HEALTH WEALTH CAREER

ASSET LIABILITY STUDY

PROJECT SUMMARY

2017 ASSET LIABILITY STUDY AND 2018 SUPPORT TO MPI AND THE GRA PROCESS

Manitoba Public Insurance

12 OCTOBER 2018

Dave Makarchuk, Partner, CFA, FSA, FCIA

MAKE TOMORROW, TODAY MERCER

OVERVIEW OF THIS PRESENTATION

- Our Engagement with MPI
- Team Members
- Project Milestones
- How Conclusions Were Reached
- Our October 2018 Perspective

MERCER'S ENGAGEMENT WITH MPI

- RFP2785 was issued by MPI on 12 September 2017 for an Asset Liability Study
- We submitted questions and received answers from MPI as scheduled
- We responded to the RFP as scheduled (22 September 2017)
- MPI notified Mercer that we were the successful proponent on 29 September 2017
- Engagement documentation followed shortly thereafter
- We completed Phases 1-3 of the project by January 2018
- Throughout 2018 we have supported MPI with its GRA and follow-on information requests

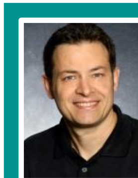
OUR MERCER TEAM


Angelo DiNoto
Lead Consultant


Dave Makarchuk
Executive Sponsor


Jared Mickall
Pension Liability Specialist


Mariusz Wielocha
Modeling Specialist


Pawel Piesowicz
Sr. Modeling Specialist


Samantha Cleyn
Fixed Income Specialist

Each member of our team has significant experience advising institutional investors such as MPI

4 of us are FSA, FCIA

2 of us are CFA Charterholders

MERCER'S 2017/2018 ASSET LIABILITY STUDY FOR MPI
PROCESS STEPS

Step 1: Project planning, data sharing and overall objectives

Step 2: Oct 13 meeting to discuss objectives, assumptions, risk measures, risk philosophies

Step 3: Oct. 30 review of preliminary Efficient Frontier analysis, first draft of Phase 1 report

Step 4: Follow-on iterations based on Oct. 30 feedback, extension to business lines

Step 5: Nov 28 Committee meeting to confirm objectives, review asset allocation recommendation

Step 6: Finalize Phase 1-3 reports

Step 7: Support MPI with IPS revisions

Step 8: Respond to follow on queries, technincal conference, GRA support

HOW CONCLUSIONS WERE REACHED

HIGHLIGHTS OF THE NOVEMBER 28 INVESTMENT COMMITTEE DISCUSSION

We discussed the relative tradeoffs of key investment considerations …

EVERY INVESTMENT DECISION WE DO (OR DO NOT) MAKE IS DRIVEN BY 4 KEY FACTORS…

Return	Risk
Cost	Time

ARTICULATING THE OBJECTIVES FOR EACH BUSINESS HELPS CLARIFY THE PURPOSE OF THE ASSETS … AND PRIORITIZE THE RELATIVE IMPORTANCE OF EACH OF THESE 4 FACTORS

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And summarized the key recommendations and expectations

STRATEGIC RECOMMENDATIONS AND EXPECTATIONS

Key Strategic Recommendations:

Segregate the assets of MPI's lines of business, RSR & pension
Significantly de-risk the assets backing MPI's Basic liabilities (no equities or alternatives)
Diversify and lengthen MPI's fixed income portfolio Diversify MPI's equity portfolio Reducing MPI's allocation to Real Estate

Key Expectations:

1. Cost: expected Returns will decline by 0.4% (or $11)/annum 2. Benefit: expected Risk will decline by 1.6% (surplus vol.) or $67M/annum (95th%ile Surplus at Risk)
3. Gradual implementation over a 24 month period

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WE RECAPPED THE KEY LEARNINGS FROM THE PROJECT…

RECAP OF PHASE 1
KEY LEARNINGS AND CONCLUSIONS

Topic	Analysis/Discussion	MPI Conclusion
Should each business have a unique asset allocation?	The profile of the obligations and risk of each of the 5 businesses is unique. At a minimum, each business should be assessed individually. Preliminary recommendation is to adopt unique asset allocations.	Decision on whether to aggregate or segregate assets depends on dispersion of objectives.
What are MPI's Investment Goals?	The current IPS emphasizes mitigating risk resulting from interest rate variations and mitigating the risk of short-term premium volatility. It also indicates that minimizing premium levels is an objective. Clarifying investment goals for each business line is recommended.	Will define the purpose and objectives for each business line.
Inflation linkage of liabilities	Much of MPI's obligations are linked to future levels of inflation. Real return bonds are the best hedge for future inflation.	Given low inflation expectations, hedge nominal, but not real, interest rate risk.

RECAP OF PHASE 1
KEY LEARNINGS AND CONCLUSIONS

Topic	Analysis/Discussion	MPI Conclusion
Merits of New Growth Portfolio Exposure	Reviewed the relative merits of International Equities, Global Equities, Low Volatility Global Equities, Emerging Markets, Private Equity, and Diversified Growth Funds.	Consider allocations to Global Equities (including Emerging Markets), Low Volatility Global Equities, and Private Equities.

RECAP OF PHASE 1
KEY LEARNINGS AND CONCLUSIONS

Topic	Analysis/Discussion	MPI Conclusion
Merits of New Fixed Income Exposure	Reviewed the relative merits of Federal Bonds, Real Return Bonds, Private Debt, Corporate Bonds Commercial Mortgages, Levered Bonds, Growth Fixed Income. Analysis considered historical and expected risk and returns, duration matching potential, cost, implementation considerations.	Consider private debt and corporate bonds as new asset classes.
Interest Rate Risk Management Strategy	Discussed the merits of duration matching, cashflow matching, and a hybrid approach.	Focus on duration matching for 100% of Basic liabilities.
Economic Assumptions	Mercer's long-term assumptions assume a gradual rise in interest rates to a long-term equilibrium state. Alternatively, we are comfortable assuming shifts in future yields implied by current forward rates.	Projections and analysis will be based on implied forward rates.

… AND CONFIRMED THAT THE PHASE 2 OBJECTIVES HAD BEEN MET.

PHASE 2 OBJECTIVES

Objective	Comments
1.Analyze characteristics and risks of claim liabilities, pension liabilities, equities.	See phase 1 for initial analysis discussion. Further analysis/discussion herein.
2. Quantify risk and return under current and alternative mixes.	Included in the detailed report.
3. Assess available asset classes and impact of adding those new asset classes.	Available asset classes assessed in Phase 1. Impact of new asset classes assessed in the detailed report.
4.Evaluate probability of meeting expected returns under various economic scenarios.	Included in the detailed report.

PHASE 2 OBJECTIVES

Objective	Comments
5. Assess asset class optimization with 1). Minimal constraints and 2). Practical implementation considerations.	Assessment with minimal constraints preceded this report. This report focuses on practical alternatives.
6. Recommend normal, minimum, and maximum allocations to each asset class.	This report focusses on normal allocations. Recommend +/- 3-5% for minimums/maximum's alongside rebalancing.
7. Recommend asset allocations that maximize the probability of achieving corporate goals within stated constraints.	Included in this report.
8. Recommend an allocation to Corporate Bonds	Included in this report.

WE CONFIRMED OBJECTIVES FOR EACH BUSINESS LINE …

A SNAPSHOT OF MPI'S BASIC LIABILITIES

Liability Overview

- Basic universal compulsory automobile insurance for Manitoban drivers
- Rates are approved by the Public Utilities Board of Manitoba
- Obligations are a mix of:
  - Long-term payments (typically disability claims indexed to inflation), and
  - Short-term payments (typically physical damage repairs)

Claims liability estimates have risk from mortality, asset and liability mismatch, investment returns, technological improvements, societal/legal. The actuarial valuation includes an 18.1% (or $273M) risk load to account for these risks

Key Statistics

Liability: $1.79Billion
Duration: 10.5 years

Liability Benchmark

- Short Provincial Bonds 28%
- Mid Provincial Bonds 18%
- Long Provincial Bonds 54%

Asset Purpose:

Ensure that Basic claim liabilities are paid to claimants as they come due

Risk Tolerance

Very low. If RSR grows in future, risk tolerance could increase.

ASSET CLASS OBJECTIVES
BASIC

Return

- Mitigating risk is more important than maximizing returns
- Willing to pursue modest incremental returns through diversified credit decisions
- Avoiding federal treasures (no credit reward)

Risk

- Mitigating risk is more important than maximizing returns
- Matching $ duration is key … no willingness to take interest rate risk
- Willing to take modest credit risk (so long as its diversified and cost effective)

… AND OUTLINED THE ASSET CLASS RECOMMENDATION FOR EACH BUSINESS LINE

PROPOSED ASSET ALLOCATIONS FOR EACH BUSINESS

	Fixed Income		Equities		Alternatives		Total
Basic	$ 1,790M	100%	$ -	0%	$ -	0%	$ 1,790M
[redacted]							
RSR	$ 49M	50%	$ 34M	35%	$ 15M	15%	$ 98M
[redacted]							
Pension	$ 162M	40%	$ 142M	35%	$ 101M	25%	$ 405M
Total Target	$ 2,128M	83%	$ 265M	11%	$ 154M	6%	$ 2,547M

	Fixed Income		Equities		Alternatives	
Aug 31 2017	$1,732M	68%	$428M	17%	$387M	15%
Change	+$396M	+15%	-$163M	-6%	-$233M	-9%

Basic will become 100% Fixed Income
RSR will become 50% Fixed Income, 50% Growth
Pension will become 40% Fixed Income, 60% Growth

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FIXED INCOME ALLOCATIONS WOULD BE AS FOLLOWS:

	Provincials		Corporates		MUSH		Private Debt	
Basic	$ 1,074M	60%	$ 358M	20%	$358M	20%	$ - M	0%
[redacted]								
RSR	$ 20M	20%	$ 10M	10%	$ 5M	5%	$ 15M	15%
[redacted]								
Pension	$ -	0%	$ 81M	20%	$ 0M	0%	$ 81M	20%
Total Target	**$ 1,145M**	**45%**	**$ 475M**	**18%**	**$ 375M**	**15%**	**$ 134M**	**5%**

	Federals		Provincials		Corporates		MUSH		Private Debt	
Aug 31, 2017	$121M	5%	$921M	36%	$8M	0%	$648M	25%	$0M	0%
Change	-$121M	-5%	+$223M	+9%	+$462M	+18%	-$272M	-11%	+$134M	+5%

Modest additions to Provincials
Introduction of Corporates and Private Debt
MUSH bonds will take time to mature

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ASSET CLASS RECOMMENDATION FOR EACH BUSINESS LINE (CONTINUED)

EQUITY ALLOCATIONS WOULD BE AS FOLLOWS:

	Canadian		Global		Global Low Volatility	
Basic	$ 0M	0%	$ 0M	0%	$ 0M	0%
[redacted]						
RSR	$ 12M	12%	$ 13M	13%	$ 10M	10%
[redacted]						
Pension	$ 41M	10%	$ 73M	18%	$ 28M	7%
Total Target	**$ 83M**	**3%**	**$ 119M**	**5%**	**$ 63M**	**2%**

	Canadian		US		Global		Global LV	
Aug 31, 2017	$287M	11%	$144M	6%	0	0%	0	0%
Change	-$204M	-8%	-$144M	-6%	+$119M	+5%	+63M	+2%

Significant reductions to Canadian and US Equity
Introduction of Global Equities, Low Volatility Global Equities

ALTERNATIVE ALLOCATIONS WOULD BE AS FOLLOWS:

	Real Estate		Infrastructure	
Basic	$ 0M	0%	$ 0M	0%
[redacted]				
RSR	$ 10M	10%	$ 5M	5%
[redacted]				
Pension	$ 61M	15%	$ 41M	10%
Total Target	**$ 96M**	**4%**	**$ 58M**	**2%**

	Real Estate		Private Equity		Infrastructure	
Aug 31, 2017	$297M	12%	$3M	0.1%	$89M	3%
Change	-$191M	-8%	-$3M	-0.1%	-$31M	-1%

Will take some time to reduce the allocations to Real Estate and Infrastructure

FINALLY WE REFRESHED ON OUR PROPOSED DECISION MAKING FRAMEWORK AND THE KEY METRICS

OUR PROPOSED FRAMEWORK TO HELP CLARIFY THE RATIONALE FOR THE RECOMMENDATIONS

Return	How does this change impact expected returns?
Risk	How does this change impact expected risk?
Cost	How much does this change cost?
Time	How much time will this change take?

COMPARING RETURN AND RISK
ALL BUSINESSES - CORPORATE

Return

	Current	Proposed
Expected Annual Total Return	4.3%	3.9% (-$11M)
Non-MUSH Yield – ALL	2.75%	3.02%
Non-MUSH Yield – Basic	2.75%	2.92%

Risk

	Current	Proposed
Expected Annual Surplus Volatility	3.4%	1.8% (-1.6%)
95th % ile Value at Risk (surplus)	-$142M	-$75M (+$67M)
Duration	7.27	8.70
Interest Rate Hedge Ratio	73%	87% (100% basic)

Shift to more bonds reduces expected annual return, but is offset by increased non-MUSH yield. Risk reduced significantly and greater amount of interest rate risk is hedged.

DRIVERS OF COST AND TIME
FURTHER ANALYSIS

Cost | Time

	Proposed	Implementation Cost	Timing
Provincials	Duration shifting	Minimal	Q1 2018
Corporate Bonds	Add 1-2 mandates	Manager Search Inv Mgmt Fees	by Feb. 28, 2018
Private Debt	Add 1-2 mandate	Manager Search Inv Mgmt Fees	2019
MUSH	Manage liquidity	N/a	Slow over 24 months
Equities	Add 2 mandates	Manager Search Inv Mgmt Fees	2018

Implementation will be phased over 24 months

OUR SUMMARY PERSPECTIVE ON THE SUBSTANTIVE ISSUES RAISED BY THE CAC/PUB IN 2018

Should liabilities have been modelled with a real benchmark?

- Acknowledge a real benchmark would have better reflected inflation volatility
- MPI clearly indicated willingness to accept inflation volatility and desire to hedge nominal risk, thus a nominal benchmark was used
- The 2% inflation assumption included in the liability cashflows is reasonable from our perspective

Should the recommended asset mix hedge inflation risk?

- Hedging inflation risk was not a stated investment objective
- Most peer investors accept inflation risk … those that hedge typically hedge only a portion for various reasons
- While headline inflation has risen since the study, the consensus expectation for long-term inflation doesn't yet suggest a long-term inflation rate in excess of that modelled during the study

OUR SUMMARY PERSPECTIVE ON THE SUBSTANTIVE ISSUES RAISED BY THE CAC/PUB IN 2018

Should leverage/ overlays have been used to hedge inflation risk?

- Investors comfortable with leverage/overlays have generally realized returns (and volatility) in excess of levels achievable simply with physical assets.
- Not all investors are comfortable with leverage/overlays (for various reasons) regardless of their sophistication or asset size
- MPI's decision to exclude leverage/overlays does not place them as an outlier relative to peer investors

Was MPI too reliant on Quantitative Models?

- While quantitative models and inputs formed the basis of our analysis and discussions with MPI, from our perspective we would suggest that qualitative considerations were more than adequately reflected in the final asset mix recommendation

OUR OCTOBER 2018 SUMMARY PERSPECTIVE

From our perspective, the Asset Liability Study we conducted with MPI was aligned with the Return, Risk, Cost, and Time objectives articulated by MPI. While other investors may have different objectives or alternate views on the relative risks of various asset classes and key economic metrics and reach different conclusions, in our opinion MPI's articulated objectives and final conclusions are consistent with those of many peers and strike a reasonable balance between enhancing returns, reducing risk, mitigating costs and making good use of governance time.

While we acknowledge that Canadian inflation rates have increased significantly since the beginning of the study (2.8% at August 2018 vs. 1.4% at August 2017), we continue to expect that over the long-term Canadian CPI will be at or below the 2.0% level modelled as part of the asset liability study, and that the merits of hedging the risk of higher inflation do not exceed the merits of hedging the risk of lower nominal yields over the long term.

Based on our understanding of MPI's investment objectives, we continue to support the recommend asset mixes for the various business lines as proposed.

Dave Makarchuk, Partner, CFA, FSA, FCIA

Angelo Di Noto, Principal

Pawel Piesowicz, Principal, CFA, FSA, FCIA

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