

Injury Schemes Seminar

Balancing Outcomes

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A ramble: Some actuarial issues with the valuation of injury schemes

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Purpose of this paper

- Have a bit of fun
- Be a little controversial and thought provoking
- Get a discussion happening
- Institute wants to encourage research – well here are a few ideas for research topics!!!
 - Risk free discount rates
 - Risk margins
 - Mortality and morbidity of the catastrophically injured
 - Superimposed inflation



Caveat

These are some personal views which may be incompletely thought through, possible irrelevant and not reflect appropriate professional practice. I reserve the right to change my mind. Similarly they may not reflect how I or my company would advise our clients based on current industry practice.



Risk free discount rates

Two philosophical approaches

- Emphasis on market consistency at a point in time
- Emphasis on liability stability across time

Regulated private insurers	Government injury schemes
I agree with the first approach	I support the second approach
Short term liabilities can be matched with Commonwealth government securities	Where long duration liabilities can not be matched
This approach ensures profit and solvency are immunised	Distortions in reported solvency distorts governance and management decision making



Risk free discount rates (cont)

Four questions to ask:

1. What best meets the needs of users of the financial reporting?
2. Are Commonwealth Government bonds a good proxy for risk free?
3. What about at longer durations where there is no observable securities?
4. What represents a risk free investment strategy?



Risk free discount rates (cont)

Q1: What best meets the needs of users of the financial reporting?

- 'Framework for the Preparation and Presentation of Financial Statements' states (paragraph 43):

"the overriding consideration is how best to satisfy the economic decision-making needs of users."

- I am strongly of the view that volatility in long tail liability assessments driven by volatility in long term economic assumptions does not best meet this consideration.
- Changes in risk free discount rates can confuse the debate about financial sustainability and appropriate response in designing and managing accident compensation schemes.



Risk free discount rates (cont)

- Example: NSW Workers Compensation Injury 2012

“The impact of using different economic assumptions and discount rates on actuarial valuations was highlighted by the Australian Lawyers Alliance, which quoted evidence given by Mr Richard Grellman to a 2001 NSW Legislative Council committee inquiry into the Workers Compensation Scheme:

“Depending on the assumptions and the various discount rates, you could come up with a report that would throw up a materially different result ... You will get different view from different actuaries.”

The Australian Lawyers Alliance and the Law Society of New South Wales stated that over the last two and a half years, the Scheme’s predicted deficit has changed by \$1.5 billion merely due to changes in the assumptions applied by PricewaterhouseCoopers. The Australian Lawyers Alliance noted that this amounted to 37.5 per cent of the current projected deficit, which it described as a ‘stroke of the pen’ increase in the alleged deficit.”



Risk free discount rates (cont)

- This is also a major issue for superannuation funds
- This is also a major issue for other government liability assessments
 - Eg NZ Treasury put out guidelines to ensure consistency of approach across spectrum of liability assessments
 - Eg HEC liabilities





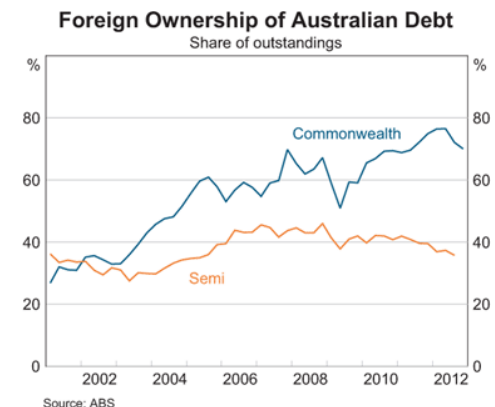
Risk free discount rates (cont)

Q2. Are Commonwealth government securities a good proxy for risk free?

- AASB1023 actually says: clause 6.1.2

*"Typically, government bond rates **may** be appropriate discount rates for the purpose of this standard, or they may be an appropriate starting point in determining such standards". (bold added by me)*

- 60-80% of Australian Commonwealth Government securities are foreign owned
- Should overseas risk issues influence how we value Australian liabilities backed by supposedly Australian risk free assets?





Risk free discount rates (cont)

- This is what wikipedia says on the topic (type in risk free interest rate):

*“The same consideration does not necessarily apply to a foreign holder of a government bond ,since a foreign holder also requires compensation for potential foreign exchange movements in addition to the compensation required by a domestic holder. Therefore it is normally the case that currency debasement is viewed as a form of default for foreign holders. Since the risk free rate should theoretically exclude any risk of default, **this implies that the yields on foreign owned government debt cannot be used as the basis for calculating the risk free rate.**” (bold added)*

- More fundamentally: why should risk free rates be influenced by supply and demand issues?



Risk free discount rates (cont)

- Wikipedia goes on to say:

“Unfortunately it has not been possible to locate a well detailed discussion on the basis of the various conventions for estimating the risk free rate through proxy rates, which appears to be a major 'hole' in the theoretical literature.”



Risk free discount rates (cont)

Q3. What about at longer durations where there are no observable securities?

- Typical industry approaches are either flat extrapolation or blend into a longer term rate
- Two ways (at least) of interpreting forward rates:
 - What are rates going to be in the future
 - What rates are available now broken down by term
- Mulquiney and Miller paper suggest blend into a longer duration “unconditional forward rate”. Some observations”
 - Derivation of unconditional forward rate relies on a risk premium? (P13).... And lots of other building blocks which are tricky to select
 - Assumes long term rates stable – are they?

Table 1 Components of the Unconditional Forward Rate for Australia in 2012

Component	Rate
Expected future short-term interest rate	
Expected future inflation	2.5%
Expected future real interest rate	2.0%
	4.5%
Term Premium	
Risk Premium	1.5%
Convexity adjustment	-0.2%
	1.3%
Unconditional forward rate	5.8%



Risk free discount rates (cont)

- An alternative approach might be to use the building blocks:
 - long term real GDP growth, plus
 - long term inflation rate (CPI)
- Say, 2.8% (RBA targets 2-3% range for inflation) + 2.7% (Real growth in GDP from Intergenerational report) = 5.5%
- Pragmatic regarding:
 - Range to transition from short term assumptions to long term assumptions
 - Whether its easier to extrapolate a flat yield curve and subtract the required gap or determine long term inflation assumption and add the require gap. What is important is the gap - which is assumed to be stable (assuming you are in the “stability” camp)



Risk free discount rates (cont)

Q4: What represents a risk free investment strategy?

Premiums + investment income = claims cost + expenses

- If a government scheme actually invested only in supposedly “risk free” assets there is a real opportunity cost
- Over longer term can expect lower investment income which requires higher premiums.
- Higher premiums is not necessarily a productive use of employers/premium payers capital – the alternative is they could have invested in their businesses.
- Investing entirely in Commonwealth Government securities would result in an increased risk that employers would end up paying higher premiums and reduce the efficiency of capital allocation in the economy.



Risk free discount rates (cont)

- A balanced investment strategy (based on historic experience) typically reverts towards expected long term average return relatively quickly over a multi-year investment horizon. Is it really that risky given the multi-year investment horizons of a typical injury scheme?
- In reality a scheme does not “reinvest” its entire asset base at each balance date just to match the yield curve. But not re-investing in Commonwealth Government bonds at each balance date creates an accounting mismatch between assets and liabilities!
- What is a replicating portfolio (ie matching by duration and currency)?
- Is the expected average investment return from a balanced investment strategy a better proxy for risk free for an injury scheme? – I am not convinced



Risk margins

- For private insurers the role of the risk margin seems self evident. To improve claimant protection against default by the insurer.
- However its ok for a government run accident scheme to run with a deficit. Some are perpetually in deficit. What is the role of a risk margin in this context?
- Does seem to be a preferable way to store capital as governments can be under pressure to reduce premiums as soon as schemes go into surplus.
- In practice, risk margins typically do not vary as a % from valuation to valuation
 - Therefore can have the effect of reinforcing economic cycle impacts
 - In GFC risk free discount rates reduced, which increased present value of net central estimate, which requires further capital to be consumed to increase the risk margin (as a \$ amount).
 - Is this good in a depressed economy?



Risk margins (cont)

Is it appropriate for a government underwritten accident compensation scheme to meet APRA regulatory standards?

- No. Capital required to meet APRA standards would be very high. It is not a productive use of the economy's capital for it to be tied up in a scheme's balance sheet as opposed to being productively employed in real businesses.

Why 75% probability of adequacy?

- Seems like a good idea. Not too high.
- My experience is that Scheme managers typically think 75% is consistent with APRA capital requirements.....It's only one small bit.
- Complying with all APRA requirements (and then having a reasonable buffer over the minimum) could be a multiple of the risk margins currently held
- Accident compensation schemes typically target a solvency ratio of between 100% - 120%. Seems reasonable to me. Not too high but not too low.



Risk margins (cont)

- Accident compensation schemes are rarely stable. Backwards looking statistical approaches less than helpful?
- Forward looking approaches also challenging but at least considering the future risks
- Example: Impact of the 2012 WorkCover NSW reforms
 - Increase uncertainty associated with reforms, but
 - A key driver of the reforms was to respond to emerging risks (the scheme had been deteriorating significantly and quickly!) and introduce a more stable scheme design – which would work to reduce risk
 - Should risk margins go up or down?
- Last year at the General Insurance Seminar Chris latham and Win-li Toh argued for a formulaic approach to setting risk margins
- I have a certain sympathy with this. We currently have a lot of witchcraft in arguing appropriate risk margins.



Mortality and morbidity for catastrophically injured

- A small number of claims can account for a substantial part of a scheme's liabilities.

- 1. Should we allow for **mortality improvement** for catastrophically injured?
 - General population has been seeing improved mortality over last 100 years. Life insurers allow to improve further (circa 6 yrs)
 - Literature for catastrophically injured appears to be sketchy at best.
 - One comment from an actuary who does make an allowance is: *"There is not a lot of literature around in relation to mortality improvements in the catastrophically injured but that which can be found tends to suggest no long term improvements for catastrophically injured."* This Scheme allows for half standard population improvement levels.



Mortality and morbidity for catastrophically injured

2. How does this compare with any **mortality impairment** assumed? I.e. catastrophically injured may not live as long as standard population.
3. Would any improvements in mortality also result in **improvements in quality of life/morbidity** which may reduce annual medical/care costs? Or would additional life expectancy be with poor(er) quality of life?
4. Will medical/care spend increase or decrease as people age? Is this a **superimposed inflation** allowance positive or negative?



Mortality and morbidity for catastrophically injured (cont)

- These four factors have different directional impacts on the insurance liabilities.
- Very little evidence to support any of them?
- Is it wrong to allow for one and not the others?
- Is this an issue better dealt with via the risk margin?
- Would it be possible to build a mortality / morbidity investigation specific to this cohort of claims to provide an evidence base?



Superimposed inflation

- I have reviewed several public liability/workers compensation portfolios over recent years which continue to have superimposed inflation assumptions of 3-5%pa plus.
- Sure there was SI for public liability throughout 1990's but seems to have been nipped by Tort law reforms in early 2000's. Little/none observed in last 10+ years.
- Is it realistic over the term of the outstanding claims liability (mean duration circa 3-4 years) to assume there will be?
- Is it realistic to assume a constant x% for ever?



Superimposed inflation (cont)

- It is generally accepted that medical costs in society are increasing at rates in excess of general inflation
- But at least a part of this is a result of:
 - Aging of the population (with health costs increasing as people age)
 - Advances in (expansive) medical treatments often associated with illnesses associated with aging (eg cancers) offset by improvements in productivity.
- Accident compensation schemes are only responsible for the originating injury (not illnesses associated with aging).
- Big part of scheme medical liabilities is associated with labour costs (eg ongoing attendant care for catastrophic injuries) not impacted by technology.



Superimposed inflation

- Some argue that originating injury may lead to higher medical costs as people age (eg dodgy knee wears out). Flip side is that as people age any compensable injury issues might get consumed into broader medical treatment associated with aging.
- I have seen no evidence in injury schemes that medical spend increases with age
- Some aspects of medical SI might be captured in a PPAC model via the projection of active claims **not** the assumed average payment size

Key point from all this:

- SI assumptions can materially change the liability. Its important the liability is a central estimate and not conservative! Spend a bit of time thinking about this assumption.



The end

- Thank you for your patience with my ramble!