Internal models and Solvency II

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Outline

- Where we are....
- The approval process
- Test and standards
- Partial Internal models
- Supervisory reporting and public disclosure
- Work in progress
- Questions
Where we are....

- March 09
  - **CP37** – Procedure to be followed for the approval of an Internal Model

- July 09
  - **Addendum to CP37** – Specificities to the approval process for groups
  - **CP56** – Tests and Standards for Internal Model Approval
  - **CP58** – Reporting (includes supervisory reporting and public disclosure related to Internal Models)

- October 09
  - **Partial Internal Models**
    - Integration of partial internal models into the Standard Formula
    - Adaptations to the tests and standards for Internal Model Approval
    - Major business units
    - Justification about the limited scope of the internal model

- January 10
  - **CEIOPS Guidance on the pre-application** (both at solo and group level)
The Approval Process

- Pre-Application
- Application *
- Assessment
- Decision

* Includes the model change policy
What does this mean in practice?

- Approval is not based on undertaking’s chosen software platform
  - Nor is it simply based on the number generated by the undertaking’s model

- Approval is required at the level of the model itself – i.e. its scope, coverage, design, build, integrity and application
  - To embed the model into the business, undertakings first have to embed the business into their models
Internal Models Framework

**Internal Models Framework**

**Internal model** (in the wider risk management sense)
- use test
- actions / steering
- internal risk control functions
- reporting / monitoring

**Actuarial model** (in the narrow sense)
- risk exposure data
- risk driver data
- forecasts for P&L distributions

**SCR** (regulatory capital)
- Pillar-2 adjustment
- SCR estimate
- adjusted SCR

**Statistical quality test**

**Myth 1**: Main use is regulatory -> internal use more important
**Myth 2**: Main goal is computation of SCR
  -> SCR/EC = “airbag”: just one aspect of car safety
**Myth 3**: One risk measure
  -> distributions & several risk measures/metrics for reporting
Pre-application

- Provides undertakings the opportunity to liaise with the supervisory authorities as they develop their internal models

- Recommended by CEIOPS

- Supervisor gives view on how prepared firm is to submit application
Application

- **Formal application**
  - Documentary evidence that requirements are met (art. 110.3)
  - The administrative or management bodies have overall responsibility for application – role of internal committees (art. 114.1)
  - Systems must be in place to ensure internal model operates properly on a continuous basis (art. 114.2)
  - Internal model governance policies (e.g. policy for changing the full and partial internal model (art. 113))

- **Supervisors shall decide on the application within six months** (art. 110.4)
  - reason for rejection must be provided (art. 110.6)

- **Supervisor may require the firm to provide an estimate of the SCR determined in accordance with the standard approach** (art. 110.7)
Model Change Policy

- Responsibility of the firm
- Model extensions excluded from model change policy, and subject to approval process
- In exceptional circumstances, supervisors may grant conditional approval of major changes
- Minor changes reported to supervisor at least quarterly
Assessment and Decision

- **Assessment**
  - Iterative process, possibly resulting in model modifications
  - Components and processes in the assessment

- **Decision**
  - Approval may be subject to “terms and conditions”
  - Limited approval
  - Waiting period
  - Disclosure of permission to use internal model
Undertakings need to evidence…

- Use test (art. 118)
- Statistical quality standards (art. 119)
- Calibration standards (art. 120)
- Profit and Loss Attribution (art. 121)
- Validation standards (art. 122)
- Documentation standards (art. 123)
- An adequate system for identifying, measuring, monitoring, managing and reporting risk

- Requirements shall not be considered in isolation – interrelations shall not be ignored

- Use of external models and data does not exempt insurers from any of the requirements (art. 124)
CP56 – Tests and Standards

Contents

- Introduction
- Legal Basis
- Use Test
- Internal Model Governance
- Statistical Quality Standards
- Calibration Standards
- Profit and Loss Attribution
- Validation
- Documentation
- External Models and Data
- Impact Assessments
CP56 – Use Test and Governance

- **Use test**
  - Lists v Principles
  - Foundation Principle
  - Frequency of calculation
  - Example uses

- **IM Governance**
  - Related to IM only – general governance covered in CP33
  - “High level” v “Detailed IM” governance
  - Group IM governance
- Definition of “probability distribution forecast”
- Data policy
- Expert judgement
- Model Coverage
- Aggregation, and link to pdf
CP56 – Calibration standards

- Use of different risk measures / time horizons
- Derivation of the SCR from the pdf
- Showing equivalence
- Benchmark portfolios
CP56 – Validation and P&L Attribution

- **Validation**
  - Validation policy
  - Testing results against experience
  - Robustness of the model
  - Scenario testing

- **P&L Attribution**
  - Business unit will be considered under PIM advice
  - Links between validation and use test
CP56 – Documentation

- Design and operational details
- Compliance with Article 118 – 122
- Detailed outline of theory, assumptions and mathematical basis
- Circumstances under which the IM does not work effectively
- Major changes
CP56 – External Models and Data

- Must be suitable to firm’s risk profile
- Need to demonstrate thorough understanding of external models / data
- Clear strategies for reviewing performance of models and integrity of data
- Recognise risks arising from use of external models / data
Addendum to CP37

- Pre-Application - scope is very important
- Application
  - Additional info in the group application pack
  - Language of the application
- Model Change - additional undertakings to be treated as model extensions
- Assessment - assessment of scope
- Decision - same as for solos
CP58 – Internal Model public disclosure

- Underlying principle
- Qualitative information
  - Governance and risk management
  - Use
  - Scope and model coverage
  - Risk measures, confidence level, time horizon
  - Methodologies
  - Data
  - Risk mitigation activities
  - Operational performance
  - Validation activities
  - Documentation
- Quantitative information
  - SCR
  - Reconciliation to last reporting period
  - Validation analysis
CP58 – Internal Model supervisory reporting

- In addition to the RTS
- Further qualitative and quantitative criteria
- Further requirements on economic capital, and reconciliation with SCR
Work in progress...

- Integration of PIM with the standard formula
  - 3 options with different levels of freedom
  - Feasibility test and Appropriateness test
  - Level 3 methods

- Guidance on the pre-application

- 2nd wave of pre-visits

- Identification of areas where Level 3 guidance may be appropriate
Conclusions…

- Planning – “failing to plan is planning to fail…”
  - Resources
  - Data
  - Senior management engagement and commitment
  - Pre-application

- Multi-disciplinary teams are needed – “internal modelling activities cannot be delegated only to actuaries”

- Proportionality “internal models are not only for large and very sophisticated firms”

- Read all IM-related CEIOPS material, but… “requirements shall not be considered in isolation – interrelations shall not be ignored” so don’t focus only on individual chapters….