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Rethinking the Funding of Mature Pension Plans

Malcolm Hamilton



Introductory Comments

- **Motivations for the Paper:**
 - Between 1990 and 2007, as the Ontario Teachers' pension plan matured
 - the cash flow went from positive to decidedly negative
 - the ratio of retired to active teachers more than doubled
 - the ratio of pension assets to payroll went from 3 to 10
 - Just how stable can the actuary make contribution rates?

- **Motivations for the Paper:**

- Has anyone noticed that runaway surplus is a problem in stochastic pension simulations?
- The longer the horizon, the larger the problem.

- **Content:**

- Back to first principles – not how to comply with existing standards and regulations.
- Mature pension plans – plans that have reached a steady growth state.
- Stable interest, inflation and population growth rates.
- One risk – variable equity returns.
- The challenge – managing that one risk in the long term.

“ If it is difficult to manage the funding position of a theoretical pension plan in a simple, stable, well understood environment then it will be even more difficult to manage the funding position of a real pension plan in an environment that is poorly understood and ever changing”

Long Term Interest Rates and Canadian Actuarial Practice

- The paper ignores interest rate fluctuations and the term structure of interest rates for the following reasons:
 - to simplify the analysis and the modeling,
 - interest rate risks, as they relate to benefits for past service, can and should be hedged,
 - interest rate risks, as they relate to benefits for future service, should be transferred to employees through salary adjustments,
 - mortality risks are small relative to equity risks.

- As regards financial economics, the author believes:
 - that actuarial liabilities should be calculated and disclosed using market interest rates on investment grade debt,
 - that funding targets for pension funds with balanced portfolios should, in the absence of concerns about benefit security, anticipate future equity risk premia.

- For example, if the riskless interest rate is 5% and the expected rate of return on a pension fund is 7%, there is no inherent contradiction in setting:
 - The Actuarial Liability = \$10 million = PV of accrued benefits @ 5%
 - The Funding Target = \$7 million = PV of accrued benefits @ 7%

The difference, \$3 million, is the portion of the liability expected to be discharged by the future bearing of investment risk.

The Funding Process

- **Funding is a process whereby:**
 - a target (the funding target) is set for the pension fund's assets, and
 - contribution rates, benefit levels and/or the asset mix are used to push the pension fund towards the target.
- **This is an exercise in stochastic control, not liability measurement. There are two relatively independent steps:**
 - setting the target, and
 - creating a viable navigation process.

- Funding targets should be chosen by:
 - government in the public interest,
 - plan sponsors pursuing their own interests,
 - fiduciaries pursuing the interests of plan members, and/or
 - plan sponsors and members jointly, through collective bargaining.

**Actuaries can calculate funding targets.
They should not choose funding targets.**

- The funding target will be dictated by the funding objectives, which can be:
 - benefit security (private sector),
 - intergenerational equity (cost shared), or
 - taking full advantage of tax shelters.
- Different objectives point to different targets; so it is important to decide which takes precedence.
 - For example; benefit security and intergenerational equity are incompatible objectives for cost shared plans.

- Once the funding target is set, we can use contributions, benefits and/or investment policy to keep the market value of the pension fund's assets within an acceptable range. To this end
 - contributions and benefits are substitutes,
 - asset mix is a complement.

- How does one distinguish effective controls from ineffective controls?

- Viability⁽¹⁾
- Short term contribution rate stability
- Long term contribution rate stability

and, where benefit security is a concern,

- expected benefit loss on wind up
- expected surplus forfeiture on wind up

⁽¹⁾ in the long run, assets should remain between zero and the present value of future benefits (open group) at the riskless rate

“Viable funding strategies must control surpluses as effectively as they control deficits.”

General Conclusions

- In a mature pension plan with a significant commitment to equities, contribution rates must move in a wide range:
 - Unless equities are eliminated as funding positions increase, contributions must be negative in good times.
 - In bad times contributions must exceed the pay-as-you-go contribution rate.

“Long term contribution rate stability is a worthwhile objective but it is not one that can be achieved in a mature pension plan with a significant commitment to equities.”

The Corollary

In a mature pension plan with a significant commitment to equities and no possibility of surplus withdrawal, equities must be cut back as the funding position improves.

- **Contributions are unstable in the long run because pension fund returns are unstable over 20 to 30 year periods:**
 - when a pension plan has a negative cash flow each year's investment return is less important than the prior year's return,
 - the first 20 to 30 years is crucial, even in a plan that grows perpetually,
 - returns are neither stable nor predictable over 20 to 30 year periods.

On smoothing...

Actuarial techniques⁽¹⁾ to promote short term contribution rate stability “*are useful in the sense that they enhance control in the short term with no materially adverse consequence in the long term. They are also dangerous if plan sponsors, confused by the fact that they have a measure of control in the short term, imagine the long term risks to be less than they really are and make foolhardy decisions as a consequence.*”

On the Virtues of Consistency

“Used opportunistically, actuarial techniques become less effective at stabilizing contribution rates and more effective at reducing funding levels.”

Techniques for managing short term volatility work best when applied to contribution rates directly, not indirectly through balance sheets. Otherwise

“the balance sheets are often not what they appear to be. They are not an attempt to accurately represent the financial position of the pension plan on the valuation date. They are a means to an end – an artifice constructed for the purpose of arriving at an acceptable contribution rate.”

On Funding on a Wind Up Basis

“To fund a pension plan on a wind up basis is not to assume that the pension plan will wind up in the foreseeable future. It is not the antithesis of going concern funding. Funding on a wind up basis means that, for as long as the plan continues as a going concern, the funding strategy will try to keep the pension plan’s assets above its wind up liabilities.”

The differences between funding on a wind up basis and funding on a going concern basis.

- the measures of success or failure.
- the target,
- the role of PADs, and
- the vigor with which deficiencies must be addressed.

Suggestions for the Regulation of Funding

On governance and the setting of contribution rates...

“The author favours a governance structure where funding decisions, including the judgements made by the actuary in performing his or her work, are made by or for the benefit of the plan sponsor but are appropriately constrained by regulations that ensure that the decisions do not unreasonably compromise benefit security.”

Suggestion #1

Distinguish plans where benefit security is a concern from plans where it is not because

- wind up is unlikely in the extreme, or
- the plan sponsor can be relied upon to make good any wind up deficiency, or
- the “deal” includes an understanding that benefits may be lost upon wind up.

It is not the actuary’s job to decide if benefit security is a concern for a particular plan.

Suggestion #2

Where benefit security is not a concern, allow plan sponsors to develop and follow their own funding policies.

- actuarial standards should focus on disclosing the role of the actuary and the consequences of the funding policy.

Suggestion #3

Where benefit security is a concern:

- abandon the going concern funding requirements,
- set the funding target equal to the wind up liability,
- calculate the normal cost assuming the pension fund earns the “riskless” interest rate,
- amortize deficiencies over 15 years,
- do not restrict the use of surplus for contribution holidays unless contingency reserves are needed to reduce the expected loss on wind up to an acceptable level.

On defining what is meant by benefit security...

“The regulator/government must decide what constitutes an acceptable benefit loss upon wind up recognizing that if the number is too large, public confidence in the pension system will erode while, if the number is too small, plan sponsors will abandon their plans.”

On the perils of asymmetry...

“Unfortunately the current funding rules in Canada, as interpreted by the courts, make it exceedingly difficult to find funding procedures that simultaneously protect members from benefit loss and sponsors from surplus forfeiture.”

Other observations

- As long as plan sponsors are expected to fund deficits and share surpluses, any move to enhance member security makes pension plans less attractive to plan sponsors.