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# **An Update from the Risk Margins Taskforce**

## **A Framework for Assessing Risk Margins**



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# 16th General Insurance Seminar



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## Agenda

- First part – background and context
- Second part – draft paper ***A Framework for Assessing Risk Margins***



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## Background

- Taskforce set up in 2006
- Presented to the 2006 seminar on reserving for general insurers
- During 2007 taskforce explored *raison d'être* in the context of international developments
- Regained focus during 2008 with aim of preparing framework paper



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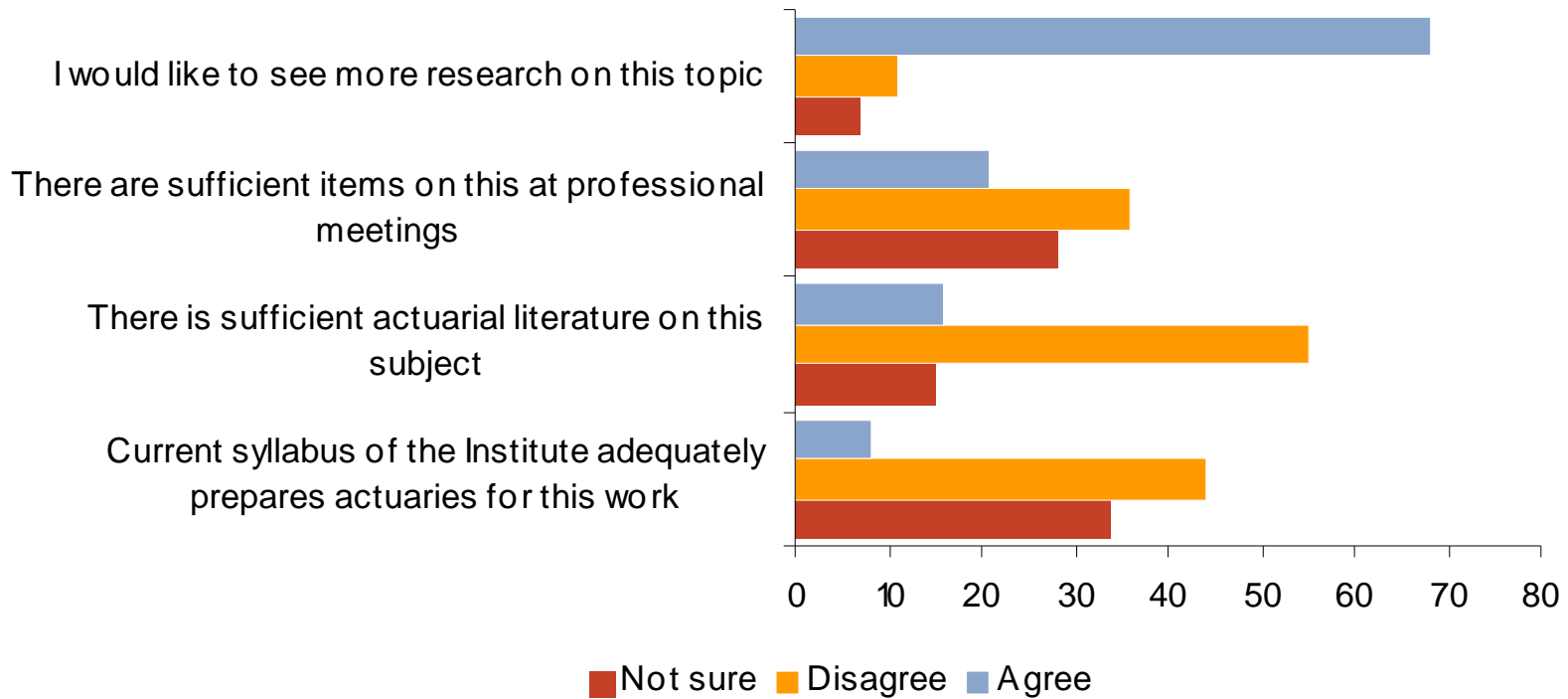


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## Opinions on risk margins

### Opinions about risk margins





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## **Role of taskforce**

- The role of the Risk Margins Taskforce was originally and can still be summarised as follows:

*To provide a framework, tools, information and support to GI actuaries to help them better understand and assess the uncertainties associated with estimating insurance liabilities with a view to selecting risk margins*



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## **Role of taskforce**

- Better equip actuaries to ask the right questions – a framework
- Provide tools to help answer these questions
- Not to provide the answers!
- Move profession away from relying on benchmarks
- Encourage consistency of approach and improved standards of documentation



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**[www.BrainyQuote.com](http://www.BrainyQuote.com)**

*“There are **known knowns**. These are things we know that we know. There are **known unknowns**. That is to say, there are things that we know we don't know. But there are also **unknown unknowns**. There are things we don't know we don't know.”*

- Donald Rumsfeld, 12 February 2002, US Department of Defense news briefing





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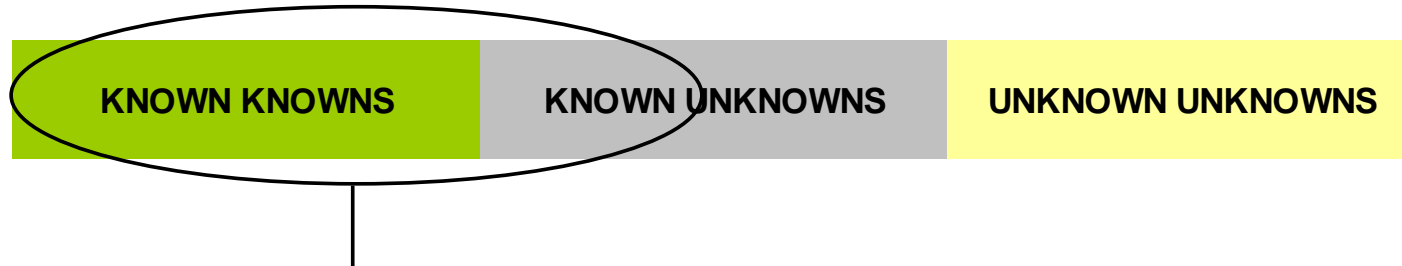
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## The past and current



**Quantitative analysis of past volatility** - captures past sources of volatility  
- does not capture all potential future sources of volatility

**Reliance on external benchmarks** - captures past sources of volatility  
- influenced by the nature of original portfolios analysed  
- does not capture all potential sources of volatility  
- does not capture characteristics of specific valuation portfolios

**Qualitative adjustments to quantitative analysis and/or external benchmarks**  
- not always done in a robust manner  
- often do not explicitly consider reasons adjustments are required

**Little consistency in approaches adopted across profession**

**Consistency between central estimate and risk margin often ignored**



# The future?



Framework implemented to ensure that all potential sources of future uncertainty are captured

Combination of quantitative and qualitative analysis

Benchmarks used to complement rather than replace individual portfolio assessment

More consistency in approach adopted across profession

Analysis of uncertainty and risk margins conducted in the context of the central estimate approach



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## **Taskforce paper**

- *A Framework for Assessing Risk Margins*
- Draws significantly from concepts presented in paper by O'Dowd, Smith and Hardy, presented to 2005 seminar, entitled *A Framework for Assessing Uncertainty in Insurance Claims Cost*
- Strong endorsement of that paper



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## **Taskforce paper**

- Focus on framework for APRA risk margins
- Principles equally valid for high probabilities of adequacy
- Not a paper on stochastic reserving
- Framework designed to integrate central estimate analysis with risk margin analysis
- Moving away from *bolt on* approach that is largely independent of central estimate analysis



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## **Taskforce paper**

- Paper in draft form for now:
  - To give actuaries an opportunity to provide feedback
  - Final paper will incorporate an appendix that will summarise quantitative modelling techniques and recommended reading on these techniques
    - Mack method
    - Bootstrapping
    - Stochastic Chain Ladder
    - Generalised Linear Modelling approaches
    - Bayesian techniques



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## **Taskforce paper**

- Paper will be completed before the end of the year
- Horizons sessions proposed to engage wider audience and allow further feedback
- Comments should be addressed to:  
[karl.marshall@quantium.com.au](mailto:karl.marshall@quantium.com.au)



# Summary of framework

Step	Framework component	Description	Section of paper
1	Portfolio preparation	Determine valuation portfolios, claim groups and techniques to deploy for each claim group	Section 2.3
2	Independent risk analysis	Conduct quantitative analysis, conduct benchmarking where appropriate, conduct retrospective analysis for stable periods	Sections 2.4 and 3
3	Internal systemic risk analysis	Apply balanced scorecard approach to objectively score central estimate valuation methodologies. Conduct analysis to determine appropriate CoVs to map to scores.	Sections 2.5 and 4
4	External systemic risk analysis	Identify, categorise and quantify potential future external sources of systemic risk	Sections 2.5 and 4
5	Analysis of correlation effects	Select correlation coefficients between valuation classes and between outstanding claim and premium liabilities for internal systemic risk and for each external systemic risk category.	Sections 2.5
6	Consolidation of analysis	Consolidate CoVs and correlation coefficients. Independence assumed between three sources of uncertainty.	Section 2.6
7	Additional analysis	Conduct sensitivity testing, scenario testing, internal and external benchmarking and hindsight analysis.	Section 2.7
8	Documentation	Document the analysis and judgement relating to each step of the framework	Section 2.8
9	Review	Conduct annual reviews of key assumptions in the context of emerging experience. Full deployment of the framework at least every three years, including active interactions with business unit management.	Section 2.8



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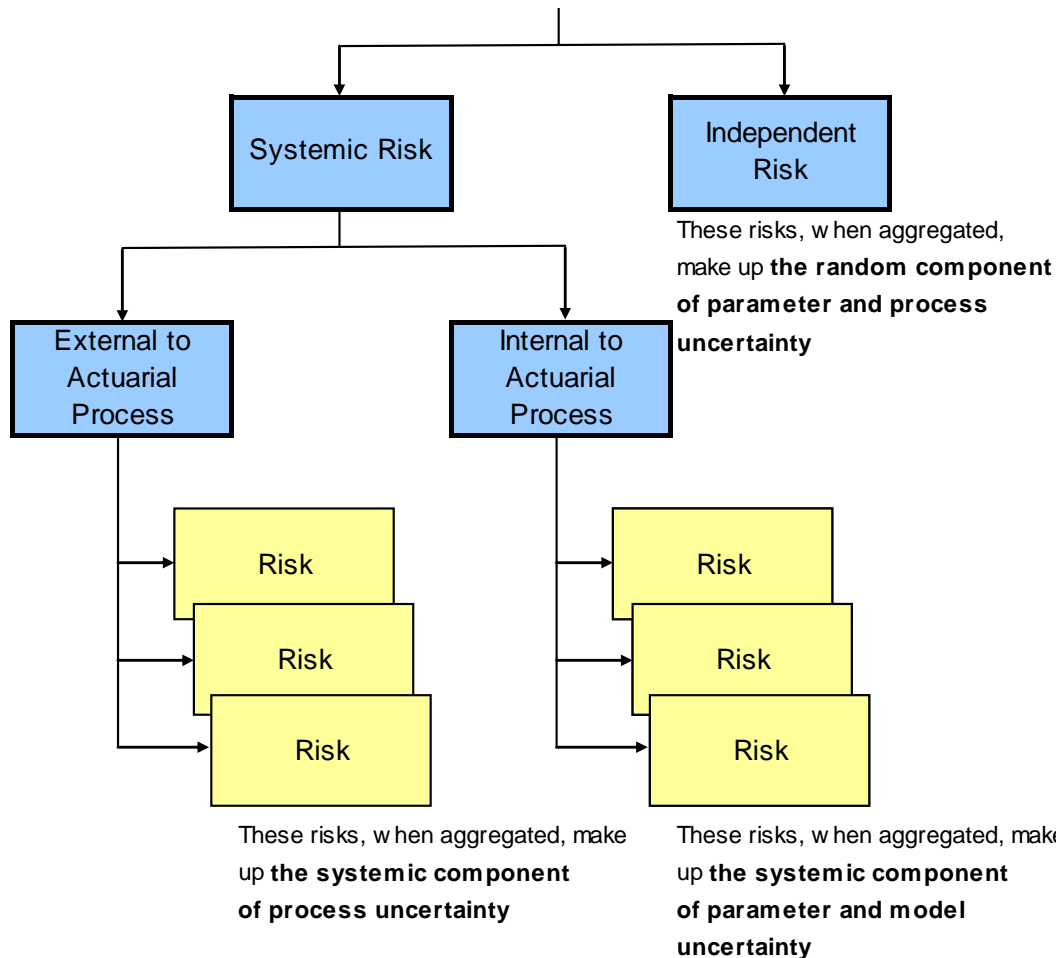
## Sources of uncertainty

- Framework designed to examine and quantify three sources of uncertainty:
  - **Independent risk**
  - **Internal systemic risk**
  - **External systemic risk**





# Sources of uncertainty



**Systemic Risk** is defined as risks which are potentially common or shared across Claim Groups or Valuation Classes

To ensure adequate identification of causes of risk, Systemic Risk is separated into risks **external** to the actuarial process (**external systemic risk**) and risks **internal** to the actuarial process (**internal systemic risk**)



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## **Portfolio preparation**

- Separate portfolio into valuation classes and, within these, homogeneous claim groups
- Align with central estimate valuation classes as far as practically reasonable
- Consider all framework components for all valuation classes and claim groups
- May not be able to apply all aspects of framework for all classes/claim groups



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## **Independent risk assessment**

- Independent risk represents risks relating to randomness in insurance process. Includes:
  - Random component of **parameter risk**
  - Random component of **process risk**
- Although some approaches allow these two components to be separately assessed, not particularly enlightening to do so



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## Independent risk assessment

- Standard quantitative modelling techniques analyse past random effects and past systemic episodes
- Well fitted models will *fit away* all or most past systemic episodes, the residual largely being random effects (independent risk)
- Some techniques have more flexibility than others
- Supplement analysis with benchmarking



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# Internal systemic risk assessment

- Risk associated with valuation infrastructure being an imperfect representation of insurance process. Incorporates:
  - **specification error**
  - **parameter selection error**
  - **data error**



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# Internal systemic risk assessment

- Typically not captured using traditional quantitative techniques
- Qualitative approach to quantification proposed
- Objective assessment important
- Balanced scorecard approach
  - qualitative assessment of infrastructure
  - score of 1 to 5 for each risk indicator
  - convert score to quantitative measure on uncertainty



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# External systemic risk assessment

- Even if valuation infrastructure is an appropriate representation of current reality future systemic trends result in uncertainty
- Cannot be captured using traditional quantitative techniques that focus on past volatility
- Quantitative/qualitative assessment required
- Systemic risks allocated to specific risk categories



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# External systemic risk assessment

- Risk categories may include:
  - economic and social risks
  - legislative, political and claims inflation risks
  - claim management process risks
  - expense risk
  - event risk
  - latent claim risk
  - recovery risk





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## **Allowance for correlation effects**

- Independent risk, internal systemic risk and external systemic risk assumed to be uncorrelated
- External systemic risk categories assumed to be uncorrelated
- Correlation assumptions required for:
  - individual risks within external systemic risk categories
  - systemic risk categories between valuation classes



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## **Allowance for correlation effects**

- Quantitative approaches do not capture future internal and external systemic risks
- Robust qualitative approach proposed
- Correlation assessment focused on individual risks within risk categories
- 2005 PwC paper discussed a good approach to conceptualising and assessing correlation effects



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## Consolidation of analysis

- Co-efficients of variation and correlation co-efficients derived in previous steps
- Normal or LogNormal distributions reasonable, depending on circumstances
- Simple linear correlation dependancy structure to implement correlations
- Implementation simplified by assumptions of independence between sources of uncertainty and risk categories



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## **Additional analysis**

- Sensitivity testing
- Scenario testing
- Internal benchmarking
- External benchmarking
- Hindsight analysis
  - Past actual insurance liabilities
  - Mechanically assessed past insurance liabilities



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## Documentation

- APRA have indicated that they would like to see improved documentation on risk margins
- Framework lends itself to more complete and robust documentation, aligned to each component
- Documentation also an important part of communication with management



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## Review

- Would not expect framework to be deployed in its entirety for every valuation
- Full review, including all of the components, every three years
- At more regular intervals, key assumptions can be reviewed in context of:
  - emerging trends
  - new sources of systemic risk
  - improvements to valuation methodology
  - new portfolios