

**Defined Benefit Investment
Cost Effectiveness Analysis**

(for the 5 years ending December 31, 2002)

Province of Nova Scotia

September 2003

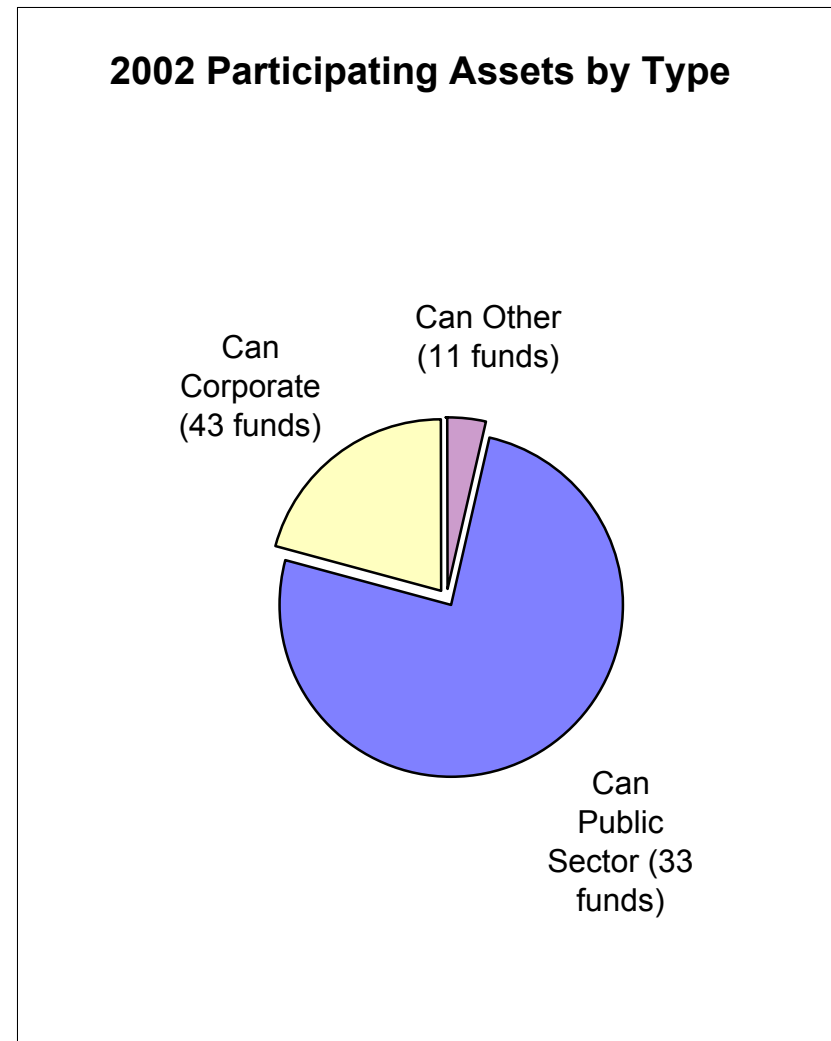


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Comparisons are to CEM's extensive pension performance database.

- 87 Canadian pension funds participate. They represent 70% of Canadian defined benefit assets. The median Canadian fund had assets of \$0.9 billion, while the average Canadian fund had assets of \$4.2 billion. Total participating Canadian assets were \$0.4 trillion.
- 138 US pension funds participate. They represent 30% of U.S. defined benefit assets. The median US fund had assets of \$3.4 billion, while the average US fund had assets of \$1.8 billion. Total participating US assets were \$1.4 trillion.
- The most meaningful comparisons for your returns and value added performance are to the Canadian universe.



This Executive Summary primarily measures and provides relative comparisons of the following:

1. Policy Return

How did your policy asset mix and return compare to other funds?

2. Implementation Value Added

Did your implementation decisions (i.e., mostly active management) add value?

3. Implementation Risk

How much risk was taken to obtain your implementation value added?

4. Costs

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

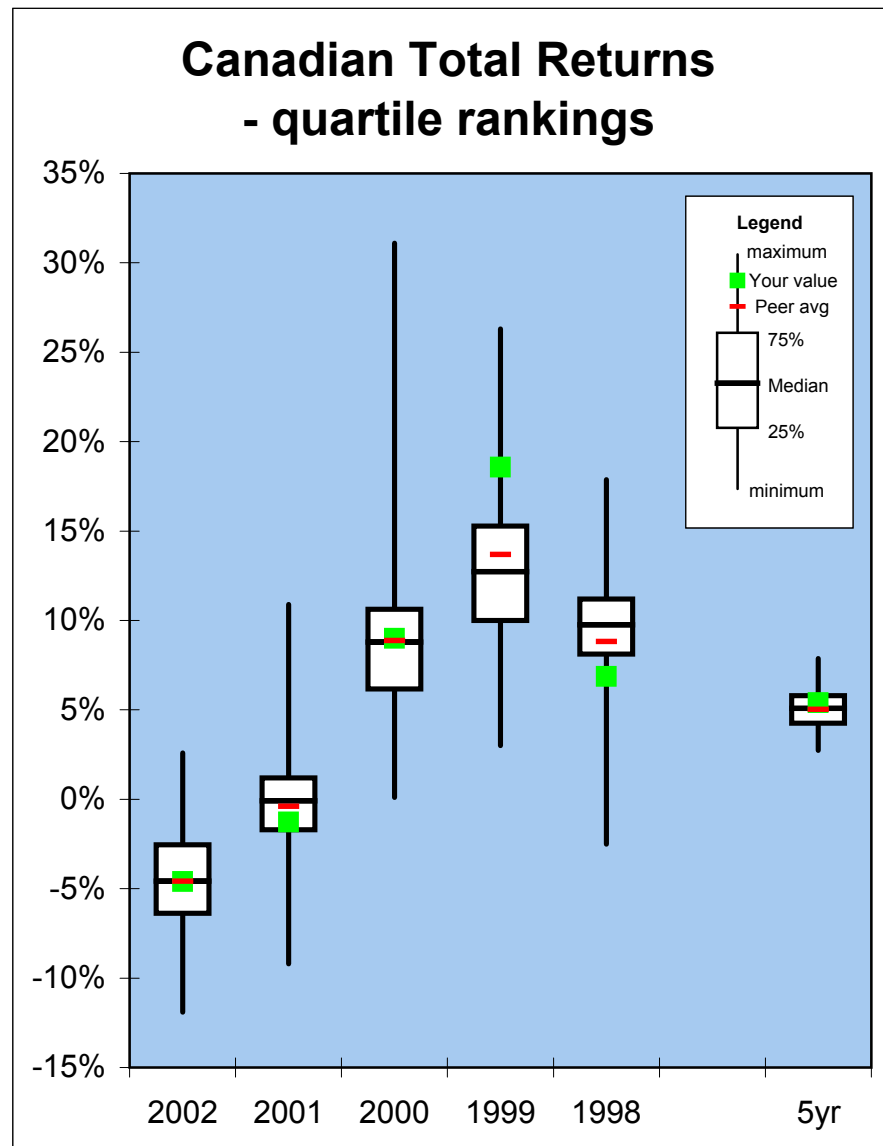
Total Returns, by themselves, are the wrong thing to compare and focus on.

They do not tell you the reasons behind good or bad relative performance.

Therefore, we separate total return into its more meaningful components - policy return and implementation value added.

	Your 5-yr
Total Fund Return	5.4%
Policy Return	3.8%
Implementation Value Added	1.6%

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



1. Policy Returns

Your 5-year policy return of 3.8% was equal to the Canadian median of 3.8%.

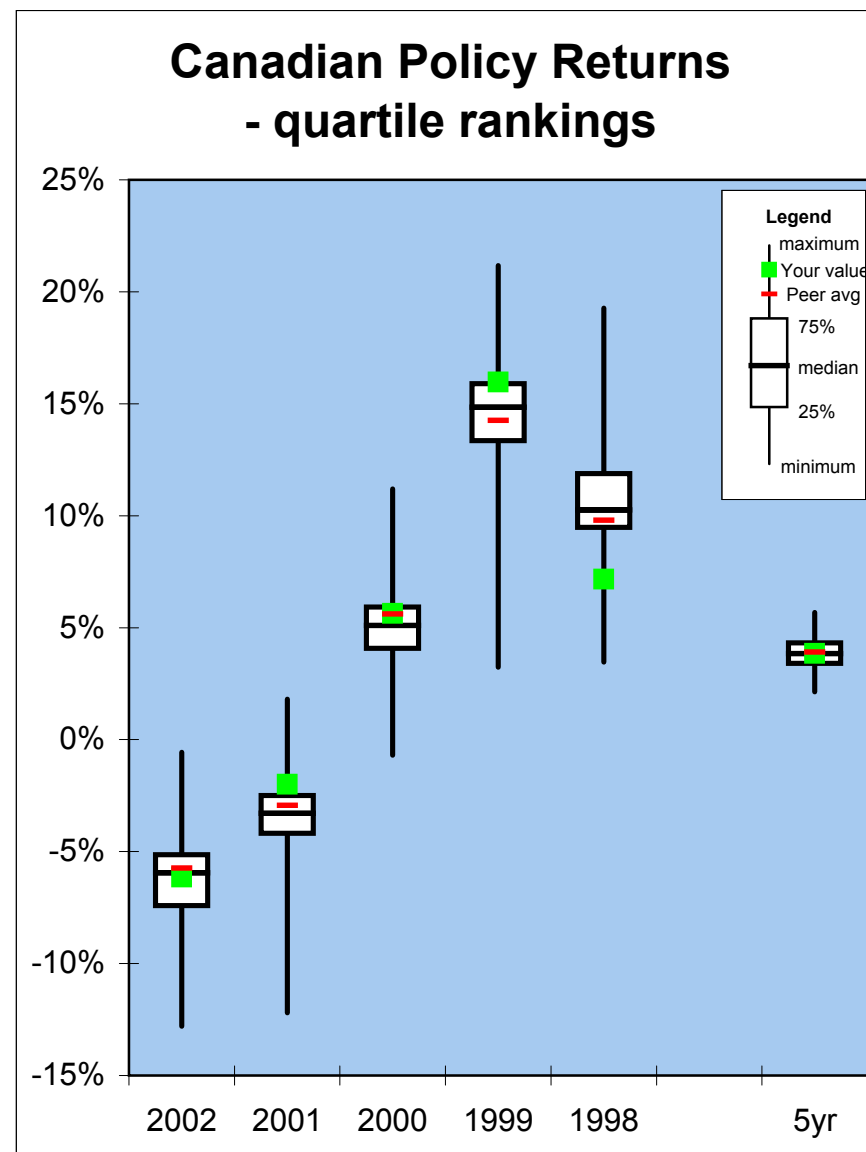
Your policy return is the return you could have earned passively by indexing your investments according to your policy asset mix.

Having a higher or lower relative policy return is not necessarily good or bad. This is because your policy return reflects your investment policy which should consider your:

- long term capital market expectations
- liabilities and
- appetite for risk

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

Note: the median 5-yr policy return for your peer group was also 3.8%.



**1. Policy Returns -
How are your policy
returns different?**

Your equal to the Canadian median 5-year policy return reflects offsetting small differences between your policy asset mix and the Canadian average.

Examples include:

- The positive impact of your relative underweighting in the poorest performing asset class of the past 5 years: Foreign Stocks (your 10% 5-year average weight versus a 5-year Canadian average of 14%).
- The negative impact of your relative overweighting in another poor performing asset class: US stock (your 15% 5-year average weight versus a Canadian average of 13%).

5-year Average Policy Asset Mix			
Asset Class	Your Fund	Peer Avg	Can Avg
Domestic Stocks	35%	32%	31%
Foreign Stocks*	10%	12%	14%
US Stocks*	15%	12%	13%
Fixed Income	35%	37%	37%
Inflation indexed bonds	0%	1%	1%
Cash	5%	2%	2%
Real Estate & REITS	0%	2%	2%
Private Equity	0%	1%	1%
Total	100%	100%	100%

* For comparative purposes, we added the US component of MSWorld to the US stock weights by assuming MS World was 40%US/ 60% foreign.

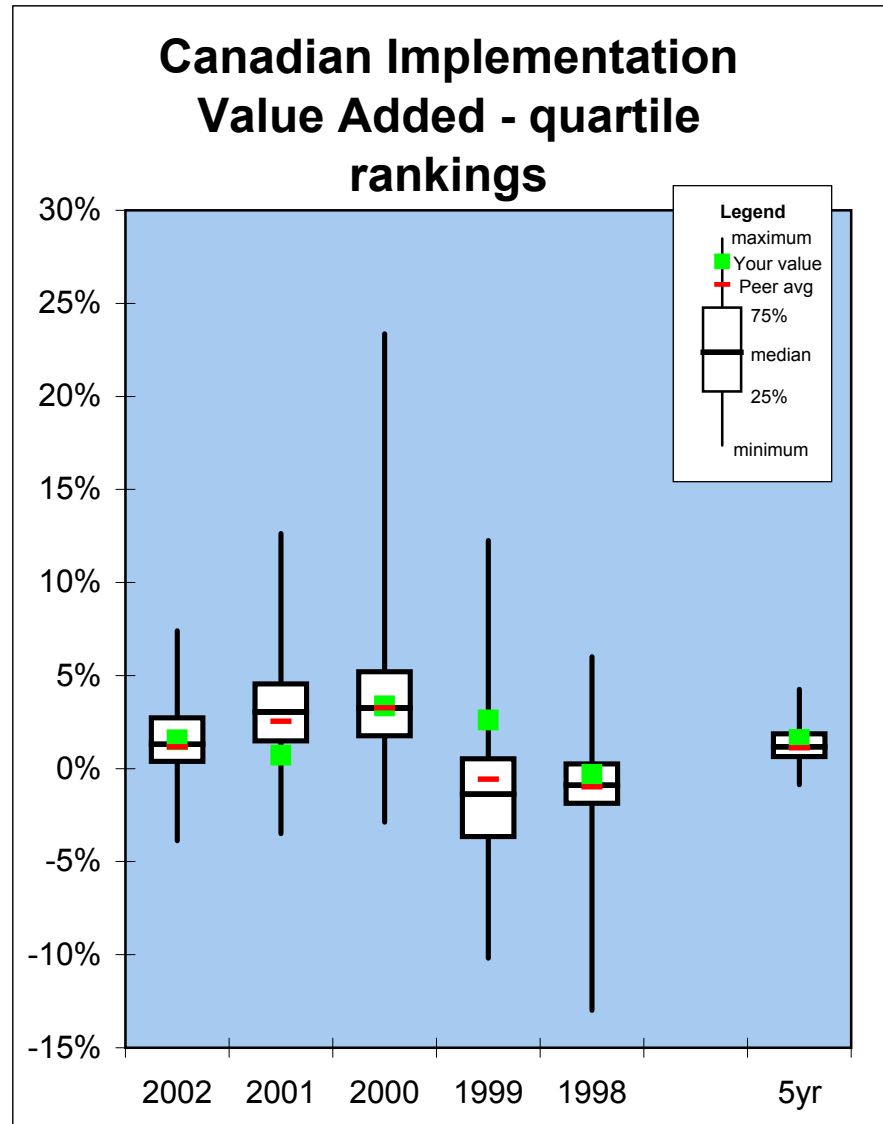
2. Implementation Value Added

Implementation value added measures the contribution from active management. Your 5-yr implementation value added was 1.6%.

- This compares to a Cdn 5-yr median of 1.2% and a peer median of 0.8%.
- Your value added from implementation decisions (mostly active management) equals your total return minus your policy return (the return you could have earned by passively indexing your policy asset mix).

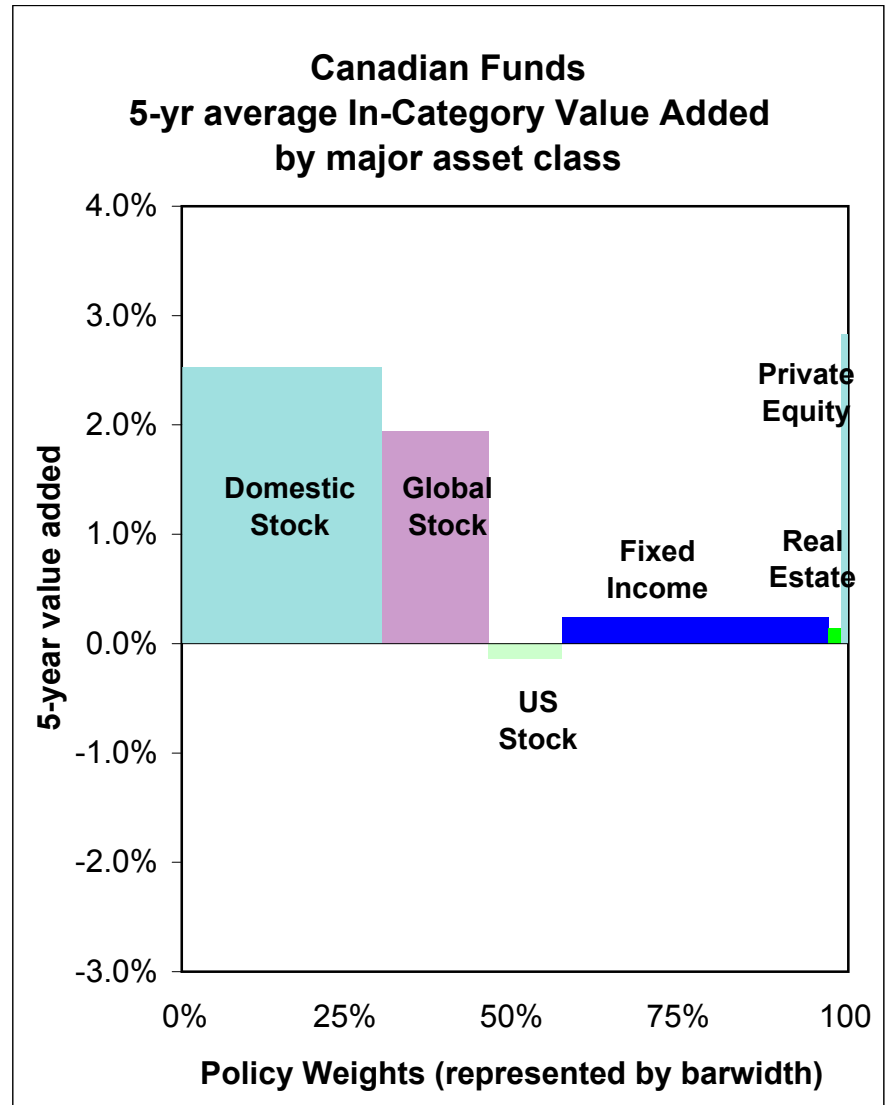
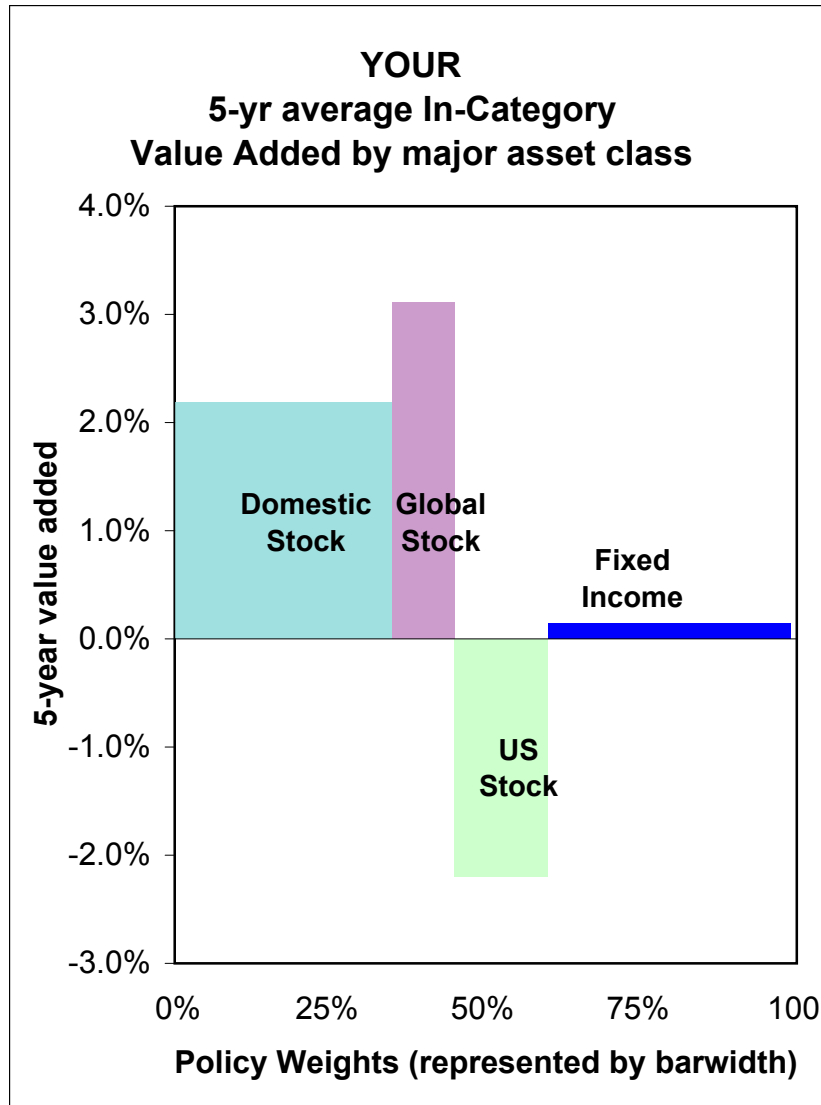
Year	Actual Return	Policy Return	Value Added		
			Total	In-Category	Mix
2002	-4.6%	-6.1%	1.5%	1.3%	0.2%
2001	-1.3%	-2.0%	0.7%	-1.8%	2.5%
2000	9.0%	5.6%	3.4%	3.3%	0.0%
1999	18.6%	16.0%	2.6%	2.0%	0.6%
1998	6.9%	7.2%	-0.3%	0.5%	-0.8%
5yr	5.4%	3.8%	1.6%	1.1%	0.5%

- Your 5-yr Implementation Value added of 1.6% consisted of 1.1% from In-Category (security selection) and 0.5% from Mix (primarily differences between your actual and policy asset mixes).



**2. Implementation
Value Added
(In-category by Asset
Class)**

You had positive 5-year In-Category value added in Domestic Equity, Global Equity and Fixed Income.

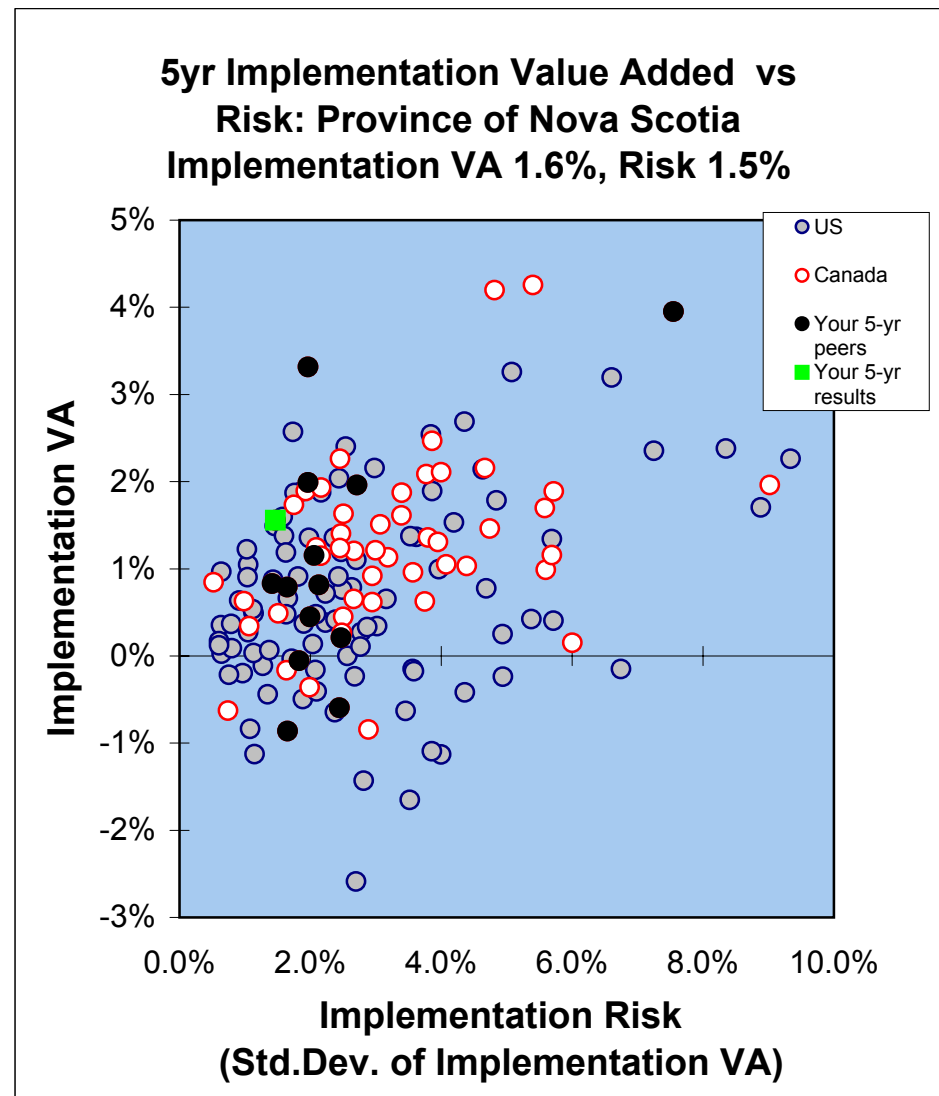


3. Implementation Risk

Your 5-yr implementation risk of 1.5% was below the Canadian median of 2.7%.

"Implementation Risk" is the risk of active management. CEM defines Implementation Risk as the standard deviation of your Implementation Value Added.

There was a positive relationship between Implementation Risk and Value Added over the past 5 years. In other words, funds that took more implementation risk earned more implementation value added.



4. Costs
(Total)

Asset mix and implementation decisions impact costs. Your asset management costs (including G&A) in 2002 were \$13.0 million or 20.7 basis points.

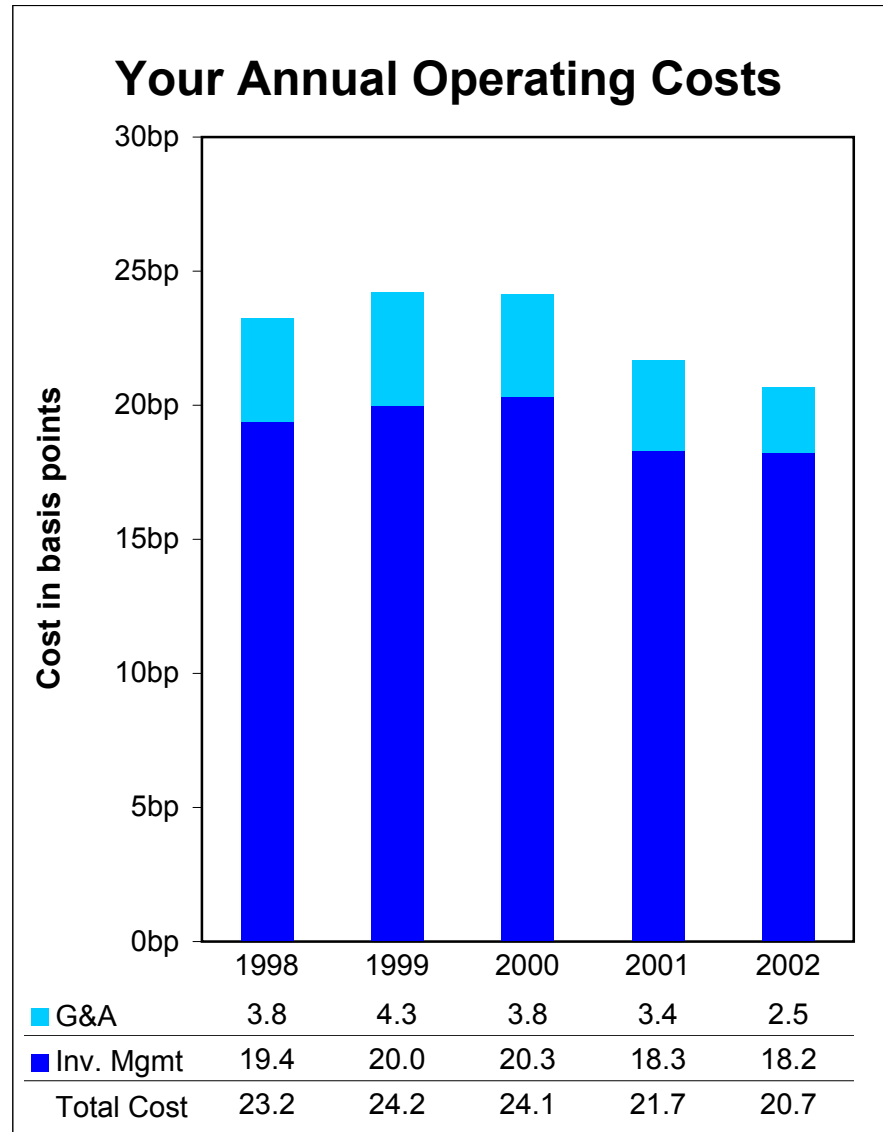
- CEM collects direct investment costs by major asset class and 4 different implementation styles.
- Governance and Administration includes all costs associated with the oversight and administration of the investment operation, regardless of how these costs are paid.
- Only asset management and oversight costs are included. Costs pertaining to member servicing are specifically excluded.

Your Direct Investment Management Costs (\$000s)					
	Internal		External		Total
	Passive	Active	Passive	Active	
Domestic Equity			156	3,296	3,452
Global Equity				2,415	2,415
US Equity			48	1,913	1,962
Fixed Income - Domestic		380		426	806
Fixed Income - Foreign					
Fixed Income - Inflation Indexed					
Fixed Income - Miscellaneous					
Cash & Equivalents		33			33
TAA/Shift					
REITs					
Real Estate				110	110
Hedge & Absolute return					
		<u>Direct</u>	<u>Direct</u>	<u>F-of-F</u>	
Venture Capital & LBO			2,681		2,681
Other Private Equity					
Overlay Programs					0
Total DIM costs				18.2bp	11,458
Your Governance & Administration - asset related (\$000s)					
Executive and Admin					449
Custodial					1,042
Consulting and Performance Measurement					
Audit					38
Other					14
Total G&A costs				2.5bp	1,543
Total Operating Costs in \$000s				20.7bp	13,001

4. Costs (History)

Your total operating costs have decreased over the past 5 years.

- Your investment management costs have decreased from 19.4 bps in 1998 to 18.2 bps in 2002, primarily because of a decrease in your Foreign Stock and Venture Capital costs.
- Your Governance & Administration costs have also decreased from 3.8bps in 1998 to 2.5bps in 2002. A big contributing factor was your lower custody costs.



4. Costs
- Are they high or low?

Benchmark cost analysis suggests that your fund was slightly low cost.

To assess your cost performance, we start by calculating your benchmark cost. Your benchmark cost is an estimate of what your costs should be given your asset size, asset mix and country of origin. These factors impact costs and are beyond your control.

Your Actual Cost of 21 bp was slightly less than your Benchmark Cost of 24 bp. Thus, your fund's Excess Cost was -3 bp or -\$1.8 million, suggesting that your fund was slightly low cost.

The following pages review reasons behind your slightly low cost status.

	(\$000)	basis points
Your Fund's Actual Cost	\$13,001	21 bp
Your Fund's Benchmark Cost	<u>\$14,792</u>	<u>24 bp</u>
Your Fund's Excess Cost	-\$1,791	-3 bp

2002 Benchmark Cost Calculation for: Province of Nova Scotia			
Characteristics	Your Values	Coeff.	Values X Coefficients
Constant or starting point estimate		79.5	80 bp
Adjusting Factors:			
Size (Log10 of Your avg size of \$6288 mil.	3.80	-18.5	-70 bp
Percentage of assets invested in:			
- Domestic Equity	33%	12.6	4 bp
- Foreign Equity	23%	62.6	15 bp
- Real Estate	1%	98.2	1 bp
- Venture Capital/LBO/Private Equity*	5%	161.5	9 bp
Country Variable (1 if Cdn, 0 if US)	1	-13.7	-14 bp
Total = Your Benchmark Cost			24 bp

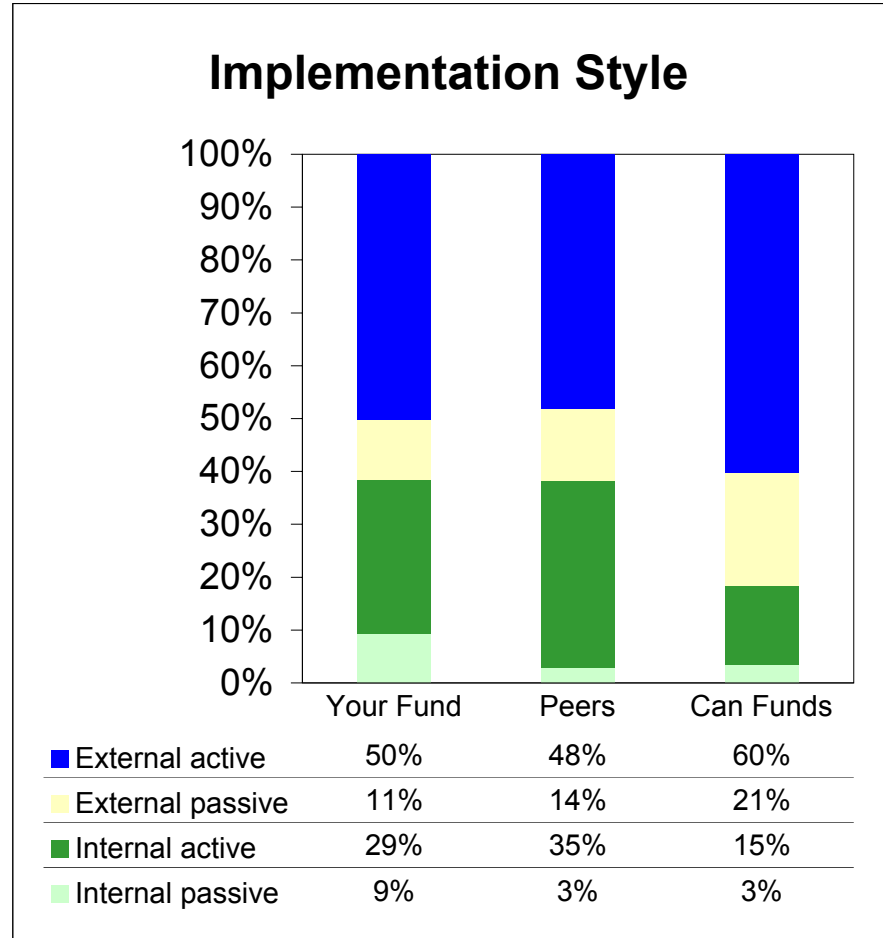
* For the Venture Capital coefficient, your value percentage is based on 'the amount on which are paid', which is generally committed capital or unfunded commitments + Net Asset Value (NAV).

4. Costs
Is it style?

Your implementation style was normal cost.

- Your fund used similar amounts of external active management than your peers (your 50% versus a 48% average for your peers).

External active management is substantially higher cost than either passive management or internal management, so small differences in the proportions of this high cost style can have a large impact on relative cost performance.



4. Costs -
Are you paying more
for similar services?

Your Governance & Administration costs were lower than your peers, particularly your Executive & Administrative costs.

Governance & Administrative Costs				
	Your 2002		Peer Median in bps	Impact of the difference in \$000's
	Avg Holdings in \$mils	Costs in bps		
Executive & Administrative	6,288	0.7	2.1	-852
Custodial	6,288	1.7	1.7	-44
Consulting & Performance Measurement	6,288	0.0	0.3	-219
Audit	6,288	0.1	0.1	-52
Other G&A	6,288	0.0	0.2	-96
Total G&A Impact in \$000's				(1264)
Total G&A Impact in basis points				-2.0 bp

4. Costs -
Are you paying
more for similar
services?

Your Internal Investment Management were in-line with your peers.

<i>Internally Managed Investment Management Costs</i>				
	Your 2002		Peer Median in bps	<i>Impact of the difference in \$000's</i>
	Avg Holdings in \$mils	Costs in bps		
Domestic Fixed Income - Active	1,850	2.1	3.2	-203
Cash - Active	38	8.6	8.8	-1
<i>Total Internal Investment Management Impact in \$000's</i>				<i>(\$203.6)</i>
<i>Total Internal Investment Management Impact in basis points</i>				<i>-0.3 bp</i>

**4. Costs -
Are you paying more
for similar services?**

Your External Investment Management costs were generally similar to your peers. One notable exception was your Active US Stock cost which was much lower than your peers.

Externally Managed Investment Management Costs				
	Your 2002		Peer Median in bps	Impact of the difference in \$000's
	Avg Holdings in \$mils	Costs in bps		
Domestic Stock Large Cap - Passive	401	3.9	2.9	38
Domestic Stock Large Cap - Active	1,309	25.2	20.8	568
Foreign Stock Developed - Active	533	45.3	49.6	-230
US Stocks - Passive	300	1.6	3.1	-45
US Stocks - Active	643	29.7	45.9	-1,038
Domestic Fixed Income - Active	449	9.5	12.0	-111
Venture Capital/ LBO - Direct*	332	80.7	80.7	0
Total External Investment Management Impact in \$000's				(818)
Total External Investment Management Impact in basis points				-1.3 bp

* For these asset classes, holdings are based on 'amount for which fees are based on' and not Net Asset Value, because costs are usually paid based on an amount other than Net Asset Value.

4. Costs - Summary

The net impact between what you and your peers paid for similar services was an overall cost savings of 3 bp.

• The chart on the right summarizes comparisons of your costs to your peers.

<i>Summary of Impact - Your Costs vs. Peers</i>	\$'000s	basis points
Governance & Administration	-1,044	-2 bp
Internal Investment Management	-204	-0 bp
External Investment Management	-818	-1 bp
Total Impact	-\$2,066	-3 bp

Overall Cost Summary

In summary, the benchmark cost analysis indicated that your fund was slightly low cost by 3 basis points.

Further analysis confirmed this conclusion because:

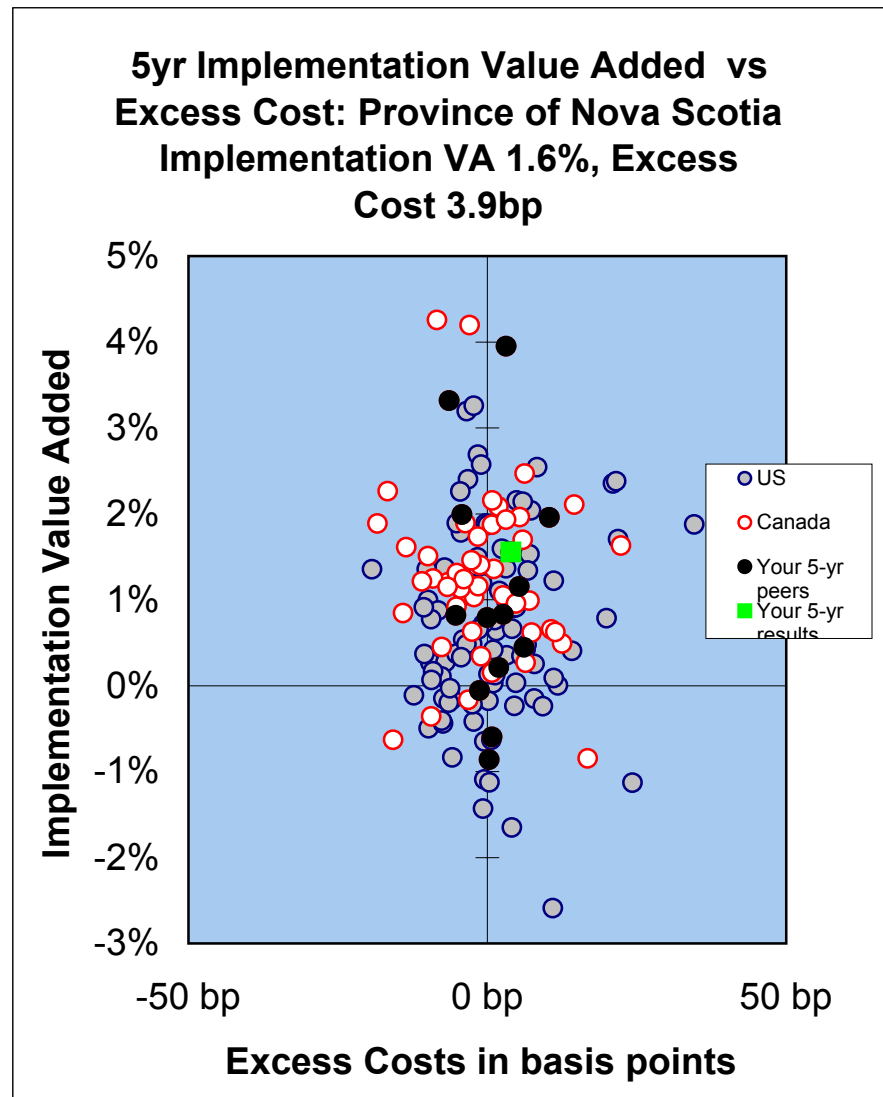
- You have a normal cost implementation style, and
- Detailed comparison of your Costs versus your peers showed an overall cost savings of 3 basis points.

Combining your Implementation Value Added and your Excess Cost provides your cost effectiveness ranking. You are in the desirable high value added quadrant.

There continues to be no relationship between value added and excess costs. In other words, paying more did not get more for the average fund.

If paying more had produced more then the observations would be upward sloping, from low cost and low value to high cost and high value instead of randomly scattered as evidenced here.

Therefore, we continue to stress the importance of measuring and managing your costs.



In summary:

1. Policy Return

Your 5-yr average policy return was 3.8%, which was equal to both the median of your peers and the Canadian universe.

2. Implementation Value Added

Your 5-yr average implementation value added was 1.6%, which was higher than Cdn median of 1.2% and the peer median of 0.8%.

3. Implementation Risk

Your 5-yr average implementation risk was 1.5%, which was lower than the Cdn median of 2.7% and the peer median of 2.0%.

4. Costs

Your 2002 total costs were 21 basis points. You were a slightly low cost fund relative to your benchmark cost of 24 bp primarily because:

- Your normal cost implementation style, and
- You generally paid similar or less than your peers for similar services. We estimate the overall net impact was cost savings of 3 bp.