

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



The diagram illustrates the approval process as a sequence of four steps, each represented by a blue chevron-shaped arrow pointing to the right. The steps are: Pre-Application, Application *, Assessment, and Decision. The arrows are connected by a white line, and the entire process is set against a background of light green, swirling, abstract shapes.

Pre-Application

Application *

Assessment

Decision

* Includes the model change policy

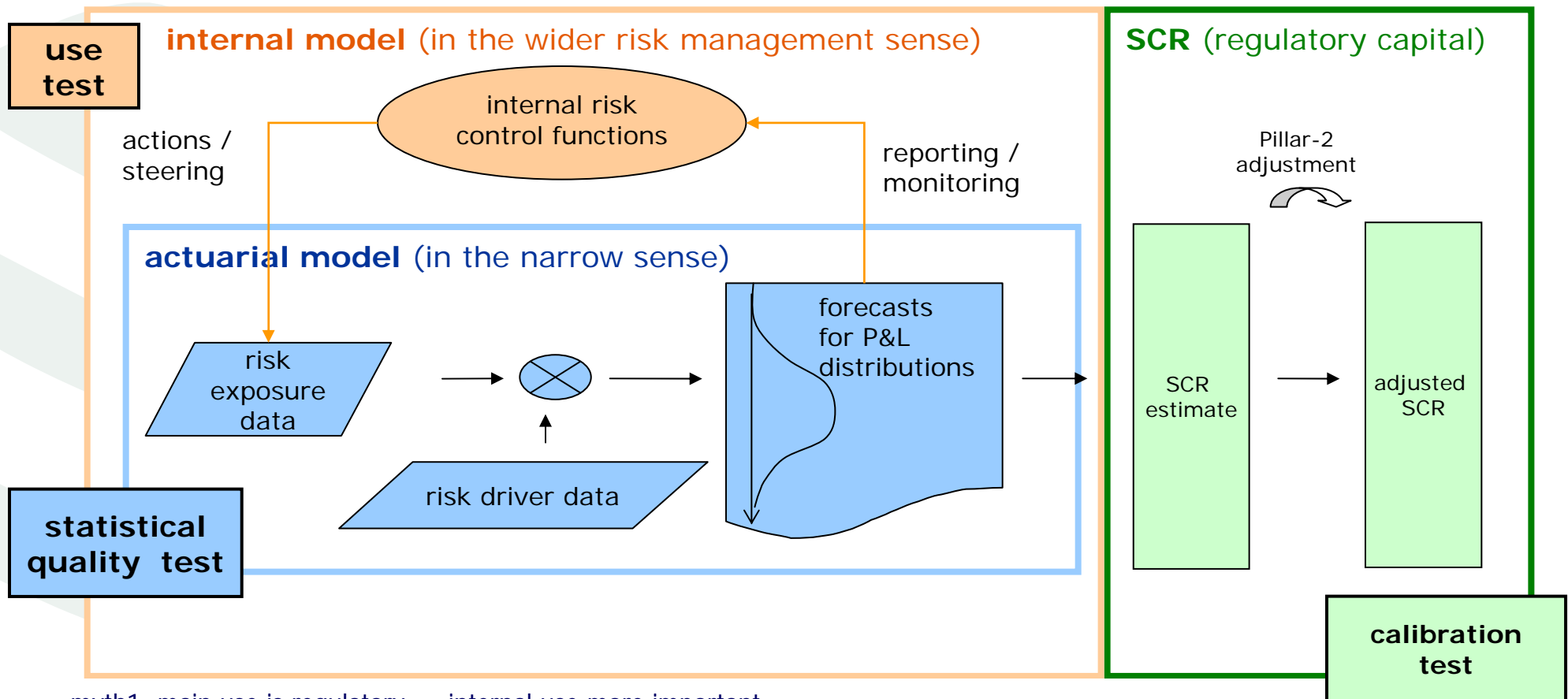
What does this mean in practice?



- 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



- myth1: main use is regulatory -> internal use more important
- myth2: main goal is computation of SCR
 - > SCR/EC = "airbag": just one aspect of car safety
- myth3: one risk measure
 - > distributions & several risk measures/metrics for reporting

- 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

- **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
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- 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

CP56 – Statistical Quality Standards



- 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

■ 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

- 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....

