

A decorative graphic consisting of two parallel, curved lines that sweep across the top of the slide. The inner line is dark blue and the outer line is yellow.

# Validation in Life Modeling

*a supervisory point of view*

Lyon – 06/10/2015

# Introduction

- ❑ **« Validation » means the internal process set up by insurance undertakings to consider their model « fit for use »**
- ❑ **Validation doesn't means the process set up by supervisors to consider model used by undertakings « compliant with legal requirements »**

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# 1. Validation of models – Regulatory references

	Best Estimate Modeling	SCR Modeling
<b>Solvency II Directive</b>	-	Articles 44 (risk management function) – 124 (IM validation) – 125 (IM documentation)
<b>Delegated acts</b>	Articles 264 (TP validation) – 265 (TP documentation) – 272 (actuarial function)	Articles 241 (Validation Process) – 242 (Validation Tools)
<b>EIOPA Guidelines</b>	Valuation of technical provisions : Guideline 8 and Section 5	Use of internal models Chapter 9 : Guidelines 32 to 42

- **Solvency II Directive** : Directive 2009/138/EC on the taking-up and pursuit of the business of Insurance and Reinsurance.
- **Delegated Acts** : Commission delegated regulation (EU) 2015/35
- **EIOPA Guidelines** : Guidelines on the use of internal models (EIOPA-BoS-14/180) - Guidelines on the valuation of technical provisions (EIOPA-BoS-14/166)

# 1. Validation of models – Regulatory requirements

## □ Objectives and roles

Best Estimate Modeling	SCR Modeling
« in order to ensure that the valuation of TP is carried out in compliance with articles 76 to 85... the system of governance of undertakings should include a validation process of the calculation of TP »	Demonstrate that the SCR resulting from the use of an internal model is appropriate
The process is coordinated by the <b>actuarial function</b>	Use of an effective statistical process
	<b>Risk management function</b> responsibility – Independence with persons in charge of developing and operating the model

# 1. Validation of models – Regulatory requirements

## □ Scope and frequency

Best Estimate Modeling	SCR Modeling
Exhaustive : Both quantitative and qualitative validation	
Quantitative scope : Data – Assumptions – Methods - results	
	Model Scope when Partial model
Qualitative scope : Documentation – Use (including communication of results)	
At least once a year - where there are indications that something is no longer appropriate	Regular cycle – at least annually

# 1. Validation of models – Regulatory requirements

## □ Processes

Best Estimate Modeling	SCR Modeling
Dynamic process that should be refined periodically when experience is gained from previous validation processes	External or internal process provided that independence is assessed
	Explicit process to be designed for each circumstances that could trigger a new validation process
The validation process should be proportionate considering the significance of assumptions, approximations and methods	Identification of person responsible for each task in the validation process
	Explicit « solution process » to be designed when validation raised an issue

# 1. Validation of models – Regulatory requirements

## □ Tools

Best Estimate Modeling	SCR Modeling
Comparison against experience	
The actuarial function should analyse experience variance, explains sources of deviations and make recommendation on assumptions or model changes if the deviations appears to be permanent	Comparison to other data if relevant
	Stability test on the outputs
	(reverse) Stress tests
	Sensitivity tests of key assumptions



# 1. Validation of models – Regulatory requirements

## □ Documentation

Best Estimate Modeling	SCR Modeling
Validation should be documented Process - Approach - Tests Results	
Main findings and recommendations should be communicated to the AMSB through the actuarial function report	Existence of a Validation report – to be included in the IM application process for supervisors

## 2. Validation in life modeling – best practices examples

### ❑ Back-testing of future discretionary benefits

- Check that credited rate in the model is coherent with the observed one

	Credited rate YE2013	Credited rate YE2014	Credited rate YE2015
Model YE2012	x	x	x
Model YE2013		x	x
Model YE2014			x
Observed	x	x	x

## 2. Validation in life modeling – best practices examples

### □ Testing granularity of model points

- Aggregation of ages, minimum guaranteed rate... could have an impact on the best estimate
- Tests should be performed to assess this impact  
-> Comparison of the best estimate with a best estimate calculated with non aggregated model points
- This tests can be performed only on a representative perimeter

## 2. Validation in life modeling – best practices examples

### □ For one risk factor (lapse, mortality, longevity) :

- For each risk, testing different model and distribution (student, normal)
- Testing the choice of the length of time series used for the calibration and the granularity (monthly/annual)
- The materiality of risk component not modeled (volatility, level, trend, mass)
- Perimetre on which the stress is applied

## 2. Validation in life modeling – best practices examples

### □ Approximation of best estimate for SCR computation :

- Validation should ensure that tests have been performed to assess on several scenarios how close the approximated BE is to the « real » BE
- Not only around SCR scenario, but considering the full distribution
- Complementary tests could be done if necessary

# 3. Validation in life modeling – Perspectives

## □ Validation has to be a « Global » process

- Validation process has to assess the overall uncertainty embedded in the modeling
- Validation process shall be aligned with senior management expectations. Overall statement better than any details.
- Granular and individual tests are often of poor interest. Life modeling in insurance is a multidimensional topic
- Stop the « red, amber, green » grids which bias the validation process to an only « kill the red issue » exercise.

**The validation process output shall be an « uncertainty bill » presented to the senior management in addition to model results**

# 3. Validation in life modeling – Perspectives

- ❑ **Validation has to go beyond checking datas and assumptions.**
  - Alternative methods shall be considered regularly.
  - Even so-called « market practice » methods shall be challenged.

**A relevant Validation process shall involve experts**

# 3. Validation in life modeling – Perspectives

## ❑ Validation process for Best estimate computation still imature.

- Not really in place yet. Lot of time spent on modeling itself for the time being.
- Not a real challenge to models in place. More a annual exercice to sign off results.
- Not a real independent process. Person in charge of validation too close to person in charge of development

**Experience gathered in SCR's models validation shall influence BE's models validation**



# 3. Validation in life modeling – Perspectives

## □ Validation process costs and benefits analysis

- **Costs** : additional steps in results sign-off process, need to hire additional experts or use external expertise
- **Benefits** : mitigate risk of errors, mitigate risk of regulatory non-compliance
- Validation creates an uncertainty culture that helps go beyond « all model are false ». Cost or benefit ?
- Danger : spend the extra cost, with no benefit
- Supervisory point of view : If modeling budget is frozen and no real validation process exists yet, reallocation from development to validation.