

TESTIMONY

Manitoba Public Insurance 2017/18 GRA

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SYMPTOMS VS PROBLEMS

15	SHAKY GOALIE	 No Real Return Bonds Poor liability protection against unexpected inflation, <u>real</u> rate risk Less effective duration management 	
YMPTON	PUCK HOG	 Canadian Equities Larger-than average home bias Concentrated sectors/stocks 	
S	SHORT- HANDED	 No International Equities Missed opportunities to add value, diversify portfolio 	
	FOCUS	 Short-term Rate <u>Stability</u> At cost of lower long-term <u>level</u> 	FRAMEWORK
PROBLEMS	PROCESS	 *Smoothed" Accounting Rather than "volatile" market value Asset-Based Rebalancing Rather than risk A-L Studies Every 4 Years Rather than annual/quarterly risk-informed discussions 	RISK BUDGETING
	B	ARRIERS TO EXCELLENCE	



TERMINOLOGY

Term	Definition
Valter	Best proxy for "Walter" (no "W" in Italian alphabet)
Risk	Potential <u>future</u> loss (absolute or relative)
Value at Risk	Market value that could be lost
VaR	See value at risk
Duration	 Measure of interest rate risk 16 year duration: 1% increase (decrease) in interest rate causes a ~ 16% decrease (increase) in asset/liability (accurate for small changes)
Inflation (i)	Annualized rate of change of prices
Nominal Interest Rate (n)	Approximately equal to sum of real rate (r) and inflation (i) n = r + i; e.g., 3% = 1% + 2%
Real Interest Rate (r)	Rate, net of inflation (r = n - i; e.g., 1% = 3% - 2%)
Nominal Bond	Bond (without inflation protection)Market value changes with <u>nominal</u> rates
Real Return Bond	 Bond with inflation protection Market value changes with <u>real</u> rates Principal "indexed to inflation" (e.g., \$100 principal rises to \$102 after 1 year if inflation = 2%); real coupon is applied to (rising) indexed base, assuming inflation > 0%
RRB	See real return bond



TRUTHS AND CONSEQUENCES

	TRUTH	We don't know very much	Beneficiaries/ owners ≠ managers	Correlations are not perfect
¹⁰ Truth		Low signal/noise (return/risk) ratio	Institutions manage \$ for clients/beneficiaries	Risks don't add (1 + 1 ≠ 2)
9 ↑ 8 7 7 Belief 4	Truth and Consequence	We need to make investment decisions but we don't know very much	The interests of stakeholders ¹ may not be aligned because beneficiaries/owners are not the same as managers	The effect of an investment on total portfolio risk depends on the characteristics of <u>other assets in the portfolio</u> because correlations are not perfect
3		•	↓	↓
$\begin{bmatrix} 1 \\ 1 \\ Myth \end{bmatrix}$	HELPFUL TOOLS	BELIEFS ²	CAPITAL/REGULATORY FRAMEWORK ³	RISK FRAMEWORK ³
° wyun	 Stakeholders inclusion Beliefs support lo 	ude MPI, rate-payers and Man ng-term portfolio design (e.g.,	itoba Finance. asset mix).	

3. Capital/Risk/Regulatory Frameworks provide a focus (clarity in mission) and process to overcome common barriers to excellence.



BARRIERS TO EXCELLENCE

Lack of **focus** or clear mission

Poor process

- Structure
- Communication
- Inertia

Inadequate resources



INVESTMENT BELIEFS

- **SUSTAINABILITY:** 1. Major risk is provisions will not be **sustainable**
 - MRP: 2. Determining Minimum Risk Portfolio is first step
- **ADDITIONAL RISK:** 3. Taking **additional risk** beyond MRP should be done only if expected additional returns justify doing so
- **TOTAL PORTFOLIO:** 4. **Additional risk to Total Portfolio** is relevant risk to consider if risk beyond MRP is taken
 - **CONSTRAINTS:** 5. **Constraints** never increase expected risk-adjusted returns



MARKET EFFICIENCY

#6 MARKET EFFICIENCY

Markets are very efficient at pricing securities relative to one another, but are not perfectly efficient due to information and execution costs

• Implicit in recommendations re: Canada/US/International "risky" portfolio mix

- "Risky" sub-portfolios should reflect global market caps, other things equal
 - "Separation theorem", may go by other name(s)
 - Investors should (generally) hold same <u>mix</u> of risky assets, (Canada/US/International Equities), but different <u>allocations</u> <u>between</u> risky and risk-free assets to reflect different risk tolerances
- Common principle applied in portfolio management



FOCUS! WHY FRAMEWORK MATTERS

	FOCUS	 Short-term Rate <u>Stability</u> At cost of lower long-term <u>level</u> 	FRAMEWORK
PROBLEMS	PROCESS	 "Smoothed" Accounting Rather than "volatile" market value Asset-Based Rebalancing Rather than risk A-L Studies Every 4 Years Rather than annual/quarterly risk-informed discussions 	
	B	ARRIERS TO EXCELLENCE	



FRAMEWORK

- Provides FOCUS (barrier to excellence)
- Context, cohesion, link between vision, mission, objectives and strategies

<u>Example</u>

- Want to earn actuarial (real) rate, which no asset guarantees
 - Closest: RRBs yielding < actuarial rate
 - Take risk to maximize returns
- Avoid undue risk, be paid for risks taken
- Measure/attribute risks to sources, improve understanding/management



FRAMEWORK

Elements:

- Primary goal: risk-adjusted net value added (RANVA), not net income (<u>market</u> returns compensated for risks taken, costs incurred)
- MRP: benchmark for RANVA (e.g., Scotia Capital RRB Index at CPPIB*)
- Risk adjustment (cost of risk capital)
- Limits
- Budget linked to goal(s)

* Definitions and parameters may have changed (were in place 2000/01 to 2005)



PROCESS! WHY RISK BUDGETING MATTERS



BARRIERS TO EXCELLENCE



RISK BUDGETING

- Risk: a "good" to budget (like any resource)
 - Targets + limits
 - Discuss big issues (surplus return/risk)
 - Integrate > 1 risk (e.g., surplus, tracking error)
- Traditional "asset mix" process needs updating
 (> focus on why, not how) i.e., asset mix (right →)
 says nothing about value <u>at risk</u>
 - Need "pie chart" of risk contributions/mix
- Risk measurement shocks people (size), but measurement does not create it (corollary true)
- Hope measurement de-emphasizes short-term focus
- Standardizes/simplifies metrics and comparison across asset classes
- Emphasizing faults like "being in Stone Age, discovering iron, complaining about rust"
- 20% to 60% solution less to do with risk estimates than frequent reporting and disciplined return/risk discussions





TEACHERS' FOCUS: SURPLUS RISK METRIC: VALUE AT RISK (VAR)

RISKS AND RISK MANAGEMENT

We manage **surplus risk** using a Value at Risk (VaR) methodology. VaR has forced us to think of surplus risk as the aggregate of liability risk, asset-mix policy risk, and active management risk, taking into account correlation and diversification between the components.

The main source of **liability risk** is a drop in real interest rates, which increases the present value of future pensions accumulated up to that point. It makes new pension liabilities more difficult to finance, and puts upward pressure on contribution rates. Higher real interest rates have the opposite effect.

Source: Teachers' 2000 Annual Report, page 22 Asset-mix policy risk would be the mirror image of liability risk, and surplus risk would be zero, if investments perfectly matched the plan's long-term objective that asset growth will average a real rate of about 4.5 percent plus inflation. Real return bonds come close, but fall a bit short on yield.

The absence of a perfectly matching asset forces us to consider assets that individually do not always behave like our pension promise, but collectively give us the best trade-off between longer term expected surplus return and acceptable short-term surplus risk. Consequently, our asset mix is heavily weighted to equities because they meet our long-term goals, while our inflation-sensitive investments give more modest real returns but dampen surplus risk.



MATCHING ASSETS AND LIABILITIES



Real return yields declined by 59 basis points in 2000, after remaining within a 10 basis point range for the three previous years.

Source: Teachers' 2000 Annual Report, page 19

MATCHING ASSETS AND LIABILITIES

To create a funding surplus we manage the relationship between investment assets and pension liabilities. Our goal is an asset mix that balances risks and rewards, avoids excessive volatility, and maintains stable contribution rates.

Because both assets and liabilities are sensitive to interest rate changes, one of our goals is to reduce the risk that liabilities will increase more than assets in response to lower real interest rates. Unfortunately, that is what happened in 2000. The sharp decline in real rates of return increased the value of total liabilities by \$3 billion. During the year, we shifted assets from fixed-income and equity portfolios to real-rate products and real estate. Debt securities, along with inflation-sensitive assets, outperformed total equities to produce the healthy accounting surplus.



MRP AND RRBS

- Some liabilities resemble RRBs (zero-coupon real cash flows)
- RRBs could closely match risks in real liabilities
- "Insurance" cost varies with yield
- <u>Nominal</u> bonds only good fit if inflation stable

Tendency to ignore portfolio risk interdependence

- Assets risky in isolation, safer when combined with other assets/liabilities (long RRB duration risky on its own, not with long liabilities)
- Diversification makes management a team sport: appetite to take risk in one asset depends on risks in other assets and liabilities



RISK BUDGETING, NOT INFREQUENT ASSET MIX REBALANCING

- Teachers' asset mix policy reviewed annually (not every 4 years)
- Risk in static policy asset mix changes (constant asset mix \neq constant risk)
- In 2000, Teachers' reduced exposure to stocks and fixed income and added inflation-sensitive assets (stocks, especially in Canada, overvalued)



TEACHERS' RANKED #1 IN WORLD "BEST-PERFORMING RETIREMENT FUND"



Source: Teachers' website and The Walrus

holland park

RETURN/RISK FRAMEWORK AT CPPIB (2001)

High Venture capital International equities U.S. equities Canadian equities z R ETU Income-producing real estate ~ Corporate bonds Real-return bonds Government bonds 8 Treasury bills RISK Low High

Source: CPPIB's Annual Report (March 2001), page 11

RELATIVE RISK / RETURN OF ASSET CLASSES



CANADIAN EQUITY CONCENTRATION

	Fiscal year	
%	2001	
ACTUAL RESULTS		
Canadian equities	(7.7)	
Foreign equities	(17.5)	
Total portfolio	(9.4)	
BENCHMARK RESULTS		
Canadian equities	(18.6)	
Foreign equities	(18.2)	
Total portfolio	(17.8)	
Chief actuary's assumption	6.6	
Long-term required return	7.9	





Source: CPPIB's Annual Report (March 2001), pages 6, 15, 18



REAL YIELDS: ~ 0% NOW



Source: Graphed using data from Bank of Canada, Real Return Bond series V122553



TEACHERS' IN 2015

Teachers' RRBs = 19%, Non-Canadian Equities = 44%, Canadian Equities = 2%



Source: Graphed using data from Teachers' 2015 Annual Report, page 71



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RECOMMENDATIONS

	6. De-Linking Discount Rates
	7. Min/Max Asset Class Constraints
	8. Evolved Risk Framework
FRAMEWORK	9. Explicit Risk Management Goals
	5. Return/Risk Definitions for Asset Mix Decision
	10. Minimum Risk Portfolio
	14. Exclusion of Real Return Bonds
	15. Effectiveness of Duration Policy
PORTFOLIO	16. Integration of Real Estate/Infrastructure Liabilities in Duration Management
	11. Canadian Equities' 10% Minimum Allocation
	12. No International Equities
	1. Clarity of Accounting Choices
METDICC	2. Adoption of More Comparable Accounting Principles
METRICS	3. AFS and HTM Accounting
	4. Pension Liability Accounting
	17. Removal of 105% Rule in Investment Policies
OVERSIGHT	13. No Over-Reliance on Quantitative Modeling
	18. Pension Fund



6. DE-LINKING DISCOUNT RATES

For ... asset allocation decision-making, ... consider "breaking ... link" (recursive) between liability valuations and ... yield on ... assets ...

		· · · · · · · · · · · · · · · · · · ·	
тп	eorv suddests	. abbroach is m	ore appropriate.

Nood to Model	• <u>Market value</u> of liabilities does not depend on portfolio composition (only cash flows from insurance, pensions, etc.)
Market "Volatility"	 "Linking" may mask market value at risk in liabilities
volutinty	 If A-L modeling doesn't reflect long-term returns/risks, optimizations won't yield best long-term return/risk tradeoffs

7. MIN/MAX ASSET CLASS CONSTRAINTS

constraints ... should be reviewed and relaxed, to avoid ... lower risk-adjusted returns ...

rationale for ... constraints should be ... explicit

• See 5th belief: "Constraints never increase expected risk-adjusted returns"



8. EVOLVED RISK FRAMEWORK 9. EXPLICIT RISK MANAGEMENT GOALS

8.

evolved risk framework should be considered to improve portfolio/risk measurement, management and/or governance

9.

framework could include ... goals ... avoid "undue risk", ... risk ... taken:

- unknowingly, ... (unaware); or
- knowingly, ...:
 - cannot be managed ..., given ... capacities (ineffective);
 - exceeds ... tolerances (prohibited);
 - ... higher than ... needs to be (inefficient); or
 - ... not understood (uninformed) ...
- See earlier discussion re: Framework



5. RETURN/RISK DEFINITIONS FOR ASSET MIX DECISION

re-define return/risk ... to inform ... asset mix ... based on ... market values, rather than accounting ... At a minimum, net income ... replaced by comprehensive income in ... return ... and retained earnings ... expanded to include ... AOCI ... in ... risk ...

In ... long term, market returns and market risks ... determine average long-term premium rates, regardless of how assets and liabilities are accounted for ...

Market Value ≠	 Accounting risk definition (volatility in retained earnings) understates market volatility (excludes largest market risks) Remeasurement of pension liabilities (~ 16 duration)
Accounting Value	<u>never</u> impacts net income/retained earnings (<u>permanent</u> AOCI)
↓ ♥	 Equity <u>unrealized</u> gains/losses (<u>temporary</u> AOCI)
Market Risk	 Makes RRBs look unattractive from risk perspective
>	 Reality: RRBs hedge long-term real rate/inflation risk best
Accounting Risk	 Adoption of comprehensive income/AOCI better (not best)
	See next page

ACCOUNTING VS MARKET VOLATILITY



Illustrative (not to scale) holland park



10. MINIMUM RISK PORTFOLIO

minimum risk portfolio ... should be ... defined ... aligned with ... stakeholders ...

- MRP should reflect risk in cash flows re: insurance, pension and other liabilities (e.g., real rates, inflation)
- MRP should include some RRBs
- MRP <u>definition</u> ("benchmark" for risk and surplus growth) says nothing about whether to buy RRBs

14. EXCLUSION OF REAL RETURN BONDS

role that RRBs can play in ... managing ... risks should be discussed, with consensus ... regarding ... effectiveness ... <u>from a risk ... perspective</u> ... independent of ... <u>cost</u> of ... "insurance" ... measured by RRB yields and ... expected returns

- Consensus should be achieved on RRB's <u>effectiveness</u> in hedging liability risks (insurance vs pensions) compared to other assets (e.g., cash, "nominal" bonds, real estate, infrastructure) on a <u>market value basis</u>
- Consensus should be achieved on RRB's <u>efficiency</u> in a total portfolio context, and on a <u>market value basis</u>



MPI'S VIEW

In questions related to RRBs, MPI said:

"Real return bonds were excluded ... because they were deemed to be expensive. Aon Hewitt's ... assumptions showed <u>real return bonds to have significant volatility and down side risk*</u> with modest returns relative to nominal bonds Also, page 17 of the Phase 1 report Aon concluded that "RRBs are not a good inflation hedge"."⁵

* Emphasized by me, not MPI, to highlight a fundamental difference in beliefs.

⁵ Source: CAC (MPI) 1-77



MPI'S VIEW

When asked if MPI agreed with AON's conclusion that **RRBs are not a good inflation hedge**, MPI said:

"The Corporation accepts Aon's belief that there are other inflation hedging asset classes available (i.e.: real estate and infrastructure) with greater expected returns ... At the time of the ALM study the real yields on RRBs were below 40 bps for 20 year terms and below 10 bps for 10 years and shorter terms. Real yields for the same terms are currently negative."

AON'S VIEW

Asked why Aon believes RRBs are not a good inflation hedge for MPI, Aon's response was:

"RRBs are not a good inflation hedge for MPI for the following reasons:

- 1. The underlying inflation according to nominal and real return bonds do not match the inflation used to value liabilities (which is based on a survey of Canadian banks);
- 2. RRBs suffer from a limited offering;
- 3. Supply and demand for RRBs have a large impact on the market value; and
- Therefore, the economics of the inflation protection from RRBs do not match the financial impact to MPI on a year by year basis."⁶

* Emphasized by me, not Aon, and discussed on the next page.

⁶ Source: CAC (MPI) 2-39



MY VIEW

My observations related to Aon's four points are:

- this is a problem with the method for valuing the liabilities (survey of Canadian banks), which is not a market-based method, not a problem with the hedging properties of RRBs against a market-valued set of liabilities;
- 2. while RRBs suffer from a limited offering (liquidity), larger funds have managed to accumulate significant exposures (e.g., the average PIAC fund has 3%);
- while supply and demand for RRBs may have a large impact on market value, presumably this is a one-time market impact acquisition cost – a small price to pay if RRBs are considered a buy-and-hold asset class, with little turnover; and
- Aon appears to concede that RRBs <u>do</u> offer inflation protection (despite their earlier comment to the contrary) but that **RRBs do not match the financial impact to MPI on a** year by year basis. This last point represents the symptom of a bigger problem, which relates to the next belief (<u>constraints</u>).



AON AGREES

When asked if Aon could list one or two asset classes that offer better inflation hedges than RRBs for MPI, and offer any evidence to support that belief, Aon said it could not, adding:

"There is no asset class that we know that can hedge the short term inflation risk ... Over the long term, where RRB's are held to maturity, shorter term price sensitivity is less relevant and inflation experienced over the period would result in higher cash flows and an inflation hedge*. It is a commonly accepted belief ... that higher inflation would gradually be reflected in nominal bond yields, equity returns through higher profits, real estate through increased rents and infrastructure, especially where regulated, through increased tariffs ..."

* Emphasized by me, not Aon, to note the tradeoff between <u>shorter term</u> price sensitivity (<u>less relevant according to Aon</u>, with which I agree) and inflation experienced over the period which would result in higher cash flows and an inflation hedge.

15. EFFECTIVENESS OF DURATION POLICY

duration policy should be reviewed, given ... inherent risks of changing <u>real</u> ... rates and ... inflation ..., and exposure to ... <u>nominal</u> ... rates in ... portfolio (... bonds without inflation protection)

- MPI agrees that duration matching is not as effective if inflation turns out to differ from expectations
- "Accepted short term inflation risk and ... accounted for risk through margins and reserve"
- "Excess portfolio was designed to provide some protection against inflation"



16. INTEGRATION OF REAL ESTATE/ INFRASTRUCTURE LIABILITIES IN DURATION MANAGEMENT

consider ... liabilities ... from all sources ..., including real estate ... in ... duration ... financial leverage ... in Asset-Liability Studies ... should be ... consistent with ... leverage actually used ..., removing ... ~ 4% difference related to ... debt

• Materiality of 4% difference depends on the marginal contribution to return/risk, measured on a market value basis, of real estate vs fixed income



11. CANADIAN EQUITIES' 10% MINIMUM ALLOCATION

10% <u>minimum</u> ... to Canadian Equities ("to retain ... meaningful exposure to home ...") should be reconsidered, given ... different interests of ... employees through ... pension ..., ... concentrated ... market ...

- Common home country bias
- Canada small (3 5% of world) and concentrated
- MPI's concentration particularly high
- See Nortel example earlier and 5th belief (constraints)



12. NO INTERNATIONAL EQUITIES

having no exposure to International should be reconsidered, given large size of foreign markets, return opportunities and diversification		Public Equity Mix Canadian Equity US Equity International Equity	MPI SGI Diff 67 47 20 33 31 2 - 23 23 100 100 -
Portfolio Theory	 Theory: funds should be close to global market cap 		100 100
Unique Allocation	 Most investors have significant International SGI: ~ ¼ of public equities PIAC > ⅓ of equites See next page 	Public Equity Mix Canadian Equity US Equity International Equity	MPI PIAC Diff 67 24 42 33 38 5 - 37 37 100 100 -



GLOBAL EQUITY MARKET CAPS: 59/37/4 US/INTERNATIONAL/CANADA



Source: Graphed using data from Teachers' 2015 Annual Report, page 71 and iShares MSCI World Index ETF (Oct 18, 2016) on next page



MSCI WORLD INDEX



Source: iShares MSCI World Index ETF (Oct 18, 2016)



1. CLARITY OF ACCOUNTING CHOICES

clarify ... flexibility ... regarding ... accounting for assets and liabilities, while remaining GAAP-compliant, and ... factors it takes into account in electing to use one method/assumption over others

- See #5. RETURN/RISK DEFINITIONS FOR ASSET MIX DECISION
- Market risk understated by use of accounting metrics
 - Volatile equities
 - Volatile pension remeasurement



2. ADOPTION OF MORE COMPARABLE ACCOUNTING PRINCIPLES

consider adopting ... principles, where GAAP allows ... elections, that reduce ... discrepancy between net income and comprehensive income ..., to improve comparability ... by accounting for more ... at ... "FVTPL"

• Important for portfolio/risk management only if return/risk for asset mix decisionmaking is based on <u>accounting</u> (without "adjustments") rather than <u>market value</u>



3. AFS AND HTM ACCOUNTING

<u>Unrealized</u> gains and losses for AFS assets ... are reported as "... OCI ..." and ... excluded from net income until realized, making ... net income recognition ... inconsistent with FVTPL assets ...

HTM Bonds ... at amortized cost, should also be re-considered. Market valuations are ... more comparable, relevant, transparent, understandable and subject to less ... bias than valuations ... based on ... current accounting

• Unrealized gains and losses are the largest component of total returns on equities (the other being dividend yield), and the most volatile component



4. PENSION LIABILITY ACCOUNTING

Reconsideration should ... include ... remeasurement of employee benefits ... which is ... OCI ...

remeasurement ... is large (... long duration of pension liabilities), but OCI ... from changing interest rates that impact ... liabilities is not recognized through ... net income

• Make "adjustments", for portfolio/risk management purposes, for differences between market and accounting risk



17. REMOVAL OF 105% RULE IN INVESTMENT POLICIES

remove ... ability to request ... managers to realize gains (losses) ..., which MPI says "... no longer relevant" ...

remove ... ability ... to cause a manager to realize gains (losses) for ... sole purpose of having ... impact on net income, without yielding ... economic value, reducing risk or ... conferring ... benefit ...

• Applaud that MPI agrees to make change



13. NO OVER-RELIANCE ON QUANTITATIVE MODELING

be vigilant about ... over-reliance on quantitative considerations, given ... high sensitivity of optimal asset allocations to ... assumptions (returns, volatilities and correlations) and ... large number of inputs

44 Assumptions	 optimal solutions from quantitative portfolio optimizations are very sensitive to the capital market assumptions used; and there are at least 44 such assumptions in the Asset-Liability Study, involving MPI's 8-asset class portfolio, as calculated below. <u>44 Important Assumptions (estimates, but "unknowns")</u> 8 average return assumptions (1 for each asset class) 8 volatility assumptions <u>28 correlations (= 8 x 7 ÷ 2)</u> 44 "unknowns" Source: Evidence, page 41
A-L Studies Every 4 Years	• Too infrequent, considering "dynamic risks" in static asset mix



18. PENSION FUND

interests of ... stakeholders should inform decisions regarding ... accounting for and management of ... assets and liabilities related to ... pension plan ...

desirable outcome is ... greater clarity around ... appropriateness and prudence of assets and liabilities commingled

Risky	Material market risk from employee benefits (re-measurement)
Component	not reflected in return/fisk in A-L Study
not	 Not appropriately considered in asset mix decisions
Considered	See next page
Unbundling Pensions	 Pension plan "unbundling" may result in <u>accounting</u> recognition of material remeasurement losses (to be confirmed by accountant(s)) Recognition depends on: Pension liability (~ 18% of assets on accounting basis) Duration (> 16) Change in discount rate (adoption of different accounting) Convexity/other (bigger for larger rate changes, lower rates)



MATERIALITY

Change in Pension Liability	y Net Income	OCI					
Current service cost			"OCI pot roflact	-od in re	sturp/ric	kin A	l Ctudy
Interest cost	Low Volatility		not considered in asset mix decisions				Lotuuy
Benefits paid	volucincy						
Remeasurement (gains) losses recognized in OCI		High Volatility					
	assumptions adopted the defined benefit ob most recent actuarial assumptions are as fol	by the Civil Servi ligation is <mark>16.29</mark> valuations, proje lows:	ce Superannuation Board. T <mark>years</mark> (February 28, 2015 - cted to February 29, 2016	he weighted - 17.15 year and the corr	average <mark>dura</mark> s). Results fr esponding ec	<mark>ation</mark> of om the onomic	
	Assumptions:	Pension Be	Pension Benefit Plan		Other Benefit Plans		
Source	Discount rate		2016	2015	2016	2015	
	Inflation rate		2.00%	2.00%	4.03%	3.00 /0	
MPI's financial	Expected salary increa	se	2.75%	2.75%			
statements Note 16	Expected health care of	cost increase (out	of scope)		4.90%	5.50%	
statements, Note 10	Expected health care of	cost increase (in s	cope)		2.00%	2.00%	
	Change in benefit	t obligations:					
		Pension Be	Pension Benefit Plan		Other Benefit Plans		
	(in thousands of Cana	2016	2015	2016	2015		
"not rofloctod"	Balance at March 1		339 334	285 326	51 785	47 812	
notrenecteu	Current service cost		14,103	12,054	5,414	5,059	
	Interest cost		12,760	12,349	931	780	
	Benefits paid		(10,832)	(9,659)	(2,983)	(2,701)	
	Remeasurement (gain	s) losses recogniz	ed in OCI (26,975)	39,264	(5,420)	835	
	Balance at February 2	9/28	328,390	339,334	49,727	51,785	
							48
	Employee contribution	for the year	9,679	8,909	- 1	-	