

Efficient Frontiers

Basic Combined

- Following the March 28th meeting, MPI requested an analysis combining the Basic Short and Basic Long assets and liabilities
- Mercer’s approach is as follows:



Step 1 – Re-Determined Liability Benchmark

	Basic Short	Basic Long	Combined
Duration	0.7 years	11.0 years	10.3 years
Liability Benchmark			
• Treasury Bills	85%	--	3%
• Short Provincial Bonds	15%	36%	39%
• Mid Provincial Bonds	---	2%	--
• Long Provincial Bonds	---	--	--
• Real Return Bonds	---	62%	58%

Step 2 – Adjusted asset mix construction based on weighted liabilities

- About 93% Long and 7% Short.
- Assumed *Midpoint (Mix B)* from the Basic Short analysis
- Constraints were maintained (i.e. 20% allocation to MUSH; max. 35% illiquid assets)

Step 3 – Refined asset mixes to optimize risk/return metrics

- Asset mixes refined to:
 - maintain 100% interest rate hedge ratio
 - align with risk/return spectrum from the Basic Long & Basic Short analysis

Efficient Frontiers (Minimally Constrained)

Basic Combined based on Portfolio EF2

	Liability Benchmark	Current (A)	Higher Return (B)	Lower Risk (C)	Midpoint (D)	Higher Return & Risk (E)
Fixed Income	100%	100%	85%	85%	85%	85%
Treasury Bills	3%	---	6%	6%	6%	6%
3x Real Return Bonds	---	---	---	---	---	---
Real return bonds	58%	---	18%	42%	31%	15%
3x Long Provincial Bonds	---	---	---	---	---	---
Provincial short-term bonds	39%	---	---	---	---	---
Provincial mid-term bonds	---	33%	---	5%	3%	---
Provincial long-term bonds	---	27%	---	---	---	---
Corporate mid-term bonds	---	9%	8%	12%	10%	7%
Corporate long-term bonds	---	11%	33%	---	15%	37%
MUSH Bonds	---	20%	20%	20%	20%	20%
Public Equities	---	---	---	---	---	---
Canadian equity (large cap.)	---	---	---	---	---	---
All Country World Equity	---	---	---	---	---	---
Alternatives	---	---	15%	15%	15%	15%
Commercial mortgages	---	---	1%	9%	5%	---
Core Canadian Real Estate	---	---	14%	6%	10%	15%
Return Metrics						
Median return - 10 year	1.82%	2.48%	3.21%	2.48%	2.83%	3.30%
Risk Metrics						
Expected excess return - 10 year		0.76%	1.43%	0.67%	1.03%	1.52%
Surplus volatility		3.69%	3.51%	1.35%	2.35%	3.77%
Information Ratio (Excess Return/Risk)		0.21	0.41	0.50	0.44	0.40
5% Value at Risk		129.0 M	139.5 M	66.5 M	100.1 M	148.4 M
Other Metrics						
Minimum Capital Required		16.8 M	97.0 M	56.2 M	75.4 M	101.5 M
Interest Rate Metrics						
Duration	10.3	11.1	10.2	10.2	10.2	10.1
Hedge Ratio	100%	108%	99%	99%	99%	99%

Basic Short Allocation to T-bills¹ Basic Short Proportion of liabilities Basic Combined Allocation to T-Bills

88% **X** **7%** **=** **6%**

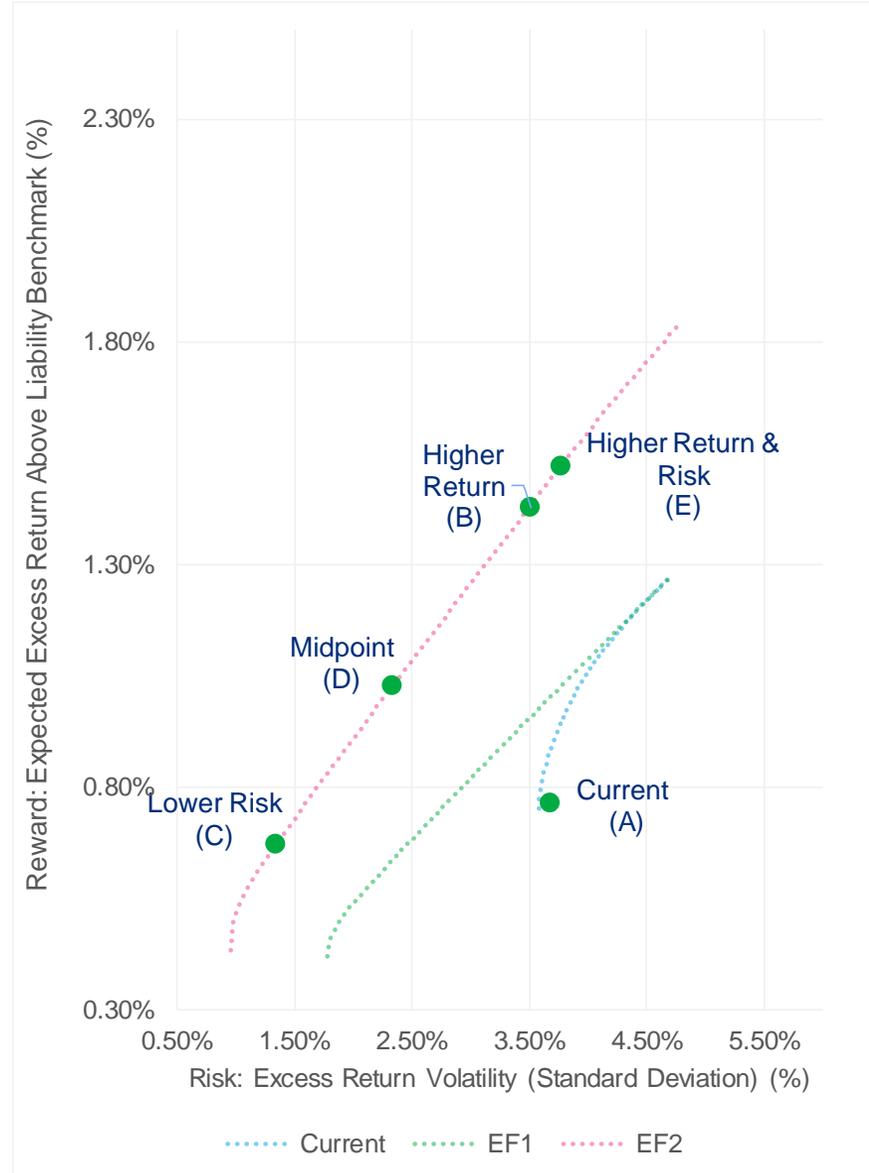
Maintained:
20% MUSH, and
15% Alternatives

- Compared to **Current**:
1. Median Returns are higher, except (C)
 2. Information Ratios are all higher
 3. 5% VaR are all lower, except (E)
 4. Minimum Capital Required is higher in all cases

¹Assumed Midpoint (Mix B) from Basic Short analysis, given Basic Short has 3 mixes and Basic Long has 4 mixes.

Efficient Frontiers (Minimally Constrained)

Basic Combined based on Portfolio EF2



- The combined mixes from the previous page are shown in the top left efficient frontier
- The results show that the combined mixes are “efficient”
 - Conducting an analysis on a separate vs. combined basis did not alter the efficiency of the mixes