

Implementing PBA - Assumptions and Feedback

Chicago Actuarial Association

Agenda

- Introduction to principles based approaches
- VM 20
- IFRS
- Solvency II
- Solvency Modernization Initiative
- Considerations of principles based approaches
- What are companies doing today to ready themselves for what lies ahead?
- Questions

Introduction to principles based approaches

Recent changes in the global capital, regulatory and rating environments are resulting in greater emphasis on the use of internal models, best estimate assumptions, explicit risk margins and expanded ERM to demonstrate an understanding of risk exposures, analyze business strategies, and estimate value of insurance and financial instruments.

Regardless of your companies filing status and structure (domestic v international, stock v mutual, large v small), significant changes to reserves and capital / solvency are expected.

- NAIC Principles Based Reserves (2014)
- IFRS and FASB changes to GAAP (date not final)
- Solvency II (January 2013)
- Solvency Modernization Initiative (date not final)
- Rating agencies

Overview of VM-20

Expected effective date: 2014

All products (new issues) to be subject to VM-20

- Except credit life and pre-need

However, some policies may be excluded from new VM-20 requirements if

- They pass two exclusion tests
- The actuary certifies that if tests were done, policies would pass

If excluded from VM-20, current SVL CRVM requirements apply

- Except for term and ULSG

Exclusion tests are optional for all products

Key Implementation Elements of VM-20

Cash Flow Models created by company

Determining Assumptions

- Some set by the company
- Some prescribed by regulators
- Determined at each valuation period (i.e., unlock or true-up)

Interest Rate and Equity Return Scenarios

- Deterministic
- Stochastic

Sensitivity Testing

Reporting & Documentation

Several calculations to determine minimum reserve

Minimum Reserve if Company Elects Reserve Exclusion

- May elect to exclude one or more groups of policies from the stochastic reserve and/or the deterministic reserve requirements
- Must pass defined exclusion tests

| Stochastic Exclusion | Deterministic Exclusion | Minimum Reserve |
|-----------------------------|--------------------------------|---|
| Pass | Pass | Net Premium Reserve |
| Pass | Fail | Greater of deterministic reserve or NPR |
| Fail or Do not elect | Fail or Do not elect | Greater of stochastic, deterministic or net premium reserve |

Deterministic and Stochastic Reserves

The Deterministic Reserve

A Gross Premium Valuation

- $PV(\text{Benefits and Expenses}) - PV(\text{Premium and Other inflows})$

Uses cash flow model to project revenue, benefits, and expenses

Aggregate reserve v seriatim

Cash flows are projected in compliance with VM-20 Cash Flow, Reinsurance, and Assumptions Sections

Deterministic Reserve Calculation

Cash flows projected under a single prescribed economic scenario

- Using the interest rate path from the baseline scenario (scenario #12) from the stochastic exclusion test

Discount rate is path of projected Net Asset Earned Rates (NAER)

- i.e., company's projected portfolio rate
- NAERs determined for each "model segment"

Net Investment Income not included in the cash flows

- Reflected in the reserve via the discount rate

The Stochastic Reserve

A Greatest Present Value of Accumulated Deficiency (GPVAD) approach

Uses cash flow model to project revenue, benefits, and expenses

Aggregate reserve v seriatim

Cash flows are projected in compliance with VM-20 Cash Flow, Reinsurance, and Assumptions Sections

Stochastic Reserve Calculation

Focus is on Tail Risk

- Risks that have high impact but low probability

Cash flows projected under multiple prescribed economic scenarios

- Such as from the Academy's interest rate generator
- Scenario reduction techniques permitted

Prescribed Discount rates

Number of scenarios is not defined

The Cash Flow Models

Company shall project Cash Flows:

- Using models that follow ASOPs
- With Model Segments consistent with Asset Segmentation
- Far enough into the future that no material amount of business remains
- Including Non-Guaranteed Elements in most cases

Used for both deterministic and stochastic reserve calculations

The Cash Flow Models cont'd

Require estimate for starting asset amount

- Equal to approximate amount of the reserve on the projection start date
- Starting assets must be within 2% of the final aggregate minimum reserve

Project assets using prescribed:

- Default costs and reinvestment spreads
- Future interest rate assumptions
- Future equity return assumptions
 - Vary between deterministic and stochastic

Valuation Assumptions Fall into One of Two Categories

Prescribed Assumptions

- Used for risks where the company has very little or no influence or control over the outcome
- All companies required to use the same assumptions
- Examples:
 - Interest rate movements, Equity movements, Asset default experience, Spreads on reinvestment assets

Prudent Estimate Assumptions

- Used where the company practice has some degree of influence on the outcome of the risk factor
- Examples:
 - Mortality, Policyholder behavior, expenses

Prudent Estimate Assumptions

Equals the actuary's best estimate of the future, (i.e., "Anticipated Experience") plus a margin

Anticipated experience

- Generally based on the actual experience of the company, or if not known, on industry experience
 - or a combination of the two
- Includes use of actuarial judgment on risk factors when there is no company or industry experience

Margin includes a provision for adverse deviation and estimation error

General Margin Requirements

Determined by the actuary using professional judgment

- Subject to any guidelines established by NAIC and ASOPs
- Exception: mortality margins include several prescribed elements

Must establish a margin on each assumption.

- Some assumptions are correlated
- Can adjust margin on multiple assumptions in combination if interdependence/correlation can be shown

The greater the uncertainty in the Anticipated Experience Assumption, the larger the required margin

Margin should result in a larger reserve

Must perform sensitivity analysis

Net Premium Reserve

Net Premium Reserve

Serves as a minimum floor

Conforms the reserve methodology to comply with the tax code

A seriatim calculation

Cash Surrender Value floor

NP Method Similar to Determination of NP Reserve Today With Exceptions

The VM20 Impact Study and Feedback Loop

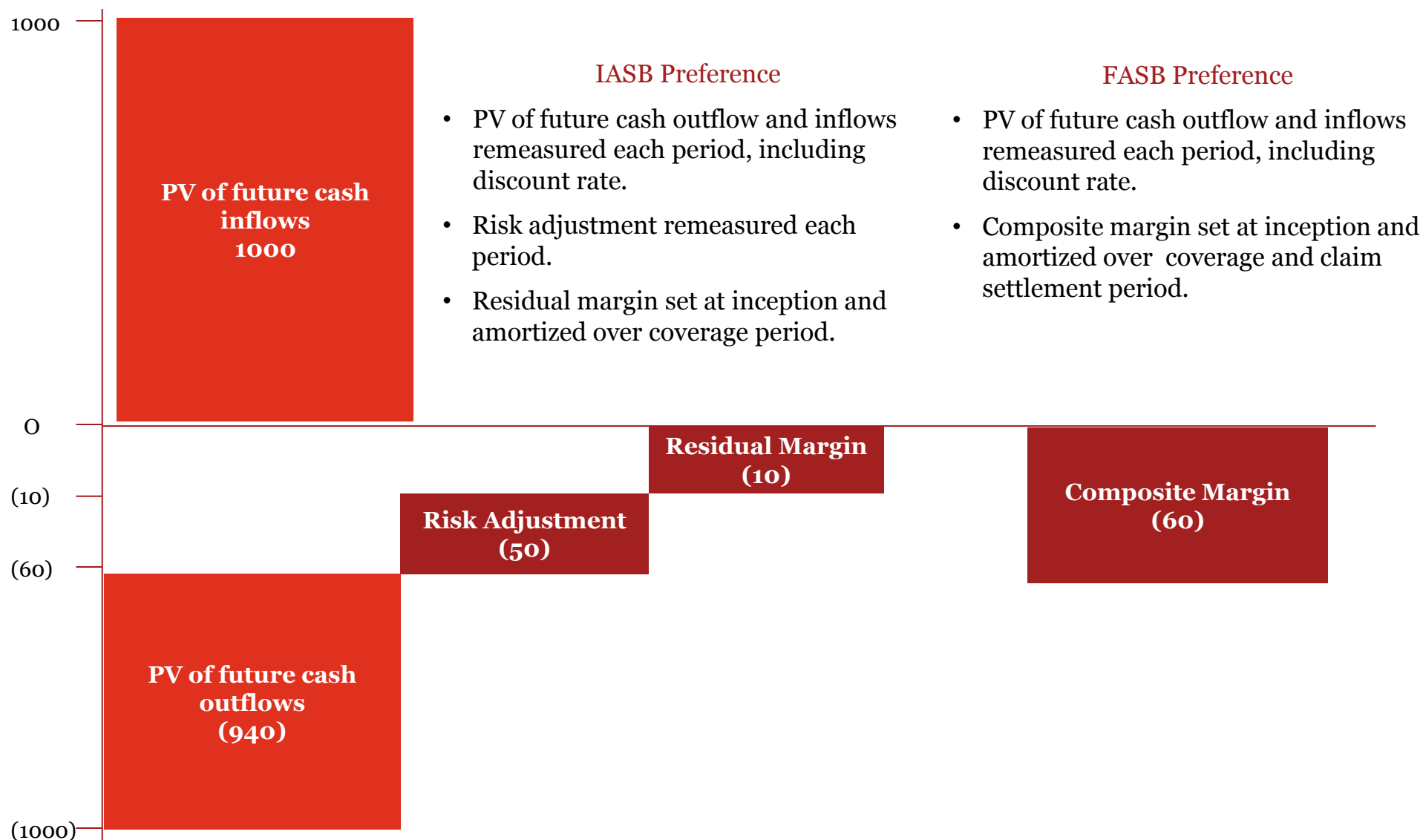
NAIC also in process of conducting an impact study, currently underway and lead by Towers Watson

- Companies still in the process of submitting modeling results
- No published study results as of yet – expect late second quarter

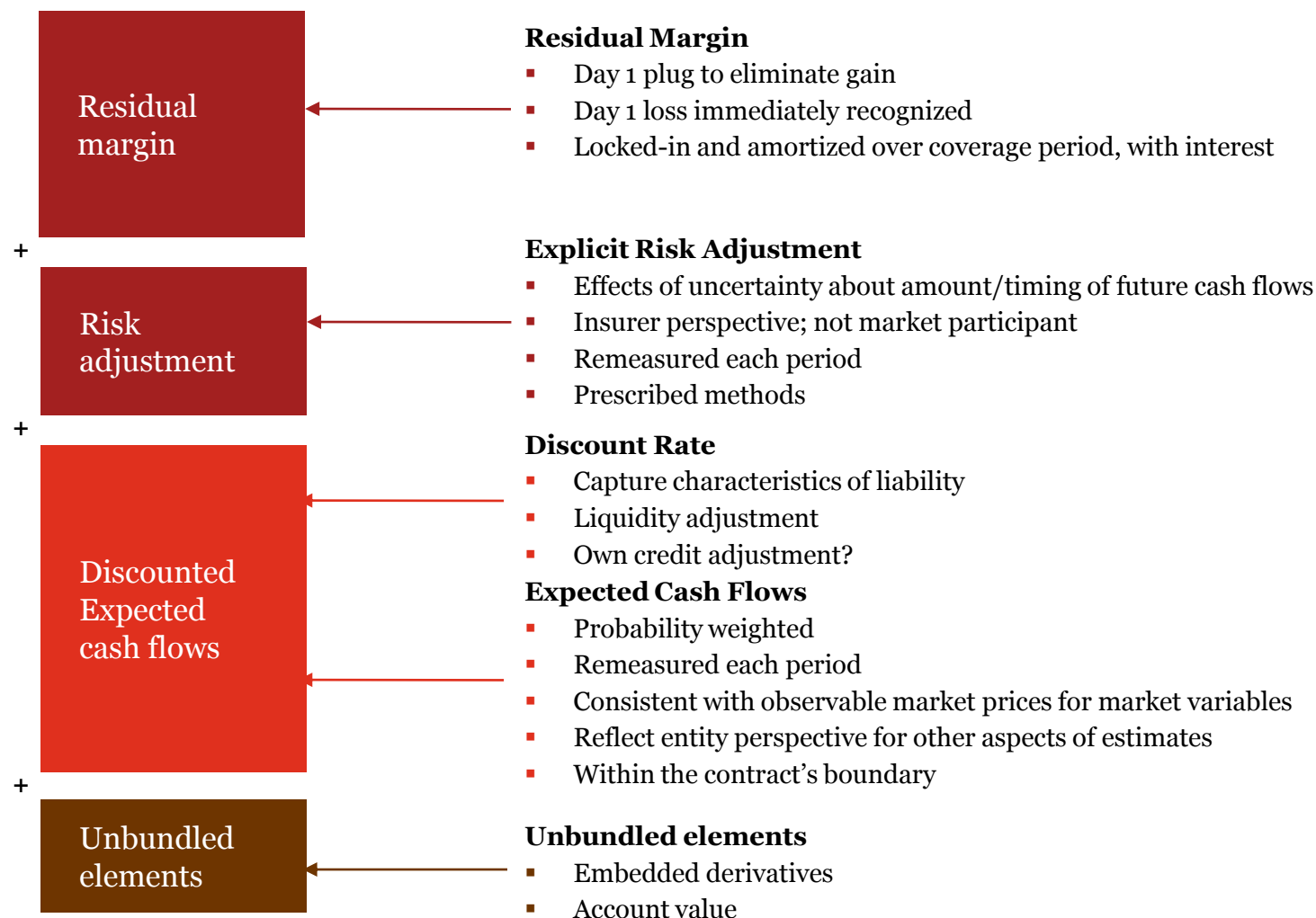
NAIC plans to implement a feedback loop to better understand how VM20 is operating and identify areas where more clarification or modification to the existing format is needed

***IFRS
IASB / FASB Insurance
Contracts Standard***

Overview of insurance contracts measurement

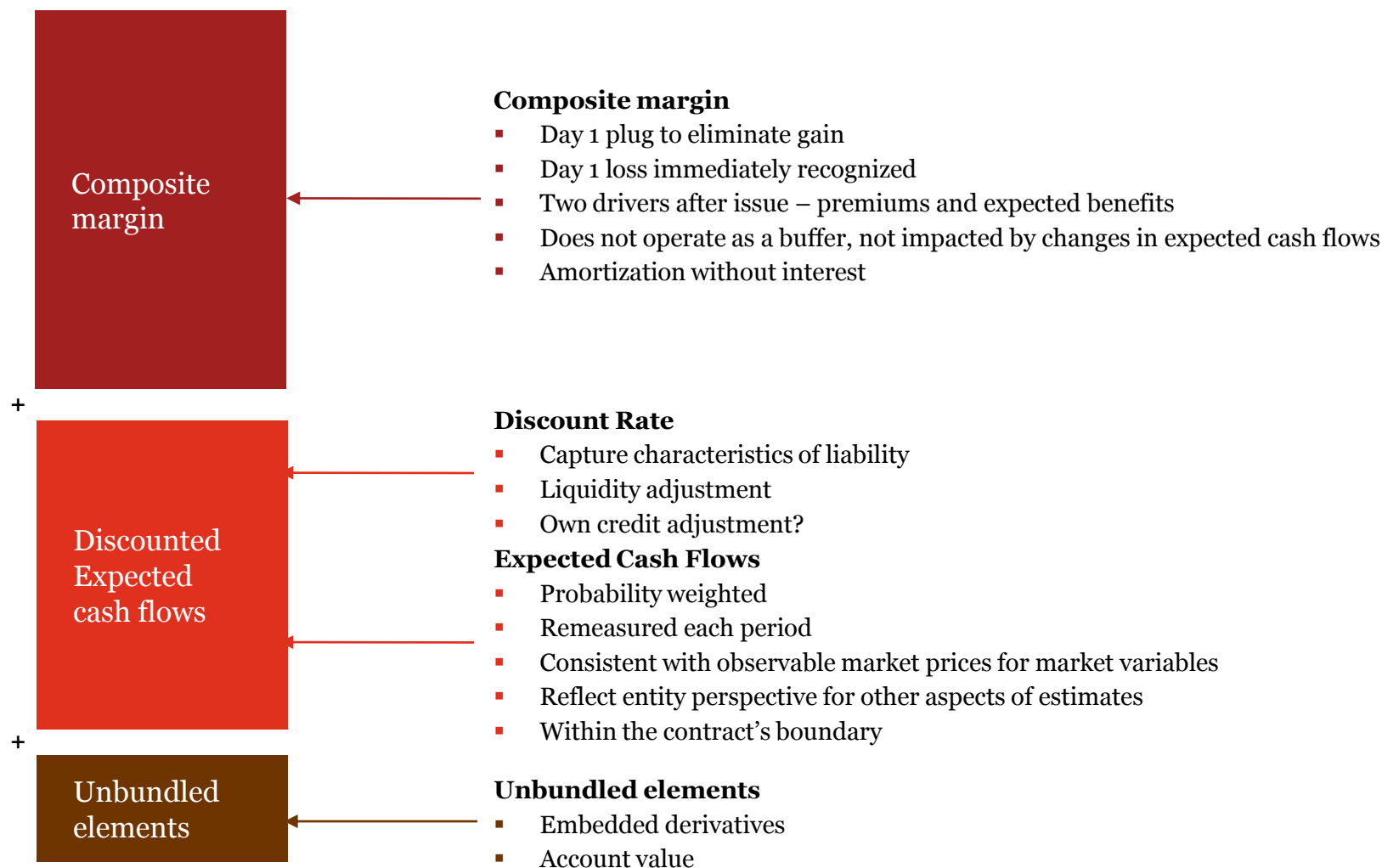


IASB Phase II building block approach



Note: Short term contracts may be required to use short duration contract model

FASB building block approach



Solvency II

What is Solvency II?

Single largest change to European Insurance regulation ever.

Solvency II Framework Directive – overview

PILLAR I

Quantitative requirements

- Assets and Liabilities - market consistent valuation
- Investments
- Solvency Capital Requirement (SCR):
 - European Standard Formula; or
 - Internal Model
- Minimum Capital Requirement (MCR)
- Own Funds

PILLAR II

Supervisor review

- System of governance
- Own risk and solvency assessment (ORSA)
- Supervisory review process
- Supervisory intervention including capital add-on

PILLAR III

Disclosure

- Public Disclosure – annual solvency & financial condition report
- Information to be provided for supervisory purposes

What is Solvency II?

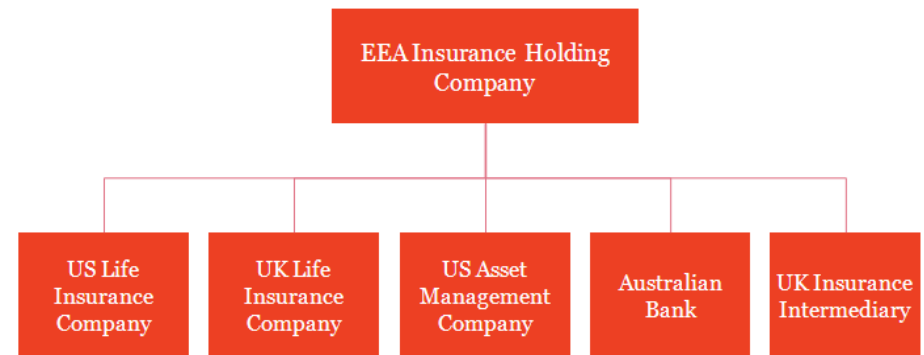
Requirements under all 3 pillars apply at both solo and group level

- A group SCR calculation will be required, either on a standard formula or on an internal model basis.
- An SCR calculation is also required at each entity level for EU companies.
- Group internal model – all the entity level internal models must be individually approved but the group model must also be approved separately.
- The group model must be documented as well as the underlying models.
- The ORSA must also be prepared and **used** at group level – the use test needs to be met.
- Governance must be effective at group level, including the internal control and risk management framework – Pillar II applies to the whole group.
- Solvency II looks at capital adequacy at the whole group level, not just at the top EEA parent level under the IGD – this is potentially much more onerous.
- Sufficient own funds must be held at the top of the group – forms of capital in place at present, such as hybrid debt, may not be sufficiently eligible to meet Solvency II needs.

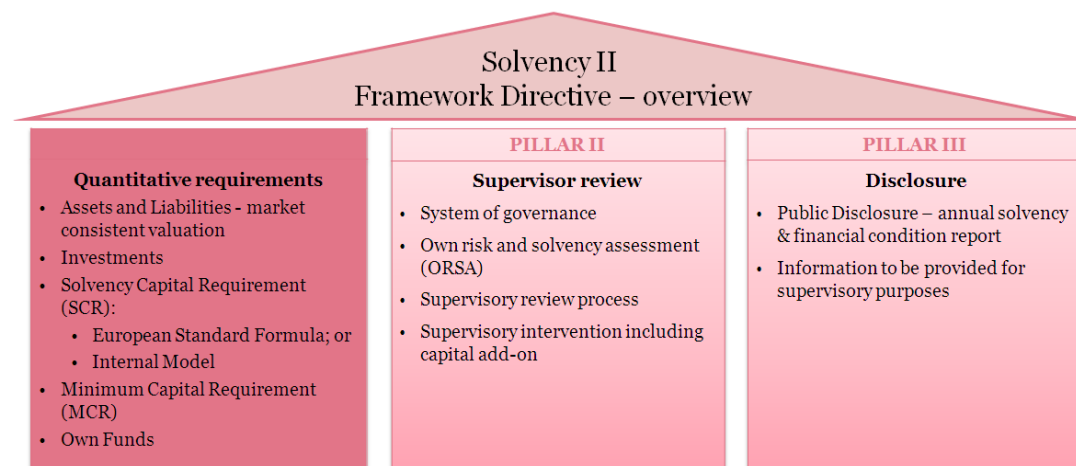
What is Solvency II

Group supervision

- Non-EU subsidiaries will not have to apply Solvency II in full but will fall under group supervision (Art. 213 2(a)) and must be included in the group SCR
- Proportionality will apply in the calculation of group solvency where the group company's contribution is not material
- Non-EU subsidiaries will still be subject to local regulatory regimes – the regulatory burden therefore doubles
- Group risk from subsidiary operations in non-equivalent regimes may be deemed higher

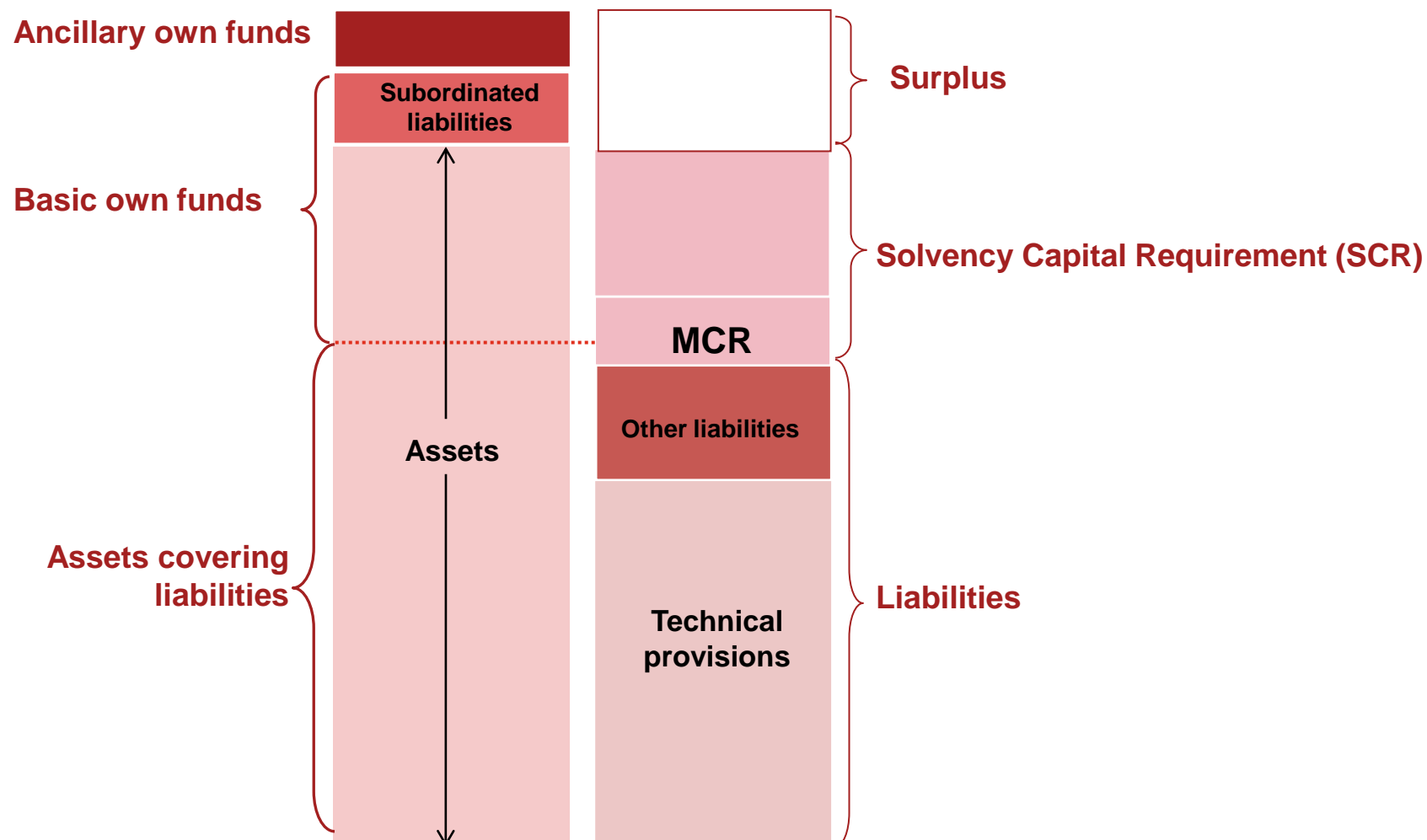


Pillar 1



Pillar 1

Quantitative capital requirements



Pillar 1

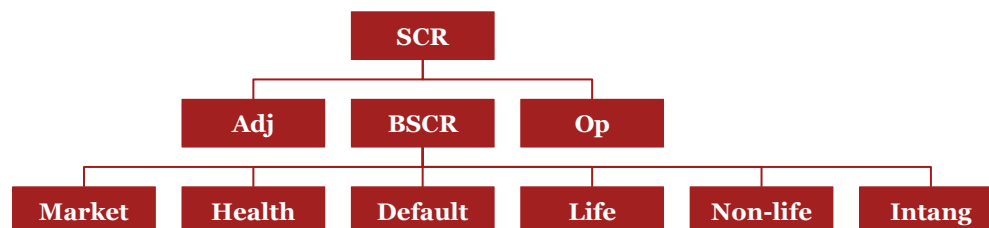
Standard Formula

Solvency Capital Requirements (SCR)

- The minimum amount of capital to be held to enable the organisation to absorb significant unforeseen losses
- The calculation of this figure takes into account the amount of risk to which the business is exposed
- Complex
- Risk-based
- Reflective of risk profile of insurer

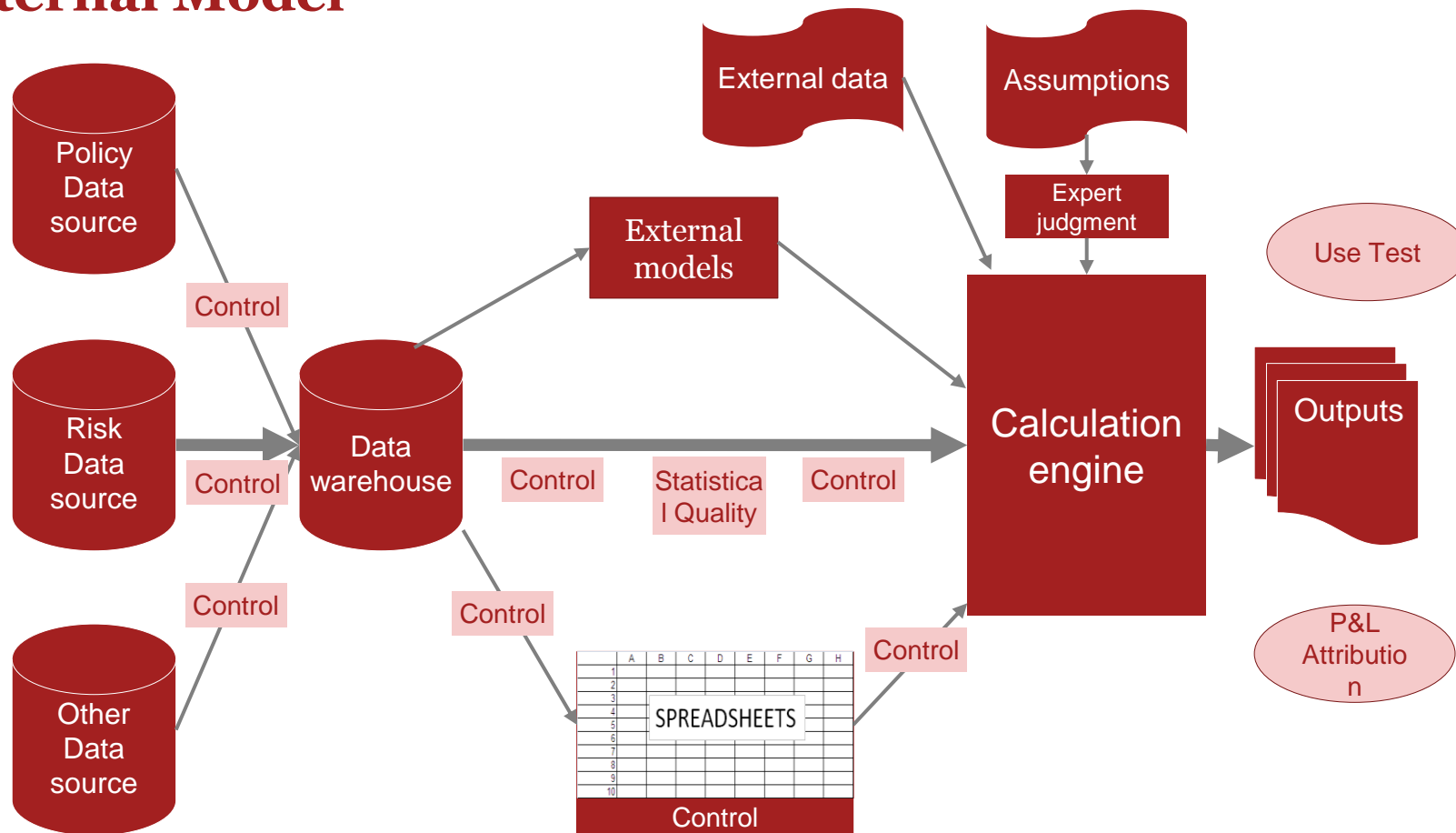
Minimum Capital Requirements (MCR)

- The level below which the amount of capital must not fall
- If it does fall below this level the insurer has three months to restore compliance before the Supervisor takes action
- Simple formula
- Floor and cap



Pillar 1

Internal Model



Governance and Documentation

IT & Systems

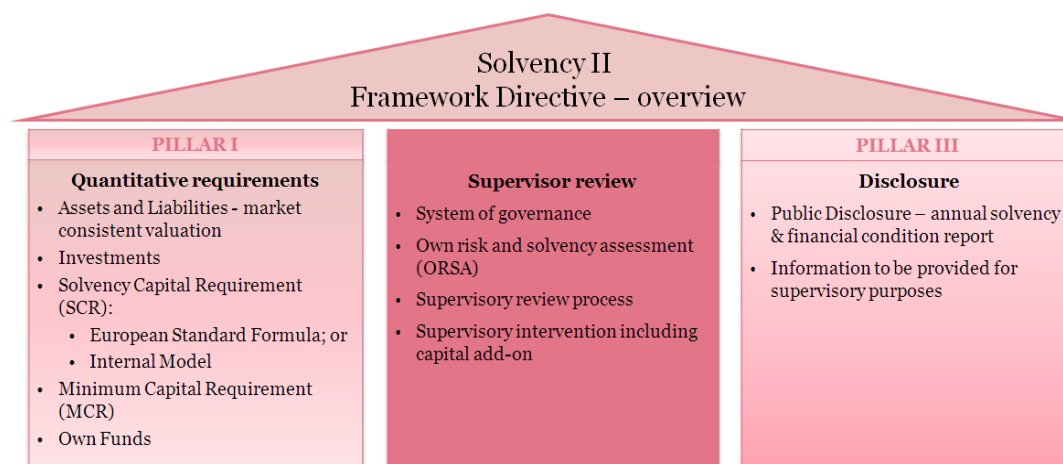
Use of Internal Model pre-approval requirements

- **Use test:** Use of the model in strategic decision making/ internal risk management
- **Statistical quality standards:** Model structure/methodology/data
- **Calibration standards:** Regulatory capital requirement
- **Validation standards:** Model validation
- **Profit/Loss attribution:** Ability of model to explain historic profit/losses by line of business
- **Documentation standards:** Model documentation

Pillar 2

‘Solvency II is not just about capital. It is a change of behavior’

Thomas Steffen, Ex-Chairman of CEIOPS



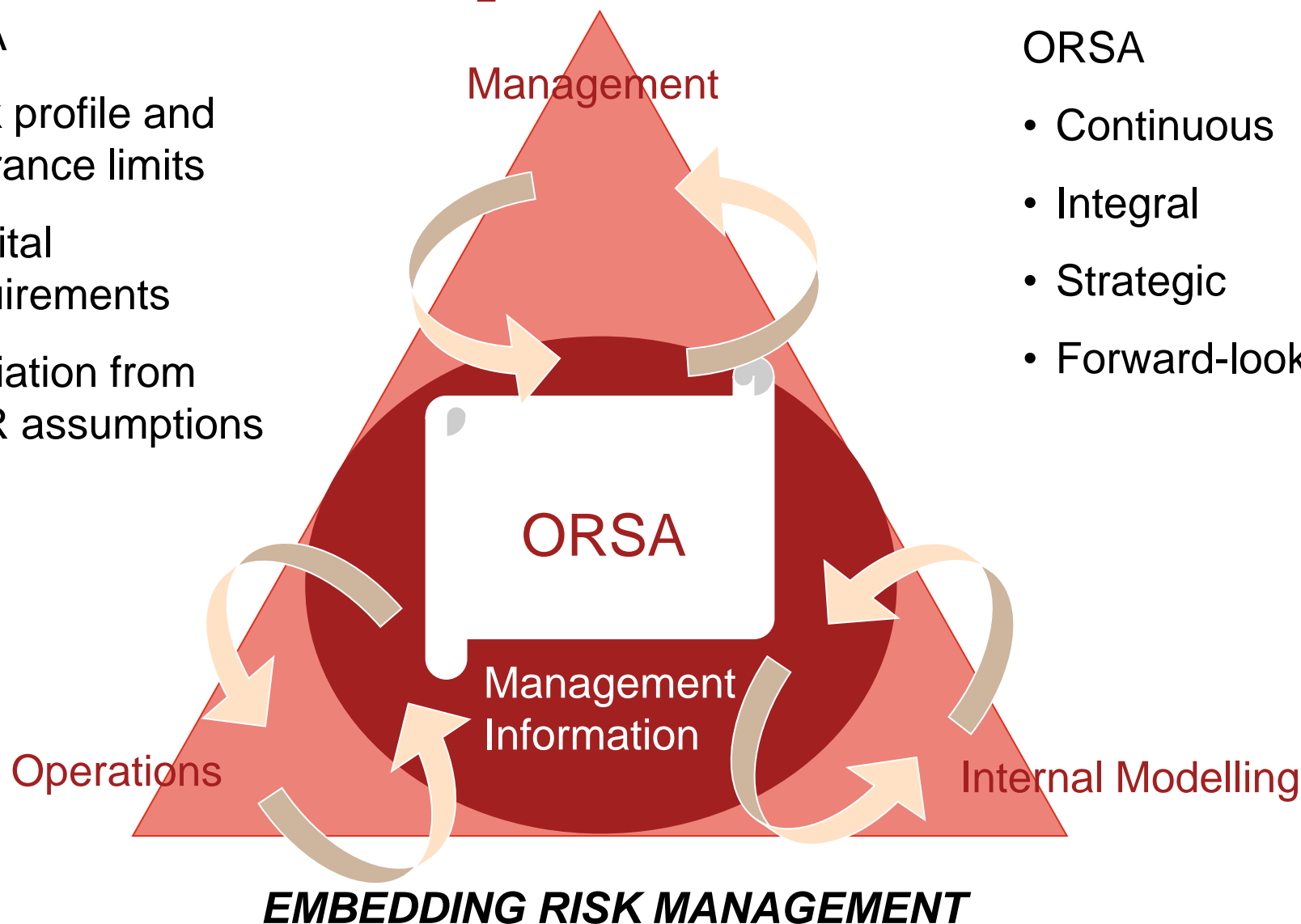
Link to ERM - Pillar II process – The ORSA

ORSA

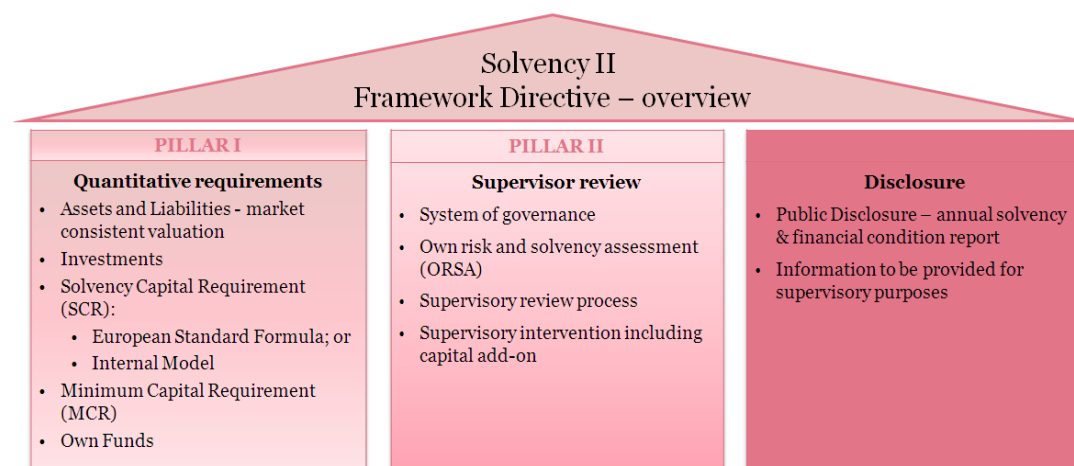
- Risk profile and tolerance limits
- Capital requirements
- Deviation from SCR assumptions

ORSA

- Continuous
- Integral
- Strategic
- Forward-looking



Pillar 3



Pillar 3

Reporting and disclosures

CP58 sets out very extensive public and private disclosure requirements

- Solvency and financial condition report (SFCR) [public]
- Report to supervisors (RTS) [private]
- Disclosures will be both qualitative and quantitative
- Reporting at both group and entity level
- Qualitative disclosure must use a predefined structure
- Firms should aim to align their regulatory reporting with existing disclosures
- Materiality is a key judgment

Equivalence

Overview

- A non-EEA regime is considered equivalent when it achieves the same level of policyholder protection as Solvency II
- If the third country regulator is deemed equivalent for group supervision, then group supervision will not be carried out at the European level
- If equivalence is not achieved, other methods of supervision may be put in place by the EU supervisors, including an EU holding company
- Equivalence may also be achieved in respect of reinsurance and non-EU solvency requirements
- Equivalence will be assessed in “waves” – the first wave will commence in July 2011 and includes Switzerland, Bermuda and Japan (reinsurance only)
- Measures are also being discussed that may allow a transitional period for countries to develop their regulatory regimes

Solvency Modernization Initiative (SMI)



SMI

NAIC is also reviewing its approach to solvency and how international developments impact US

SMI Task Force and its Working Groups charged to:

- Monitor financial, solvency, and accounting IAIS work products; and
- Recommend whether and/or how we should implement the ideas in those papers in the U.S. regulatory solvency system

5 focus areas of SMI

1. Capital Requirements
2. Governance and Risk Management
3. Group Supervision
4. Statutory Accounting and Financial Reporting (including international accounting & valuation issues)
5. Reinsurance

SMI

In 2011, SMI Task Force to assist in the following IAIS goals:

- Standard setting
- Standard implementation
- Financial and insurance market stability
- External interaction
- Effectiveness and efficiency

Equivalence under Solvency II is a desired outcome

February 11, 2011, issued proposal for US version of ORSA

- Significantly increased focus on ERM and internal models

Considerations of Principles Based Approaches

Considerations of principles based approaches

Reserve patterns likely to change from current levels and comparability between companies may become more difficult due to variation in assumptions and risk margins

Education of users of financial information important

Reserves may likely have volatility from year to year due to reserve “unlocking”

- In pricing, need to look not only at IRR but also emergence of earnings

Pricing and valuation actuaries must work closely together

- Establishment of anticipated experience **assumptions** and **margins**
- Improved experience analysis and requirement for credibility modeling for mortality (NAIC)
- Sensitivity testing around emergence of earnings and the level of the margin for both capital and reserves
- Active product management required

Considerations of principles based approaches cont'd

Modeling complexity

- e.g., 3 measures, 3 different calculations under PBR (NAIC)
- Assets and liabilities
- Stochastic modeling on more products than today
- Model compression and scenario reduction techniques

Improved **controls and governance** over models, model documentation and model validation

- Need for a model validation framework
- ORSA

An essential control in mitigating model risk is a **sound governance framework** that includes periodic independent validation of models and the way in which they are used.

What are companies doing today to ready themselves for what lies ahead?

Educating management and boards of changes and potential impact to income statement presentation

Improve data and assumption governance

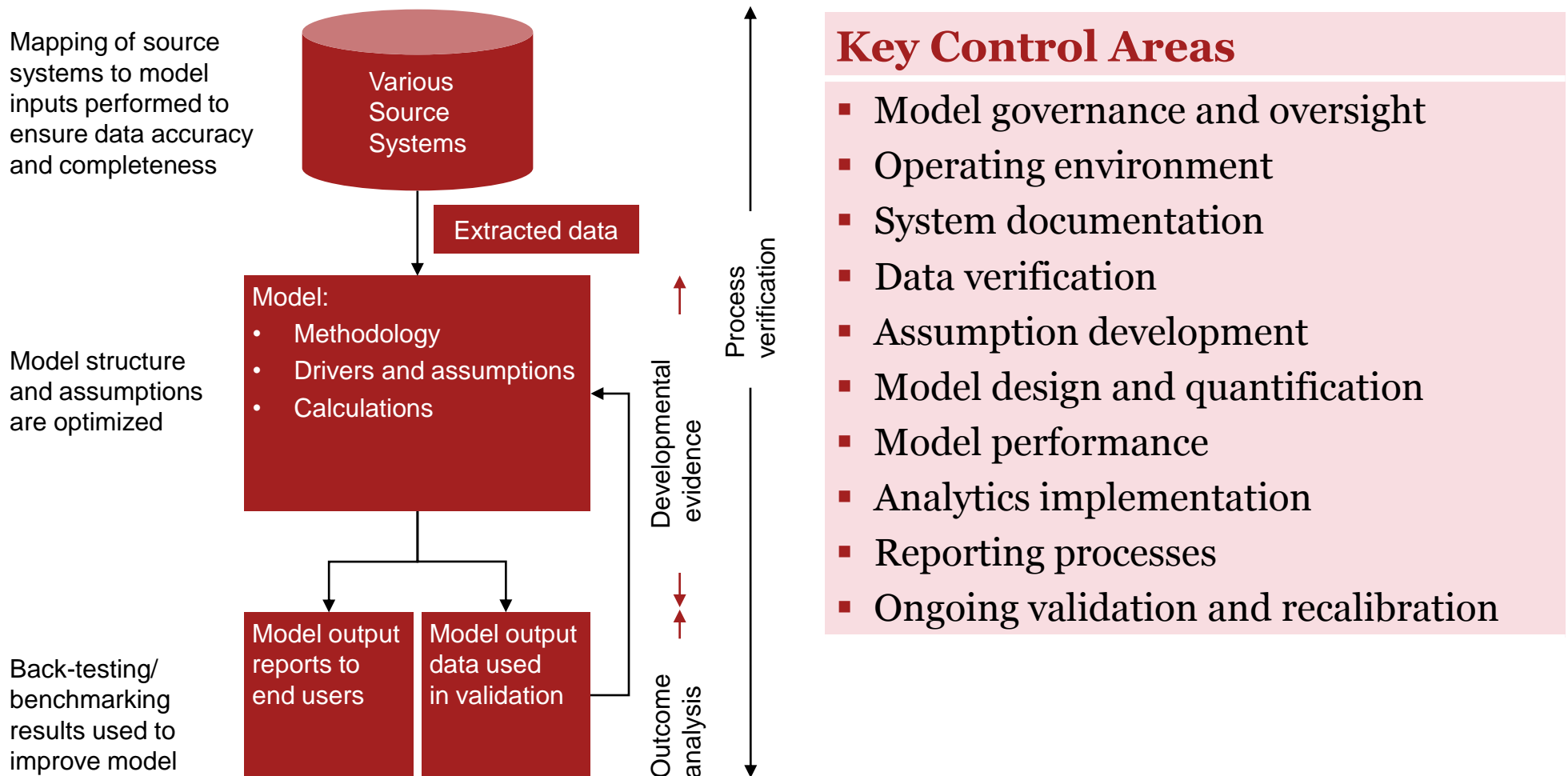
- Data definition
- Data warehouses
- Data governance
- Assumption setting governance
- Enhanced experience analysis

What are companies doing today to ready themselves for what lies ahead?

Inventory, assess and improve controls and governance over models, model documentation and model validation

- Improve ERM / economic capital modeling / ORSA
- Rationalize use of spreadsheets
- An essential control in mitigating model risk is a sound governance framework that includes periodic independent validation of models and the way in which they are used.

A model control framework needs to cover end-to-end activities



Questions

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