

Review of Capital Requirements for Risk Business in Australia

New Zealand Society of Actuaries Conference 2008

**Risk Capital Taskforce
Paul Nuttall**



Purpose of this session

- Objectives of the Taskforce
- Overview of Current Australian Rules
- Proposed framework
- Simple examples
- Key Issues & Discussion



Risk Capital Taskforce

Terms of Reference

- Initiated by APRA (previously LIASB)
- Review the capital requirements for protection business (risk and annuities)
- Report to Institute of Actuaries Australia



Work initially Split into Two Parts

- Review the use of minimum termination values (MTV/CTV) – Insights Oct '07
- Review mortality and morbidity margins in LPS 2.04 & LPS 3.04



IFSA Task Force

- IFSA relying on Institute Task Force to review capital requirements
- IFSA Task Force reviewing types of capital used to back risk business
 - DAC cannot be covered by sub-debt
 - Equity main source of funding
 - Inconsistent with international practice



Current Australian Basis

Solvency Standards LPS 2.04

Capital Adequacy Standards LPS 3.04

- Prospective valuation
- Solvency - prescribed assumptions based on standard tables or best estimate
- Cap Ad - range (based on risk) applied to best estimate assumptions
- CTV Floor (DAC is inadmissible)



Starting Point

- Capital Adequacy margins designed to meet a 1 in 400 year event
 - over the next 12 months
 - at a statutory fund level
 - Solvency 1 in 200



Risk Margins

5 Step Framework

- 1) Identify material risks
- 2) Set individual risk confidence levels
- 3) Quantify individual risk margins
- 4) Consider the base to use
- 5) Consider extreme shock events



Step 1

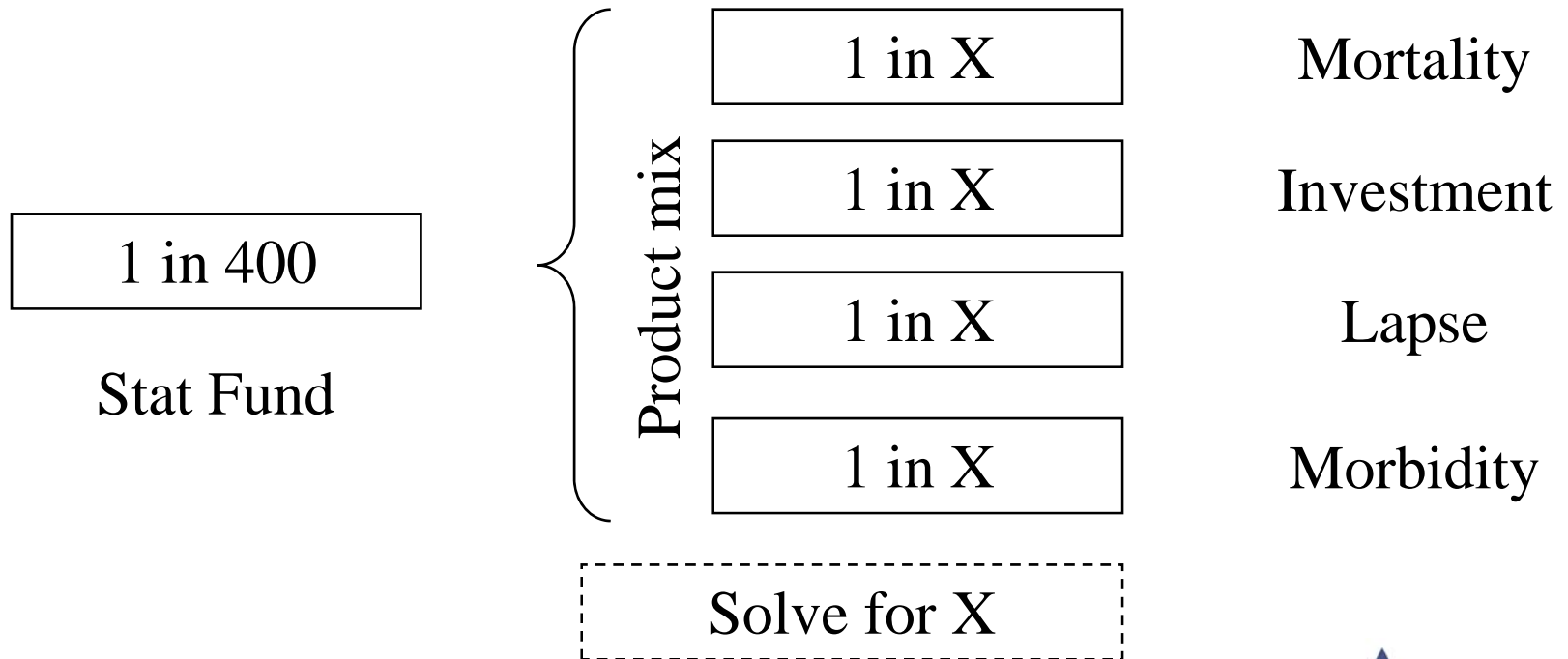
Identify Mortality & Morbidity Risks

- Estimation risk
- Statistical fluctuation (company specific)
- Trend risks (incl systemic risk)
- Concentration risk
- External shocks



Step 2 – Set individual risk confidence levels

Determine the required level of capital for each risk



Individual Capital Sufficiency for Different Product Mixes

	Death Only	Risk Only	Risk & Trad	Risk, Trad & Annuities
Solvency	3.3%	4.1%	4.7%	5.0%
Cap Ad	2.2%	2.9%	3.4%	3.7%

Recommendations for “X”

	Current Standards	Our View
Solvency	5%	5%
Cap Ad	1%	3%

Diversification: individual risks @ 3% level convert to 1:400 when combined.



Step 3 – Quantify Individual Risks

- Split into:
 - mis-estimation of the mean
 - trend uncertainty
 - statistical fluctuation
- Based on 3% (1 in 33.3) sufficiency (Cap Ad)



Step 3 – Risk Margin

	Trend Uncertainty (ongoing)	Mean Uncertainty (ongoing)	Statistical Fluctuation (1 year)	Minimum Risk Margin (ongoing)
Mortality – Term	Low (5%)	Low (5%)	15%+	15%+
Mortality – Group	Med (10%)	Med (15%)	15%+	25%+
TPD – Term	Med (15%)	Med (10%)	30%+	30%+
TPD – Group	High (20%)	Med (15%)	30%+	40%+
Trauma – Term	High (20%)	Med (10%)	25%+	35%+
DI	High (20%)	Med (15%)	30%+	40%+ (*)
GSC	High (25%)	High (20%)	25%+	45%+ (*)

(*) Open claims 25%

One year Statistical fluctuation is converted into an ongoing margin

Assumes 50% correlation



Solvency

- Solvency follows similar principles to Cap Ad
- No longer on prescribed assumptions
 - Except for companies without credible best estimate assumptions
- Solvency margins 85% of Cap Ad margins
 - Simple approach
 - Based on normal distribution



Step 4 - Base Assumptions

- Methodology based on applying margins to best estimate assumptions



Step 5 – Extreme Shock Events (Pandemic)

- Steps 1-4 exclude severe external shock
- International trend is to allow for Pandemics (Solvency II & UK Internal Capital Assessments)
- Impossible to predict
- Used Pandemic as a proxy
 - 1.7 per mille SI (Cap Ad)
 - 1.0 per mille SI (Solvency)
- Applied similar loading on Disability Income
- Capital based on greater of Lump sum and DI
- Only need to cover best estimate liability post pandemic



Step 5 – Extreme Shock Events (Surrenders)

- Current standards apply a minimum liability based on all policies in the Related Product Group (RPG) lapsing

The Taskforce reviewed this in detail considering:

- Independent lapses – is a 100% lapse event a plausible outcome assuming independent lapses?
- Mass lapse triggered by external shock – is it likely that an external event will result in all policies leaving?
- Distressed sale value was considered a more relevant test



Distressed Sale Value

- Distressed sale is theoretically correct

However:

- Practical difficulties in setting a distressed sale scenario
- In a forced sale who gets the DAC asset ?

Conclusion:

- Distressed sale too difficult
- 100% lapses but at a category not RPG level



Step 5 – Extreme Shock Events (Surrenders)

- 100% lapses
- Applied at a category level
- Lapse shock uses best estimate liability on open claims & IBNRs
- Allowance for tax relief is possible if realistic



Determination of Margins: An Example

Mortality margin for a medium sized insurer:

- Identify significant mortality risks
- Consider diversification
- Quantify margins identified



Determination of Margins: An Example

2. Consider diversification -

Stat Fund includes all types of risk cover, but no other products

	Death Only	Risk Only	Risk & Trad	Risk, Trad & Annuities
Solvency	3.3%	4.1%	4.7%	5.0%
Cap Ad	2.2%	2.9%	3.4%	3.7%

Current Standards	Our View
5%	5%
1%	3%



Determination of Margins: An Example

3. Quantify margins identified –

Mis-estimation of Mean

a) Company conducts it's own experience investigation using 3 years of data (150 claims)

b) Also uses information from reinsurers and industry studies to help set rates

-> 5% (base) + 5% (company specific)

Mortality – Term	Mean Uncertainty Low (5%)	Trend Uncertainty Low (5%)	Statistical Fluctuation 15%+	Minimum Risk Margin 15%+
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Determination of Margins: An Example

3. Quantify margins identified –

Trend Uncertainty

a) Subjective

b) Not necessarily size dependent, but size has implications for identification period

c) Company has recently increased u/w limits

-> 5% (base) + 5% (company specific)

	Mean Uncertainty	Trend Uncertainty	Statistical Fluctuation	Minimum Risk Margin
Mortality – Term	Low (5%)	Low (5%)	15%+	15%+



Determination of Margins: An Example

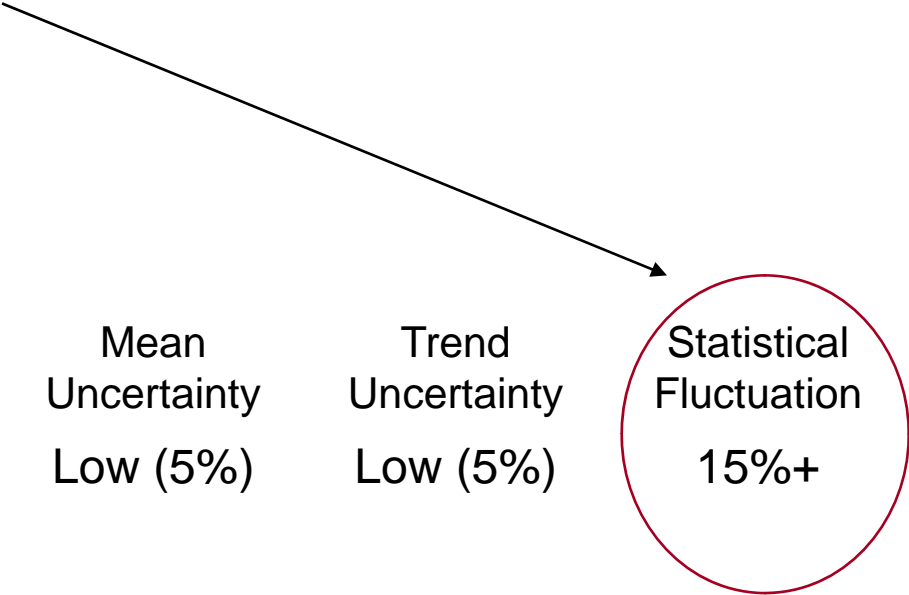
Quantify margins identified –

Statistical Fluctuation

a) 30,000 lives

b) Reinsure everything over \$250K (approx normal distribution)

-> 15% (base) + 15% (company specific)



	Mean Uncertainty	Trend Uncertainty	Statistical Fluctuation	Minimum Risk Margin
Mortality – Term	Low (5%)	Low (5%)	15%+	15%+



Determination of Margins: An Example

3. Quantify margins identified – Result

	Mean Uncertainty	Trend Uncertainty	Statistical Fluctuation	Minimum Risk Margin
Mortality – Term	Low (5%)	Low (5%)	15%+	15%+
Medium Life Insurer	10%	10%	30%	30%

A red oval highlights the 10%, 10%, and 30% values in the 'Medium Life Insurer' row, which are summed to reach the 30% Minimum Risk Margin.

One year Statistical fluctuation is converted into an ongoing margin



Cap Ad Margin Changes (large Insurer)

	Current	Proposed
YRT Term	YRT Term	
Death	20%	15%
TPD	25%	30%
CI	40%	35%
Average	23%	19%

	Current	Proposed
Group Life	Group Life	
Death	20%	25%
TPD	25%	40%
CI	25%	40%
Average	22%	30%

	Current	Proposed
Disability	DI & GSC	
DI	40%	40%
GSC	30%	45%
Disabled Life Res	25%	25%



Possible Impact – Large Complex Insurer

	Current Basis			Impact of Margin Changes		
	Capital on CTV	Capital on CAL	Current Capital	Change in CTV	Change in CAL	Impact on capital
Term	5	-51	5	-1	-2	-1
Group Risk	142	170	170	-19	4	4
Disability Income	85	4	85	-17	0	-17
Non Par Inv Acc & Trad	102	95	102	0	0	0
Participating	365	382	382	0	0	0
Non Participating	334	218	363	-37	2	-14
Participating	365	382	382	0	0	0
Total	700	600	745	-37	2	-14

Note: Numbers exclude resilience

	CTV	CAL	Pandemic	Total	Impact of Grouping	Total Change
Non Participating	297	220	180	297	-52	
Participating	365	382	306	382	0	
Total	662	602	486	679	-52	-66

Reduction mainly from grouping “CTV” products with
“CAL” products



Annuity mortality margins

- Longevity main risk due to guarantees - but no local data
- Piggyback off European work (CEIOPS under Solvency II)
 - Solvency Capital Requirement (SCR) - 25% decrease in best estimate mortality at all ages (1 in 200 tolerance)
 - covers risks of mis-estimation of mean, stochastic variation and trend risk
- Proposal:
 - Solvency: 25% decrease in mortality for all ages
 - Capital Adequacy: 30% decrease
 - Assumes only annuities in the stat fund (product diversification may justify a lower margin)



Likely Impact - Annuities

Age at valuation	Percentage of current Capital Adequacy requirement		
	Min	Mid	Max
Age 65	101%	97%	93%
Age 75	104%	99%	94%
Age 85	108%	102%	96%



Next Steps

- Finalise paper to LIWMPC – 30 Nov
- LIWMPC approve paper and send to APRA



Points for Discussion

- 100% lapse scenario
- Grouping at a category level
- Stress test & its application
- Solvency no longer prescribed basis
- Solvency margins 85% of Cap Ad margins
- Use of internal assumptions and models
- Overall framework



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Appendices



Relative Standard deviations

Product Mix within the Statutory Fund

	Term Only	Risk Only	Risk & Trad	Risk, Trad & Annuities
A. Mortality	100	100	100	100
B. Market	25	25	50	75
C. Morbidity	0	100	100	100
D. Business	50	60	70	80
Total	175	285	320	355

Correlation Table by Risk Type

Risk Type	A. Mortality	B. Market	C. Morbidity	D. Business
A. Mortality	1.0	0.0	0.3	0.2
B. Market	0.0	1.0	0.3	0.2
C. Morbidity	0.3	0.3	1.0	0.2
D. Business	0.2	0.2	0.2	1.0



Trend Risk

Product	Risk Category	Reasoning for Risk Category	Implied Margin
Term – mortality	Low		5%
Term – TPD	High	Economic cycle	15%
Term – Trauma	Very High	Medical advances	20%
Disability Income	Very High	Unemployment , behavioural changes. Long claim durations	20%
Group Business	Low to Very high	Workplace safety, moral hazard	Individual Margin + 5%



Statistical Fluctuation

- Simple stochastic model
- Probability of death modelled as binomial dist.
- 1,000 random results
- Various sum insured distributions used
- Various levels of reinsurance investigated
- Cap Ad results based on 97 percentile

