

Pacific Business and Law Institute An Actuarial Primer for Trustees and Administrators

PREPARED BY: Brendan George, Partner

February 25, 2015

400-601 West Broadway
Vancouver BC V5Z 4C2

Toll-free: (888) 800-1450
georgeandbell.com



Agenda

- Typical actuarial calculations
- Relevant legislation
- Funding rules
- Actuarial valuations
- Why fund conservatively?
- Pension administration issues
- Questions?

Typical Actuarial Calculations

- Calculation of liabilities/reserves or contribution rates for pension or benefit plans:
 - Pension plans (defined benefit, target benefit, Multi-employer)
 - Health & Welfare Trusts (LTD)
 - Post-retirement benefits (dental, life insurance, medical)
- Legal evidence:
 - Criminal rates of interest
 - Loss of earnings
 - Split of pensions on marriage breakdown
- Early days:
 - Church of Scotland ministers set up a fund in 1744 to fund pensions for widows and orphans of deceased ministers
 - Today: Scottish Widows insurance company

Relevant Legislation: H&W Trusts

- H&W Trust funding:
 - Income Tax Act (impacts tax status of investment earnings)
 - No funding standards; Trusts set guidelines in Trust Agreement or funding policy

Relevant Legislation: Pension Plans

- Income Tax Act: Limits the maximum amount of tax deductible contributions and funding
- Pension Standards Legislation:
 - Registered pension plans cannot be funded on a pay-as-you-go basis (must be prefunded)
 - Must be funded in accordance with a method permitted by the legislation
 - Funding requirements depend on the plan
 - defined contribution plan
 - defined benefit plan
 - negotiated cost plan

Pension Plan Funding Legislation

Pension legislation requires two funding tests (every 3 years):

1. **Going concern:** value plan assets and liabilities assuming long-term continuation of Plan
 - Funding surplus/deficit = Plan assets - Going Concern liabilities for service to date
 - Normal cost = cost of benefits being earned over the next year; often expressed as % of payroll
2. **Solvency:** assumes Plan wind-up and payout of member earned benefits
 - Solvency surplus/deficit = Plan assets – Solvency liabilities for service to date

Target Benefit Plan Funding Rules

- Available in Alberta, coming to B.C.
- No solvency test
- Going concern “plus”:
 - Contribution rates – needed to fund benefits plus PFAD
 - PFAD: Provision for Adverse Deviations
 - PFAD increases with equity exposure in Plan assets; also increases if funding discount rate above a benchmark rate
 - Deficits amortized over 15 years (or average future service if shorter)

Pension Plan Funding Legislation

- Minimum Funding requirements: Plan normal cost + 15-year amortization of going concern deficits + 5-year amortization of solvency deficits
- Some jurisdictions allow solvency exemption or longer period to pay solvency deficits e.g. 15 years
- Going concern and solvency tests use different methods and assumptions: going concern are long-term and solvency are market-based
- Maximum funding allowed: Normal cost + lump sum payments to fund full solvency and funding deficits
- Income Tax Act does not allow contributions to continue when Plan's funded ratio exceeds 125% (with a few exceptions)

Actuarial Valuation - Overview

Purpose:

- Adjust contribution rates on regular basis
- To provide funds sufficient to provide all Plan benefits
- Recognizing past actual and expected future experience

Contributions + Investment Earnings – Expenses = Benefits

Sample Pension Valuation Results

Going Concern Basis	31-Dec-12	31-Dec-13
Actuarial value of assets	72,249,000	79,618,000
Actuarial liability	88,747,000	91,768,000
Funding Surplus (deficiency)	(16,498,000)	(12,150,000)
Funded Ratio	81%	87%

Solvency Basis	31-Dec-12	31-Dec-13
Solvency Assets	79,132,000	87,965,000
Solvency Liabilities	115,263,000	102,999,000
Solvency Surplus (deficiency)	(36,131,000)	(15,034,000)
Solvency Ratio	69%	85%

Sample Pension Valuation Results

Contribution Requirements	31-Dec-12	31-Dec-13
Total cost of accruing benefits for next year	1,370,000	1,093,000
Members' contributions	(541,000)	(466,000)
Employer current service cost	829,000	627,000
Employer's current service cost as a % of member's required contributions	153%	134%
Minimum special payments to amortize solvency deficit	3,900,000	3,760,000
Minimum employer contributions	4,729,000	4,387,000

Key Risk Factors

	Pension Plans	H&W Trusts
Economic Risks:		
- Asset returns	High	Medium
- Interest Rates	High	Medium
- Inflation/salary increases	Medium	Low
Demographic Risks:		
- Retirement rates	Medium	N/A
- Life Expectancy	Medium	Low
- LTD Experience	N/A	High

Valuation Results

- Key factors impacting pension plan liabilities and normal cost
 - Data/member demographics (actives vs. retirees, age, service, salary)
 - Actuarial assumptions (discount rate, inflation, salary increases, retirement rates)
 - Actuarial methods (Projected unit credit, entry age, attained age)
 - Plan benefits (retirement, termination, early retirement, indexing)
 - Solvency test

Actuarial Methods

- Projected unit credit (PUC): normal cost for actives is increase in past service liability over the next year; past service liability is present value of expected future payments for past service
- Unit credit (UC): same as PUC, with no salary projection
- Attained Age (AA): normal cost for actives is average cost of all future service benefits; past service liability same as PUC
- Entry Age (EA): normal cost is level % of payroll needed to fund past and future service benefits from date of entry; accrued liability = present value of all benefits – present value of future normal costs
- Under all methods, liabilities for inactive members are present value of expected future payments

Actuarial Methods

- Comparison of funding:
 - EA and AA funding cost is constant as % of payroll over whole working career; leads to earlier funding than PUC and UC
 - UC and PUC funding cost increases as member gets older
- Uses for methods:
 - EA and AA: closed plans or multi-employer plans
 - PUC: open single-employer plans
 - UC: multi-employer negotiated cost plans

Actuarial Assumptions

- Common going concern assumptions:

Economic:

Discount rate: 5.0% (net of investment fees)

Inflation: 2.0%

Salary Increases: 2.5%

YMPE Increases: 2.5%

Admin Expenses: Based on Plan experience

- Demographic assumptions based on Plan experience, except for mortality table

Actuarial Assumptions

- Derivation of Discount Rate:

Inflation Rate	2.0%
Expected Gross Real Rate	4.0%
Expected Gross Nominal Rate	6.0%
Deduction for Expenses paid from Fund	(0.5%)
Expected Net Nominal Rate (best estimate)	5.5%
Provision for adverse deviations (PFAD)	(0.5%)
Valuation interest rate net of expenses	5.0%

Mortality Table

- In Feb 2014, the Canadian Institute of Actuaries (CIA) issued the first ever mortality tables and mortality improvement scales based on pensioner mortality experience in Canada
- Will impact a number of plans across Canada
- Previously, Canadian pension actuaries could access primarily U.S. based pension mortality tables (UP94 Table)
- New Mortality Table: CPM2014 (Private sector, Public sector and combined table)
- Impact on pension plan liabilities: typically 5% increase; differs by plan and public / private sector

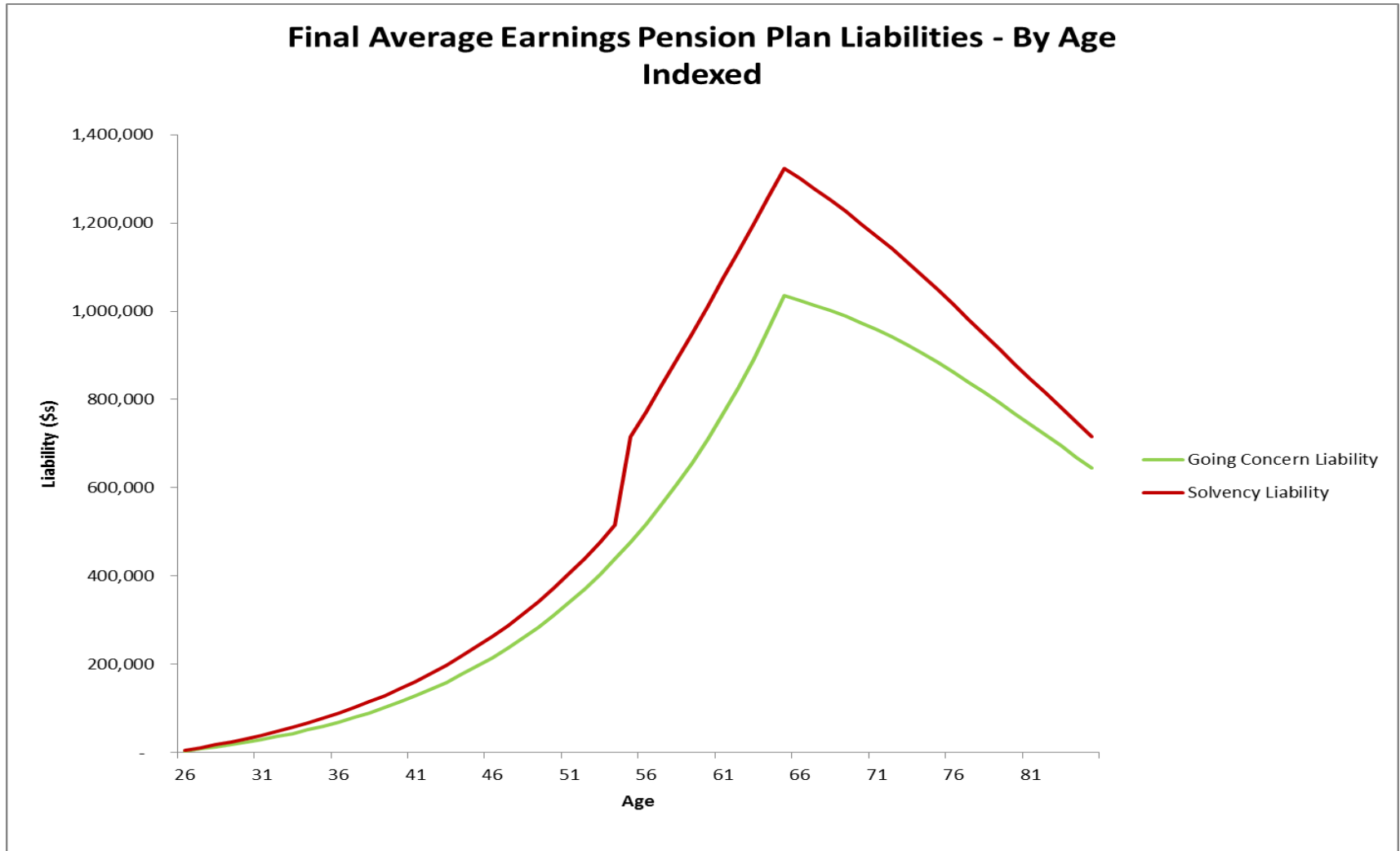
Solvency Assumptions

- Common Solvency Assumptions:
 - Commuted Values in Dec 2014
 - Mortality: UP94 with Generational Mortality (likely changing in 2015)
 - Interest (non-indexed): 2.5% for 10 years, 3.8% thereafter
 - Interest (indexed): 1.3% for 10 years, 1.6% thereafter
 - Annuities in Dec 2014
 - Mortality: UP94 with Generational Mortality
 - Interest (non-indexed): 2.52%
 - Interest (indexed): -0.58% (not a typo!)

Solvency vs. Going Concern

- Contributions are designed to be driven by going concern
- Solvency applies if solvency test fails
- Today, solvency is driving, an example:
 - Final Average Earnings Plan (1% of FAE)
 - Individual entering at age 25
 - Earnings start at \$50,000 and grow at 3% per year

Solvency vs. Going Concern



Why are Actuaries Conservative?

- Best estimate assumption: 50% chance of being too conservative
- Margins/PFAD: more likely to generate positive results in future e.g. lower discount rate, high inflation rate/salary increase rate
- Advisors like to deliver positive surprises
- Conservative funding:
 - Build up contingency reserve/cushion for bad times (e.g. 2008)
 - Results in less volatility of funding level and contribution rates
 - Last 20 years:
 - ❖ Surpluses in 90s
 - ❖ Surpluses disappeared in early 2000s
 - ❖ Large deficits post-2008
 - ❖ Getting back to full funding now

Pension Administration

- Actuarial equivalent: of equal value (no gain/loss to Plan)
- Impacts of actuarial calculations:
 - Different forms of pension at retirement
 - Lump sums offered to members on termination/death
 - Some early retirement reduction factors (6% per year reduction)

Questions





georgeandbell.com