



**Accounting related activities of the  
International Actuarial Association  
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# Agenda

- *Measurement of Liabilities: Current Estimates and Risk Margins*
- Other activities



## IAA paper background

- Originally requested by the International Association of Insurance Supervisors (IAIS)
  - Scope not restricted to regulatory reporting
- The IAA ad hoc Risk Margin Working Group (RMWG) was the author
- Published in April 2009
- Provides results of research and discussion related to the measurement of liabilities of insurance contracts for regulatory and general purpose accounting



# RMWG paper – key sections

- 3 Introduction to measurement
- 4 Current estimates
- 5 Discounting cash flows
- 6 Risk margin measurement methods
- 7 Risk mitigation techniques
- 8 Other issues

## Appendices

- B Current estimate assumptions
- C Statistical background, product assumptions and risk distributions
- D Life insurance and annuity risk margin examples
- E Diversification
- F Research recommendations



# Measurement

- Conceptually the measurement of a financial item can be based on
  - A price (e.g., marked-to-market)
  - A model (e.g., marked-to-model) or
  - A combination of a price and a model
- Insurance contracts are measured by a model or a combination
- Explores measurement in terms of the IASB three building blocks
  1. An current estimate of expected cash flows
  2. The effect of the time value of money
  3. A margin over current estimates – “an explicit and unbiased estimate of the margin that market participants require for bearing risk (a risk margin) and for providing other services, if any (a service margin)”
- Identifies three types of current measurement objectives
  - Exit (transfer), settlement, and fulfillment
  - No position taken
- Discusses effects on measurement of risk mitigation techniques



# Expected cash flows

- Important because a large percentage of the liability of most insurance contracts consists of expected value of future cash flows of the net contractual obligations
  - “net” refers to after reflection of expected premiums
- Derived from a model reflecting all relevant expected cash flows in an unbiased manner as of the report date
  - Prospective in nature
- Consistent with the scope of and context within which the estimation is made



# Expected cash flows

- Generally, priority given to those derived from a relevant market
  - Assuming that reliable prices from a market are more objective and reliable than model inputs
- Characteristics
  - Explicitly determined
  - Current estimates, not necessarily current conditions
  - Portfolio unit of account
  - Internally consistent
  - Reflects expected asymmetry of expected costs
    - Including options and guarantees
  - Not necessarily based on stochastic methods
- Examples of issues
  - Expenses, e.g., incremental/variable, one-time or market clearing
  - Trends and calamity, such as mortality improvements, pandemics, asbestosis
  - Relevance of sources, such as outsourcing and reinsurance



# Discount rates

- The purpose of discount rates is to reflect the time value of money
  - Is time value consistent in all cases ?
- Alternative choices include
  - Current market-based rates
    - Risk (default) free interest rates
    - Other bases
  - Reflection of liquidity features
  - Based on expected investment earnings on linked assets or the intended method of managing financial risks





# Discount rate issues

- Risk-free discount rates – possibly based on
  - Government bond rates
  - Government bond rates plus adjustment
  - Corporate bond rates minus adjustment
  - Swap rates minus adjustment
  - Swap rates
- Liquidity
  - More commonly applied to assets
  - Many insurers assume they can achieve a yield greater than risk-free investment returns
- Expected yield rate
  - Linked and related approaches based on management's investment policy



# Objectives of risk margins

Can depend on accounting objective

- Market-based approach
  - Price of bearing risk
- Fulfilment-based approach
  - Cost of bearing risk
  - Alternatively, a reward or compensation for bearing risk
- Insurance supervisory / policyholder view
  - Confidence level



# Objectives of risk margins

## Relation between the perspectives

- Very much related to each other
- All arise from the uncertainty associated with the present value of the expected cash flows
- All consider nature of characteristics of the obligations of the portfolio
- Any transferee would have to settle the obligations, as the transferor would remain obligated to fulfil the promises involved
- Assumes that market, insurer and policyholder risk tolerance/view are not quantitatively different
- Differences may arise if the regulatory selected security level differs from the market participants' requirements for a price for accepting risk



# Possible criteria for risk margins

IAA, IAIS and IASB have indicated the following are possible criteria that may be used to assess risk margins:

- The less that is known about the current estimate and its trend, the higher the risk margins
- Risks with low frequency and high severity will have higher risk margins than those with high frequency and low severity
- For similar risks, contracts or claims over a longer timeframe will have higher risk margins than those of shorter duration
- Risks with a wide probability distribution will have higher risk margins than those risks with a narrower distribution
- To the extent that emerging experience reduces uncertainty, risk margins will decrease, and vice versa



# Possible criteria for risk margins

## Other possible criteria:

- Apply a consistent methodology for the entire lifetime of the contract
- Use assumptions consistent with those used in the determination of the corresponding current estimates
- Be determined in a manner consistent with sound insurance pricing practices
- Vary by product (class of business) based on risk differences between the products
- Be easy to calculate, especially given short time for financial reporting close
- Be consistently determined between reporting periods for each entity, that is, the risk margin varies from period to period only to the extent that there are real changes in risk
- Be consistently determined between entities, that is, two entities with similar business should produce similar risk margins using the methodology
- Facilitate disclosure of information useful to stakeholders
- Provide information that is useful to users of financial statements
- Reflect effect of risk mitigation techniques
- Be consistent with relevant accounting standard objectives



# Possible risk margin approaches

- Quantile methods
  - Percentile / confidence levels, CTE, TailVaR
  - Multiple of the second and higher moments of the risk distribution
- Cost of capital methods
- Explicit assumptions (related to specific risk factors)
- Discount rate related
  - Risk adjusted discount rates
  - Deflators
- Implicit
- Other possibilities not discussed in paper
  - Utility, hazard transforms



# Statistical concepts

- The normal distribution is rarely applicable to insurance situations, as there are never enough risks and the risks are correlated
- Most insurance risks have a high probability of having no claim or policy obligation during a reporting period, resulting in skewed distributions
- Combining many policies in a pool or portfolio often reduces but does not eliminate skewness
  - For some types of coverage, e.g., coverage of natural catastrophes, combining policies may not reduce skewness, as such loss events either do not occur or arise under many policies simultaneously
- The time it takes to settle a claim or a policy obligation can affect the size of the risk margin
  - The risk distribution and the settlement times can be related, as obligations that take longer to settle often have greater skewness and larger coefficients of variation



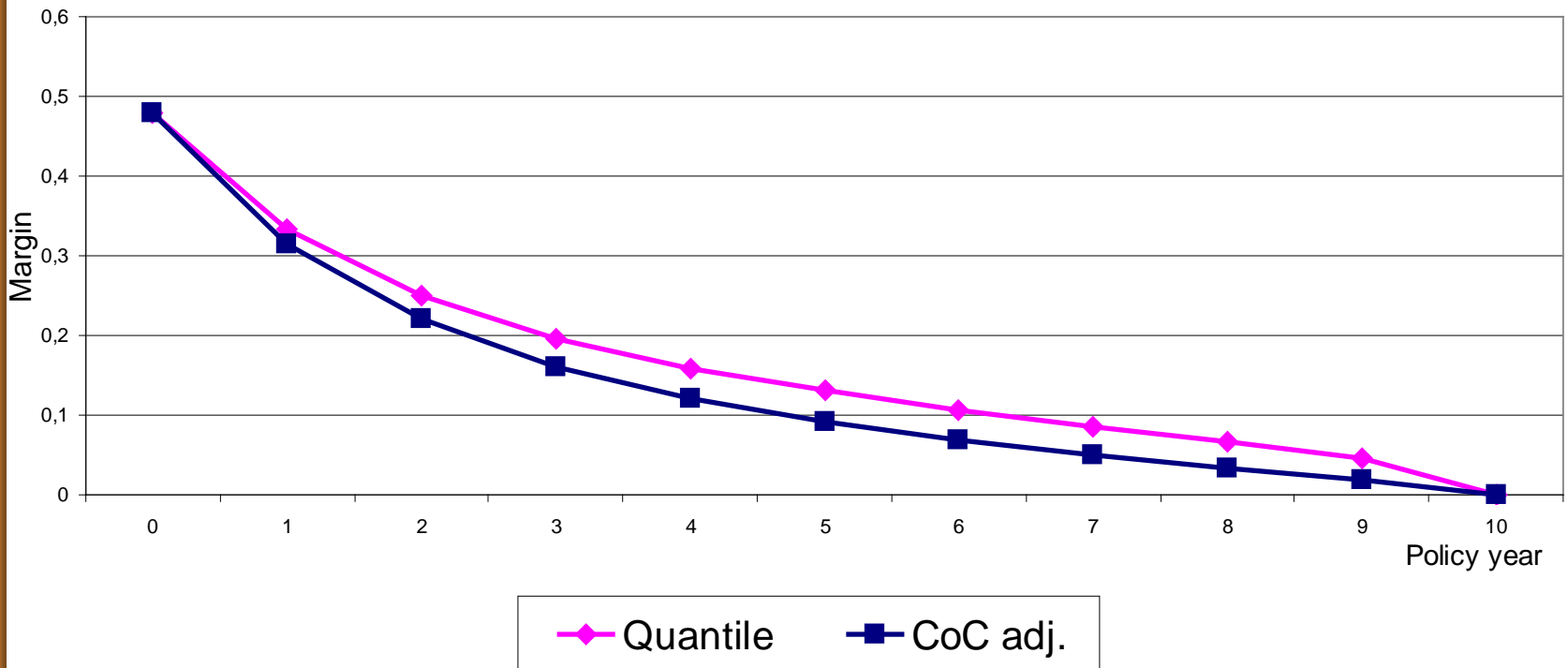
# Comparison of methods – example

Risk margin approach	Product A Simple life	Product B Motor	Product C Risky liability	Product D Cat cover
<b>Confidence level</b>				
65%	1.1%	4.4%	7.1%	-16.0%
75%	2.0	8.5	15.7	15.1
90%	3.9	17.6	35.7	123.2
40% CTE	1.9	8.4	16.2	51.7
<b>Cost of Capital</b> (99.5%VaR*)	4.1	4.5	36.8	94.7
<b>Implicit</b> (0% discount)	44.6	7.7	23.4	7.7
<b>Discount</b> 2% discount rate (4% risk free - 2% risk adjust)	19.0	3.7	10.7	3.7
*Initial capital % of current estimate	8.3	39.1	86.8	816.3



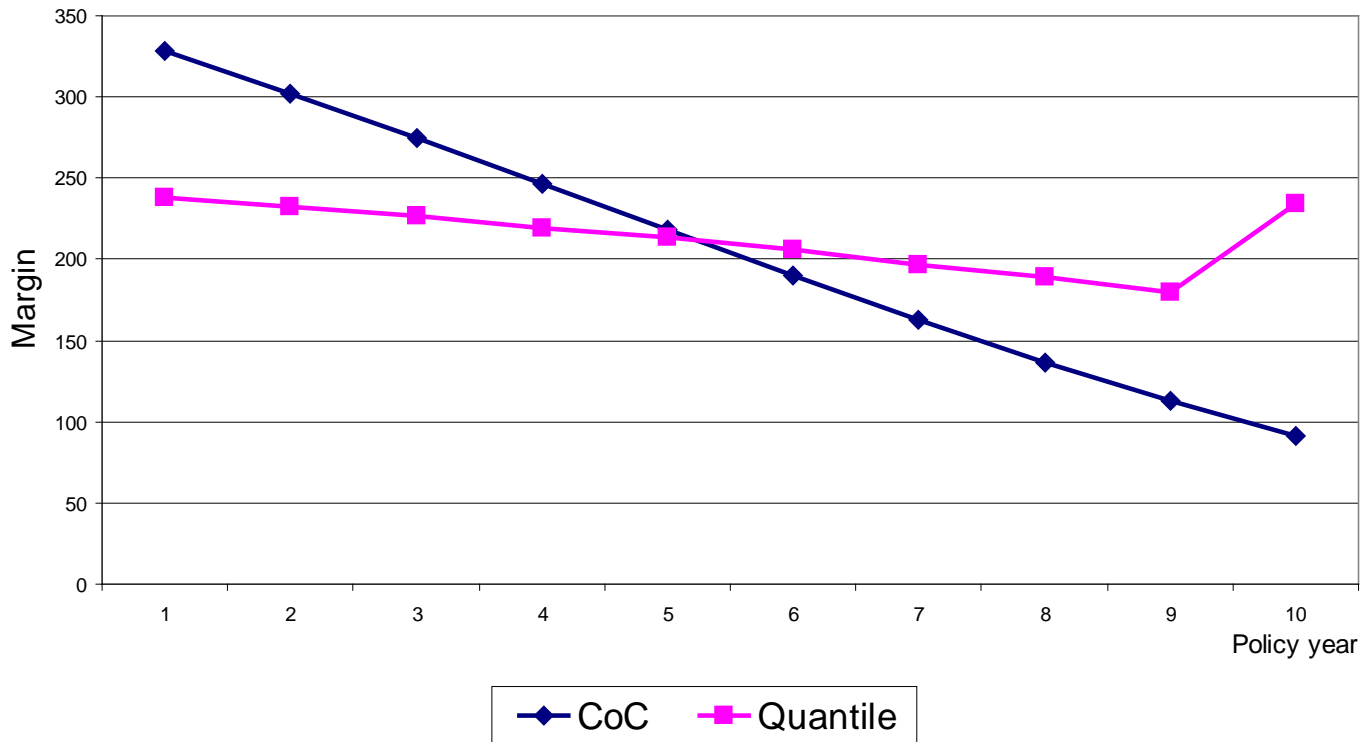
# Example - Term insurance

## Risk margins



# Example - Term insurance

Release of risk margin





# Comparability of liability values

- Historically, risk measurement was performed on an individual entity or group basis, assuming size and business mix diversification mattered
  - Such a liability would not be comparable between entities
- The IAIS has proposed that “similar obligations with similar risk profiles should result in similar liabilities”, even when the obligations are in different entities
- To achieve this objective using risk distributions, e.g., the quantile or cost of capital methods, the individual entity may not be able to serve as the sole basis of measurement of risk margins
  - One way to achieve this is to measure the risk margin by considering how it would be valued by a potential standardized entity, notionally representing a transferor -- the ‘reference entity/portfolio’ concept



# Practical Issues

- Quantile methods
  - Selection of level of confidence
  - Determination of what variables vary by how much
    - Degree of skewness of risk has a large impact
- Cost of capital
  - Economic capital estimates
    - As described in “A Global Framework for Insurer’s Solvency Assessment” (IAA)
  - Cost of capital rate
    - Through judgment, historical returns, market value analysis
    - Examples: a high level of confidence (99.5%) & 6% cost, 99.95% VaR & 4% cost, 99% CTE, constant capital ratio
- Application by less sophisticated professionals, insurers, markets
- Quantification of risks, interrelation and calibration

# Qualitative Comparison\*

Desirable Characteristic	Cost of capital	Quantile methods		Discount	Explicit assumptions
		CTE & std dev***	Confidence level		
Complies with five IAIS desirable characteristics	1	2	2	3	4**
Consistency across classes of business	1	2***	3	3	4**
Ease of calculation	4	3	3+	2	1**
Disclosure	1	1	1	1	1
Market-consistent - in theory	1	2	3	4	4**
Market-consistent - in practice	unknown	unknown	unknown	unknown	unknown

\*From IAA Risk Margins paper, expressing view of author team. Ranks shown are on a stand-alone basis.

\*\*As an approximation, explicit assumption ranking would be close to the target method.

\*\*\*Standard deviation method is more often used in pricing than confidence levels.

+Among quantile methods, confidence level risk margins might be easier to determine than CTE or standard deviation risk margins.



# Risk mitigation techniques

- Pooling
- Diversification
- Offsetting risks
- Reinsurance
- Contractual features related to assets
- Contract adaptability
  - Including dividends/bonuses and other non-guaranteed features



# Pooling and diversification

- Generally, pooling of similar risks in portfolios or diversification by combining portfolios that are sufficiently uncorrelated reduces risk
  - Could result in a lower coefficient of variation and skewness of the risk distribution
- The degree of pooling and diversification to be reflected for specific financial reporting systems has not yet been determined. Risk margins might be based on:
  - The entity's own size, separately by line of business (no inter-portfolio diversification),
  - An entity's own size and diversification by line, the entity group pool size and diversification, the average pooling and diversification achieved or expected to be achieved by the insurers in the local industry of the entity or where the group is active, or
  - By the potential designated and preferred acquirer of portfolio locally or globally



# Other issues

- Non-performance risk or credit characteristics of liabilities
  - Remains controversial
  - If required, how to measure it
  - As it is related to the obligation, would be expected to be reflected in cash flows, except possibly in heavily savings oriented contracts
- Profit (residual) versus risk margin
- Subsequent measurement, i.e., how should profits be recognized
- Governance
  - Process
  - Disclosure





# Other IAA Activities

- *Stochastic Modeling* book
  - To provide practical guidance for stochastic modeling
  - Includes particular applications to financial reporting and capital assessment
  - Scheduled completion this fall
- IAIS Issues Paper on *the Roles and Relationships between the Actuary and the External Auditor in the Preparation and Audit of Financial Reports*
  - Worked with the IAIS, with input from the IAASB staff