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# ORSA for Actuaries

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# Agenda

- ORSA regulation and principles
- ORSA process
- ORSA related tasks for actuaries
  - Planning
  - Risk assessment
  - Risk projections

# Own risk and solvency assessment (ORSA)

—  
regulation and principles

## Directive (L1)

- One of the reasons for Solvency II (36)
- Article 36 – Supervisory review process – ORSA should be in particular followed
- Article 45 – Own risk and solvency assessment
- Article 246 – Supervision of the system of governance – ORSA to be followed also on group level

## Delegated acts (L2)

- Own funds – classification of own funds – ORSA should contribute
- Should participate on covering all risks by risk management system
- Mostly mentioned as part of reporting requirements

## Guidelines on ORSA (L3)

- Guideline 1 – Principle of proportionality
- Guideline 2 – Role of the AMSB
- Guideline 3 – Documentation
- Guideline 4 – ORSA policy
- Guideline 5 – General rule of ORSA evidence
- Guideline 6 – Internal report on ORSA
- Guideline 7 – Valuation and recognition

- Guideline 8 – Assessment of the overall solvency needs
- Guideline 9 – Forward-looking perspective
- Guideline 10 – Regulatory capital requirements
- Guideline 11 – Technical provisions
- Guideline 12 – Deviations from assumptions underlying the SCR calculation
- Guideline 13 – Link to the strategic management process and decision-making framework
- Guideline 14 – Frequency of the ORSA
- Guideline 15 – Scope of the group ORSA
- Guideline 16 – Reporting to the supervisory authorities
- Guideline 17 – Assessment of overall solvency needs
- Guideline 18- General rule for group ORSA
- Guideline 19 – Specific requirements for a single ORSA document covering the participating insurance or reinsurance undertaking or the insurance holding company and any subsidiary in the group
- Guideline 20 – Internal model users
- Guideline 21 – Integration of related third-country insurance and re-insurance undertakings

**The main purpose of the ORSA is to ensure that the undertaking engages in the process of assessing all the risks inherent in its business and determines its corresponding capital needs.**

- **To achieve this, an undertaking must have adequate, robust processes for assessing, monitoring and measuring its risks and overall solvency needs**, while ensuring that the output from the assessment is embedded into the decision making processes of the undertaking.
- **An undertaking cannot simply rely on the regulatory capital requirements to be adequate for its business and risk profile.** An essential part of risk management involves the undertaking performing its own assessment of the own funds (including amount, quality, etc.) it needs to hold in view of its particular risk exposure and business objectives. Since the risks the undertaking is exposed to translate into solvency needs, looking at risk and capital management separately is not appropriate.
- **As the overall solvency needs assessment is an undertaking's own analysis, undertakings have flexibility in this assessment.** However, supervisory expectations are more specific with regard to the continuous compliance with the regulatory capital and technical provisions and the assessment of any deviation between the undertaking's risk profile and the assumptions underlying the SCR calculation.
- **The undertaking is also expected to consider whether the SCR, calculated with the standard formula or an internal model, would be appropriate according to the undertaking's risk profile.**

## Proportionality principle

- An undertaking's assessment of its overall solvency needs **does not necessarily call for the use of a complex approach.**
- The methods employed may range **from simple stress tests to more or less sophisticated economic capital models.**
  - Where such economic capital models are being used, they **do not need to meet the requirements** for the use of internal models for the calculation of the SCR.

## All material risks are considered

- The assessment covers all material risks, including non-quantifiable risks like reputational risk or strategic risk, amongst others.

## Capital is not the only way

- In its assessment of the overall solvency needs an undertaking could decide not to use capital as a buffer for all its quantifiable risks but to manage and mitigate those risks by other means (e.g. management actions).

## Compliance with capital requirement

- The undertaking has to comply **on a continuous basis** with the Solvency II regulatory capital requirements.
- The assessment includes at least
  - the potential future material changes in the risk profile;
  - the quantity and quality of its own funds over the whole of its business planning period or period relevant for the present/coming risks; and
  - the composition of own funds across tiers and how this composition may change as a result of redemption, repayment and maturity dates during its business planning period.

## Deviations from assumptions underlying the SCR calculation

- The assessment of the significance with which the risk profile of the undertaking deviates from the assumptions underlying the SCR calculation ensures that **the undertaking understands the assumptions underlying its SCR calculation and considers whether those assumptions are appropriate.**
- To do this, the undertaking will have to compare those assumptions with its own understanding of its risk profile. **This process needs to prevent an undertaking from simply relying upon regulatory capital requirements as being adequate for its business.**



### Overall solvency need assessment

- The assessment of the overall solvency needs is expected to at least:
  - Reflect the material risks arising from all assets and liabilities, including intra-group and off-balance sheet arrangements;
  - Reflect the undertaking's management practices, systems and controls including the use of risk mitigation techniques;
  - Assess the quality of processes and inputs, in particular the adequacy of the undertaking's system of governance, taking into consideration risks that may arise from inadequacies or deficiencies;
  - Connect business planning to solvency needs;
  - Include explicit identification of possible future scenarios;
  - Address potential external stress; and
  - Use a valuation basis that is consistent throughout the overall solvency needs assessment.
- The assessment could take several forms.
  - It could be pure quantification based on quantitative methodologies or
  - an estimated value or range of values which are based on particular assumptions or scenarios,
  - or it could be more or less judgemental.
- **It is, however, required that the undertaking demonstrates the rationale for the assessment.**



### „Use test“

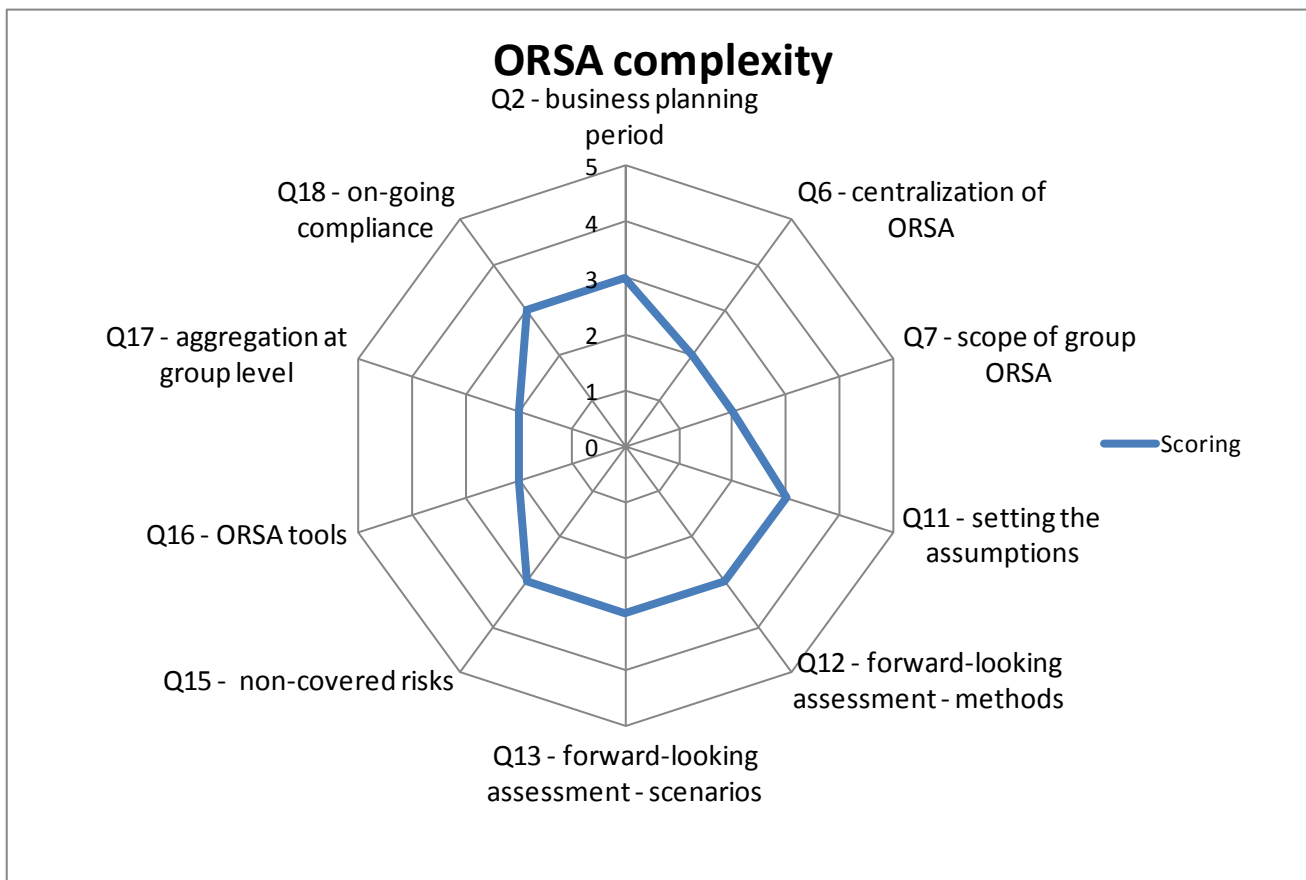
- The undertaking takes into account the results of the forward looking assessment of the undertaking’s own risks and the insights gained during the process of this assessment in at least:
- its capital management;
- its business planning; and
- its product development and design

### ORSA

- Ensures that management pays appropriate attention to the risks and enables it to do so.
- Connects all areas of Risk-Capital-Return to provide comprehensive view on the company’s performance.
- Has many cultural as well as detailed technical requirements on availability of specific information and its use in steering the company.

ORSA requirements	Technical	Cultural
<b>Information</b>	Availability of the specific information and its supply to the users.	Active use of this specific information.
	Documentation of the production of this information.	Documentation of the use of this information.
<b>Activity</b>	Risk management – provides comprehensive assessment of the risks surrounding the company – current and future view, stress testing and scenario analysis.	Steering processes – considers risk information on a routine basis.
	Actuarial – supplies calculated results together with calculations adequacy assessments.	Everyone in the company has part in risk management and internal control .
	Internal Control – provides comprehensive operational information on achieving company’s goals.	

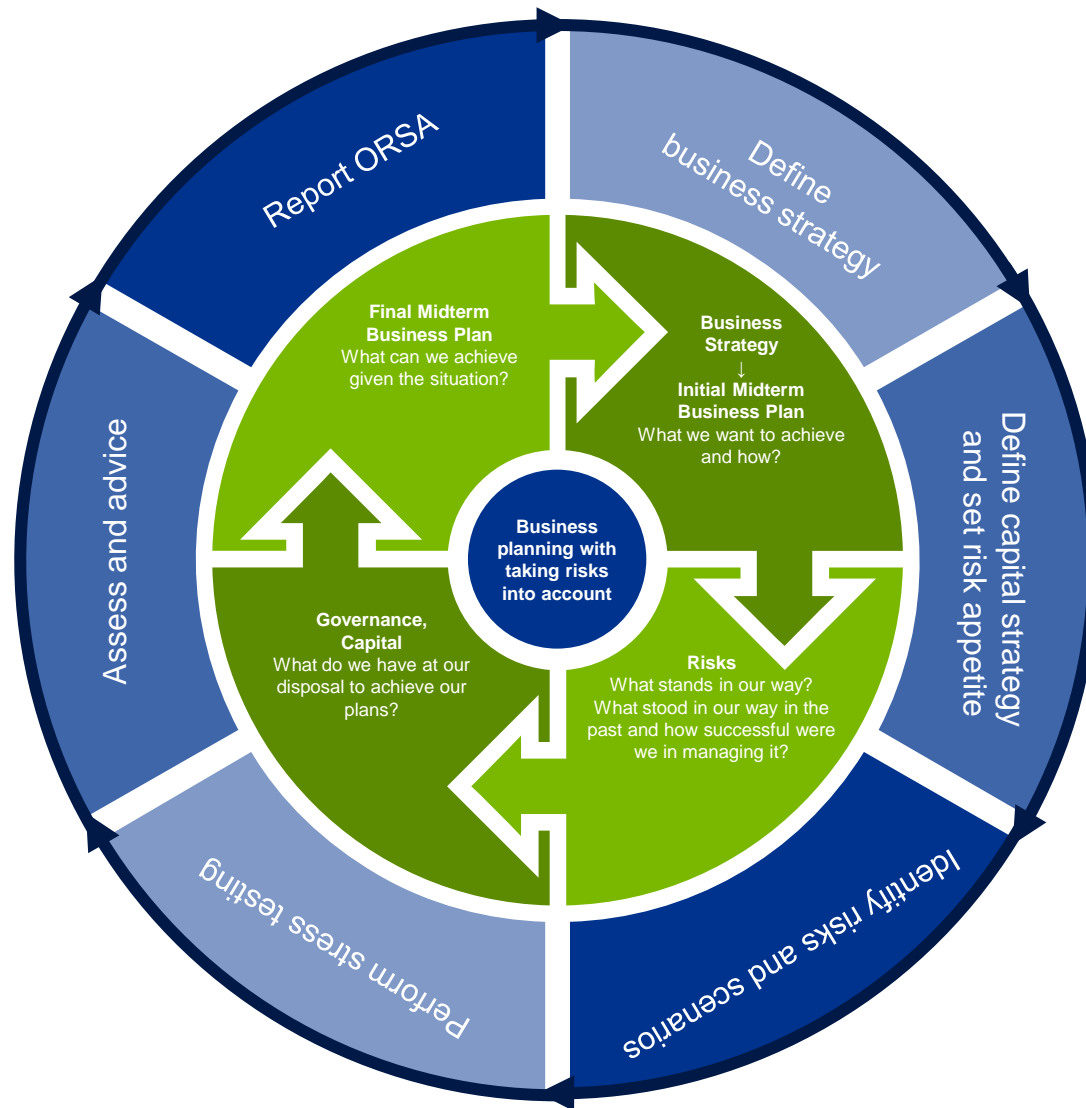
# ORSA especially has to fit ones real needs...



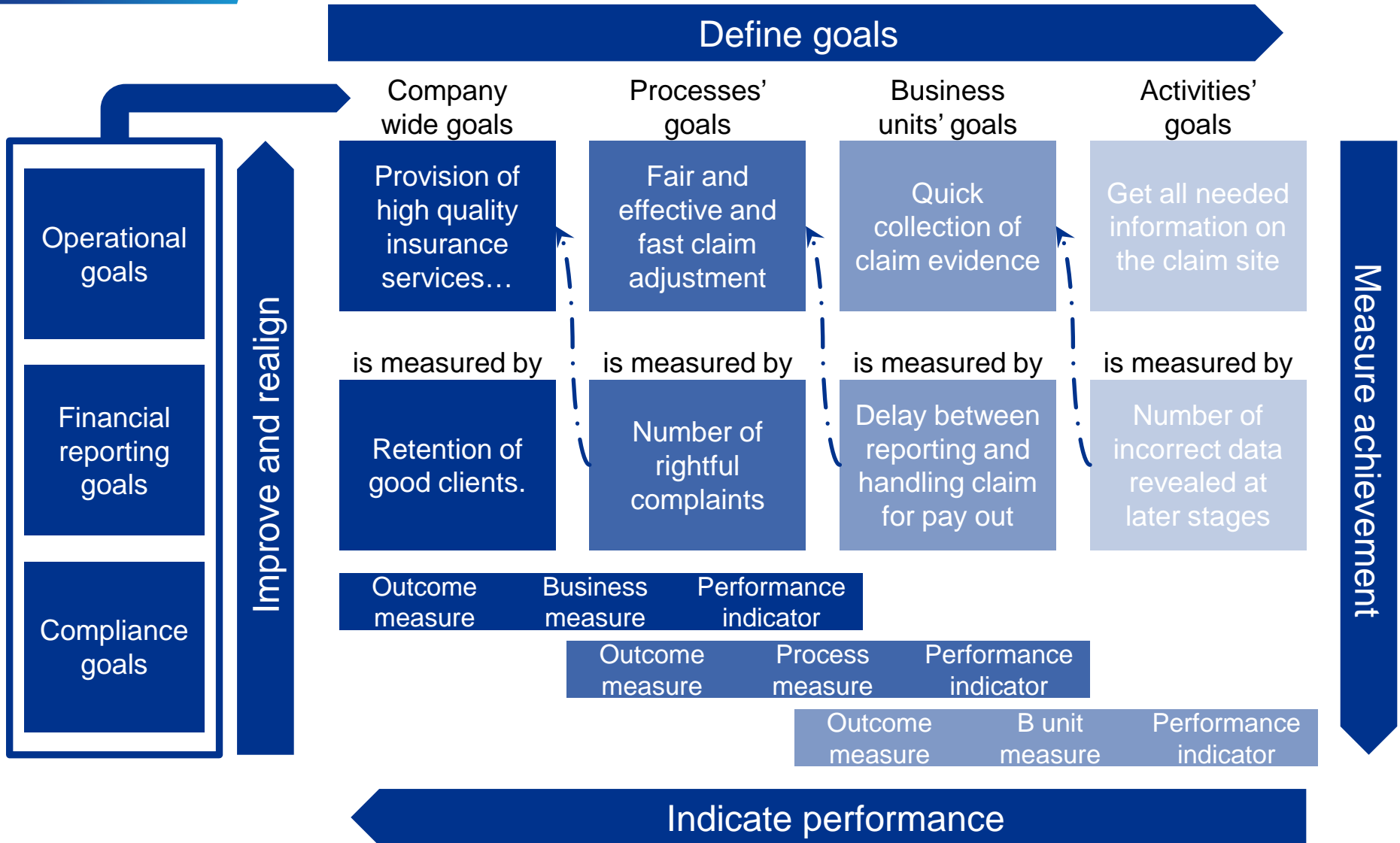


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# ORSA process



# Define business, capital and risk strategies



## Risk profile assessment

- Risks identification including emerging risks
  - Task for business units as part of regular process.
  - Closely related to internal control system (ICS).
- Risks assessment
  - Quantification of risks – models, assessments...
  - Identification of scenarios and stresses to evaluate risk impacts.

## Calculations adequacy assessment

- Evaluation of adequacy and scope of risks and TP quantification methods, calculations and assumptions
- Calculations sensitivities analyses.

## Continuous compliance

- Ongoing compliance with capital requirements – own funds, SCR, TP.
- Related to risk appetite, capital allocation, risk limits and ICS.



## Business plan

- Base realistic planning scenario for the planning period.
- More pessimistic yet realistic scenarios of potential future.
- Sufficient detail to project own funds and EC/SCR.

## Stress tests and scenario analyses

- On top of business planning scenarios apply stresses and adverse scenarios.
- Scenarios and stresses may be identified as part of the risk profile assessment and further developed as part of projecting future.
- Reverse stress testing – identification of circumstances leading to bankruptcy.

## Project future

- Project economic capital, solvency capital requirement and own funds under various future scenarios.
- Projections need to reflect current risk profile.





### Corrections to the business plan

- Planning with ORSA is an iterative process.
- ORSA results affect steering of the company.

### Contingency planning

- ORSA shall identify circumstances under which specific management actions are needed.
- As part of the ORSA process those actions should be planned in a sufficient detail to ease their use at the time of need.

### Adjustments to the processes

- ORSA reveals shortcomings of the risk management processes and proposes measures for improvement.



## Documentation of the ORSA process

- Documentation of risk management processes contributing to the ORSA should be itself in a sufficient detail to comply with ORSA requirements.

## ORSA report

- Static part – References to documentation produced by various risk management processes – RCSA, risk limitation, calculation assessments, ...
- Dynamic part – Current risk profile summary, identified future stresses and scenarios, future projections and identified management actions, iterations of business plan...
- Internal and regulatory versions of the report.

**SFCR**

**RSR**



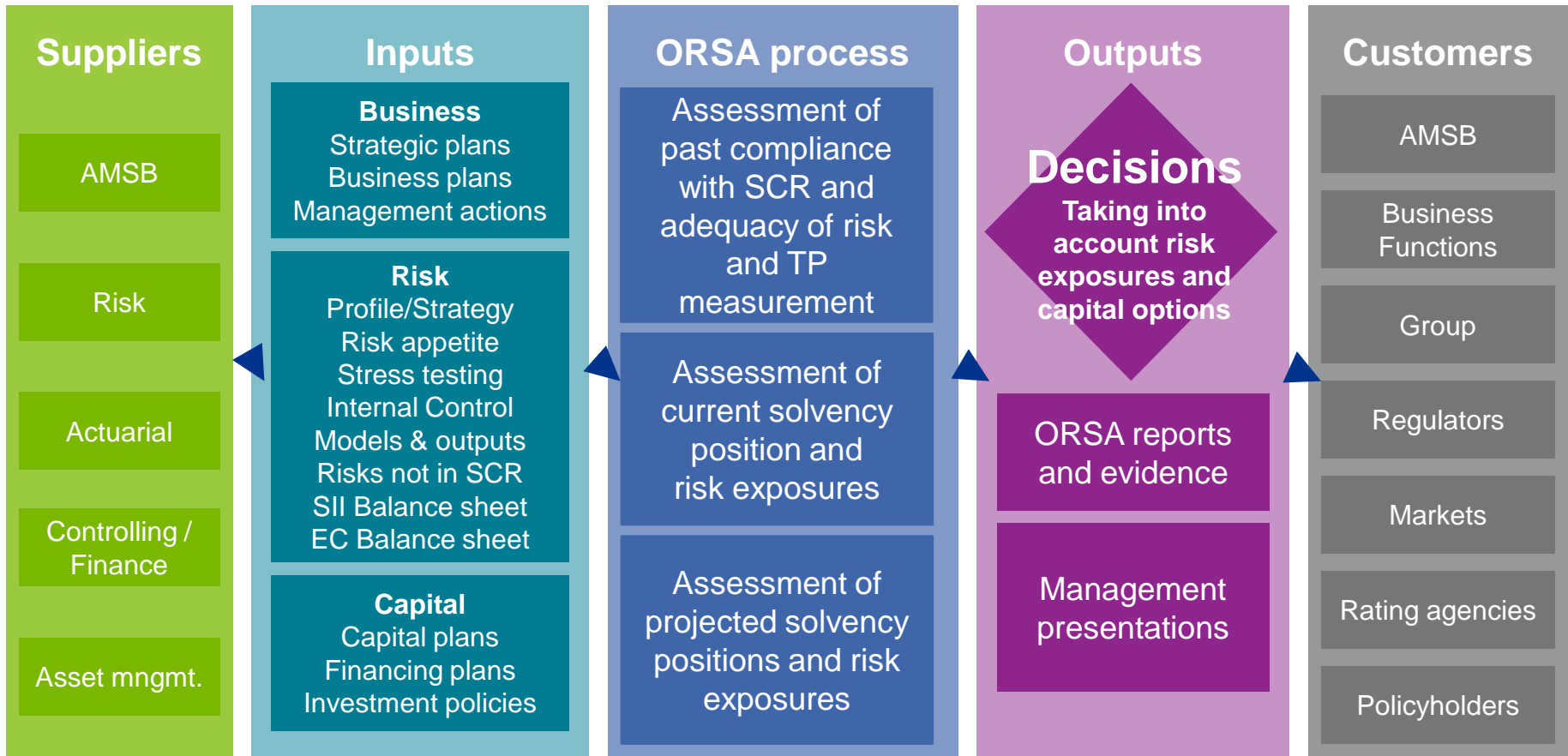
**Requirement to thoroughly document the ORSA process does not mean necessarily specific ORSA documentation.**

**The aim of the documentation is to have an “audit trail” which enables a knowledgeable third party to reconstruct an individual ORSA to determine**

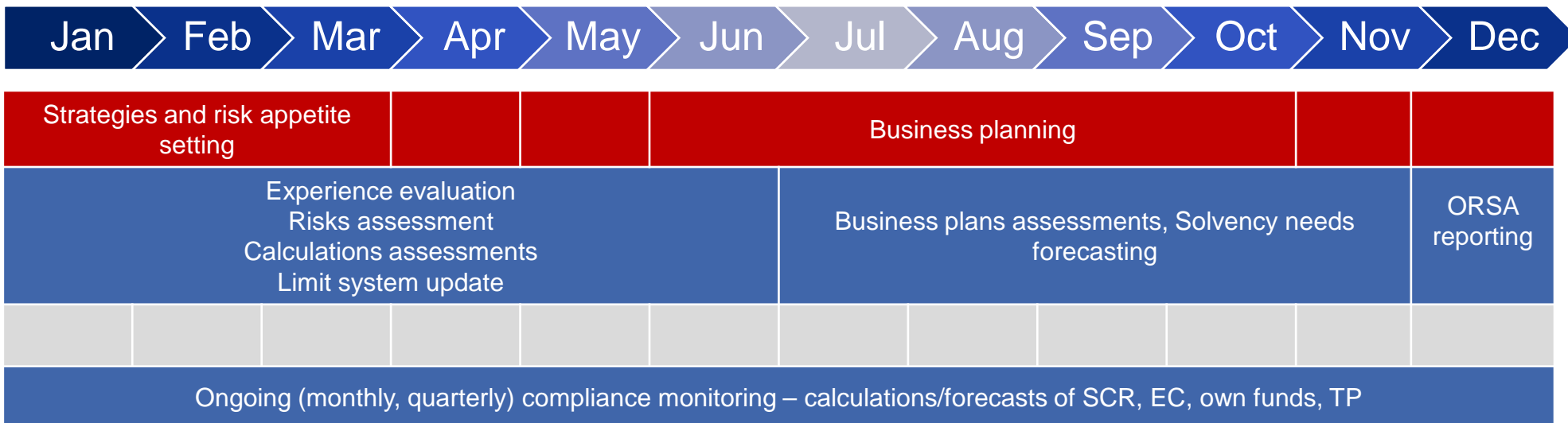
- What input data were used;
- What assumptions were used;
- What were the outputs of the ORSA;
- How the outputs were devised.

Likely to be ready	ORSA specific
Inputs	Outputs of the ORSA
Monitoring results	Derivation of the ORSA outputs – use of ORSA inputs
Calculation adequacy assessments	
Risk profile assessments	

## Governance - ORSA policy



## ORSA supporting processes/ infrastructure



### No clear guidance from EIOPA

Supervisory ORSA report is not included in the “reporting package” (QRTs, RSR, SFCR) – undertakings are free to decide when to perform ORSA

### Need to connect ORSA to the

- Business planning process
- Capital planning process

Business tasks

ORSA tasks

# ORSA related tasks for actuaries

## What does the business planning mean?

- Translating strategy into real business plan
- Projecting financial statements under IFRS 4 and transforms them to Solvency II accounts
- Projecting risk drivers / risk factors used for the capital need projections
- Projecting inputs for calculation of MCR in future time steps

## Focus on projection of:

- Portfolio composition – clients/products
- Technical provisions
- Investments based on the selected investment strategy

## Necessary inputs to planning

- General inputs
  - Investment strategy – target split of asset portfolio, duration and ratings of bonds
  - Economic assumptions – discount rates, spreads, yields on asset classes, Economic scenarios
- Line of business specific inputs and calculations
  - Inputs
    - Development of portfolio
    - Claim development
    - Costs and commissions
    - Reinsurance characteristics
- List of assets currently held by the company with characteristics necessary for revaluation in future time steps
- Algorithms for rebalancing the assets based on selected investment strategy, revaluation of the assets and development of the liabilities



## Projection of technical provisions

- Best estimate at the end of the year  $t+i$  assessed in year  $t$  as discounted value of expected cash flows related to
  - Run-off of existing portfolio (VIF),
  - New business underwritten in future years ( $t+1, t+2, \dots, t+i$ ) (NB).

Projected cash flow for the existing as well as new business							
Year $t+1$	Year $t+2$	Year $t+3$		Year $t+i$	Year $t+i+1$	Year $t+i+2$	
$\Sigma$	$\Sigma$	$\Sigma$	$\Sigma$	$\Sigma$	$\Sigma$	$\Sigma$	$\Sigma$
VIF <sub>&lt;=t,t+1</sub>	VIF <sub>&lt;=t,t+2</sub>	VIF <sub>&lt;=t,t+3</sub>	...	VIF <sub>&lt;=t,t+i</sub>	VIF <sub>&lt;=t,t+i+1</sub>	VIF <sub>&lt;=t,t+i+2</sub>	...
NB <sub>t+1,t+1</sub>	NB <sub>t+1,t+2</sub>	NB <sub>t+1,t+3</sub>	...	NB <sub>t+1,t+i</sub>	NB <sub>t+1,t+i+1</sub>	NB <sub>t+1,t+i+2</sub>	...
	NB <sub>t+2,t+2</sub>	NB <sub>t+2,t+3</sub>	...	NB <sub>t+2,t+i</sub>	NB <sub>t+2,t+i+1</sub>	NB <sub>t+2,t+i+2</sub>	...
		NB <sub>t+3,t+3</sub>	...	NB <sub>t+3,t+i</sub>	NB <sub>t+3,t+i+1</sub>	NB <sub>t+3,t+i+2</sub>	...
			...	...	...	...	...
				NB <sub>t+i,t+i</sub>	NB <sub>t+i,t+i+1</sub>	NB <sub>t+i,t+i+2</sub>	...

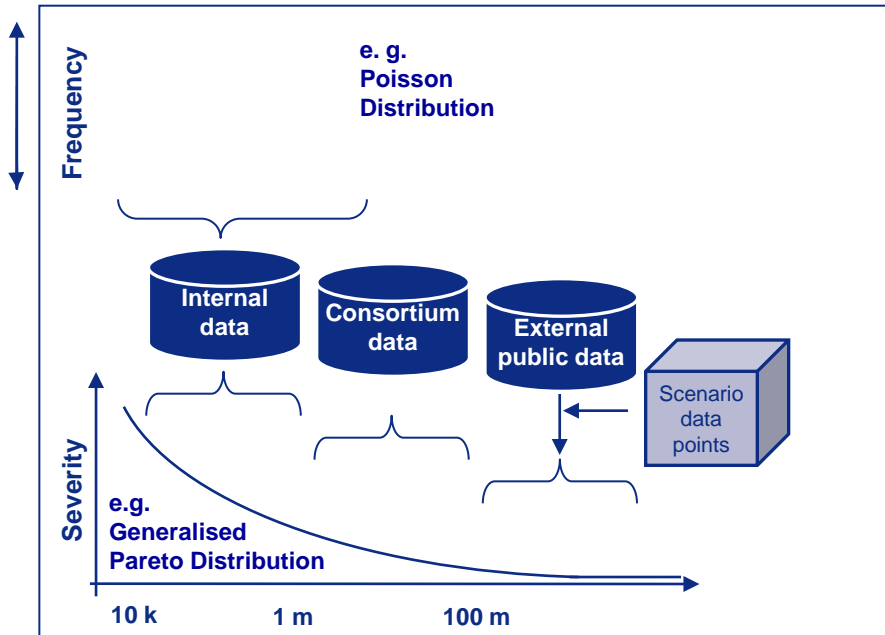
Note: The first index denotes the year of conclusion of business and second index refers to the cash flow period

- Risk margin
  - Cost-of-Capital method requires nested calculation of SCRs.
  - Proxy by risk driver extrapolation.

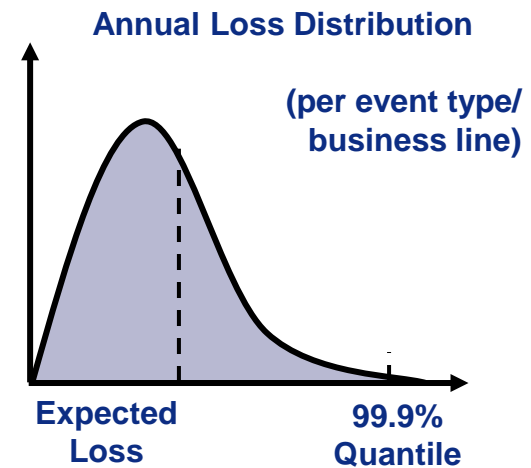
## Projection of assets

- Assumptions driven method of projection
  - The value of a certain asset class (e.g. bonds) in year  $t+i$  is set in year  $t$  as sum of following components:
    - The value of asset in year  $t$ .
    - Anticipated growth/decrease of the value of that assets within years  $t+1, \dots, t+i$  driven by change of the value of assets.
    - Anticipated portion of net cash flow in years  $t+1, \dots, t+i$  allocated to the asset class. Net cash flow corresponds to the projected development of liabilities.
- The investment strategy reflected by rebalancing of asset classes
- Projections using economic scenarios

- Deterministic Scenario analysis.
- Stochastic Modelling using Expert Judgement – advanced Deterministic scenario analysis.
- Stochastic Modelling using Loss Data
  - Internal and external loss data are used as primary model input.



- Frequency and severity are modelled separately
- Different data sources cover different parts of the severity distribution



- From the aggregated loss distribution required risk figures are derived
  - expected loss
  - VaR (e.g. 99.9%)

## Step 1 - consequences

Consider the potential consequences should the risk materialize:

- what would be the effect on the business (existing and future)
- what would be needed to restore original state of things,
- would there be some indirect expenses, etc?

Develop one or few, scenarios.

These might be pessimistic, best estimate and optimistic or at specific assessment points.

## Step 2 - probabilities

For individual scenarios consider the probability of them occurring in the period.

In statistical terms quantiles can be assigned to these scenarios to enable integration with other quantification methods used maybe for some other risks.

If the probabilities are incompatible with other quantification methods used, adjust the scenario to fit to predefined assessment points – 1/200, 1/100, ...

## Step 3 - losses

Consider and describe the loss amounts for individual scenarios.

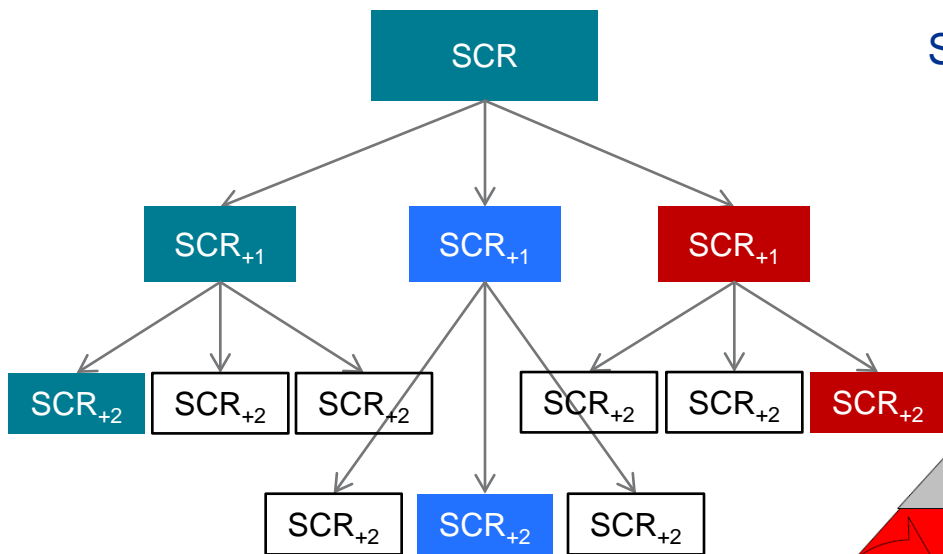
Estimates need to be based on the same time horizon as is used for quantification of other risks.

Estimation of financial impact of scenarios should include all payments like payments policyholders, suppliers or other additional costs to company.

Various levels of complexity of scenario analysis enable simple start and gradual development. Level of detail for risk quantification not prescribed – staying at higher level possible.

## Options:

- Estimates
- Scenario analyses and one year calculations
- Full multi-year internal model calculation

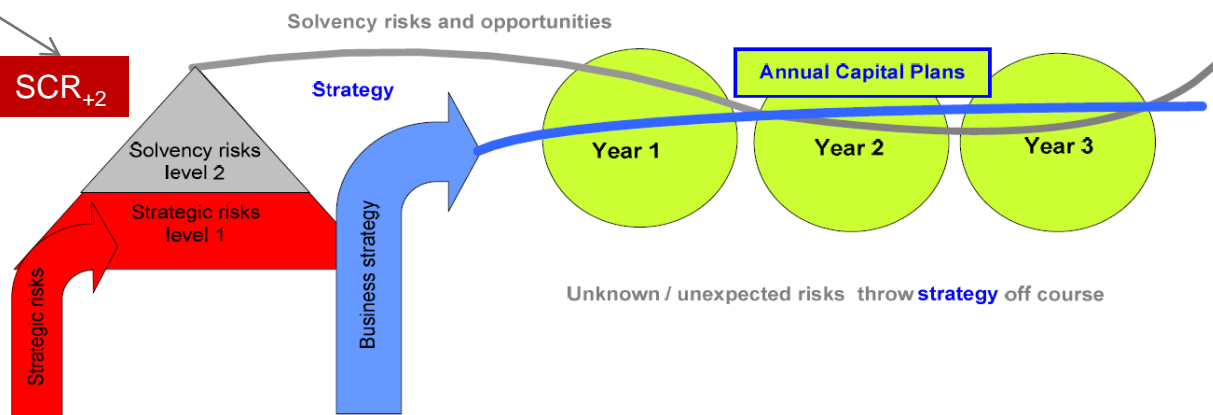


## General approach:

Step 1: 1-year capital calculation – best available calculation

Step 2: Chain together consecutive 1-year calculations: trends on volume, exposures, KRI, loss ratios, the insurance cycle → financing of preferred path for the business

Step 3: Apply shocks to central capital forecasts → contingency capital planning → studies of plan ROE and variability of ROE



## Estimates – SCR roll forward

- Simple risk drivers
  - Linear extrapolation of SCR/ECs for individual risk types from the last full calculation values based on development of selected risk drivers anticipated in given scenario.
  - The simplest and widely used market practice for projection of SCR/EC.
- General proxy function projection
  - General function using multiple risk drivers.
- Detailed risk drivers
  - Extrapolation of components of SCR/EC – stressed values – for individual risk types from last full calculation based on development of selected risk drivers anticipated in given scenario.

- The split of SCR to components is driven by the different character of the sub-risks included in the risk sub-module (e.g. different catastrophic risks, different asset classes, different lines of business)

## Chained full one year calculations

- Full SCR/EC calculations in each projection year based on the inputs as anticipated in a given business scenario.

## Multiyear projections

- Capital need is projected for longer time horizon that 1 year used in P1 calculations.
- Relieve of the requirement towards separability of the solvency needs outlook into individual projection years.
- Valuable mainly for internal model users.

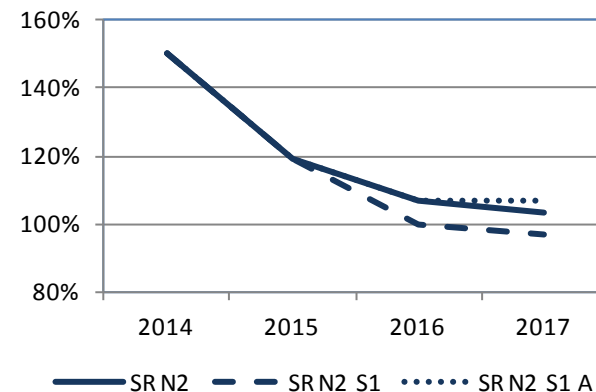
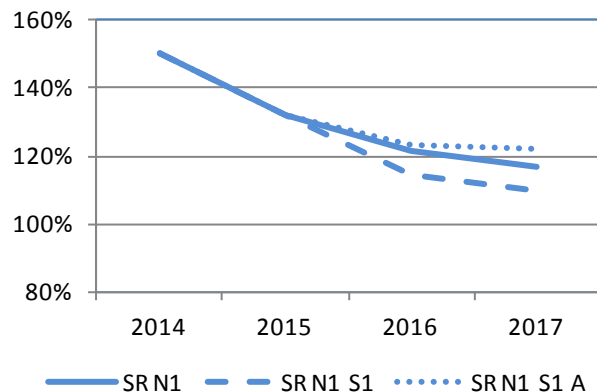
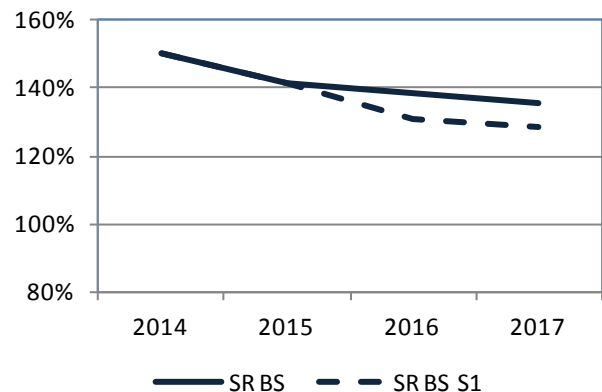
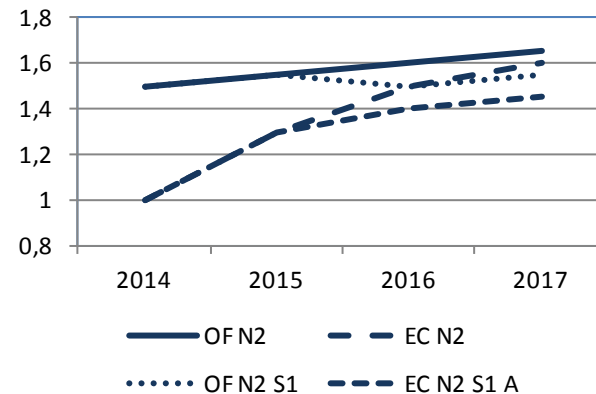
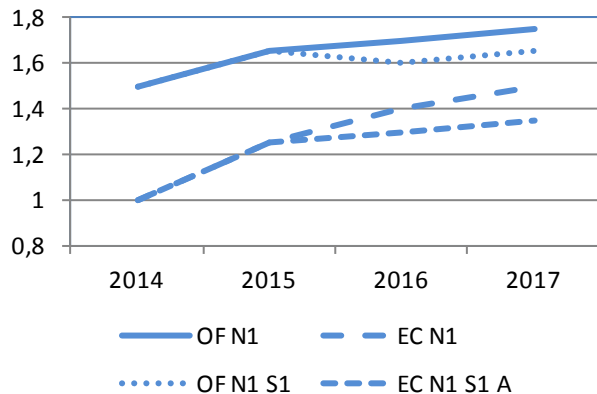
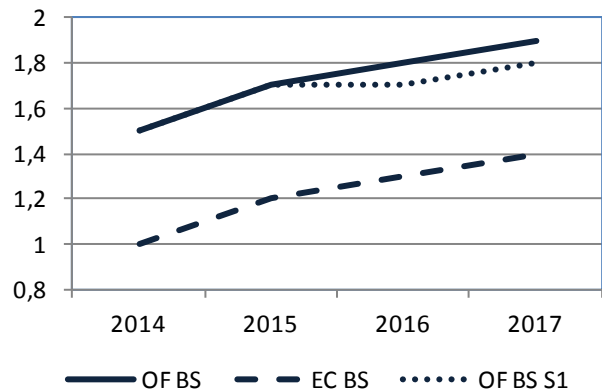
**Different projection methods can be used for different risks.**

### Companies from the capital need calculation perspective

- Internal model – to be used also for P2 capital
- Partial internal model – to be used also for P2 capital
- Standard formula users with own EC model – EC model for calculating P2 capital needs
- Standard formula users without any EC model – SF will likely serve also as a basis for P2 capital model development.
  - Projection on the level of SF module or Sub-module;
  - Full or detailed risk drivers calculations for important risks;
  - Simple risk drivers for less important risks;
  - No calculation for irrelevant risks;
  - Extension of standard formula by inclusion of risks not covered by standard formula.

**Validation and proper understanding of all components involved in the calculations and projections are key elements. Simpler methods more accessible for the decision makers are likely to be the right choice at the beginning.**

# Illustrative ORSA future projection results



OF – own funds, EC – economic capital, SR – solvency ratio, BS – base scenario, N1 negative scenario 1, N2 – negative scenario 2, S1 – scenario including stress 1, A – after management action





**Thank you**

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