The Role of the Actuary in the Prudential Supervision of Insurance Companies-Life Perspective

An IAA Paper

Won How Lo, Taiwan - Session 93

Insurance Regulation Committee
Terms of Reference

- To liaise with the International Association of Insurance Supervisors (IAIS) on issues relating to the regulation and supervision of insurance companies.
- To liaise with other interested bodies at the international level, on issues relating to the regulation and supervision of insurance companies.
- To assist the IAIS and the World Bank in the development of international guidelines or standards relating to matters such as technical reserves, capital adequacy requirements, valuation of assets and liabilities, financial condition reporting, the role of the actuary, actuarial opinions and actuarial qualification standards.
- To outline international frameworks for actuarial standards of practice in relation to the role of actuaries in insurance companies with regard to regulatory requirements.
- To develop outline protocols regarding the respective responsibilities of actuaries and auditors in relation to financial statements prepared for supervisory purposes.
- To liaise with the Insurance Accounting Standards Committee of the IAA in relation to the interface between accounting standards and supervisory requirements for insurance companies.
- To promote the role of actuaries in the regulation and supervision of insurance companies in order to ensure that the public interest is served.

The IAA and the IAIS

- The IAA is an Observer Member of the IAIS
- The IAIS is an Institutional Member of the IAA
- Proposed addition to terms of reference:
- **The Chair of the Committee will act as the Representative Observer Member to the IAIS on behalf of the IAA. This role will include attending such IAIS meetings as are appropriate, promoting the IAA within the IAIS and liaising with other Observer Members to further the interests of the IAA and the actuarial profession. The Representative Member will also encourage proactively other senior members of the IAA to attend or listen to IAIS and Observer meetings and conference calls as relevant topics emerge. This responsibility will include the circulation of papers and the dissemination of information on developing issues to interested actuaries.**

Introduction

- Purpose – to set out IAA's position on the role that actuaries should fulfill in prudential supervision of insurers
- Basis of an ongoing dialogue with IAIS
- Prudential supervision and the role of actuaries are both evolving

Importance of Prudential Supervision

- IAA committed to effective supervision
- Supports the IAIS in raising standards of solvency management
- IAA promotes the highest standards of actuarial practice in insurance finances
- IAA promotes common standards based on best practice internationally for:
  - Examining technical competence
  - Professional conduct
  - Disciplinary procedures

Framework for Solvency and Capital Adequacy

- Realistic provision which meets existing liabilities based on the expected value of future experience – plus
- An additional capital sum based on the risks in the insurer's business and the business's immediate capital investment plans intended to meet a confidence level of capital adequacy at least as high as a particular defined level

Framework Comments

- Prudent management depends on the broadest application of risk management techniques including dynamic financial models to enable management to avoid or mitigate adverse outcomes.
- Regulators are coming to see these as the most comprehensive form of solvency management.
- The actuarial profession endorses this development and is well placed to provide professional opinions on this work.
- The actuarial profession also has the experience to support qualitative analysis, "fit and proper" standards, and strong corporate governance.

Involvement of Actuaries

- Regulators may rely on formulaic approach
  - Simplest approach
  - Actuaries helpful but not essential
- Increasing complexity of markets and products makes formulaic approach unreliable making it necessary to utilize on site professional practitioners
  - Actuaries are most appropriate by training and experience
  - Actuaries are members of a professional body
- IAA supports the "appointed" actuary approach

Actuarial Profession

- Standards of training and conduct
- Monitored by professional colleagues and subject to disciplinary procedures
- Codes of professional conduct set priorities by which actuaries abide despite commercial pressure
- Standards set nationally and coordinated across national borders

Range of Actuarial Supervision

- Pricing and Product Design
- Establishing policy and claim liabilities and determining capital requirements
- Monitoring market conduct and policyholders' expectations; and
- Direct responsibility to the regulators under "Appointed Actuary" approach

Pricing and Product Design

- Board of directors responsible with advice from actuary on soundness to cover:
  - Policy obligations
  - Capital required
  - Policy options including the cost of hedging
  - Front and back office operations

Policy and Claim Liabilities and Capital Requirements

- Funding Adequacy
- Earnings Capacity
- Strategic Capital Adequacy
- Dynamic Solvency Testing

Funding Adequacy

- Actuary should ensure that total assets plus future revenues shall be sufficient to cover:
  - Expected value of obligations for existing business with appropriate margins for risk
  - Capital requirements
  - Risk absorption and hedging
  - Administrative costs
  - Funding of sales activities

Earnings Capacity

- Actuary should ensure the present value of expected future free cash flows (existing and new business) should not be negative under a reasonably probable future scenario to ensure that there is:
  - Appropriate incidence of distributable profits
  - Transferability of policy liabilities
  - Advance warning of adverse developments

Strategic Capital Adequacy

- Actuary should ensure total free surplus plus free asset revenues should be sufficient to finance future expected new business costs and associated additional solvency requirements according to the organization's approved medium term business plan. The involvement of actuaries in general business planning provides a proper balance of shareholder and policyholder interests from the outset.

Dynamic Solvency Testing

- Actuary should ensure capital should be sufficient under demanding but not unrealistic scenarios either to:
  - Supplement available funds to cover the cost of policy obligations and operations; or
  - Transfer the liabilities to another carrier.

Monitoring Market Conduct and Policyholders' Expectations

- Actuaries advice to directors should ensure that:
  - Promises made are being honored
  - There is equitable distribution of policyholder dividends/bonuses
  - Unit pricing for unit linked policies is accurate and fair
  - Discretionary alterations of policies do not involve excessive cost to policyholder
  - Illustrations to prospective policyholders are not misleading or overly optimistic

Direct Responsibility to Regulators

- Appointed actuary must have right to present concerns to board of directors
- If the board does not respond to advice, the actuary has right and responsibility to inform regulatory authorities as a last resort
- Appointed actuary should have legal protection from action by management

Summary

- The ability of regulatory authorities to protect policyholders, by maintaining solvency and by ensuring that their reasonable expectations are met, is greatly enhanced by the extensive involvement of actuaries in insurers' operations. IAA believes that the appointment of an actuary to to take professional responsibility for the monitoring of key areas of the insurers' operations provides comfort to both regulators and policyholders that regulations are being correctly applied and policyholders and claimants are protected.

IAA Solvency Project
Report of Working Party

Harry Panjer, Canada – Session 54

Stuart Wason, Canada - Session 93

Working Party Members

- Allan Brender (Canada)
- Henk van Broekhoven (Netherlands) – Vice-chairperson
- Jan Dhaene (Belgium)
- Marc Goovaerts (Belgium)
- Teus Mourik (Netherlands)
- Glenn Meyers (U.S.)
- Harry Panjer (Canada)
- Dave Sandberg (U.S.)
- Harvey Sherman (U.S.)
- Simon van Vuure (Netherlands)
- Stuart Wason (Canada) - Chairperson
- Hans Waszink (Netherlands)

Strategy of the Working Party

- **Main themes to be considered by WP**
  - ✓ Identify the types of risk to which insurers are subject
  - ✓ Identify the approaches used to model, and the data resulting from such modelling, of each of the types of risk
  - ✓ Identify the approaches used to model, and the data resulting from such modelling, to determine the interaction/correlation between risks
- **WP review of modelling approaches to focus on,**
  - ✓ Techniques for analyzing the tail of the distribution
  - ✓ Time horizon to be used in the modelling
  - ✓ Techniques for determining the “catastrophic” portion of the distribution
  - ✓ Practical guidance on modelling the interaction between risks
  - ✓ Identify the implications for regulatory capital measurement

Executive Summary

- Assessing risk in an insurance company is an extremely complex topic. The actuary is in a unique position to provide advice to the insurer as well as the regulator.
- There is currently no single internationally agreed upon scheme for classifying insurer risks. This report suggests a scheme.
- WP believes the “three pillar” approach to banking supervision (i.e., minimum capital requirements, a supervisory review process, measures to foster market discipline) is also useful approach for supervision of insurers.

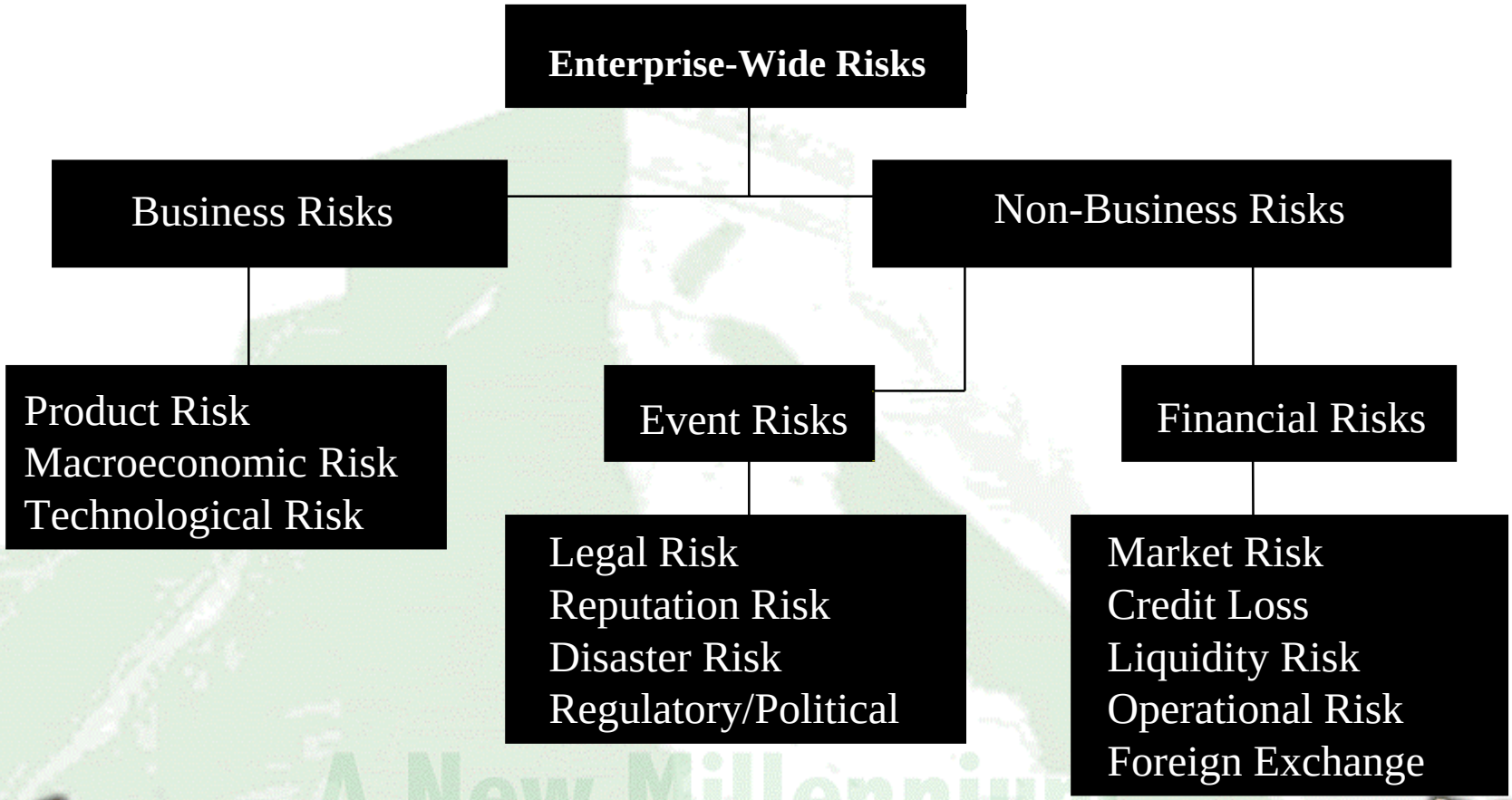
Executive Summary

- Report provides an overview of some aspects of the risk assessment process that can be used by actuaries to model and manage the risks of insurers.
  - ✓ Actuaries use a variety of powerful tools to model risk
  - ✓ Actuaries pay special attention to the key components of risk for each peril, notably their volatility risk, uncertainty risk and extreme event risk.
  - ✓ A longer time horizon than that commonly used for the banks, is needed to assess potentially serious threats to the insurer's solvency.
  - ✓ An assessment of insurer risks must recognize the variety of techniques used to manage those risks.
  - ✓ There can be significant difference between gross effect of insurer's risks and the combined net effect of all its risks.
  - ✓ The use of internal models within the first pillar may therefore be more important for the solvency assessment of insurers than for banks.

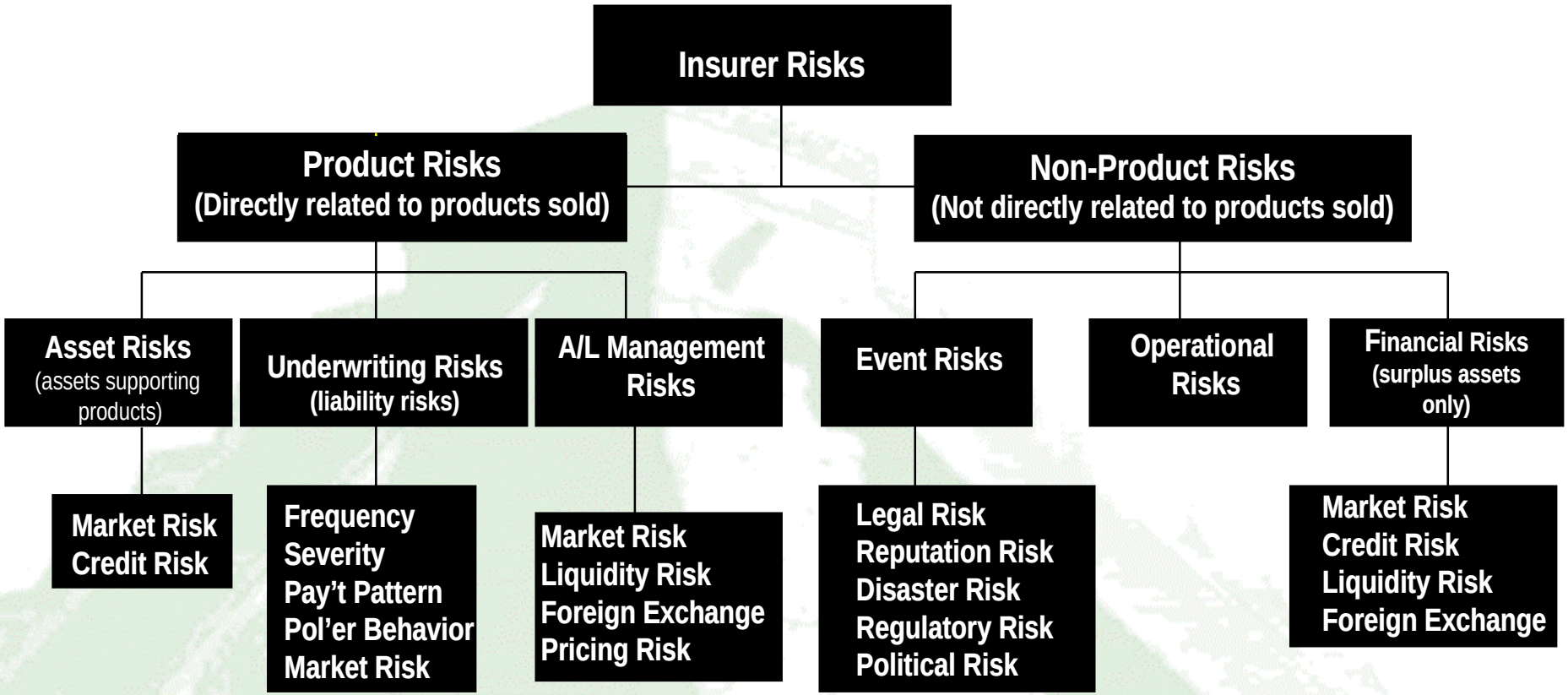
Classification of Insurance Company Risks

- No single generally accepted classification system of insurance company risks
- Insurance supervisory groups have developed a variety of classification schemes
- Banking authorities have similarly developed classification schemes for bank risks (e.g. Bank for International Settlements)
- The different schemes have common elements but also tend to use different terminology
- Insurers take on significant risks not reflected in the schemes designed for banks

A General View of Enterprise Risks



A General View of Insurer Risks



Other Classification Schemes

International Association of Insurance Supervisors (IAIS)

- ***Investment Risks*** (Various kinds of asset risks which are directly or indirectly associated with the insurers' asset management)
- ***Technical Risks*** (Various kinds of liability risks which are directly or indirectly associated with the technical or actuarial bases of calculation for premiums and technical provisions in both life and non–life insurance, as well as risks associated with operating expenses and excessive or uncoordinated growth)
- ***Non-Technical Risks*** (Various kinds of risk which cannot in any suitable manner be classified as either technical risks or investment risks)

Other Classification Schemes

Bank for International Settlements - Basel Accord for Banks

- ***Credit Risk*** is the risk of default and change in the credit quality of issuers of securities, counter-parties and intermediaries, to whom the company has an exposure.
- ***Market Risk*** arises from the level or volatility of market prices of assets. Market risk involves the exposure to movements in the level of financial variables such as stock prices, interest rates, exchange rates or commodity prices.
- ***Operational Risk*** is the risk of direct and indirect losses resulting from the failure of processes, systems or people.

Working Party Proposal

- ***Underwriting Risk***
- ***Credit Risk***
- ***Market Risk***
- ***Operational Risk***
- ***Liquidity Risk***
- ***Event Risk***

Examples of risks within each category

- ***1. Underwriting Risk***
  - ✓ Underwriting process risk
  - ✓ Pricing risk
  - ✓ Product design risk
  - ✓ Claims risk (for each peril)
  - ✓ Economic environment risk
  - ✓ Net retention risk
  - ✓ Policyholder behavior risk
- ***2. Credit Risk***
  - ✓ Business credit risk
  - ✓ Invested asset credit risk
  - ✓ Political risk
  - ✓ Reinsurer risk
  - ✓ Sovereign risk

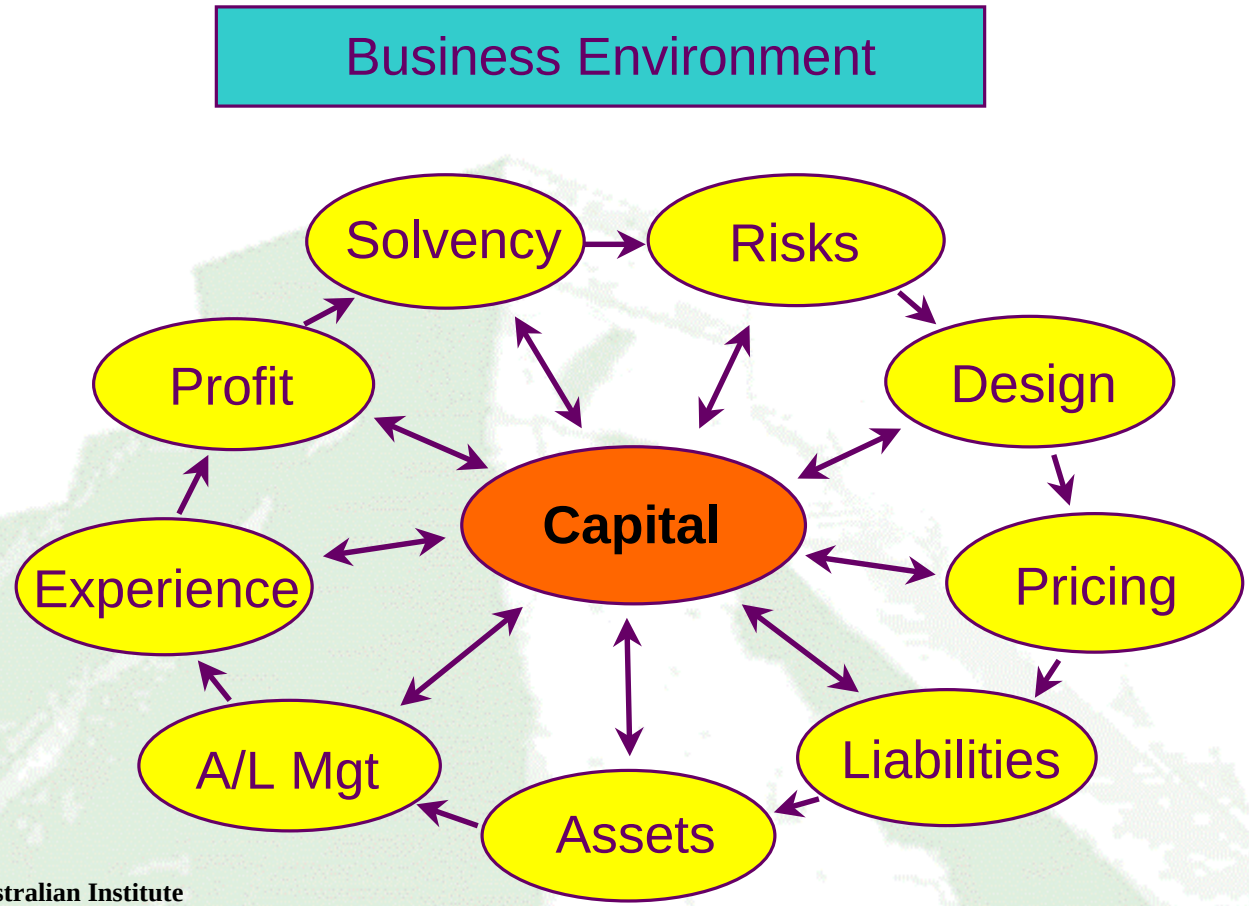
Examples of risks within each category

- ***3. Market Risk***
  - ✓ Interest rate risk
  - ✓ Equity and property risk
  - ✓ Currency risk
  - ✓ Basis risk
  - ✓ Reinvestment risk
  - ✓ Concentration risk
  - ✓ ALM risk
  - ✓ Off-balance sheet risk
- ***4. Operational Risk***
  - ✓ Human capital risk
  - ✓ Management control risk
  - ✓ System risks
  - ✓ Strategic risks

Examples of risks within each category

- ***5. Liquidity Risk***
  - ✓ Liquidation value risk
  - ✓ Affiliated company risk
  - ✓ Capital market risk
- ***6. Event Risk***
  - ✓ Legal risk
  - ✓ Reputation risk
  - ✓ Disaster risk
  - ✓ Regulatory risk
  - ✓ Political risk

Risk Assessment Process*



*** Phrase coined by Australian Institute of Actuaries**

Some Modelling Tools

- ***Collective risk models***
  - Frequency of claims (or credit events)
  - Severity of claims (or credit events)
  - Build aggregate models using these components
- ***Diffusion models and other stochastic processes***
  - Evolution of risk, stock market, or yield rates over time
  - May be in continuous time or in discrete time
- ***Multi-state models***
  - Movement from state to state over time
    - alive to disabled to dead
    - claim occurrence to reported to settled to reopened
    - credit risk movements between rating categories
- ***Cash flow models***
  - Provides framework for valuation and solvency assessment
  - Scenario analysis and stress-testing are key tools

Key Components of Risk Models

- ***Volatility risk***
  - ✓ Process risk
  - ✓ Diversifiable
- ***Uncertainty risk***
  - ✓ Model specification error
  - ✓ Parameter estimation error
  - ✓ Structural risk error
  - ✓ Systematic risk and non-diversifiable
- ***Extreme event risk***
  - ✓ High impact one-time shocks
  - ✓ May be completely unanticipated and not captured in model

Time horizon to measure risk

- Trading risk using VaR uses 1-10 days typically
- Insurer often has long term liabilities
- Short assessment period may miss key long-term uncertainty risk; e.g. improving mortality
- Long period may introduce excessive long-term uncertainty risk due simply to limited data
- Long time frame needs to also capture management responses to emerging adverse results (feedback loop)

Risk management

- ***Risk reduction***
  - Limiting exposure to certain risks
- ***Risk integration***
  - Managing assets and liabilities in an integrated way - ALM
- ***Risk diversification***
  - Increasing number of policies reduces relative risk
- ***Risk hedging***
  - Offsetting transaction reduces risk
    - ✓Natural mortality hedge between annuities and life insurance
    - ✓Reinsurance
- ***Risk transfer***
  - Sale or securitization
- ***Risk disclosure***
  - Requirements support better risk management

Approaches to Combining Risks

- ***Aggregated (integrated) risk modelling***
  - Based on “internal model” approach
  - Captures complex relationships; especially economic changes
    - ⇨Solvency measure is applied to the totality of all risks
- ***Separate models for each risk***
  - A model of each risk type is developed (whether internal or factor based)
    - ⇨Specific solvency measure applied to each such risk
  - Solvency measures are combined using formulas or estimated correlations to recognize the interactive effects of risks
    - ⇨e.g. USA RBC formulas that recognize full or no correlation or possibly partial correlation.

Implications for Solvency Assessment

Role of the Actuarial Profession

- Assessment of risk is key to operations of an insurer
- Through the actuarial control cycle, actuaries are involved in the assessment of risk throughout an insurer's operations
- Insurance business, especially long term business, is complex
- Continuous monitoring allows management to take positive actions
- Actuaries have been doing this complex analysis for some time in some countries
- Actuaries are professionals who are well positioned to assist the regulators in the solvency assessment of insurers

Implications for Solvency Assessment

Supervisory Approach

- WP is supportive of a “three pillar” insurer supervisory approach.
- WP recognizes that “three pillar” approach is not unlike the prudential framework for insurer supervision in some jurisdictions.
- Insurer risks are sometimes very complex and varied and may be difficult to adequately capture in a common, yet simple, set of RBC formulas.
- WP supports the use of internal models within the first pillar as the ultimate goal with consistent RBC-type formulas as an attainable intermediate step.

Implications for Solvency Assessment

Supervisory Approach (continued)

- As a long-term goal, internal models will require the development of models which balance individual insurer experience and an industry need for standardization and transparency
- Reasons for developing unified international solvency assessment framework for both banks and insurers are many. Question which WP has not explored is whether banking industry may be more prone to systemic (system-wide) risk than the insurance industry.
- Due to the long term nature of insurance contracts, it is likely that insurers are more prone to systematic risk than banks, and hence, require more detailed, long term modelling.

Examples included in the paper

Underwriting Risk Examples

- Extremely Large Fire Insurance Losses
- Creditor Insurance Portfolio Mortality Risk
- Catastrophe Hedge Program Effectiveness
- Establishing Capital Requirements for P&C Insurers
- Automobile insurance
- Mortality Risk: An Analytical Approach to Volatility
- Capital Requirements for Annuity Liabilities

Market Risk Examples

- Guaranteed Minimum Value of Investment Funds
- Annuity Portfolio Interest Rate Risk

Operational Risk Examples

- A Parametric Approach
- A Causal Approach

Aggregation of Risk Example

- Combination of Insurance Risks

Status of the Report

- Final Report has been accepted by the IAA Insurance Regulation Committee and is in the process of receiving IAA member association acceptance as well.
- Final Report is available on the IAA web-site.
- Report has been received favourably by the IAIS.
- IAIS has suggested the IAA could be helpful in assisting in the development of a global structure for insurer risk based capital (initially more focused on principles than numbers).

Further steps by the IAA

*New WP on **RBC Solvency Structure** has been formed to develop a universally applicable framework for RBC.*

- **April 2002:** Finalize terms of reference
- **May 2002:** Assemble information about ongoing related work. Develop first sketch of broad global RBC principles.
- **August 2002:** Have draft report on global RBC principles available for IAA Insurance Regulation Committee. Report will include additional practical content for each principle. Report will identify additional work to be done by the WP.
- **October 2002:** Have received feedback from IAA and IAIS meetings discussing work of WP
- **May 2003:** Issue complete draft report to the IAA Insurance Regulation Committee

You can participate

- To join as an observer - send an email to Christian Levac at the IAA Secretariat at christian.levac@actuaries.org
- To contact the WP directly, send an email either to
  Stuart Wason at stuart.wason@ca.wmmercer.com or
  Henk van Broekhoven at Henk.v.Broekhoven@mail.ing.nl

Thank you

Developing Actuarial Standards for the proposed IFRS on Insurance Contracts

General Overview

Mukesh Mittal

Session 93

Driving influences

- International Organisation of Security Commissions (IOSCO)
- International Association of Insurance Supervisors (IAIS)
- Joint Forum
- European Union
- International Federation of Accountants (IFAC)

International Accounting Standards Board (IASB) to develop a new International Financial Reporting Standard (IFRS)

as a high-priority, leadership project

Accounting characteristics

- Understandability
- Relevance
- Reliability
- Comparability

Accounting concepts

From the IAS Framework:

An item should be recognised if:

- It is probable that any future economic benefit associated with the item will flow to or from the enterprise; and
- the item has a cost or value that can be measured with reliability.

Draft Statement of Principles (DSoP)

- Largely published on IASB web site
- Key remaining chapters:
  - Performance linked contracts
  - Disclosure
  - Performance reporting expected by end of March

DSoP IAS 39

Need to connect insurance contract accounting with financial instrument accounting

DSoP applies to insurance contracts rather than to enterprises.

Definition of insurance contract

DSoP

Definition of insurance contract: involving material insurance risk, i.e., timing, severity, or development risk that does not merely arise from a change in a price or index.

Standard applies to insurance contracts rather than to enterprises.

DSoP

DSoP recommends ‘entity specific’ values rather than ‘fair’ values, but ESV definition not yet clear or accepted.

The best estimates will be estimates that are appropriate to the circumstances of a company that intends to hold the obligation rather than appropriate to a company that intends to dispose of the obligations.

DSoP

- Use of most current info rather than historical info such as pricing
- Credible data: high degree of rigor
- Actual assets that back the insurance contract are deemed irrelevant unless the benefits are directly linked with the assets.
- Credible info about the future may require the use of probability distributions rather than point estimates.

Areas of potential conflict

Reliability concept

- At what point should adverse experience be recognised?
- Reliability in reflecting renewals; what is a valuable insurance option?
- Reliability in including future investment margins?
- Reliability of embedded options and guarantees

IASB Board developments

- Insurance accounting discussed every meeting from November to February
- Board agreement on definition and scope
- Agreement in broad terms with a number of principles
- Still need to agree on some fundamental issues

IASB field visits

- Commenced in Canada October 2001, following many countries, most recent Japan.
- Separate visits for reinsurers
- Key issues:
  - Implementation timing (costs, systems development and staff education)
  - Embedded options pricing
  - Financial assets
  - Presentation/disclosure and management intent

Risk Based Capital Issue Paper

- Disclosure in financial notes of a new international capital ratio?
- Disclosure of the country capital ratio?
- Consistency of risk assessment under new international accounting requirements and international capital requirements?

IAA activities

- New actuarial standards setting sub-committee
- IASB insurance accounting committee preparing DSoP response
- Both standards and accounting discussion progress available from IAA web site
- Face to face meeting December 13-14 2001 in London and March 14 – 16 in Cancun

Actuarial Standards of Practice

Work in progress:

- drafting group (8) to write papers on some 45 issues
- define what is in the DSoP
- define what is meaningful
- discuss alternative approaches
- group will consider standards for non insurance contracts issued by insurers

Actuarial Standards of Practice

Challenges:

- Global standards
- Moving accounting principles
- Coordinated response and input
- Implementation
- Education