar services		
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• Oversight, custodial & other costs	11,030	3.6
	<u>13,869</u>	<u>4.5</u>
Total savings	(11,501)	(3.8)

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

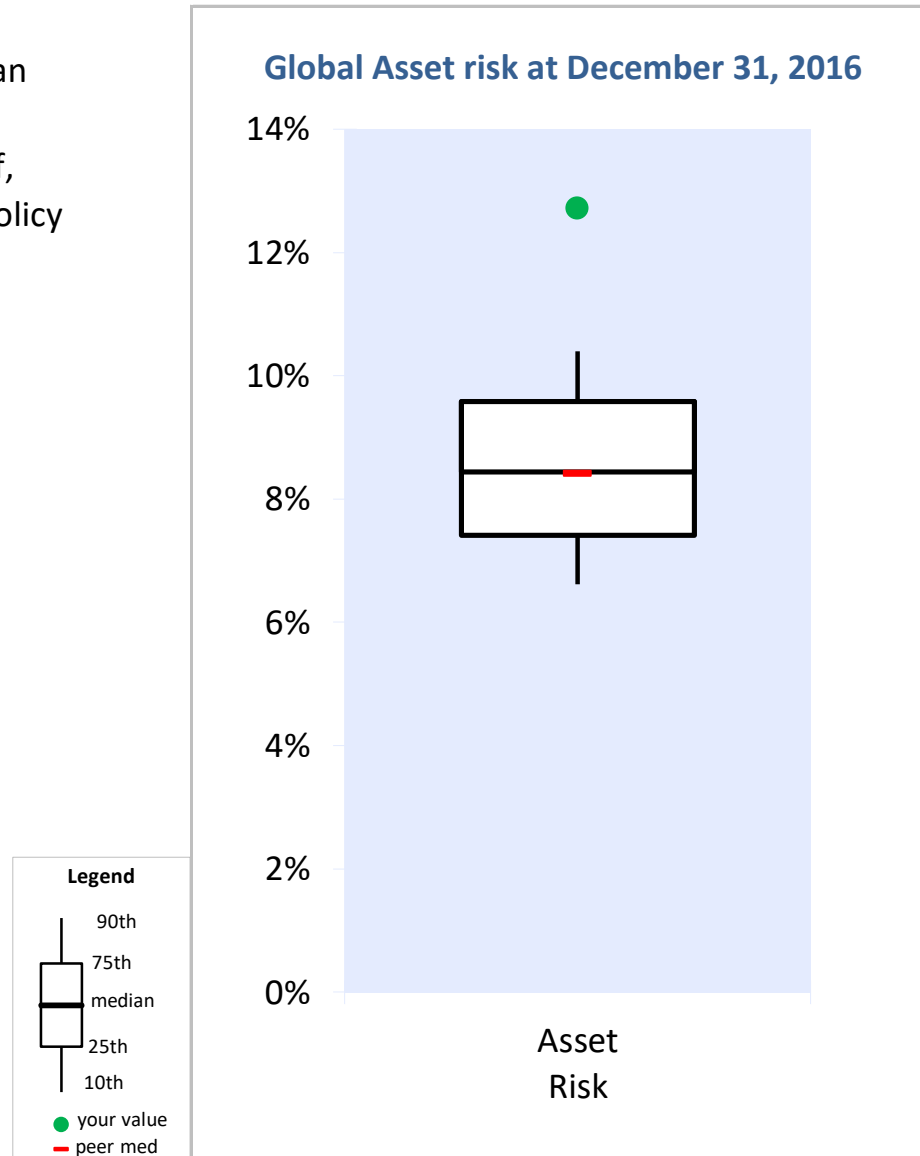


1. Your 5-year cost savings of 2 basis points is the average of your cost savings for the past 5 years.

	2016	2015	2014	2013	2012	5-year
Net value added	316 bp	280 bp	150 bp	510 bp	255 bp	299 bp
Excess Cost	-4 bp	-6 bp	-5 bp	3 bp	1 bp	-2 bp

Comparison of risk levels

Your asset risk of 12.7% was above the Global median of 8.4%. 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.



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 15.5%. This was above the Global median of 8.8% and above the peer median of 9.1%.
- Your 5-year policy return was 12.6%. This was above the Global median of 8.5% and above the peer median of 8.5%.

Value added

- Your 5-year net value added was 3.0%. This was above the Global median of 0.4% and above the peer median of 0.6%.

Cost and cost effectiveness

- Your investment cost of 33.8 bps was below your benchmark cost of 37.6 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 partly offset because you paid more than peers for some services.

Risk

- Your asset risk of 12.7% was above the Global median of 8.4%.