

Montana Board of Investments

CEM Benchmarking Results

(for the 2-year period ending December 31, 2011)

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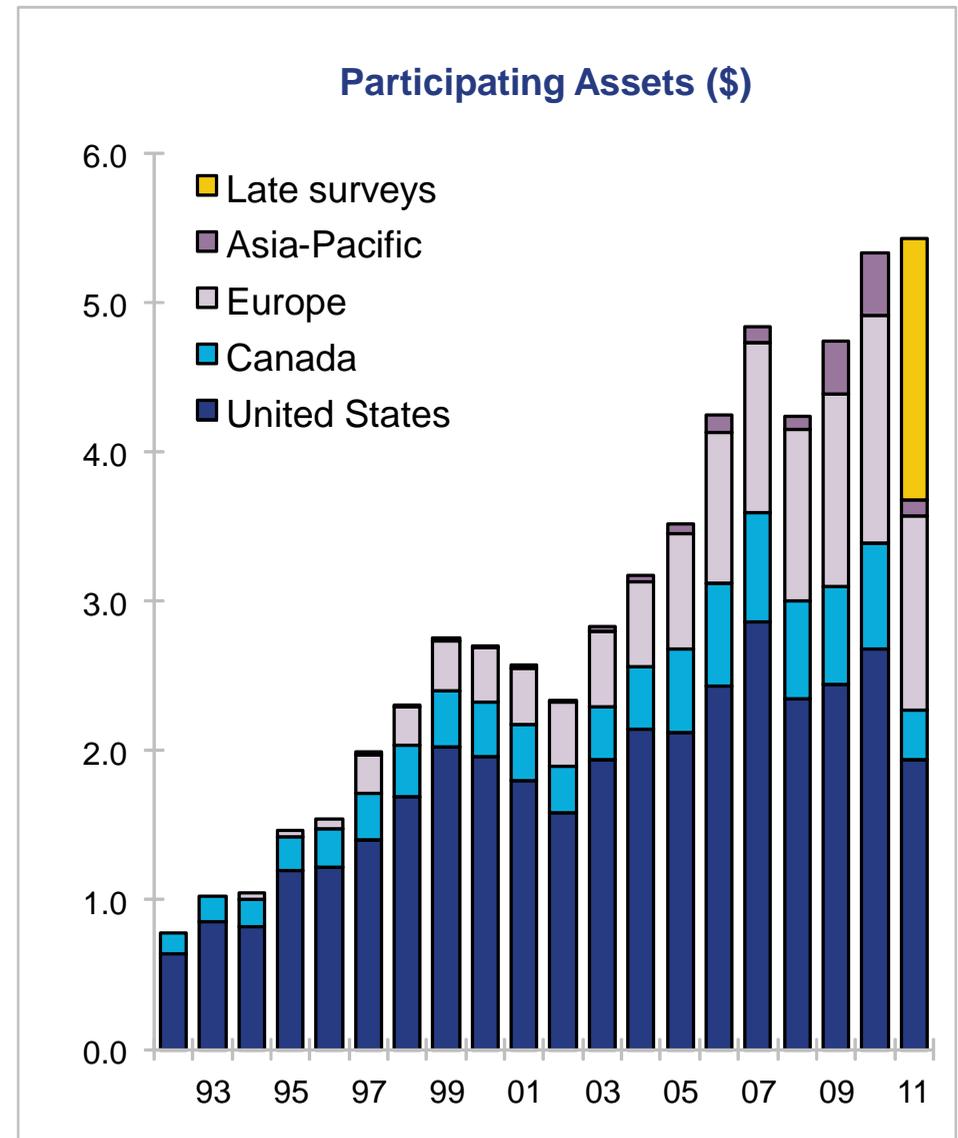
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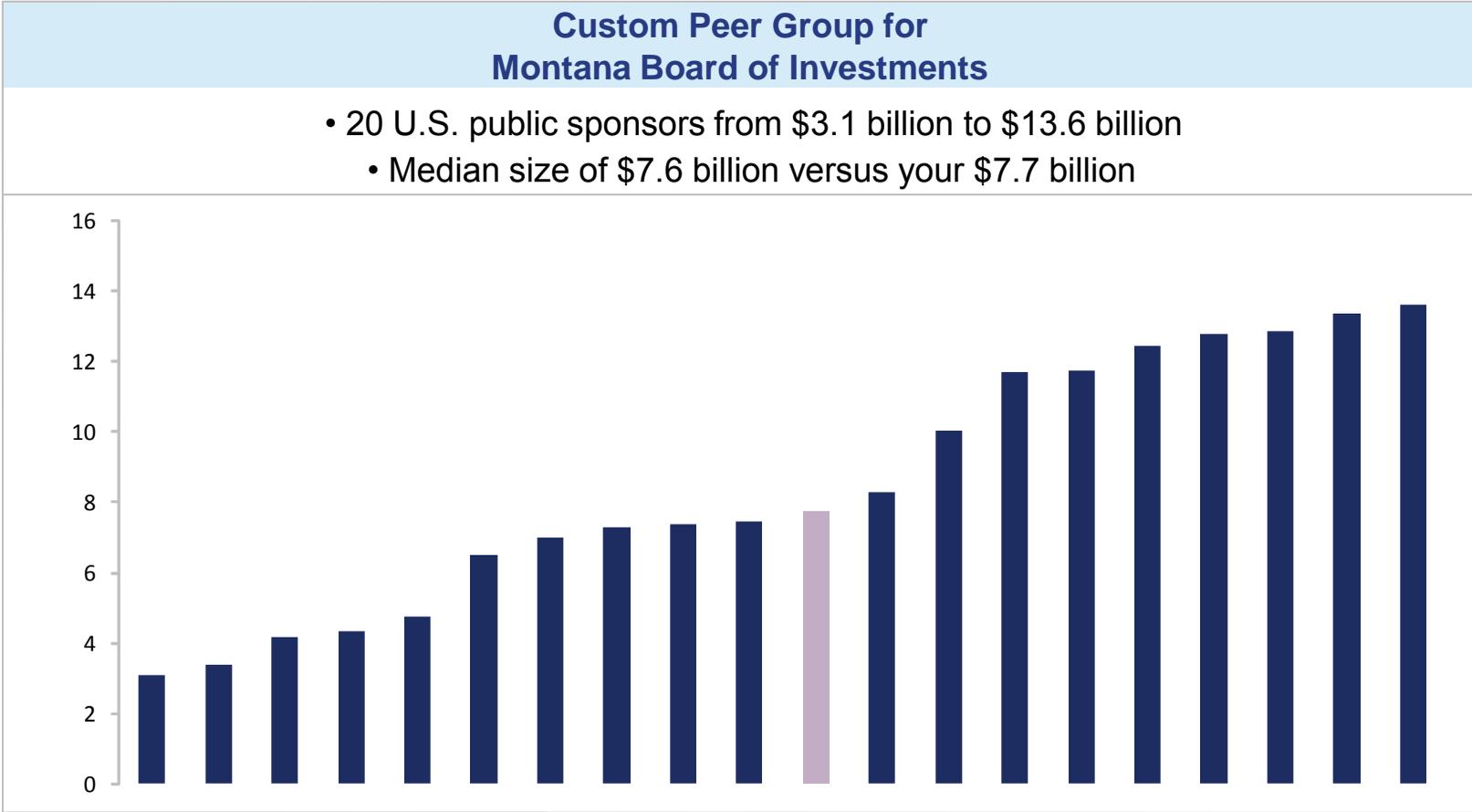
This benchmarking report compares your cost and return performance to CEM's extensive pension database.

- 163 U.S. pension funds participate. The median U.S. fund had assets of \$4.5 billion and the average U.S. fund had assets of \$11.9 billion. Total participating U.S. assets were \$1.9 trillion.
- 73 Canadian funds participate with assets totaling \$330 billion.
- 32 European funds participate with aggregate assets of \$1,306 billion. Included are funds from the Netherlands, Norway, Sweden, Finland, Denmark and the U.K.
- 6 Asia-Pacific funds participate with aggregate assets of \$106 billion. Included are funds from the Australia, New Zealand and South Korea.

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



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



To preserve client confidentiality, given potential access to documents as permitted by the Freedom of Information Act, we do not disclose your peers' names in this document.

What gets measured gets managed, so it is critical that you measure and compare the right things:

1. Policy Return

How did the impact of your policy mix decision compare to other funds?

2. Value Added

Are your implementation decisions (i.e., the amount of active versus passive management) adding value?

3. Costs

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

4. Cost Effectiveness

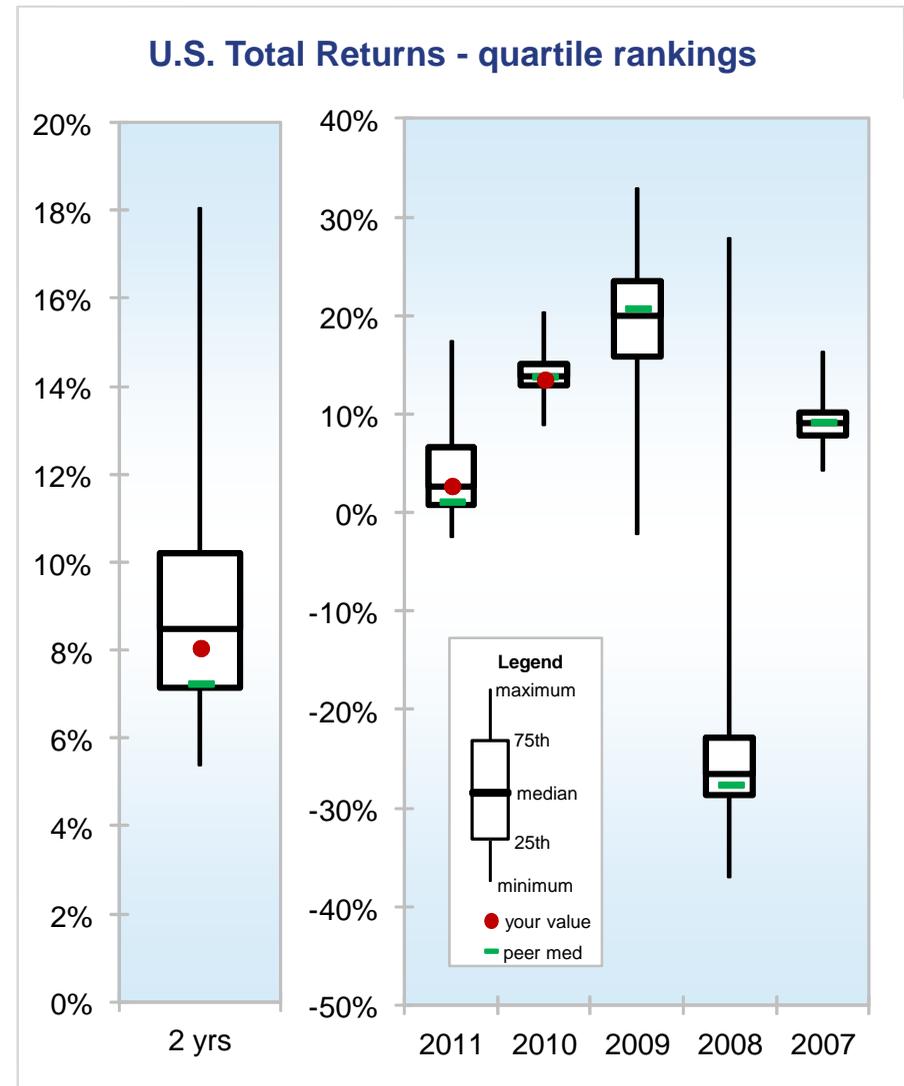
Net implementation value added versus excess cost. Does paying more get you more?

Your 2-year total return of 8.0% was below the U.S. median of 8.5% and was above the peer median of 7.2%.

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, cost and value added.

	Your 2-yr
Total Fund Return	8.0%
- Policy Return	7.3%
- Cost	0.7%
= Net Value Added	0.1%

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).



1. Policy Return

Your 2-year policy return of 7.3% was close to the U.S. median of 7.2% and above the peer median of 6.4%.

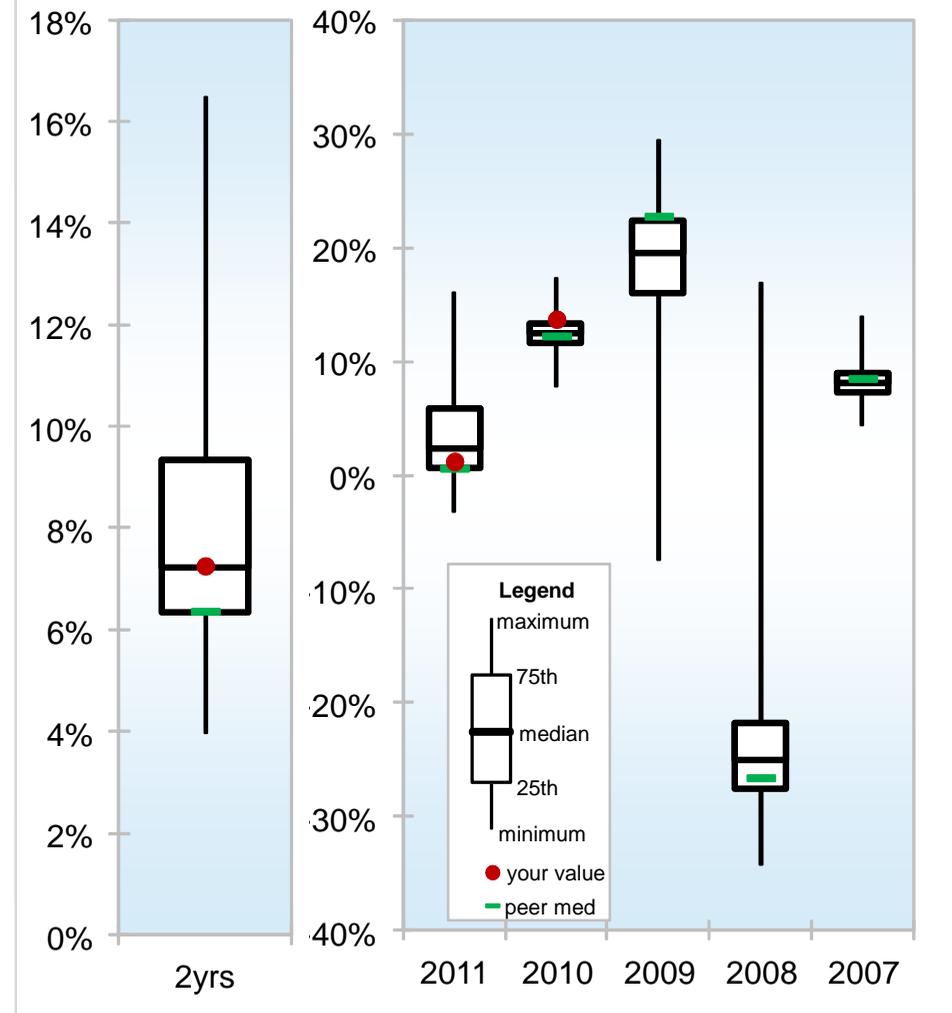
Your policy return is the return you could have earned passively by indexing your investments according to your policy mix.

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:

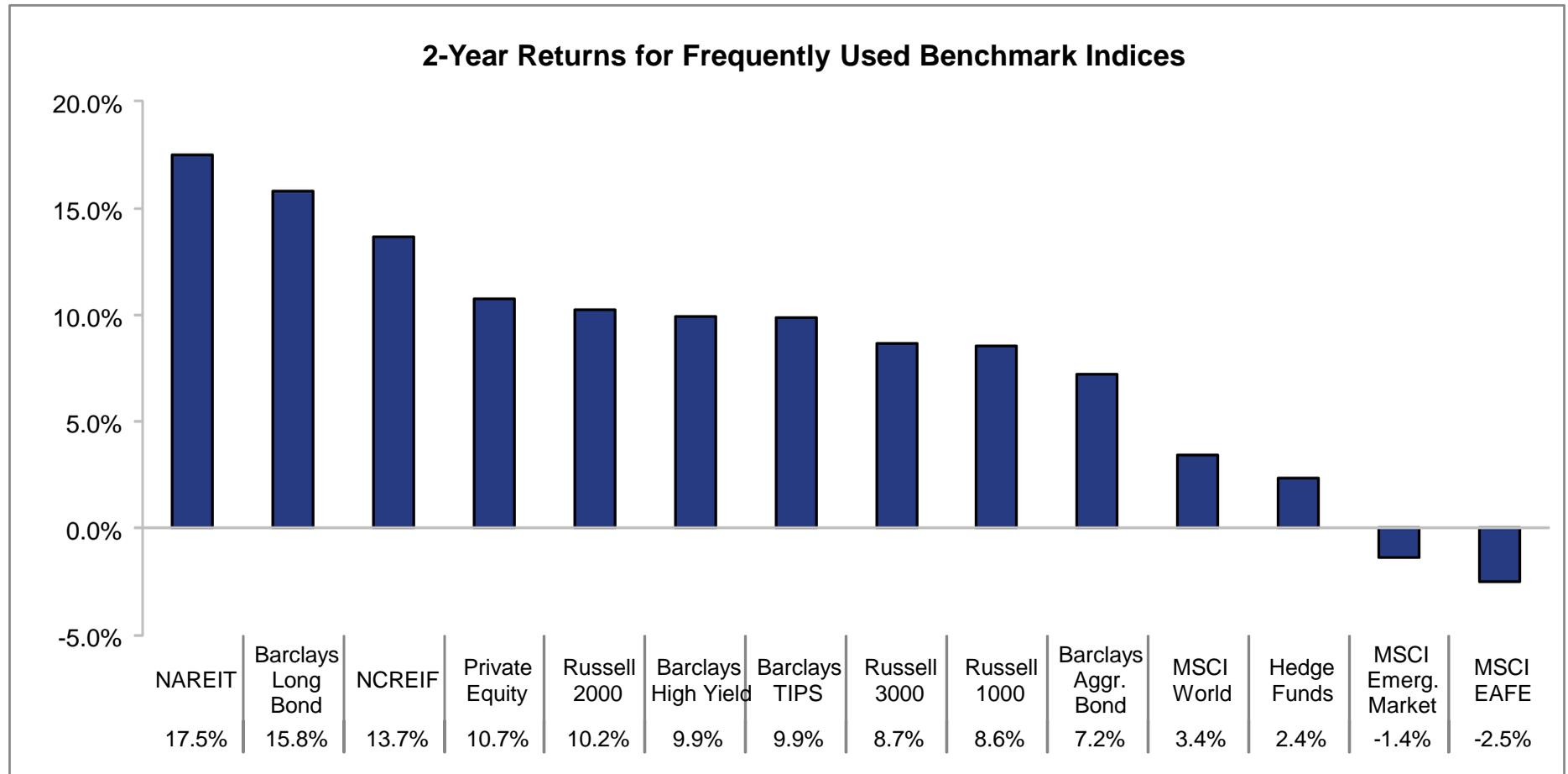
- Long term capital market expectations
- Liabilities
- Appetite for risk

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

U.S. Policy Returns - quartile rankings



Differences in policy returns are caused by differences in benchmarks and policy mix. The two best performing asset class benchmarks for the 2 years ending 2011 were Real Estate REITS and Long Bonds.



The private equity and hedge fund benchmark returns shown reflect the average of all benchmarks given by CEM participants.

Your 2-year Policy Return was close to the U.S. median because of mostly offsetting effects. Two examples were:

- The positive impact of your higher weight in one of the better performing asset classes of the past 2 years:
Private Equity.
- The negative impact of your lower weight in one of the better performing asset classes of the past 2 years:
Long Bonds

2-Year Average Policy Mix			
	Your Fund	Peer Avg.	U.S. Avg.
U.S. Stock	36%	23%	28%
EAFE/Global/Emerging	<u>18%</u>	<u>30%</u>	<u>22%</u>
Total Stock	54%	54%	50%
U.S. Bonds	22%	19%	18%
Long Bonds	0%	0%	12%
High Yield Bonds	3%	2%	1%
Cash	1%	1%	1%
Other Fixed Income	<u>0%</u>	<u>5%</u>	<u>3%</u>
Total Fixed Income	26%	27%	35%
Hedge Funds	0%	4%	4%
Real Estate ex-REITs	8%	6%	4%
Other Real Assets ¹	0%	3%	2%
Private Equity	12%	7%	5%
Total	100%	100%	100%

¹ Includes Real Estate, REITS, Commodities, Infrastructure, and Natural Resources.

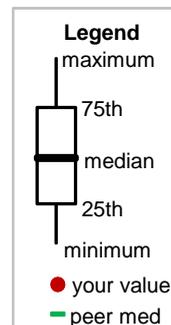
2. Net Value Added

Net value added is the component of your total return from active management. Your 2-year value added was 0.1%.

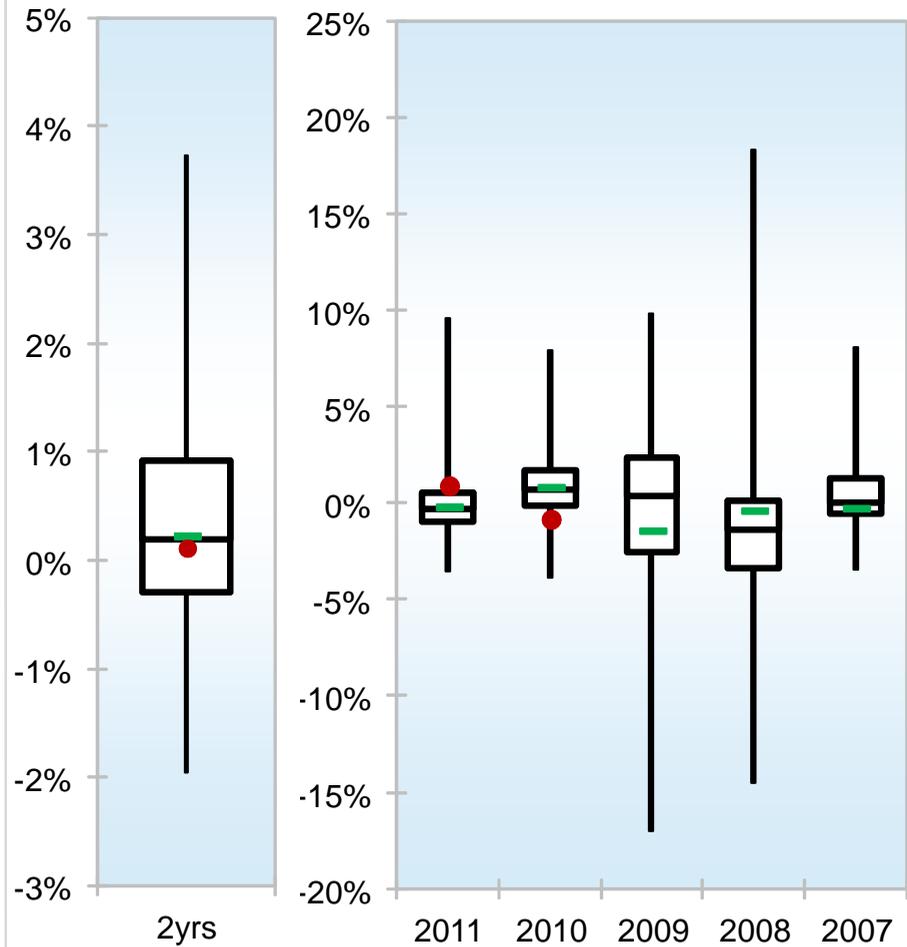
Net value added equals total return minus policy return minus costs.

Montana Board of Investments				
Year	Total return	Policy return	Cost	Value Added
2011	2.8%	1.2%	0.6%	0.9%
2010	13.6%	13.7%	0.7%	(0.8)%
2-year	8.0%	7.3%	0.7%	0.1%

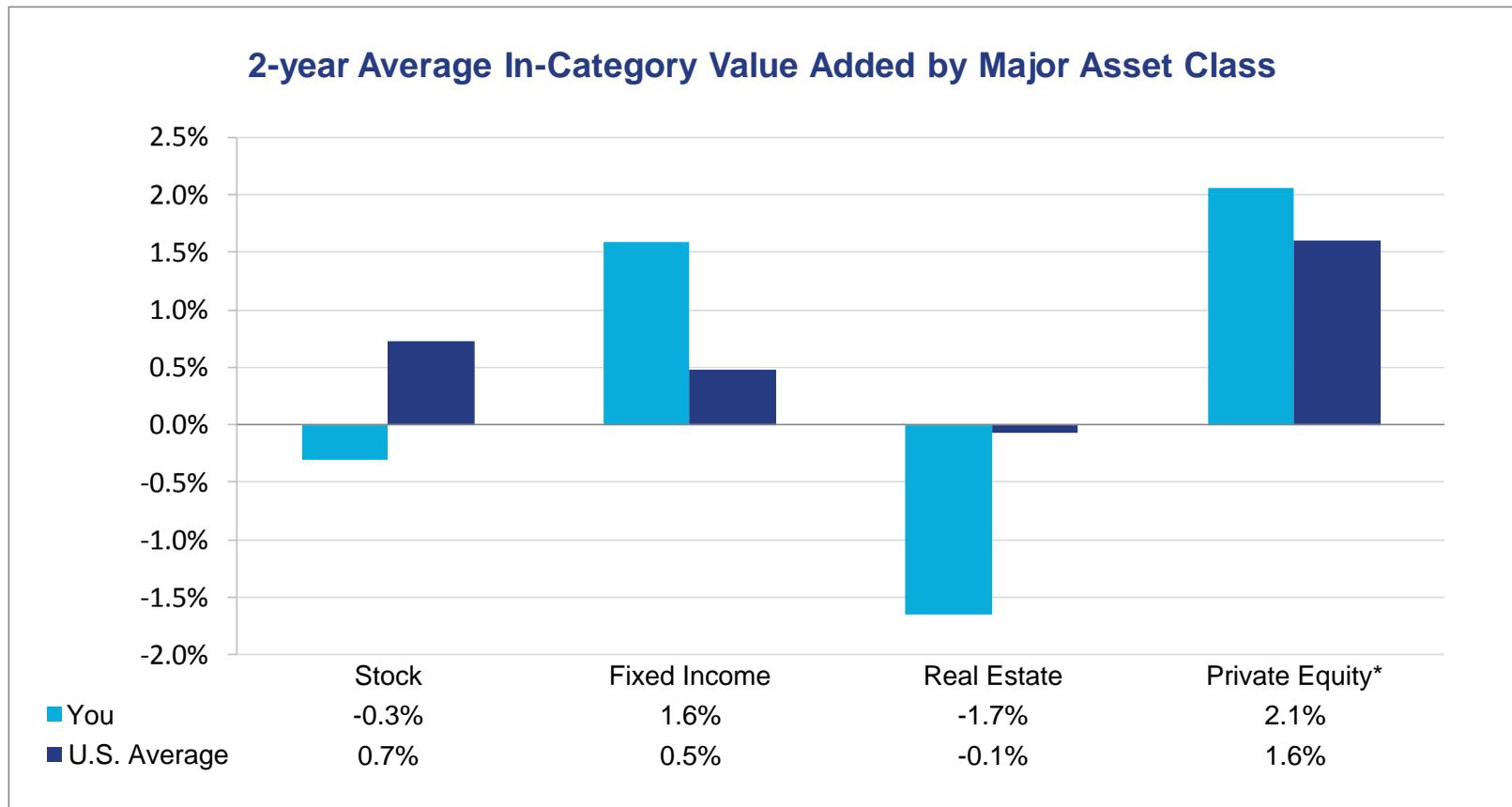
Your 2-year net value added of 0.1% compares to a median of 0.2% for your peers and 0.2% for the U.S. universe.



U.S. Net Value Added - quartile rankings

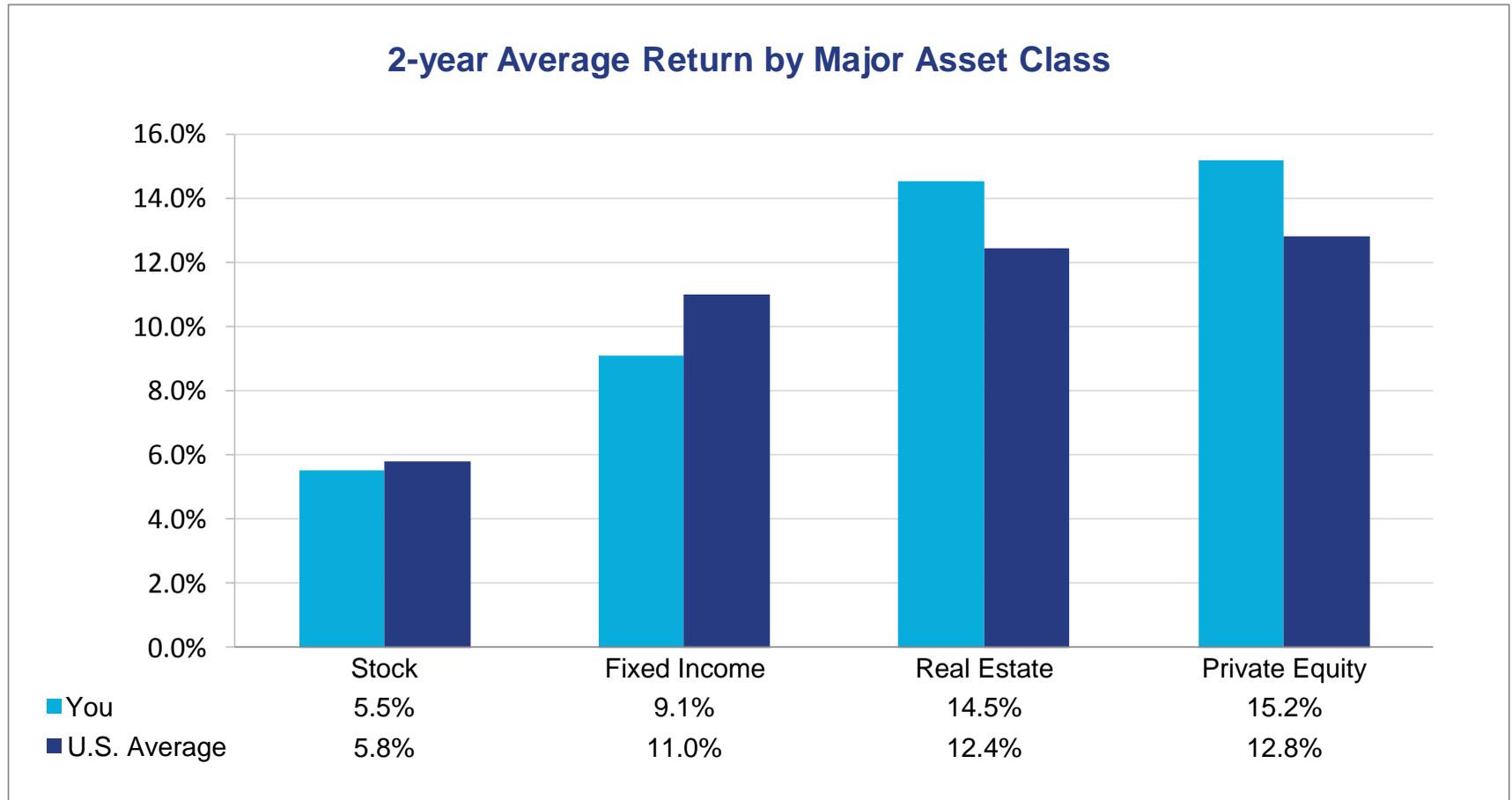


You had positive value added in fixed income and private equity. Value added is the difference between your actual returns and your benchmark returns. For the U.S. universe, it is the difference between their actual returns and their benchmark returns.



* Private equity value added is net whereas the other asset classes are gross.

You had better 2-year returns relative to the U.S. average in real estate and private equity.



3. Costs

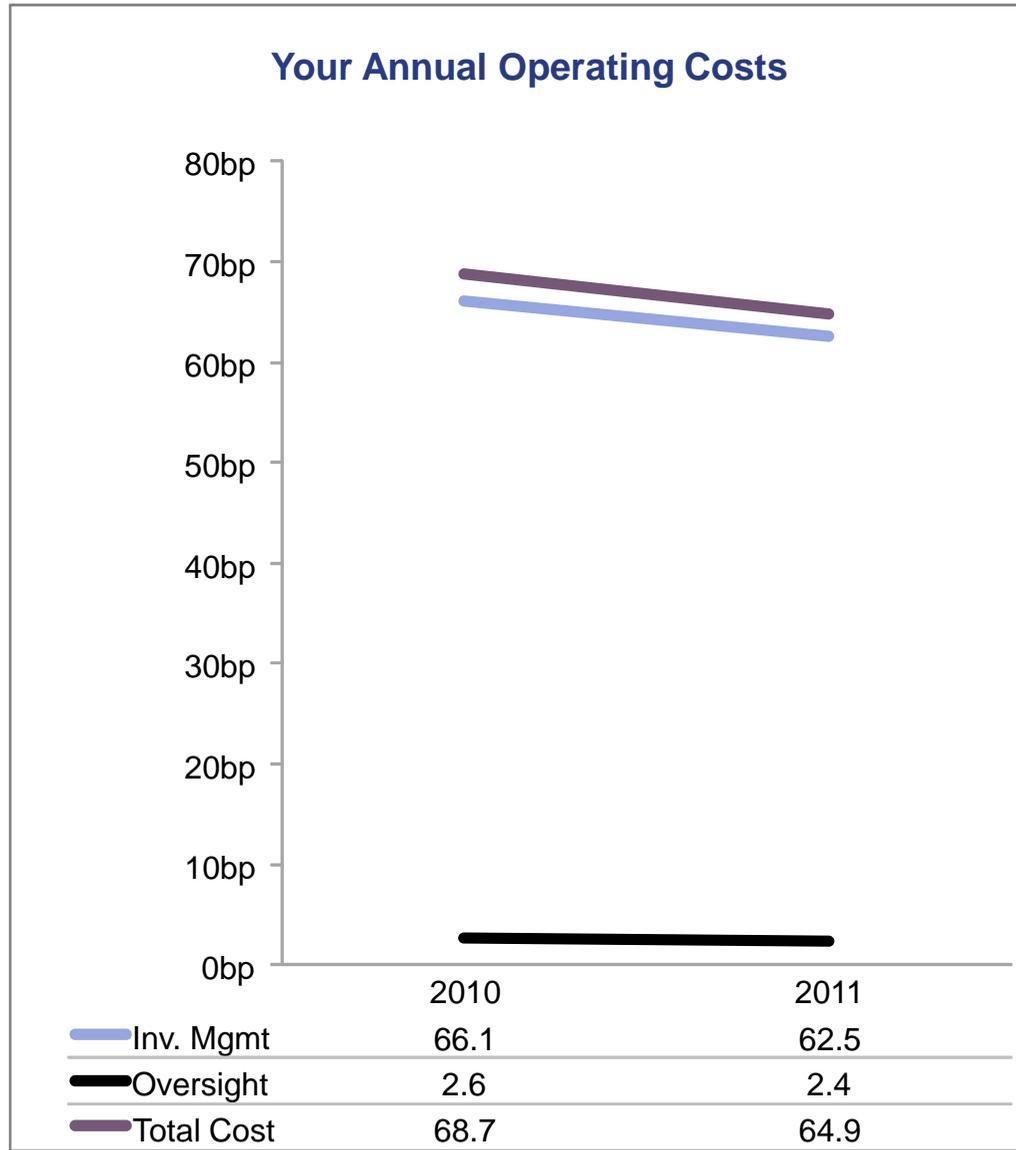
Your asset management costs in 2011 were \$50.2 million or 64.9 basis points.

Your Investment Management Costs (\$000s)								
	Internal		Externally Managed				Total	
	Passive	Active	Passive	Internal and Other	Active: base fees	Active: perform fees		Internal and Other
U.S. Stock - Large Cap			101		7,309		335	7,744
U.S. Stock - Small/Mid Cap			98		2,324		67	2,489
Stock - ACWIxU.S.			486		4,125		406	5,017
Fixed Income - U.S.		340			663		83	1,085
Fixed Income - High Yield					837		40	877
Cash		14						14
Real Estate ex-REITs					2,089		153	2,242
Real Estate ex-REITs - Limited Partnerships					5,194		215	5,410
Diversified Private Equity					14,132		513	14,645
Diversified Private Equity - Fund of Funds 1					8,838			8,838
Total investment management costs							62.5bp	48,363

Your Oversight, Custodial and Other Asset Related Costs (\$000s)		
Oversight of the fund		541
Trustee & custodial		1,018
Consulting and performance measurement		214
Audit		48
Total oversight, custodial & other costs		2.4bp
Total asset management costs		64.9bp
		50,183

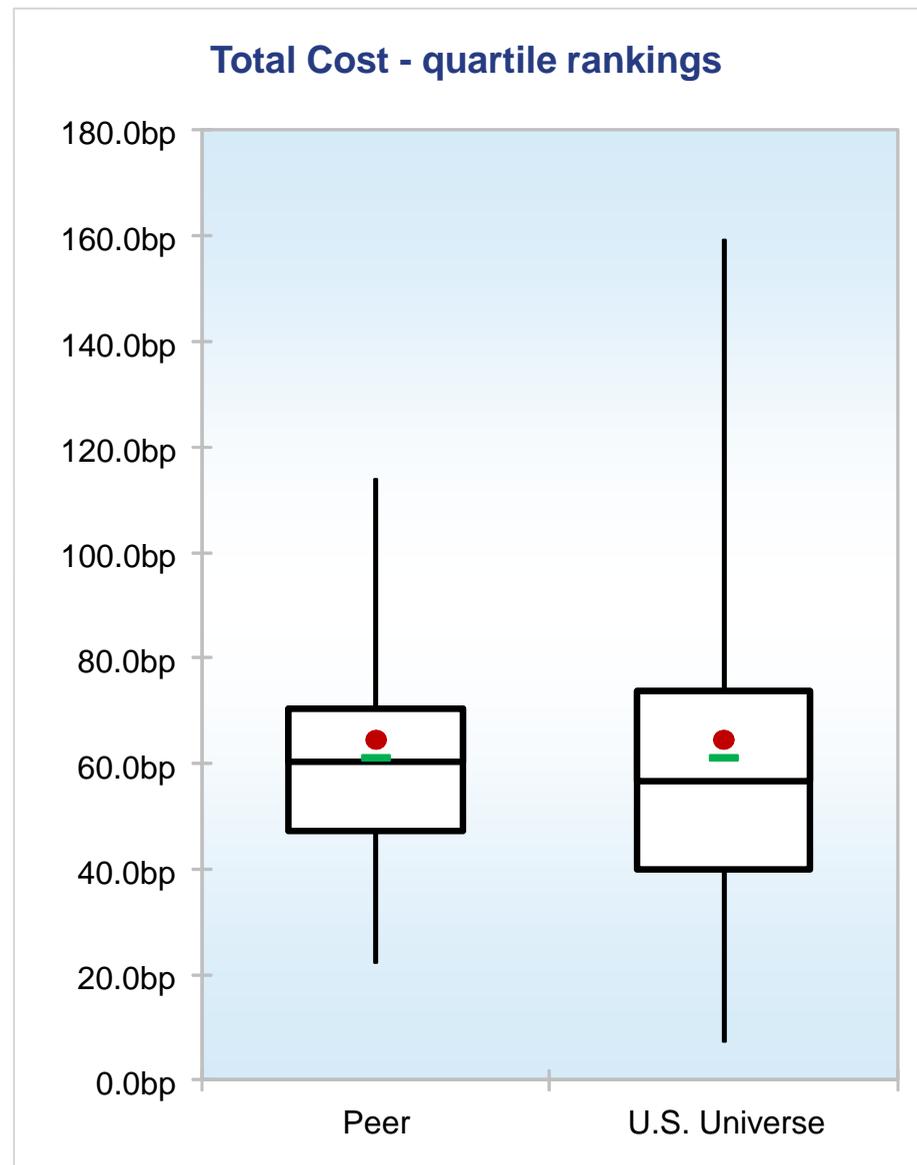
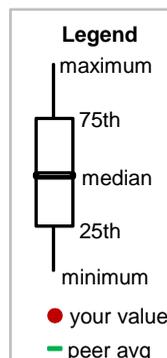
- 1 Includes default for fees paid to underlying partnerships in fund of funds. The default for diversified private equity was 165 basis points.

Your costs decreased slightly between 2010 and 2011.



Your total cost of 64.9 bps was close to the peer median of 61.4 bps.

Differences in total cost are often caused by two factors outside of management's control: asset mix and plan size. Therefore, to assess whether your costs are reasonable, CEM calculates a benchmark cost for your fund. 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.



Benchmark cost analysis suggests your fund was normal cost.

	\$000s	basis points
Your actual cost	50,183	64.9 bp
Your benchmark cost	<u>53,285</u>	<u>68.9 bp</u>
Your excess cost	-3,102	(4.0) bp

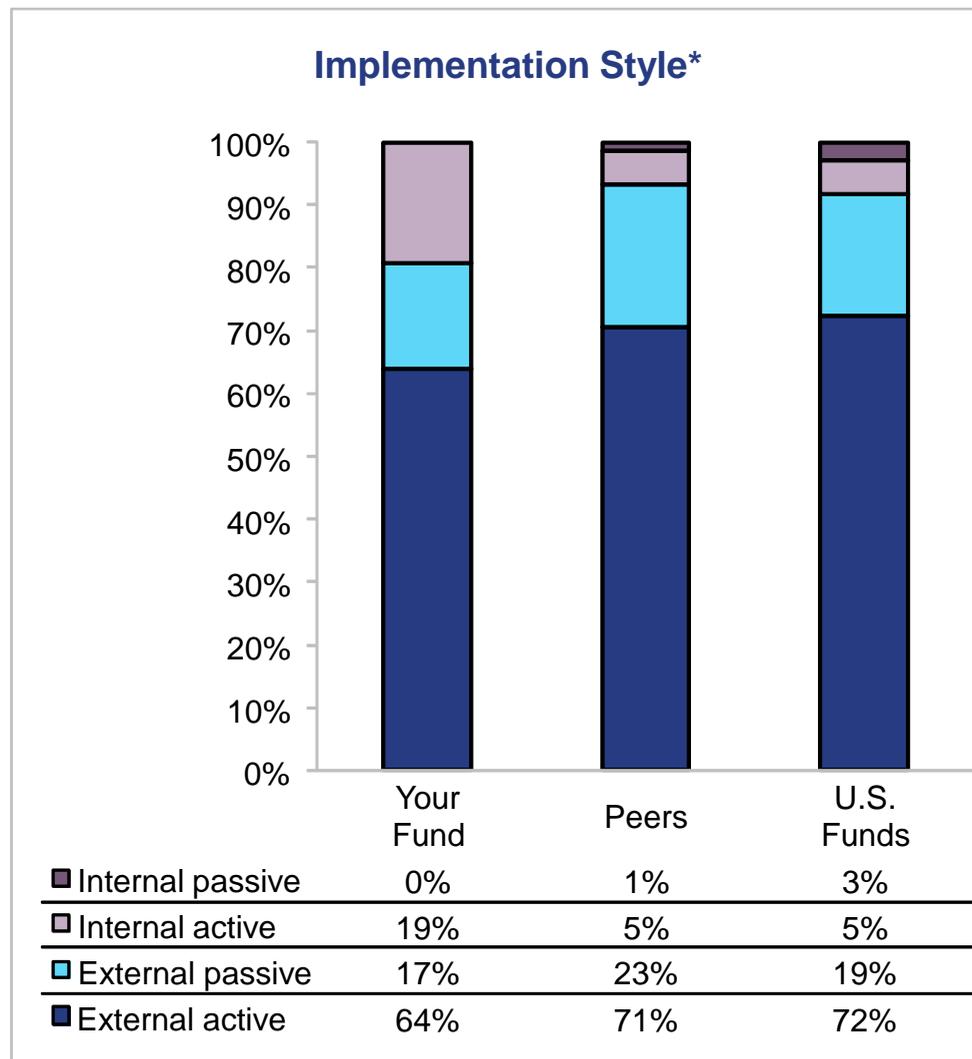
Your total cost of 64.9 bps was below your benchmark cost of 68.9 bps. Your cost saving was 4.0 bps, or \$3.1 million.

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 64% versus 71% for your peers).
- Within external active holdings, fund of funds usage because it is more expensive than direct fund investment. You had similar amounts in fund of funds.



* The graph above does not take into consideration the impact of derivatives.

Differences in implementation style saved you 2.6 bp relative to your peers.

Cost Impact of Differences in Implementation Style						
Asset class	Your avg holdings in \$mils	% External Active			Cost ^{1,2} premium	Cost/ (Savings) in \$000s
		You	Peer average	More/ (less)		
U.S. Stock - Large Cap	2,294	72.3%	65.0%	7.2%	30.6 bp	508
U.S. Stock - Small/Mid Cap	461	75.1%	89.8%	(14.8%)	45.0 bp	-306
Stock - ACWIxU.S.	1,376	59.6%	60.5%	(1.0%)	35.5 bp	-48
Fixed Income - U.S.	1,727	19.6%	72.1%	(52.6%)	17.9 bp	-1,624
Fixed Income - High Yield	165	100.0%	97.3%	2.7%	N/A	0
Real Estate ex-REITs	716	100.0%	99.9%	0.1%	N/A	0
of which Ltd Partnerships represent:		70.5%	54.5%	16.0%	16.7 bp	191
Diversified Private Equity	1,528	100.0%	100.0%	0.0%		0
of which Fund of Funds represent:		25.9%	28.1%	(2.3%)	88.7 bp	-309
Total				0.0%		-1,587
Total external active style impact in bps						(2.1) bp
Impact of differences in the use of lower cost styles ³						0.3 bp
Savings from your lower use of portfolio level overlays						(0.8) bp
Total style impact						(2.6) bp

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 of 'N/A' indicates that there was insufficient peer data to calculate the premium.
3. The 'Impact of differences in the use of lower cost styles' quantifies the net impact of your relative use of internal passive, internal active and external passive management.

The net impact of differences in external investment management costs saved you 0.2 bps.

Impact of Paying More/(Less) for External Investment Management					
	Your avg holdings in \$mils	Cost in bps			Cost/ (Savings) in \$000s
		You	Peer median	More/ (Less)	
U.S. Stock - Large Cap - Passive	636	1.6	1.6	(0.0)	-1
U.S. Stock - Large Cap - Active	1,657	46.1	32.2	14.0	2,314
U.S. Stock - Small/Mid Cap - Passive	115	8.6	4.5*	4.1	47
U.S. Stock - Small/Mid Cap - Active	346	69.2	49.5	19.7	680
Stock - ACWIxU.S. - Passive	556	8.7	6.3	2.5	137
Stock - ACWIxU.S. - Active	820	55.3	41.8	13.5	1,108
Fixed Income - U.S. - Active	338	22.0	20.6	1.4	48
Fixed Income - High Yield - Active	165	53.2	44.1	9.1	151
Real Estate ex-REITs - Active	211	106.3	86.6	19.7	416
Real Estate ex-REITs - Limited Partnership	505	107.1	103.3	3.9	195
Diversified Private Equity - Active	1,133	129.3	165.0	(35.7)	-4,043
Diversified Private Equity - Fund of Fund	395	223.7	253.7	(29.9)	-1,182
Total external investment management impact				(0.2) bp	-130

*Universe median used as peer data was insufficient.

The net impact of differences in internal investment management costs saved you 0.3 bps.

Impact of Paying More/(Less) for Internal Investment Management					
	Your avg holdings in \$mils	Cost in bps			Cost/ (Savings) in \$000s
		You	Peer median	More/ (Less)	
Fixed Income - U.S. - Active	1,389	2.4	4.2	(1.8)	-244
Total internal investment management impact				(0.3) bp	-244

The net impact of differences in your oversight, custodial & other costs saved you 0.9 bps.

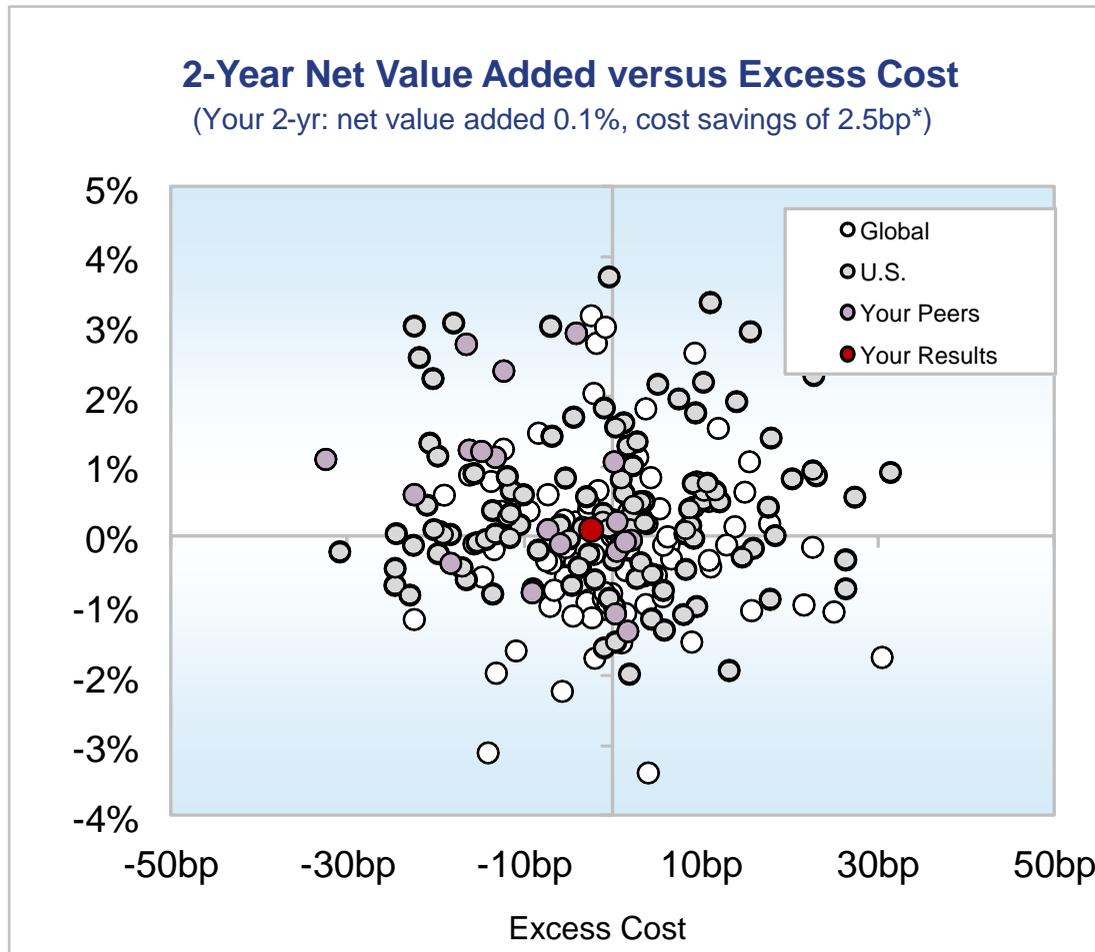
Impact of Differences in Oversight, Custodial & Other Costs					
	Your avg holdings in \$mils	Cost in bps			Cost/ (Savings) in \$000s
		you	Peer median	More/ (Less)	
Oversight	7,738	0.7	1.6	(0.9)	-712
Custodial / trustee	7,738	1.3	0.6	0.8	590
Consulting / performance measurement	7,738	0.3	0.8	(0.5)	-401
Audit	7,738	0.1	0.1	(0.0)	-23
Other	7,738	0.0	0.2	(0.2)	-162
Total impact				(0.9) bp	-708

In summary, you were normal cost because you had a slightly lower cost implementation style and paid slightly less for some services.

Reasons for Your Low Cost Status		
	Excess Cost/ (Savings)	
	\$000s	bps
1. Lower cost implementation style		
• Lower use of fund of funds	-309	(0.4)
• Differences in the use of external active management	-1,278	(1.7)
• Lower use of overlays	-638	(0.8)
• Other style differences	<u>205</u>	<u>0.3</u>
	-2,020	(2.6)
2. Paying less than your peers		
• External investment management costs	-130	(0.2)
• Internal investment management costs	-244	(0.3)
• Oversight, custodial & other costs	<u>-708</u>	<u>(0.9)</u>
	-1,081	(1.4)
Total savings	-3,102	(4.0)

4. Cost Effectiveness

Your fund had 2-year net value added of 0.1% and cost savings of 2.5 bps.



* Your 2-year net value added of 0.1% equals your 2-year 0.8% gross value added minus your 0.7% 2-year average cost. Your 2-year excess cost of -2.5bp is the average of your excess cost for the past 2 years.

In summary:

1. Policy Return

Your 2-year policy return was 7.3%. This was close to the U.S. median of 7.2% and above the peer median of 6.4%.

2. Value Added

Your 2-year net value added was 0.1%. This compares to the U.S. median of 0.2% and the peer median of 0.2%.

3. Costs

Your actual cost of 64.9 bps was close to your benchmark cost of 68.9 bps. This suggests that your fund was normal cost. You were normal cost because you had a slightly lower cost implementation style and paid slightly less for some services.

4. Cost Effectiveness

Your fund had 2-year net value added of 0.1% and cost savings of 2.5 bps on the cost effectiveness chart.