

SOLVENCY II

Level 2 Implementing Measures

Executive Summary

Position After the Three Waves of Consultation Papers
and the Quantitative Impact Study 5 Technical
Specifications

August 2010



The data and information contained in this booklet is provided as a source of general information for our clients. This publication is not intended as advice. No liability for errors of fact or opinions contained herein is accepted.

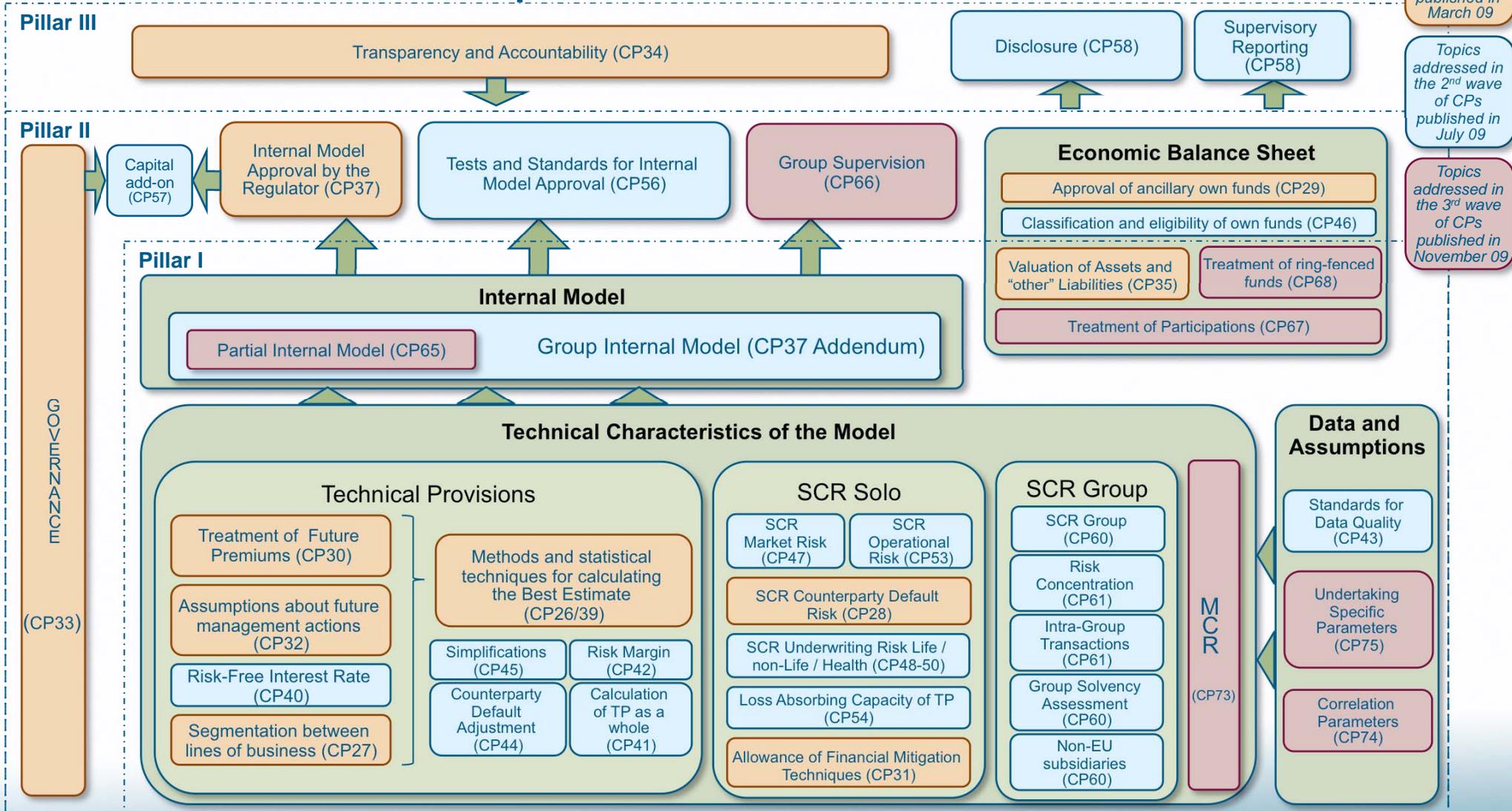
Copyright © 2010 Milliman, Inc.



Introduction

- Following the publication of the three waves of Consultation Papers (CPs) for Solvency II Level 2 implementing measures and the final technical specifications of QIS5, we have prepared this document, for senior managers and board members of (re)insurance companies, which summarises the main changes in the process leading to a Solvency II-compliant environment.
- This document is based around six main themes: **Economic Balance sheet, Data Management, Standard Formula, Internal Model, Risks Governance & Supervisory Review and Disclosure**. These are the main issues arising due to:
 - ❑ Their novelty compared to the current best practices
 - ❑ The strategic nature of the problems
 - ❑ The level of investment likely to be required to comply with the upcoming Solvency II framework
- The European Commission asked CEIOPS to launch a wide consultation process with the (re)insurance industry players:
 - ❑ A first wave of 12 consultation papers was published on 26 March 2009
 - ❑ A second wave of 24 consultation papers was published on 2 July 2009
 - ❑ A third wave of 17 consultation papers was published on 2 November 2009
 - ❑ The outcomes from these consultations assisted CEIOPS in issuing final advices to the Commission
 - ❑ The European Commission published QIS5 Technical Specifications on 6 July 2010
- The following diagram shows the main topics addressed in the Level 2 implementation measures, organised by theme, with the topics addressed in the 1st, 2nd and 3rd waves of CPs illustrated in orange, blue and red, respectively.

Overview of the Main Topics Addressed in the Level 2 Implementation Measures



Economic Balance Sheet

CP 26 – Technical Provisions – Methods and Techniques for calculating the Best Estimate

CP27 – Segmentation

CP30 – Treatment of Future Premiums

CP35 – Valuation of Assets and ‘other Liabilities’

CP39 – Technical Provisions – Actuarial and statistical methodologies to calculate the Best Estimate (BE)

CP42 – Calculation of the Risk Margin

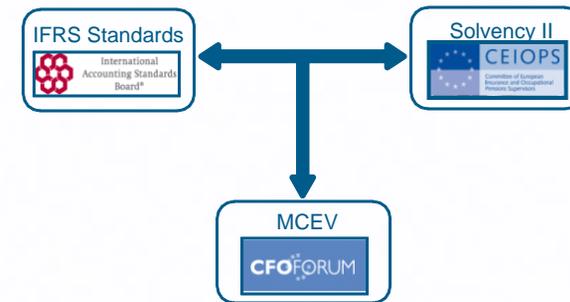
CP46 – Classification and Eligibility of own funds

QIS5 – Technical Specifications

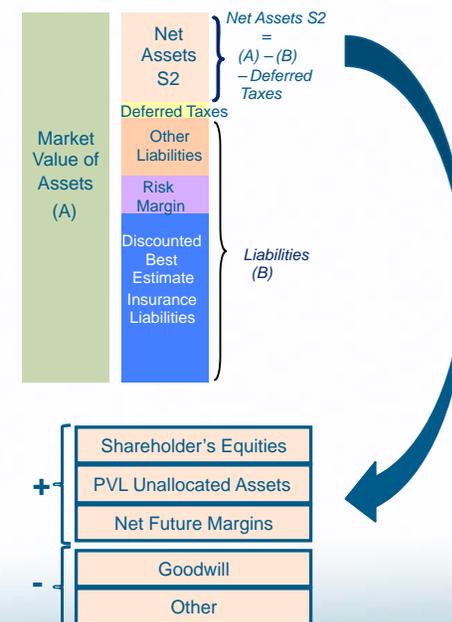
Economic Balance Sheet

Main Principles to Remember

- The insurance industry is knowledgeable about the requirements for building an economic balance sheet, following the recent publication of the QIS5 technical specifications and the release of CPs 26, 27, 30, 35, 39, 42 and 46.
- In addition to the methods of valuation of the different components of the balance sheet, it is important to highlight **two important principles** reinforced in the first wave of consultation:
 - **Convergence of the regulatory environment:** CEIOPS has chosen a pragmatic approach by defining the economic valuation of the different components of the Solvency II balance sheet according to the IFRS principles. This approach should be beneficial to (re)insurance companies:
 - ✓ By leading to a synergy of costs and resources between Solvency II and IFRS projects
 - ✓ By easing future financial communications (inside and outside of the company) as reporting will be undertaken on a consistent basis across different departments/subsidiaries
 It should be noted that although Solvency II and IFRS Phase II contain similar principles, there are a number of important differences in the technical provisions and other elements of insurance company balance sheets.
 - **Predominance of the Balance Sheet approach:** Following an approach similar to IFRS, Solvency II focuses on defining the valuation principles of assets and liabilities. As a result, own funds are simply estimated as the balancing item between the valuation of those two elements.
 - ✓ It is important to note that this approach leads to a recognition of net asset value, comprised of the value of future profit/loss generated by existing contracts as well as reserves strengthening/being released. The cash-flows generated by the assets can be split between the policyholders (best estimate and risk margin), taxes (deferred taxes) and the future profit allocated to shareholders. As a result, the economic valuation of both assets and liabilities implicitly leads to the consideration of future profits within the net assets.
 - ✓ Moreover, the balance sheet approach will ultimately lead (re)insurance companies to adopt new KPIs which are more relevant within this new environment. A Solvency II implementation plan, based on a thorough gap analysis, would identify more appropriate measures of the company's performance (or evolution of value over time), e.g., via an embedded value approach.



Solvency II Balance Sheet



Economic Balance Sheet

Technical Provisions

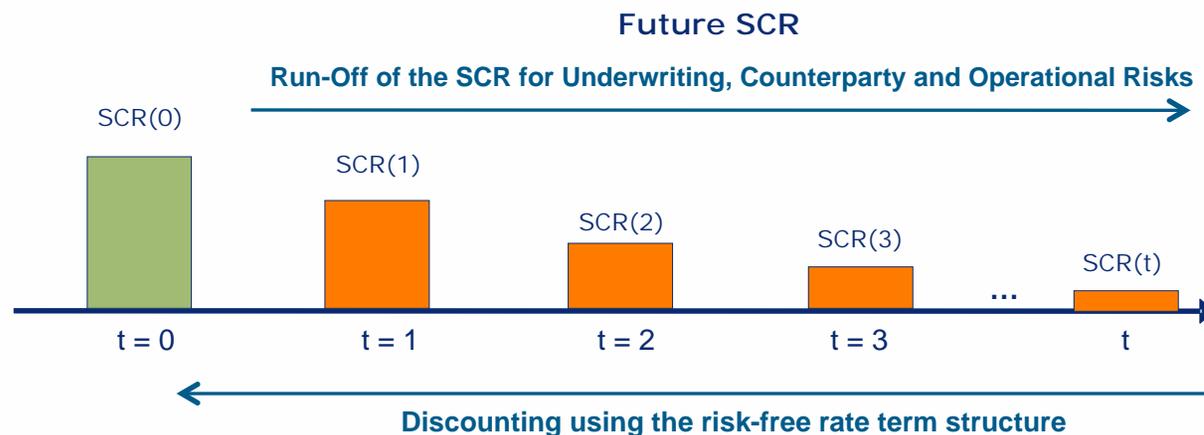
- The Solvency II framework Directive will lead to major changes in the valuation of the balance sheet items compared to the current local GAAP and, in particular, in the valuation of insurance liabilities which will need to be undertaken on a market-consistent basis.
- Technical provisions will typically be estimated on a proxy to a market value, i.e., a best-estimate basis allowing for the time value of money supplemented by a risk margin. It will now become important that companies focus on the projection of future cash flows. In projecting cash flows, companies need to bear in mind that:
 - Cash flows should be estimated gross of amounts recoverable from reinsurance contracts
 - Cash flows should account for the full lifetime of existing insurance contracts and reflect policyholder behaviour and management actions
 - Companies need to consider all inflows (e.g. premiums and receivables) and outflows (i.e. claims payments, all expenses ...)
 - Cash flows for premiums provision and outstanding claims need to be estimated separately
- A major change for the insurance industry is the fact that unearned premiums reserve is to be replaced by premiums provision. Premiums provision corresponds to the present value of cash inflows and outflows related to the unexpired risk. Therefore, it may happen that premiums provision could be negative (e.g. premiums paid in arrear). Generally speaking, this change could have a significant impact on the balance sheet as expected future profits or losses on unexpired risk are recognised.
- It appears to have remained largely unnoticed, but tacit renewals which have already taken place at the valuation date should lead to the recognition of the renewed contract and therefore be included in the calculation of the best estimate of the premiums provision.
- Particular attention is also required on the analysis of expenses (allocated and unallocated) as expenses will be included in projected future cash flows.
- Recoverables should be shown separately on the asset side of the balance sheet and should follow the same principles as the gross claims provisions. Note that recoverables should be adjusted for the counterparty default risk and do not require any risk margin.
- CEIOPS, in CP39, seem to move away from a full stochastic approach and come back to an expert judgement approach based on a blend of different methods. Thorough documentation and validation processes (such as sensitivity tests, actual versus expected checks ...) need to be implemented.

Economic Balance Sheet

Technical Provisions

- The choice of discount rate is of particular importance. There are currently lengthy discussions regarding the use of risk free interest rate term structure (based on government bonds) versus the use of credit swap rates. Whereas QIS4 and CP40 favoured the use of government bonds for the risk-free rate term structure, QIS5 is prescribing the use of credit swap rates.
- Following stakeholders consultation and a paper published by CFO/CRO Forum, the rate term structure will include a 50% illiquidity premium in QIS5 for non-life liabilities. Its application to insurance liabilities aims only to eliminate a valuation mismatch between the valuation of assets and liabilities. It also has an anti-cyclical effect and allows a harmonised treatment in distressed market conditions. This is new compared to QIS4 and contrary to the final advice of CP40.
- CEIOPS has retained a cost-of-capital approach for the estimation of the risk margin with a rate of at least 6%. It is important to note that in QIS5, the risk margin is calculated at an undertaking level and not at a line-of-business level as it was recommended in the final advice of CP42. This means that undertakings will enjoy the diversification benefits between lines of business within the risk margin. Should an undertaking decide to transfer a line of business, the contribution of each line of business to the risk margin can be allocated separately.

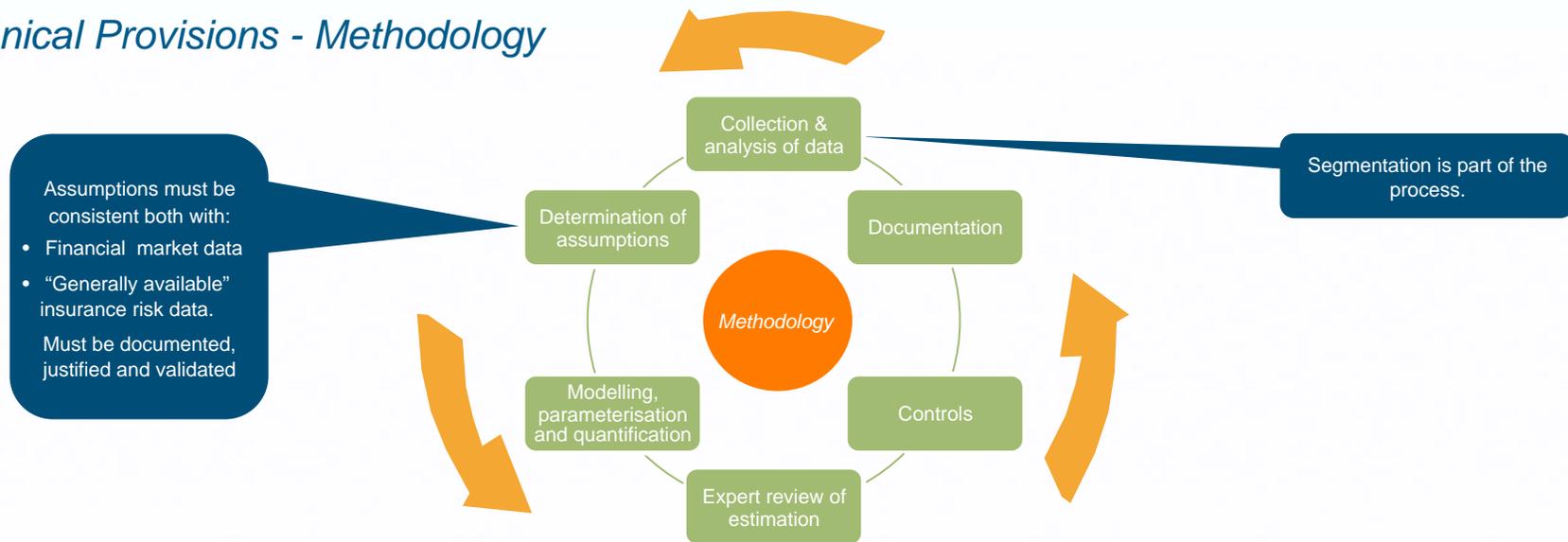
The risk margin is calculated as follows:



$$CoC = 6\% \times \sum_{t>0} \frac{SCR(t)}{(1+r_t)^t}$$

Economic Balance Sheet

Technical Provisions - Methodology



- Segmentation suggested by CEIOPS is based on the risks covered by insurance policies: A policy covering several risks will need to be split into different segments. CEIOPS has kept the QIS4 approach for segmentation, i.e., 14 risk classes for Non-Life (re)insurance and a double segmentation in Life (re)insurance with 16 classes.
- It is very likely that for reporting purposes (Pillar 3), CEIOPS will ask that economic capital be split according to the same segmentation.
- We think that communication around economic capital split by risk class may cause several issues:
 - ❑ **Coherence of communication:** A company's communicating emphasis varies by topic depending on its relative strengths and weaknesses
 - ❑ **Allocation of the diversification benefit**
- As these are usually questions of strategic importance for insurance groups, it is important to follow future developments regarding segmentation and public disclosure.

14 segments (including "Worker's compensation") in Non-Life (Re)insurance	
Non-Life Insurance and Proportional Reinsurance	Non-Life Non-Proportional Reinsurance
Worker's compensation	Casualty
Accident and Health	Property
Motor Vehicle Liability	Marine, aviation, transport
Motor other classes	
Marine, aviation, transport	
Fire and other damages to Property	
Third-Party Liability	
Credit and Surety	
Legal Expenses	
Assistance	
Miscellaneous	

Economic Balance Sheet

Own Funds

- Undertaking's own funds are classified in three tiers which are based on six key characteristics (Article 93) such as subordination, loss absorbency, sufficient duration, free from requirements to redeem, free from mandatory fixed charges and absence of encumbrance.

Nature \ Quality	On balance sheet (basic own funds)	Off balance sheet (ancillary own funds)
High	Tier 1	Tier 2
Medium	Tier 2	Tier 3
Low	Tier 3	

Source: European Commission

In addition, capital tiering will have to satisfy the following requirements:

- SCR limits applicable
 - Tier 1 items $\geq 50\%$
 - Tier 3 items $< 15\%$
- MCR limits applicable
 - Tier 1 items $\geq 80\%$
 - Tier 3 items = 0
- Other limits
 - Tier 1: (preference shares + subordinated liabilities) $\leq 20\%$

- The supervisory approval of an undertaking's own funds should be principle-based. The undertaking assesses the appropriate classification of the own fund item for which it seeks supervisory approval and whether the inclusion of this item is compatible with the quantitative limits envisaged by the implementing measures to cover the Solvency Capital Requirement and the Minimum Capital Requirement. The undertaking is responsible for providing the related documentation.

Economic Balance Sheet

Other Topics – Points to Note

Future Premiums

- The treatment of future premiums within the valuation of the Best Estimate for technical provisions is a very sensitive issue which impacts the capital requirement of an insurance company directly. There are two main points to consider:
 - **Scope**
 - ✓ CP30 clarifies cases where future premiums should be included in the valuation of the Best Estimate.
 - This may differ from current national guidance relative to future premiums.
 - ✓ However, some of the rules suggested in CP30 for the treatment of future premiums may lead to the following inconsistencies:
 - The scope of the technical provisions could vary from one year to the next depending on the financial environment.
 - The treatment of future premiums could lack homogeneity between the best estimate valuation (looking at the mean) and the SCR's valuation (looking at a quantile).
 - **Complexity of the calculation**
 - ✓ For an insurance contract that includes options, the requirement to do a calculation at the beginning in order to determine if future premiums should be included or not in the Best Estimate is quite a heavy burden.
 - ✓ Having to assess for each scenario the impact of the treatment of future premiums (increase or decrease in the Best Estimate) leads to overly complex calculations of the SCR and would probably force companies to change their model.

Deferred Taxes

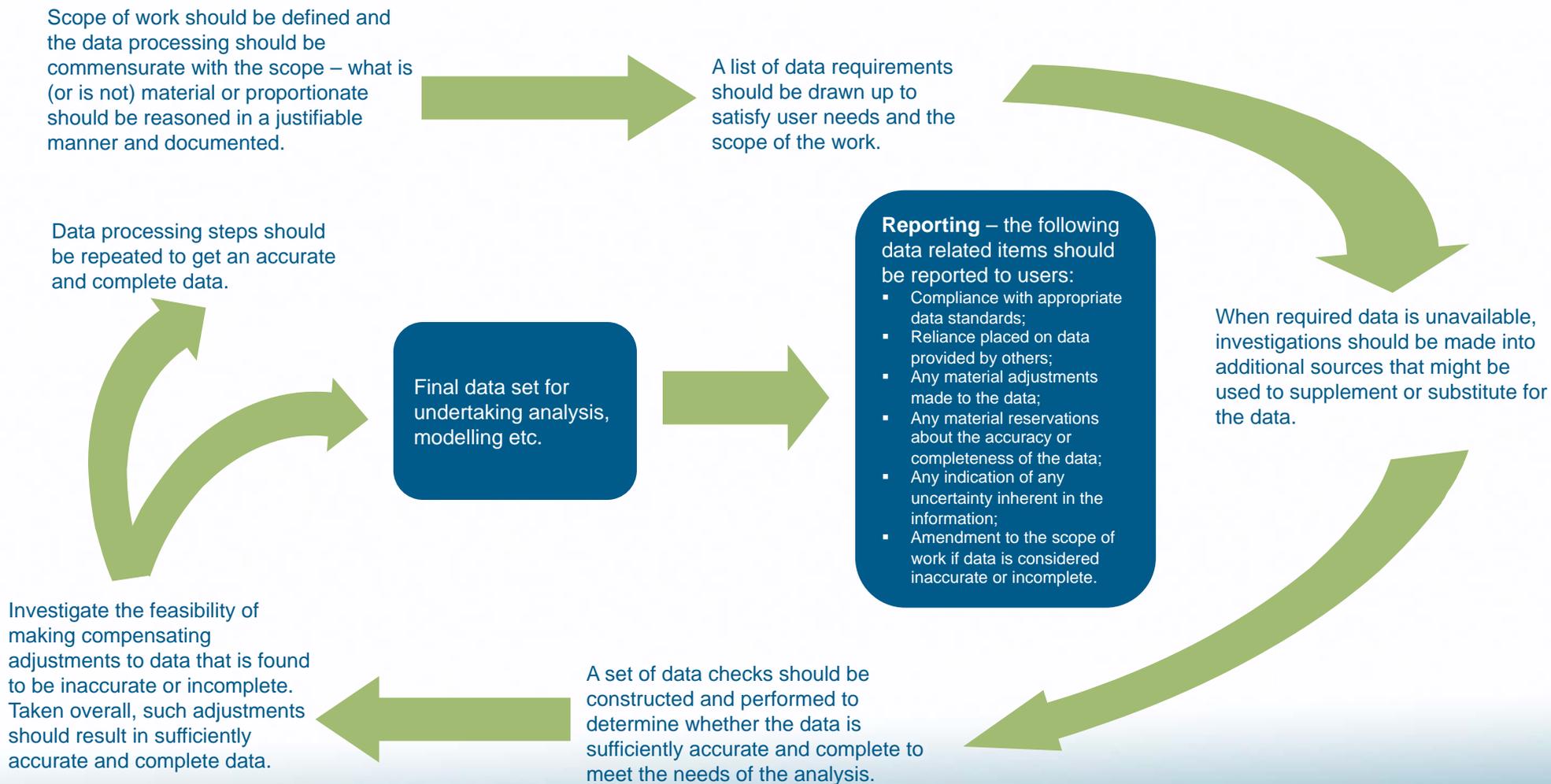
- Firstly, it is important to note that CP35 does not mention the possible tax deduction (and the extent of it) to the gross SCR. The other points relating to deferred taxes are of a lesser importance. However, the following two points are interesting to consider:
 - We struggle to understand the reasons behind the removal of tax credits from the assets. As long as the company can demonstrate that tax credits can be recovered, these assets are a real economic advantage which should be included in the economic balance sheet.
 - CP35 suggests that where deferred taxes can be used, these should be undiscounted, in line with IAS12. In our experience, some insurers use discounted cash flows for deferred tax for their internal economic balance sheets, and we do not view this as a major issue.

Data Management

CP43 – Standards for Data Quality

Data Management

Data Cycle and Good Practice



SCR Solo

CP47 – SCR Market Risk

CP48 – SCR Underwriting Risk

CP51 – SCR Counterparty Default

CP53 – SCR Operational Risk

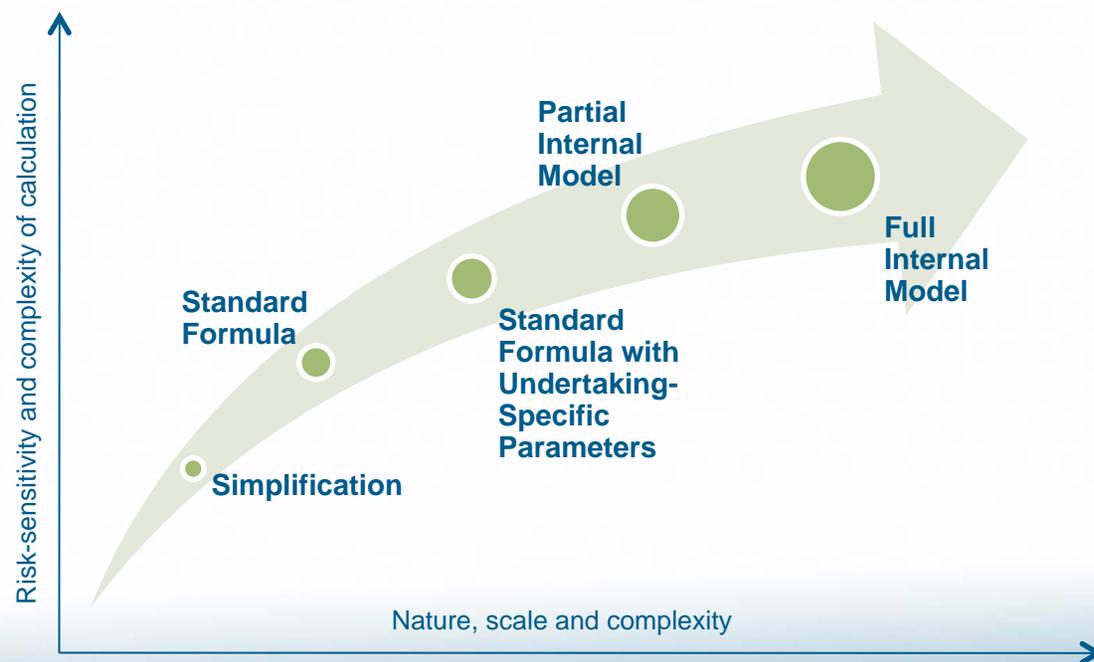
CP75 – Undertaking Specific Parameters

QIS5 – Technical Specifications

Solvency Capital Requirement

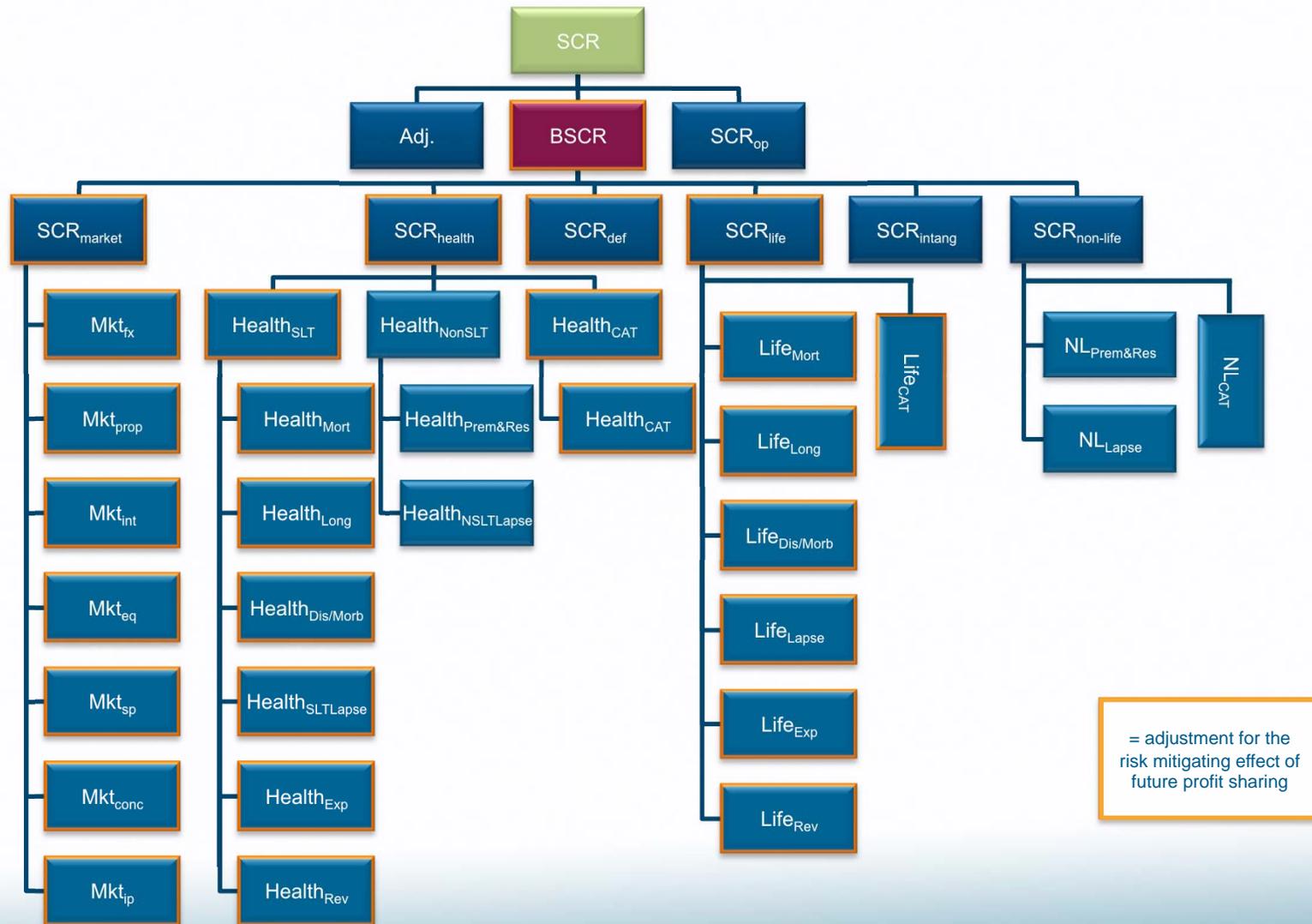
Overall Methodology

- Article 101 of the Solvency II Framework Directive
 - ‘The Solvency Capital Requirement (SCR) shall be calibrated so as to ensure that all quantifiable risks to which an insurance or reinsurance undertaking is exposed are taken into account. It shall cover **existing business**, as well as the **new business** expected to be written over the following 12 months ... It shall correspond to the Value-at-Risk of the basic own funds of an insurance or reinsurance undertaking subject to a confidence level of 99,5 % **over a one-year period.**’
- Firms must determine the SCR by using appropriate methods and should be able to explain what methods are used and why specific methods are selected.
- Solvency II provides for a range of methods that increase in terms of both risk-sensitivity and complexity for the calculation of the SCR.



Solvency Capital Requirement

Standard Formula



Solvency Capital Requirement

Standard Formula

- The standard formula for the SCR is a specified set of stress tests or factor-based formulae that companies will have to apply to their assets and liabilities for the following risks:
 - ***Market***
 - ***Non-life Underwriting***
 - ***Life Underwriting***
 - ***Health Underwriting***
 - ***Counterparty Default***
 - ***Intangibles***
 - ***Operational***
- Standard formula uses correlation matrices to aggregate across the risks
- The standard formula is *calibrated to the whole EU market* and may not be suitable for every single company.

Solvency Capital Requirement

Recent Developments in the Standard Formula and USP

Non-life premium and reserve risk

- Many of the factors applied in calculating premium and reserve risk have increased since QIS4, leading to what may be a significant effect on the risk charges. Particularly evident for non-proportional reinsurance classes. These factors, however, tend to be lower than those in the CPs and Final Advice.
- QIS5 allows undertakings to adjust premium risk factors to allow for some of the effect of outwards non-proportional reinsurance. These adjustments are, however, not simple without sufficient data.

Non-life catastrophe risk

- Produce gross results and then apply the reinsurance programme.
- Personalised scenarios are no longer an allowable option in QIS5.
- Standardised scenarios should be used where possible; where not, factor-based methods should apply (e.g., for natural catastrophe exposures outside of the EEA, miscellaneous insurance and non-proportional reinsurance business).
- If undertakings write material amounts of non-proportional reinsurance or have material amount of exposures outside the EU, CEIOPS would expect them to seek partial internal model approval.

Market risk

- Most factors and approaches for calculating market risk have increased significantly in QIS5. This includes higher spread risk factors for corporate bonds, increased currency and interest rate risks shocks, and increased correlation between sub-risk groups.
- Illiquidity premiums have been added.

Undertaking specific parameters (USP)

- USP can be used to adjust the standard formula parameters to reflect an undertaking's risk profile for non-life premium and reserving risk, but not catastrophe risk.
- The specified methodologies to be used in deriving the USP have changed from QIS4 to QIS5.
- An undertaking should not use both USP and geographical diversification, as this would result in double counting.

Solvency Capital Requirement

Recent Developments in the Standard Formula

Minimum Capital Requirement (MCR)

- The calculation of MCR combines a linear formula with cap of 45% of SCR and a floor of the higher of 25% of SCR and an absolute floor, expressed in euros, depending on the nature of the undertaking.
- The linear formula depends on technical provisions and written premiums for each line of business and line of business specific factors.

Other changes that may have a significant impact

- A non-life lapse risk module has been introduced to take account of the effect of higher than expected policy lapse rates.
- An intangible asset risk charge has been introduced as 80% of the fair value of intangible assets.
- Correlation factor between non-life premium and reserve risk and non-life catastrophe risk has increased from zero to 0.25.
- Geographical diversification has been kept in QIS5, despite CEIOPS proposing that it should be removed. Entities may either assume that all business falls into one segment or may use the specified methodology and geographical segmentation. Changes have, however, been made to this methodology. One of the changes was the reduction in number of separate geographical regions from 54 to 18.
- In QIS5, risk margins must take account of diversification between lines of business. Risk margins are still required for each line of business. The allocation of the whole account risk margin, allowing for diversification, must recognise the contribution of each line of business to the overall SCR over the lifetime of the liabilities.
- An illiquidity premium adjustment to the risk-free interest rate term structure will now be allowed for in the discounting of cash flows. Non-life contracts should use 50% of the illiquidity premium while risk margins should use no adjustment.
- The risk-free interest rate term structures have changed significantly since QIS4.
- The QIS5 structure of the life underwriting risk module is mainly unchanged from that in QIS4. There is a reduction in the longevity stress, an increase in the mortality stress and a few adjustments in the lapse and expense risk modules.

SCR Group

CP60 – Assessment of Group Solvency

CP61 – Supervision of Risk Concentration and Intra-Group Transactions

CP66 – Group Solvency for Groups with Centralised Risk Management

CP67 – Treatment of Participations

Groups

Supervision and Solvency Capital Requirement

- A group will be supervised by a single authority responsible for leading the supervision of the group, with the local regulators retaining responsibility for the solo insurers. The various supervisors will operate together through a supervisory college.
- The default group solvency calculation (to determine both available capital and the SCR) is based on consolidated data using the standard formula or an internal model (consistent with solo entity options). An alternate method, subject to supervisory approval, is to aggregate some or all the entities by aggregating their solo solvency positions.
- In addition to a group solvency calculation, group requirements include: a group ORSA; group disclosure and solvency & financial condition reporting; reporting of group risk concentrations and intra group transactions; and group governance and risk management involvement.
- There are two cases when applying for approval of a Group Internal Model:

Case 1 – Applying to use an Internal Model to calculate the consolidated group SCR and the solo SCR of (re)insurance undertakings in the group

1. Submit application to the group supervisor.
2. The group supervisor informs other supervisory authorities concerned.
3. Supervisory authorities concerned reach a joint decision.
4. CEIOPS can be consulted.
5. If the supervisory authorities concerned cannot make a joint decision, the group supervisor decides and informs the other supervisory authorities.

Case 2 – Applying to use an Internal Model to calculate the consolidated group SCR only

1. Submit application to group supervisor.
2. Group supervisor makes the decision.

Source: FSA

Groups

The Treatment of Participations

- The industry has strongly condemned the removal of the Group Support plan, hence seriously reducing the financing flexibility of group subsidiaries (e.g., through the use of diversification benefits).
- CP67 focuses on the treatment of participations and tries to answer some key issues relative to participations at a group level, one being the double gearing issue.
 - When one insurer (parent company) invests in a second insurer (subsidiary), there will be an increase in own funds for the subsidiary in the form of ordinary share capital. Whilst the own funds position of the balance sheet of the parent remains the same, the injection causes the subsidiary's own funds position to increase. Therefore, the same amount of own funds are being used by both undertakings to meet their capital requirements: This is known as double counting or double gearing.
 - However, if a loss is suffered by the subsidiary, the capital resources of both insurers will decrease. If own funds are being used by the subsidiary to absorb losses, then the value of the participation in the parent company balance sheet will decrease; this will reduce the excess of assets over liabilities and thus the basic own funds of the parent company.
- The treatment of participations must ensure that the supervisors have a meaningful picture of the solvency position of each solo undertaking. CEIOPS' members consider that the issue of double gearing needs to be addressed at both the solo and the group levels, and this is fundamental so as to maintain the integrity of the solo solvency calculation.
- The following objectives are also relevant when considering the treatment of participations:
 - Ensuring that the capital held in each solo entity is commensurate with the risks run in that entity - this requires supervisors to have the ability to identify where capital and risks reside
 - Limiting systemic risk
 - Avoiding the contagion of risks within a group through subsidiaries/participations
 - Avoiding incentives for regulatory arbitrage through group structuring
- The proposed treatments are based on whether the participation is included in or excluded from the group, and are also by the nature of the participation (financial/financial non regulated/non financial).

Groups

Fungibility and Transferability Constraints

- Fungibility and transferability constraints occur because:
 - Transfer of assets to another entity may not be allowed
 - Transfer of assets to another entity cannot be completed within a nine-month period
 - Some own funds may be available to absorb only certain losses

- Areas where fungibility and transferability constraints require particular attention include:



- Group own funds need to reflect the above constraints. Group-level non-fungible own funds are limited to the extent that they cover the contribution of the corresponding solo SCR to the group SCR.

Internal Models

CP32 – Assumptions on Future Management Actions

CP37 – Procedure to be Followed for the Approval of an Internal Model

CP56 – Tests and Standards for Internal Model Approval

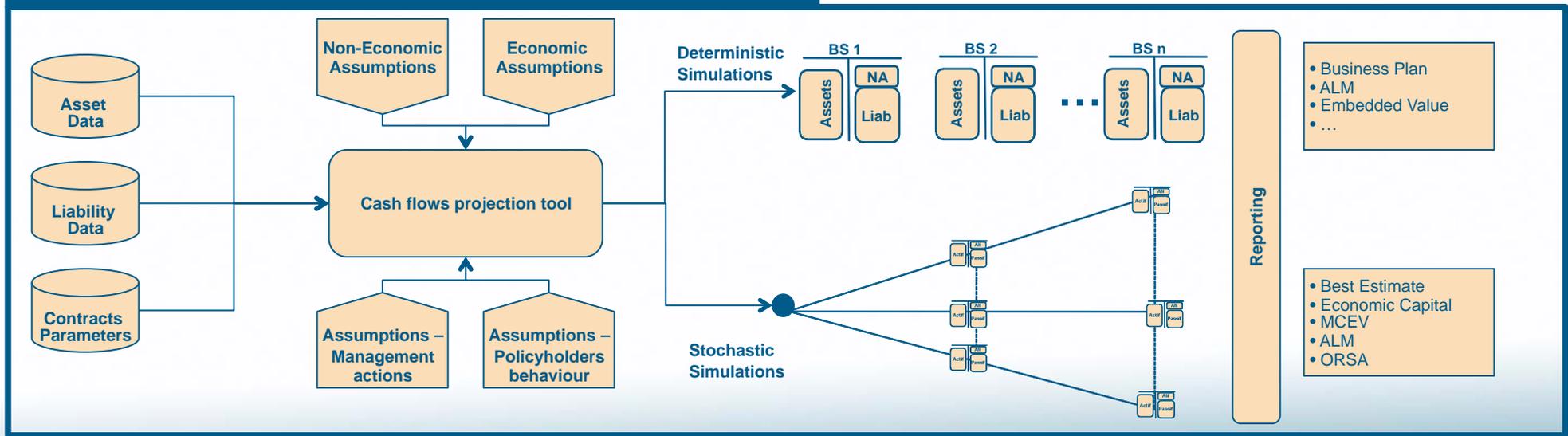
CP65 – Partial Internal Models

Internal Models

General Structure

- The analysis of all measures relating to internal models (or models used for the parameterisation of the standard formula) is a central element of the path towards Solvency II. We have made a selection of the main topics related to internal models which were addressed in the three waves of consultation papers. They are as follows:
 - Assumptions for future management actions (CP32),
 - Process to be followed for the approval of an internal model (CP37)
 - Tests and Standards for Internal Model Approval (CP56)
 - Partial Internal Models (CP65)
 - Treatment of Future Premiums (CP30)
 - Segmentation for the calculation (CP27)
- For each of the topics above, CEIOPS is asking for transparent governance of the internal model, and CP37 defines the different stages of the approval process, by a supervisor, for an internal model.

Illustration : Simplified structure of an insurance internal model



Internal Models – Internal Model Validation by Management

New Responsibility

- The official recognition of the importance of internal models developed by insurance companies for supervisory reporting and soon for financial reporting (see IFRS Phase 2 on insurance contracts) is undoubtedly genuine progress:
 - The lack of a regulated market for insurance liabilities could have led supervisors to seek valuations based on standard methods or formulae (e.g., entry value, amortised value ...). These choices by default (even if they are still being discussed by the IASB Board) would have been unsatisfactory for many people (e.g., not tailored to a company's risk profile, no accounting for specific company management ...).
- This recognition of the use of internal models for valuation implies, however, **new responsibilities for management** and a strictly defined and transparent **approval process**.
 - In principle, we can only agree with the willingness of the supervisors to seek formal commitment from the management team with respect to the internal model as a whole and more specifically to its most strategic assumptions.
 - The possible future outcomes of internal models depend on many assumptions, some of which should replicate expected management behaviour:
 - ✓ Profit-sharing policy
 - ✓ Profit margin policy
 - ✓ Asset management policy
 - ✓ Pricing policy
 - ✓ ...
 - The models' credibility is largely dependant upon the credibility of the 'strategic' assumptions. Therefore, it is crucial to get formal commitment from the management that would guarantee:
 - ✓ Consideration of the company's activities as a whole
 - ✓ Stability of the assumptions over time
- Based on our experience, we have observed that the requirements of the 'sign-off' process with respect to management actions is not clearly defined within CP32.
- The 'sign-off' of the management action assumptions is a new challenge for companies that will require the design and implementation of a brand new process:
 - Identification of all the strategic assumptions
 - Thorough documentation leading to high-level understanding by management with respect to very complex issues:
 - ✓ Impact studies
 - ✓ Stress tests
 - ✓ Historical analyses
 - Reference in management "dashboards"
 - Ability of the company to implement assumptions with respect to expected management actions within the model

Internal Models – Internal Model Validation by Management

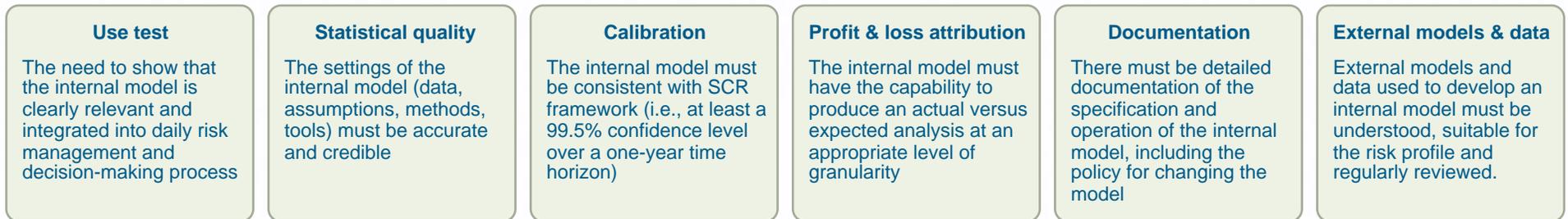
New Responsibility

- CP32 allows companies to consider expected management actions in their internal models. These assumptions will need to be approved by the management and will need to satisfy the following criteria:
 - ❑ **Objectivity:** For the purpose of the calculation of the “best estimate” of technical provisions, there should be some clear trigger points and algorithms showing when and how management actions might be applied by companies.
 - ❑ **Realism:** Future management actions should be consistent with the company’s current principles and practices in running the business (i.e., respect their obligations to policyholders and reflect the appropriate degree of competitiveness experienced by the company).
 - ❑ **Verifiability:** There should be sufficient evidence to demonstrate that the management actions are objective and realistic (mainly through the analysis of management actions which were taken in the past).
- The criteria of realism is ambiguous: The valuation of liabilities (‘best estimate’ of technical provisions) is calculated in a run-off environment, whereas under the notion of realism it should be considered, like historical practice, as an ongoing environment. Further, with respect to asset management policy or profit-sharing policy, some management actions could be considered as reasonable in a run-off environment, but totally inappropriate in an ongoing environment.
- We would also like to raise the point about the potential risk of losing some autonomy of decision making in an environment where management actions, as implemented in an internal model, would have already been approved by the management. A limited use of management actions in internal models, however, would give more freedom to management, but at a certain capital cost. Thus management and actuarial departments will need to find the right balance between the freedom of action in response to different events (an internal model cannot include all possible events) and the optimisation of economic capital as estimated by an internal model (requiring thorough parameterisation and assumptions).

Internal Models - Approval of the Internal Model by the Supervisor

Main Challenges

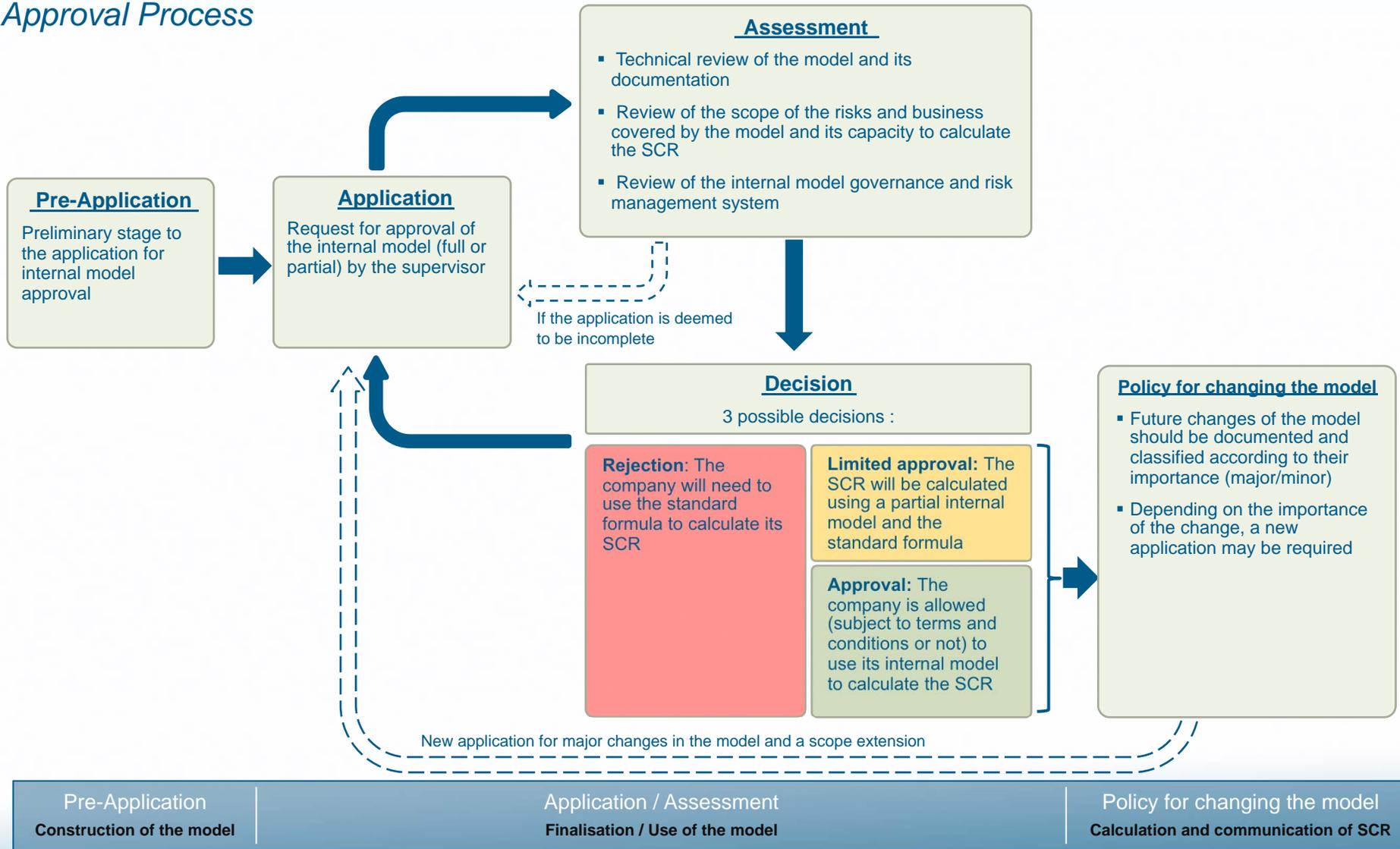
- The need to have the internal model approved before being allowed to use it for regulatory solvency requirements is a major development for the teams working on capital models. In any application for approval, undertakings will need to submit, as a minimum, documentary evidence that the internal model meets all the requirements set out in the Directive:



- Approval will be based on all the tests above and the model itself not on the software used or number produced.
- Companies will have to consider the pre-application process carefully, which is crucial in anticipating the hurdles in the actual application process.
 - Companies will need to prepare well in advance for the approval of the internal model by the supervisor. Basel II showed clearly the huge difficulty in getting an application's documentation ready in time.
 - Companies will also need to consider a dry-run period for their internal model in order to be able to produce stable results (SCR, ORSA, use test ...).
- The internal model application process may have a significant impact on the company's image as the decision of the supervisor regarding the approval (or not) may be disclosed to the financial industry.
- One of the key requirements to get the model approved by the supervisor is the implementation of internal model governance in order to ensure the durability and consistency of the methods and ensure the rules are understood and validated by the management.
- In addition to the assignment of roles and responsibilities (as described in CP33) and the system of control for the model, one of the main pillars of internal model governance is the policy of future development of the model, which classifies possible developments according to their importance and future implementation. CEIOPS raised two main questions:
 - **Scope of the policy:** CEIOPS recommends that the policy of internal model development covers all possible changes within the company that could impact the model (organisation, process, strategy, etc ...) and not only the calculation/simulation engine.
 - **Classification of model changes:** As it stands, CEIOPS does not explicitly define what falls under minor changes (quarterly communication) and major changes (requires approval by the supervisor). In particular, it is not specified if a change in the parameterisation (even minor) is considered model development or a change in the model.
- The next page shows a simplified illustration of the approval process as defined in CP37.

Internal Models - Approval of the Internal Model by the Supervisor

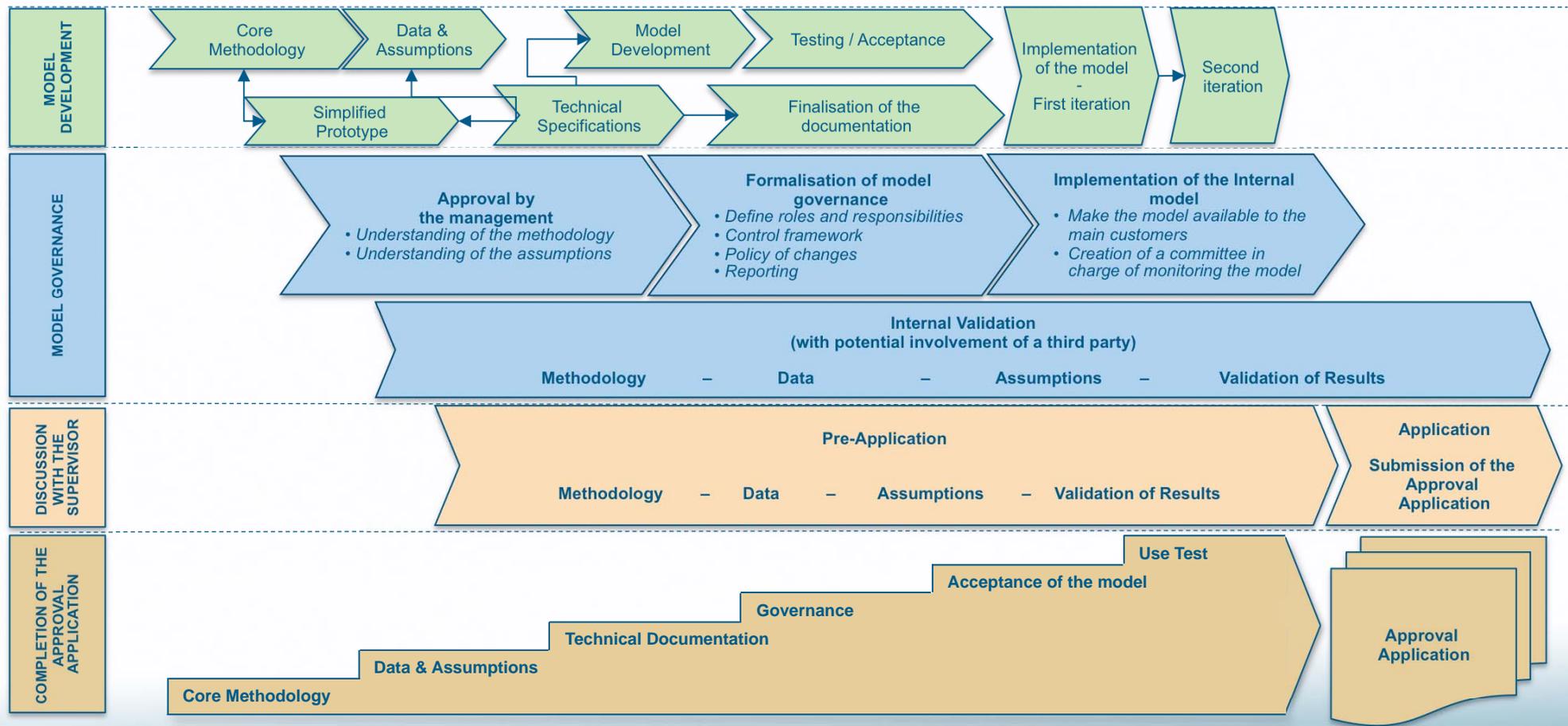
Approval Process



Internal Models - Approval of the Internal Model by the Supervisor

Steps to Follow for the Completion of an Approval Application

- Based on our experience of developing actuarial models, the documentation for the approval process needs to be produced alongside the development and the validation of the model. The documentation would also include information gathered during discussions with the supervisor in the context of the pre-application process.



Internal Models

Partial Internal Models

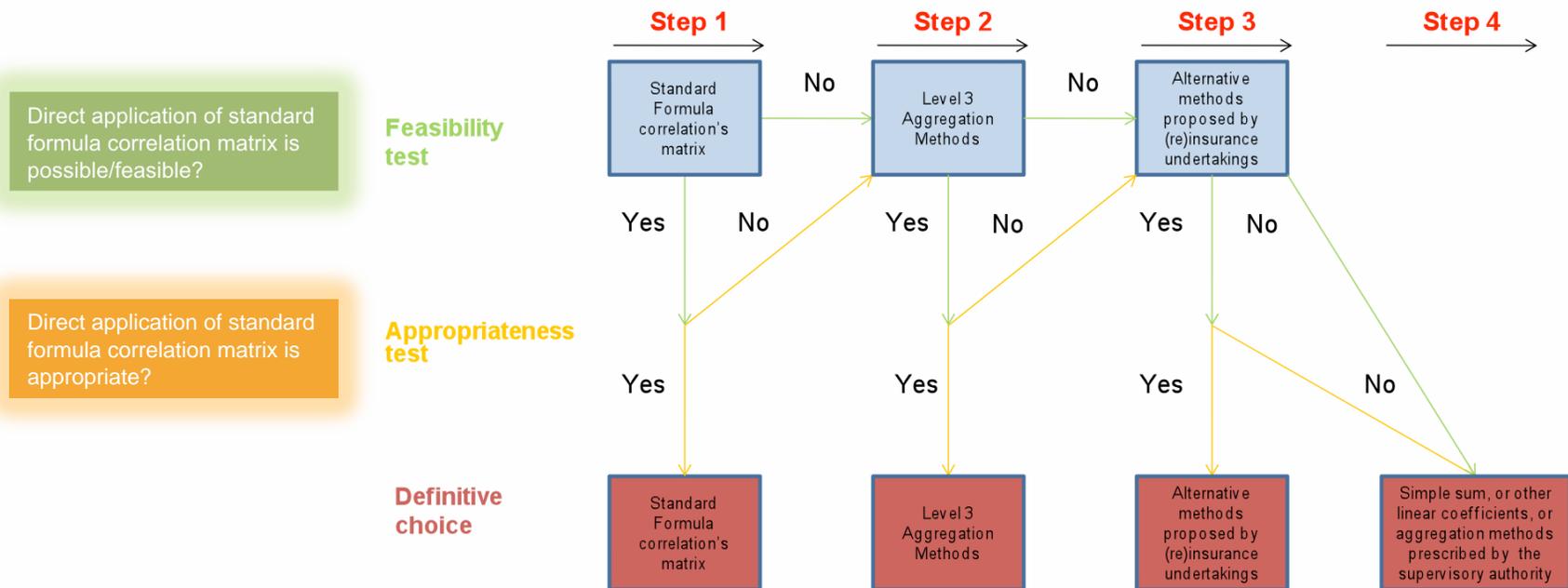
- Article 112(2) of the Level 1 text allows firms to use a partial internal model for the calculation of the SCR of certain risks or part of their business.
- Scope of partial models is flexible:
 - *One or more risk modules, or sub-modules*
 - *Different risk categorisations or risks not covered by the standard formula*
 - *Whole business or only one or more major business units*
- Approval process is required for partial model:
 - *Requirements of Articles 120 – 125 for internal model (adapted)*
 - *Justification for limited scope*
 - ✓ *Represent a transitory step towards a full internal model*
 - ✓ *Lack of reliable information to model other risks/business units*
 - ✓ *Proportionality principle*
 - ✓ *Encourage innovation and specialization to certain area*
 - ✓ *M&A*
 - *Better reflection of risk profile*
 - *Design consistent with SCR principles*
- The onus lies with the undertaking to demonstrate that the limited scope is justified. Undertaking may supplement their rationale with quantitative evidence. If the supervisory authorities are dissatisfied with the justification provided by undertakings, they may require undertakings to perform specific exercises, if applicable and practicable.

Internal Models

Partial Internal Models - Integration

The integration of partial internal model results into the standard formula, which could present challenges, will follow a multi-step procedure as shown below.

Decision tree on partial models' integration



Governance and Supervisory Review

CP33 – System of Governance
Own Risk Solvency Assessment (ORSA)
CP57 – Capital Add-on

System of Governance

Principles

- The Level 2 implementing measures specify in detail the requirements for insurance companies in terms of system of governance.
- The system of governance for (re)insurance companies should define an organisational structure that is clear and robust:
 - Adequate and operational structure
 - Clear allocation of tasks and responsibilities
 - Transparency of the organisation
 - Efficient information systems concerning all business activities
- It is drawing on six fundamental requirements including four key functions :

Risk Management

- The risk management system shall cover, at least, the areas of underwriting and reserving, asset-liability management, investment, liquidity and concentration, reinsurance and other risk mitigation techniques.
- The risk management function is responsible for the coordination of risk management activities across the undertaking. It should assist the administrative and management body in the effective operation of the risk management system, monitoring the risk management system, maintaining an aggregated view of the risk profile, reporting details on risk exposures, and identifying and assessing emerging risks.

Actuarial function

The actuarial function shall as a minimum:

- Apply methodologies and procedures to assess the sufficiency (and uncertainty) of technical provisions and to ensure that their calculation is consistent with the underlying principles.
- Inform the administrative or management body of the reliability and adequacy of the calculation of the technical provisions and how it arrived at its opinion.
- Produce written reports to be submitted to the administrative or management body documenting the tasks that have been undertaken, clearly state any shortcomings identified and give recommendations as to how the deficiencies could be remedied.

Internal audit

- The internal audit function is an **independent** function within the organisation which examines and evaluates the functioning of the internal controls and all other elements of the system of governance as well as the compliance of activities with internal strategies, policies, processes and reporting procedures.
- Reports should be produced if deficiencies are identified in an audited area and also be transmitted to the administrative or management body in the case of major deficiencies.

Internal control

- An internal control system should ensure: effectiveness and efficiency of the company's operations in view of its risks and objectives, availability and reliability of information and compliance with regulations.
- **Compliance function:** Is the administrative capacity for ensuring that all the actions of the company comply with applicable laws and regulatory requirements. It should also identify, assess, monitor and report the compliance risk exposure of the company.

Fit and proper requirements

The system of governance should:

- Ensure that the members of the management body possess sufficient professional qualifications, knowledge and experience in the relevant areas of the business.
- Ensure it employs personnel with the skills, knowledge and expertise necessary for the proper discharge of the responsibilities allocated to them.
- Communicate to the supervisor any change of personnel within the management body with the skills mentioned above.

Outsourcing

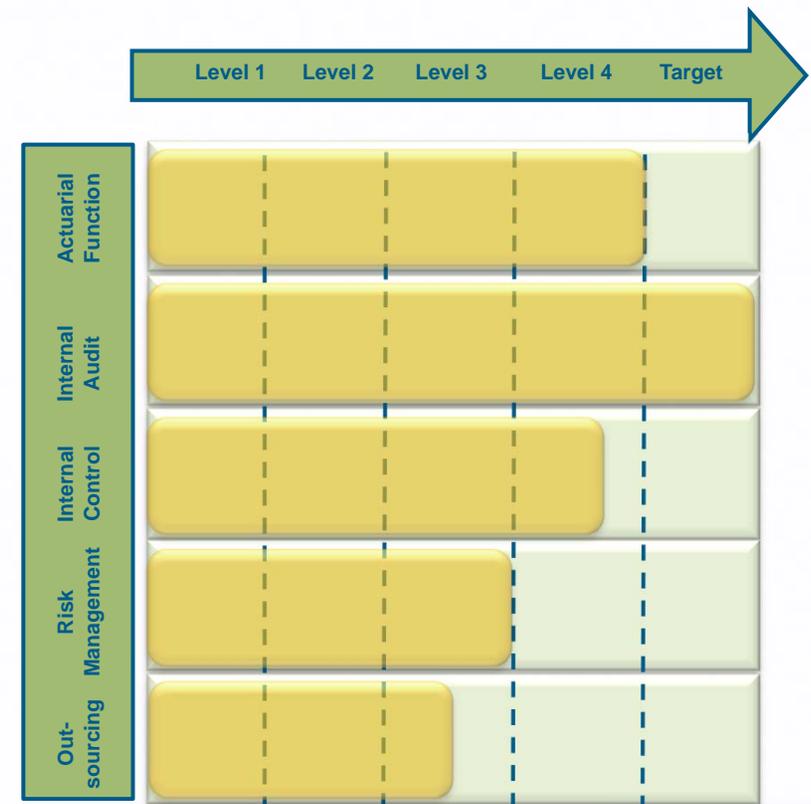
- When companies outsource operational functions or any insurance or reinsurance activities, such companies remain fully responsible for discharging all of their obligations under this Directive.
- The outsourced activities must be adequately included in the company's risk management and internal control system.
- The supervisory authority shall be informed of the outsourcing of important activities.

System of Governance

General Governance of an Insurance Company

- Current regulation and market best practices have already shaped the governance of insurance companies:
 - Internal control and internal audit are already largely defined and required in the current regulatory environment in a similar way to that set out in the Solvency II Directive
 - Risk management and actuarial functions already exist but are not properly defined, hence there should be some significant changes with Solvency II
- The main changes within the Solvency II directive in terms of governance are:
 - Requirement of formal governance in order to efficiently implement policies decided by the management body
 - Requirement of a full system of governance ensuring:
 - ✓ Identification, assessment and management of risks
 - ✓ Efficient communication of information
 - ✓ Reporting of a consolidated view of the risks
- The implementation of a system of governance is a detailed process which should draw on existing processes within companies:
 - To achieve Solvency II compliance for governance, the implementation should follow a thorough analysis of the existing processes (gap analysis)
- It is important to assess the demands in terms of cost, resources, and skills for each of the functions defined within the system of governance.

*Illustration:
Position of a company towards its Solvency II
Target*



System of Governance

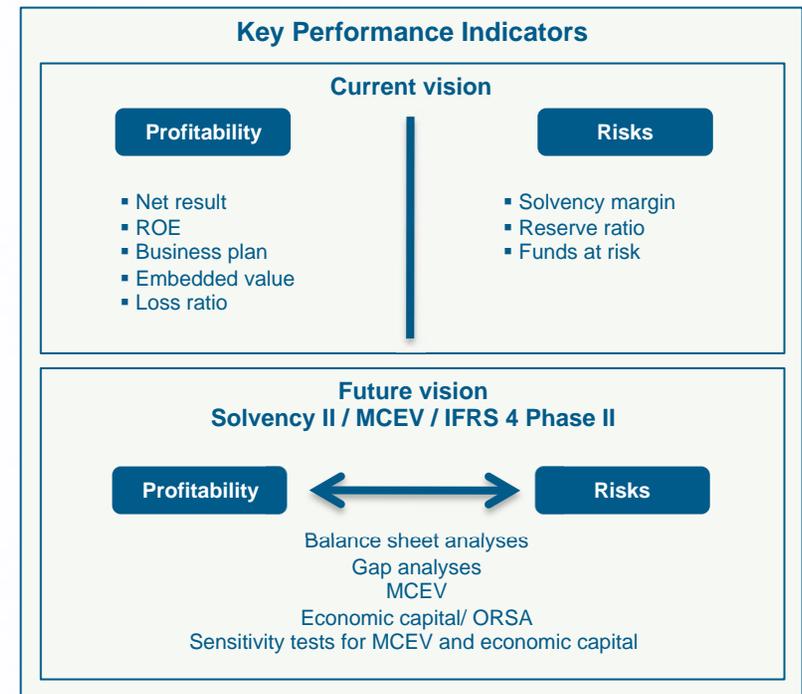
Risk Management and Actuarial Functions – Ambiguous Roles

- CEIOPS defines relatively clearly the fundamental requirements for a system of governance:
 - CEIOPS recommendations are more than general principles, they define an organisational structure
 - These detailed prescriptions could turn out to be inadequate for certain organisations, which by definition should remain the responsibility of companies as long as they remain compliant with the Directive's principles
- For the risk management function, CEIOPS prescribes (for large companies) the creation of a Chief Risk Officer (CRO) who will be responsible for:
 - Leading the risk management function
 - Reporting the risk exposure to the administration and business operation
 - Maintaining a consolidated view of the risks through the ORSA (Own Risk Solvency Assessment)
- CEIOPS recommends that the risk management function has leadership of the internal model in terms of conception, maintenance and management of results. The Actuarial function contributes to the implementation of the internal model.
- These recommendations do not remove the ambiguities and difficulties of implementation:
 - Ambiguities regarding the split between the work of conception, development and validation are still present
 - For most companies, modelling skills are concentrated in a single team. Splitting the functions of development and validation would cause duplication issues of scarce skills
- CEIOPS defines the actuarial function as the role of controlling and reporting technical provisions by means of an actuarial report:
 - **Coordination and control of the technical provisions valuation**
 - **Statement of opinion regarding underwriting and reinsurance policies**
 - ✓ The actuarial function should express an opinion independently from any other administration or business operation department.
- This is another point where there are ambiguities in the roles of the risk management function and the actuarial function, in particular for the leadership on the best estimate reserves computation in the SCR calculation:
 - The ownership of the model and the consolidated vision of the risks would mean that the calculation of the SCR (hence of the best estimate reserves under Solvency II) should be the responsibilities of the CRO. This would appear to restrict the role of the Actuarial function.

System of Governance

Reporting Risks

- The Solvency II Directive and the Level 2 implementation measures significantly change the risk management of insurance companies by defining:
 - An objective measure of risks: the SCR
 - A risk management and governance system which will force companies to clearly define their strategy and risk appetite
 - Risk reporting which should allow the management to follow the consumption of budgeted amounts allocated for business operations
- This last point, along with other changes in financial communication within the insurance sector (MCEV, IFRS4 Phase 2), will force insurance companies to undertake an in-depth review their risks and results reporting with the following objectives:
 - **Managing risks and performance**
 - **Ensuring a consolidated view of the risks**
 - **Defining risk appetite and translating it into risk budgets for business operation**



Supervisory Review

ORSA - Principles

- Article 44 states that:
 - ‘As part of its risk management system every undertaking shall conduct its own risk and solvency assessment (ORSA). The ORSA shall include at least the following:
 - a) The overall solvency needs taking into account the specific risk profile, approved risk tolerance limits and the business strategy of the undertaking
 - b) The compliance with the capital requirements and with the requirements regarding technical provisions
 - c) The extent to which the risk profile of the undertaking deviates significantly from the assumptions underlying the SCR, calculated with the standard formula or with its partial or full internal model’
- The ORSA principles should be applied in a proportionate manner having due regard to the nature, scale and complexity of the activities of the undertaking concerned



Source: Groupe Consultatif

Principle A	<ul style="list-style-type: none"> ▪ The ORSA is the responsibility of the undertaking and should be regularly reviewed and approved by the undertaking's administrative or management body.
Principle B	<ul style="list-style-type: none"> ▪ The ORSA should encompass all material risks that may have an impact on the undertaking's ability to meet its obligations under insurance contracts.
Principle C	<ul style="list-style-type: none"> ▪ The ORSA should be based on adequate measurement and assessment processes and form an integral part of the management process and decision making framework of the undertaking.
Principle D	<ul style="list-style-type: none"> ▪ The ORSA should be forward-looking, taking into account the undertaking's business plans and projections.
Principle E	<ul style="list-style-type: none"> ▪ The ORSA process and outcome should be appropriately evidenced and internally documented as well as independently assessed.

Supervisory Review

Capital Add-on

- Setting a capital add-on is a supervisory power aimed at ensuring an adequate level of SCR, thereby protecting policyholders' interests and presenting a level playing field. This power shall be used as a corrective measure and not as a punitive power, in the context of 'exceptional circumstances'.
- CEIOPS has classified a capital add-on into two types:
 - Capital add-on triggered by a significant deviation from the risk profile embedded in the SCR calculation, either calculated by the standard formula or by an internal model, referred to as a 'Risk Profile Capital Add-On'
 - Capital add-on triggered by a significant governance deficiency, referred to as a 'Governance Capital Add-On'
- The setting of a capital add-on should follow a due process. The supervisory authority should give proper consideration to whether a capital add-on is an adequate supervisory measure, taking into account the position of the undertaking concerned:
 - That all the relevant steps (such as the **identification of an issue, the assessment of the issue and the calculation of an add-on if appropriate**) have been followed
 - That the results from the steps have been properly documented
 - That any relevant conclusion or measure by the supervisory authority have been shared with the undertaking concerned and that the undertaking has been given the opportunity to present its views on these conclusions or measures within an appropriate timeframe
- The setting and the amount of a capital add-on should be reviewed more frequently than annually if there are indications that the situation that led to the setting of the capital add-on has changed based on valid experience.
- In situations where a capital add-on is set, supervisory authorities should put down their decisions in writing and justify them to the undertaking. Future Level 3 guidance will set out guidance on the information to be transmitted to the undertaking in order to harmonise the process of setting a capital add-on.
- The public disclosure of the SCR incumbent on the undertaking shall provide separately the amount calculated using the standard formula or an internal model and any capital add-on, with concise information on its justification by the supervisory authority concerned.
- The decision-making process for applying a group capital add-on and the consultation process for applying a solo capital add-on is firmly embedded in the college arrangements.
- The calculation of a group governance capital add-on should be assessed on a case-by-case basis to reflect the structure and complexity of the group.

Supervisory Review

Capital Add-on

1 Identification of an issue

Deviation from the risk profile standard formula / internal model

A risk profile deviation could be identified, for example:

- Via the analysis of ratios
- Via stress tests
- Via supervisory enquiries

The main source is likely to be the quantitative information received periodically from the undertakings.

A risk profile may arise from any quantifiable risk, whether or not those risks are explicitly covered in the standard formula.

Governance deficiency

A governance deficiency could be identified:

- Via on-site inspections, either routine or on-site inspections triggered by an off-site analysis
- Via supervisory enquiries
- Via the knowledge by the supervisory authority of any relevant information (e.g. auditor's report)

CEIOPS expects that simply requiring more capital would not compensate for poor governance.

2 Assessment of an issue

Deviation from the risk profile standard formula / internal model

The significance of the deviation should be assessed in view of the effect of the recalculation on the overall SCR of the undertaking.

CEIOPS intends to consider only the risks that are underestimated by the SCR formula by default, disregarding any of the risks that are overestimated.

In cases where a Risk Profile Capital Add-On is appropriate it will come into play only after the initial approval of the internal model, regarding quantifiable risks which are captured insufficiently.

Governance deficiency

CEIOPS suggests a case-by-case analysis. The governance requirements should be implemented in accordance with:

- The principle of proportionality
- The fact that there are different ways of organising a proper system of governance

If the situation is very serious, the setting of an add-on could be followed/accompanied by other measures.

3 Calculation of a Capital Add-on

Underestimation of particular sub-risks risk modules or model component

1. Identify the relevant sub-risks or risk modules
2. Consider the cause of the significant deviation:

- Inadequacy of the calibration of parameters
 - => Ask the undertaking to use new parameters, derived from its own data, that best reflect the risk profile of the undertaking
- Inadequacy of the design assumptions
 - => Ask the undertaking to look for alternative design approaches
 - => Failing that, set the capital add-on on a more 'crude' basis, through comparative analysis or incorporating a more subjective analysis.

Quantifiable risks not covered by the SCR calculation

1. Identify risks not covered by the standard formula
2. Consider the methodologies available to better quantify the risk
3. Aggregate the identified risk with the other risks covered by the standard formula

Aggregation mechanism

1. Identify the reasons for the significant deviation:
 - Inadequacy of correlation factors
 - => Ask the undertaking to assess the value of 'new' correlation factors
 - Inadequacy of the linear correlations assumption
 - This case is not considered as feasible for the calculation of the capital add-on
 - Set a capital add-on through comparative analysis
 - Inadequacy of the dependency structure
 - => Ask the undertaking to find an alternative aggregation mechanism
 - => Failing that, set the capital add-on through comparative analysis

Governance deficiency

When assessing and quantifying the deficiencies, the supervisory authority will need to use an element of judgement

CEIOPS considers three options regarding the possible ways of calculating a governance capital add-on:

- Option 1: Percentage of the overall SCR established by categories according to a specific grouping of deficiencies
- Option 2: Predefined scenarios (cause and effect)
- Option 3: Harmonised criteria to be taken into account in determining the amount in addition to cause and effect.

Disclosure

CP58 – Supervisory Reporting and Public Disclosure Requirements

Supervisory Reporting and Public Disclosure

- As part of Pillar 3, three reports (in a format that will be developed by CEIOPS) will be required and signed-off by the Board:
 1. Public Disclosure - **SFCR** (Solvency and Financial Conditions Report)
 2. Private Reporting - **RTS** (Reporting To Supervisor)
 3. **Quantitative reporting** will be added to the RTS, some quantitative forms should also be included in the SFCR.

Structure SFCR and RTS

Business and performance	System of governance	Risk Management	Regulatory Balance Sheet	Capital Management
A.1 Business and external environment A.1A Objectives and strategies (RTS only) A.2 Performance from underwriting activities A.3 Performance from investment activities A.4 Operating/other expenses A.5 Any other disclosure	B.1 General governance arrangements B.2 Fit and proper processes and procedures (RTS only) B.3 Risk management system B.4 ORSA B.5 Internal control B.6 Internal audit function B.7 Actuarial function B.8 Outsourcing B.9 Any other disclosures B.10 Reporting at group level (SFCR only)	C.1 Underwriting risk C.2 Market risk C.3 Credit risk C.4 Liquidity risk C.5 ALM risk C.6 Operational risk C.7 Other material risks C.8 The nature of material risk exposures C.9 The nature of material risk concentrations C.10 Risk mitigation practices C.11 Risk sensitivities C.12 Any other disclosures	D.1 Assets D.2 Technical provisions D.3 Other liabilities D.4 Any other disclosures	E.1 Own funds E.2 MCR and SCR E.3 The option used for the calculation of its SCR E.4 Differences between the standard formula and any internal models used E.5 Non-compliance with the MCR and significant non-compliance with the SCR E.6 Any other disclosures

- For the first financial year after the Directive comes into force, all undertakings will be required to complete a full qualitative RTS. CEIOPS considers that annual reporting for the RTS best meets the objectives set by the Commission and believes that the maximum period between full reports should not be more than five years
- The undertaking or group should also disclose details of any capital add-on applied to the SCR together with information on its justification from the supervisory authority concerned, depending on the decision of the undertaking's Member State supervisor relating to Art. 50(2)

For further details relating to any aspect of this report, please contact one of the following authors:

Gary Wells
gary.wells@milliman.com

Jeff Courchene
jeff.courchene@milliman.com

Vincent Robert
vincent.robert@milliman.com

Peter Moore
peter.moore@milliman.com

Fabrice Taillieu
fabrice.taillieu@milliman.com

Thomas Guidon
thomas.guidon@milliman.com

Joël van der Vorst
joel.vandervorst@milliman.com

You can also contact your local Milliman office

<p>France 64 rue Pierre Charron 75008 Paris +33 1 42 99 15 60</p>	<p>Germany Altheimer Eck 2 80331 Munich +49 89 1271 0870</p>	<p>Ireland Verschoyle House 28/30 Lower Mount Street Dublin 2 +353 1 647 5900</p>	<p>Italy Corso Europa, 5 Floor 5 20122 Milan +39 02 7626 0521</p>	<p>Netherlands Baarnsche Dijk 12c 3741 LS Baarn +31 35 54 88 013</p>
<p>Poland ul. Emilii Plater 53, 11th floor 00-113 Warsaw +48 22 528 6962</p>	<p>Romania 6 Monetariei Street Entrance C, 2nd floor 12B Sector 1, Bucharest 011216 +40 314 326 526</p>	<p>Spain Edificio Centro 23 Paseo de la Castellana, 91 P. 14 28046 Madrid +34 91 598 40 77</p>	<p>Switzerland Lavaterstrasse 65 8002 Zurich +41 44 287 9070</p>	<p>UK 11 Old Jewry, 3rd floor London, EC2R 8DU +44 20 7847 15 00</p>

About Milliman

Milliman is among the world's largest independent actuarial and consulting firms. Founded in Seattle (USA) in 1947, the company currently has 52 offices in key locations worldwide employing over 2,400 people.

Milliman's client offerings:

- Actuarial & risk consultants covering
 - Insurance & Risk Management
- Research & development on key EU issues
- Global vision, local expertise

europe.milliman.com

