

European Actuarial Academy

an initiative of the 'Deutsche Aktuarvereinigung', the Dutch 'Actuariel Genootschap', the 'Schweizerische Aktuarvereinigung' and the 'Aktuarvereinigung Österreichs'

The role of an actuary within the solvency regime

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Martin Balleer

- *Past president (1995-2003), honourary member German Actuarial Association (DAV)*
- *Honourary Fellow Institute of Actuaries and Swiss Actuarial Association*
- *Member Advisory Board German Supervisory Authority (BaFin) 1997-2007*
- *Board member of Gothaer Insurance Group 1975 – 2002; former member of the presidential board of the German Insurers Association (GDV)*
- *Lectures in insurance technics, insurance law and risk management at Göttingen University*
- *Chairman Advisory Board European Actuarial Academy (EAA)*



Agenda

- *The actual status: Deregulation and actuarial competence*
- *The future status: Actuarial functions within solvency concept*
- *Draft EU Solvency Directive and corporate governance*



Regulated market
= *Traditional actuarial technics*

- *standard biometrics, morbidity, claims frequencies etc.)*
- *deterministic calculations of present values and technical provisions*
- *profit testing and office modelling*
- *deterministic embedded value*

Competition related to marketing and sales

Deregulated market
= *Advanced actuarial technisc*

- *high differentiation in data structure*
- *stochastic methods in biometrics, technical provisions, claims reserves, ALM*
- *stochastic methods in measuring risk potentials*
- *scenario and simulation technics*

Competition related to capital allocation and risk management



Consequences:

- 1. Actuarial skills have become key competences of an insurance company in deregulated markets especially in risk management against the background that actuaries are able to analyse and to structure complex questions and to think interdisciplinary, i.e. to integrate actuarial knowledge in the economic and legal framework as well as to think in categories of marketing and IT.*
- 2. The (legal) responsibilities of an actuary have been upgraded in many countries by implementing a Responsible Actuary system following the recommendation by the EU-Council when implementing the Third EU-Directive of life insurance .*



Example: ALM in Life Insurance

Actuaries have to deal with the risk potentials of the assets

High quota of shares ask for high risk capital and/or low guarantees

- Risk capital**
- Equity
 - free reserves on liabilities
 - free reserves on assets

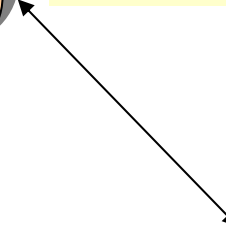
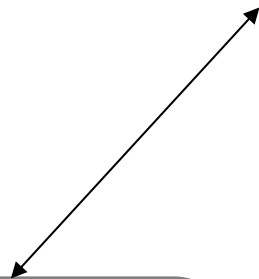
Products have to generate sufficient risk capital as free reserves on liabilities

Asset allocation
e.g. quota of shares

- Key challenges:**
- determining the risk exposure
 - **asset-liability-matching**

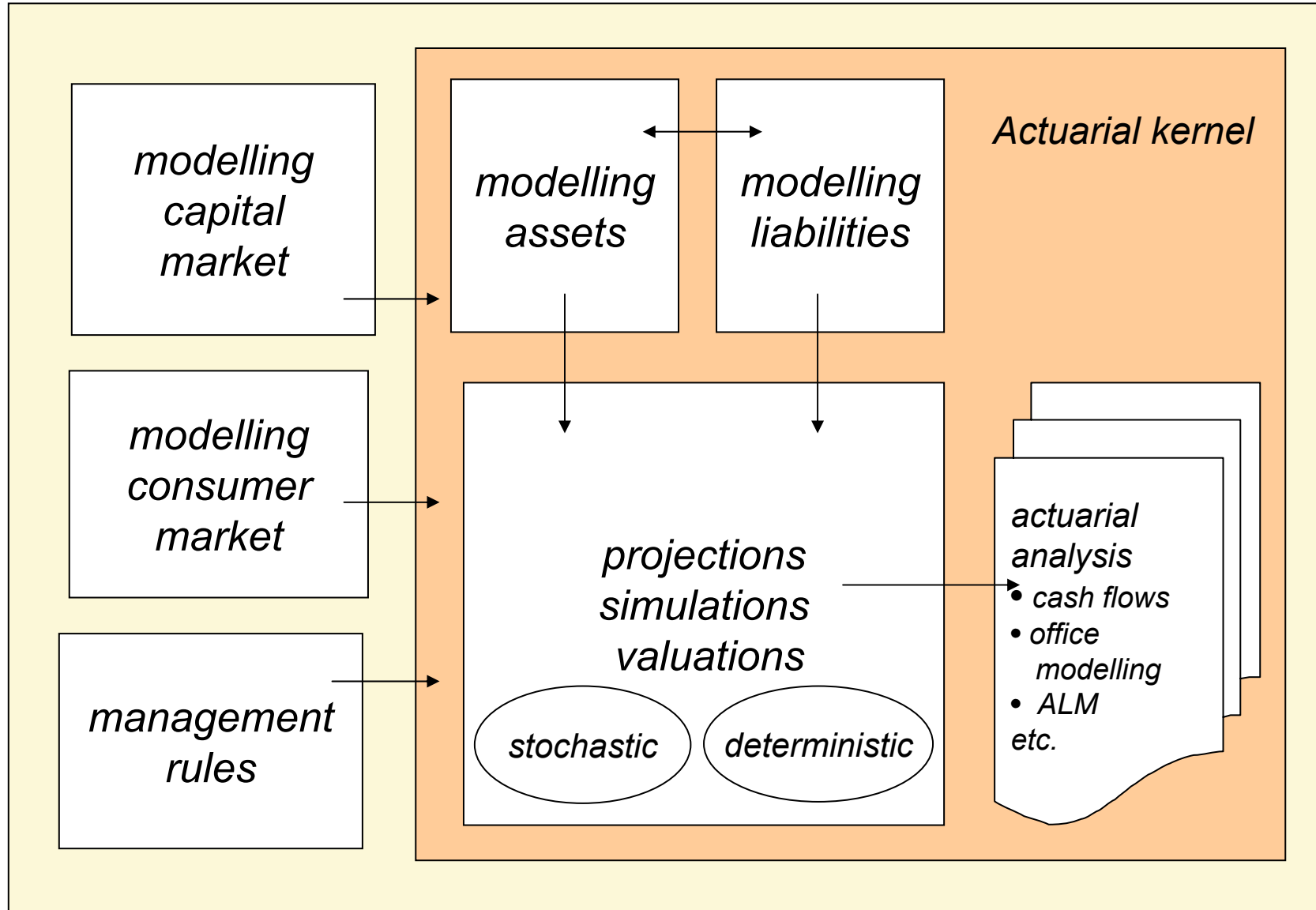
Quality of products

e.g. Level of guarantees, risk adjusted products





Example: ALM in Life Insurance





ALM (illustrating examples)

- *Modelling inflation with „mean reversion“*

$$I(t) = I_{\infty} + b_1 * [I(t-1) - I_{\infty}] + \sigma_1 * Z_1(t)$$

- *stochastic modelling the interest rate*

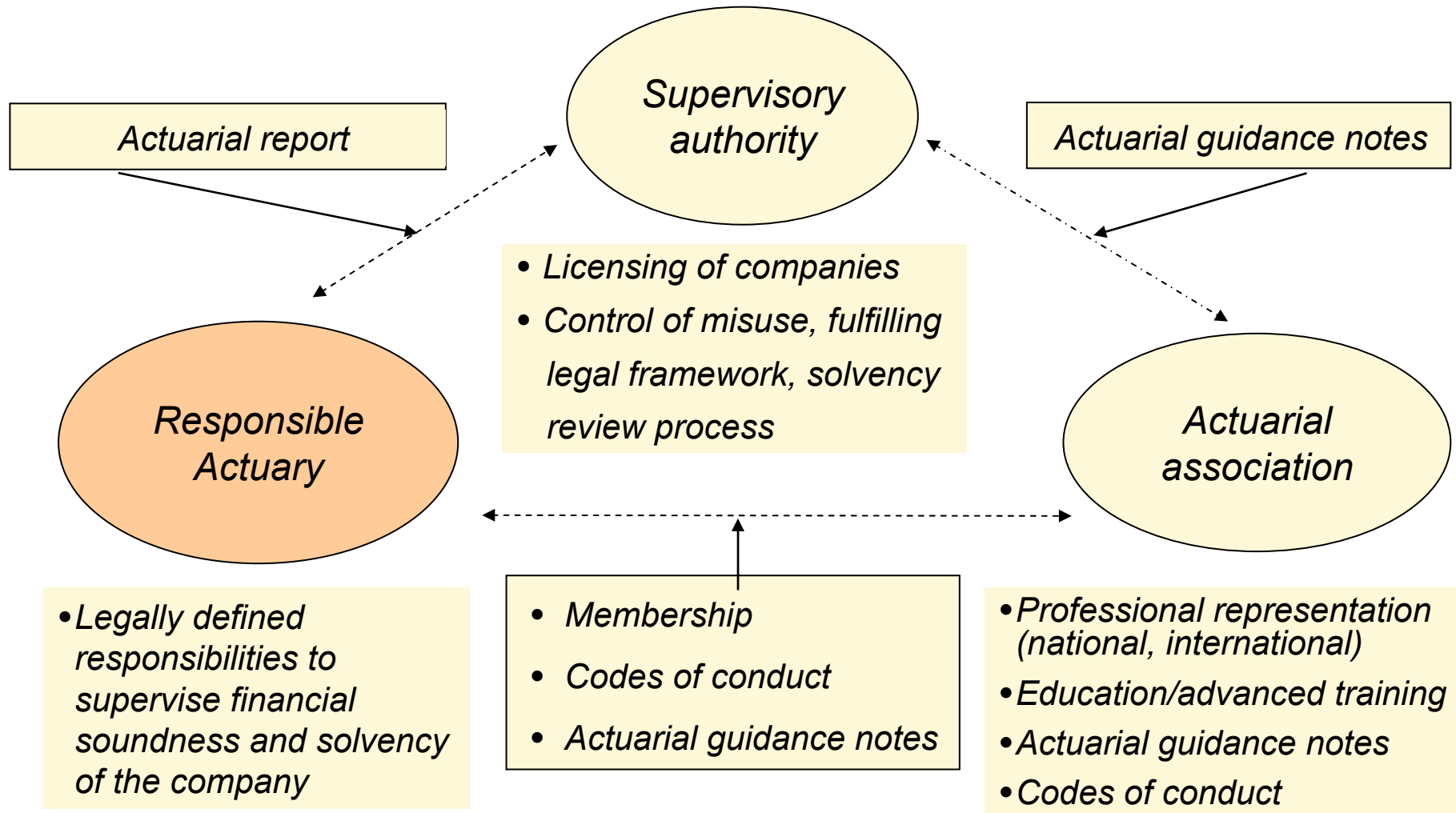
$$R(t) = (R_{\infty} - I_{\infty}) + b_0 * I(t) + \sigma_2 * Z_2(t)$$

- *Modelling stock market by geometric Brown process*

$$A(t) = A(t-1) + A(t-1) * (\mu + \sigma_3 * Z_3(t))$$



Actuarial infrastructure in deregulated markets





Main function of the Responsible Actuary

Principle: Monitoring financial soundness

Legal requirements:

- *controlling the levels of premiums and tariffs following sound actuarial calculation principles*
- *valuating and certifying the technical provisions*
- *monitoring solvency requirements*
- *proposing bonuses for with-profit-policies*
- *presenting the actuarial report to the regulator via the board of managers*

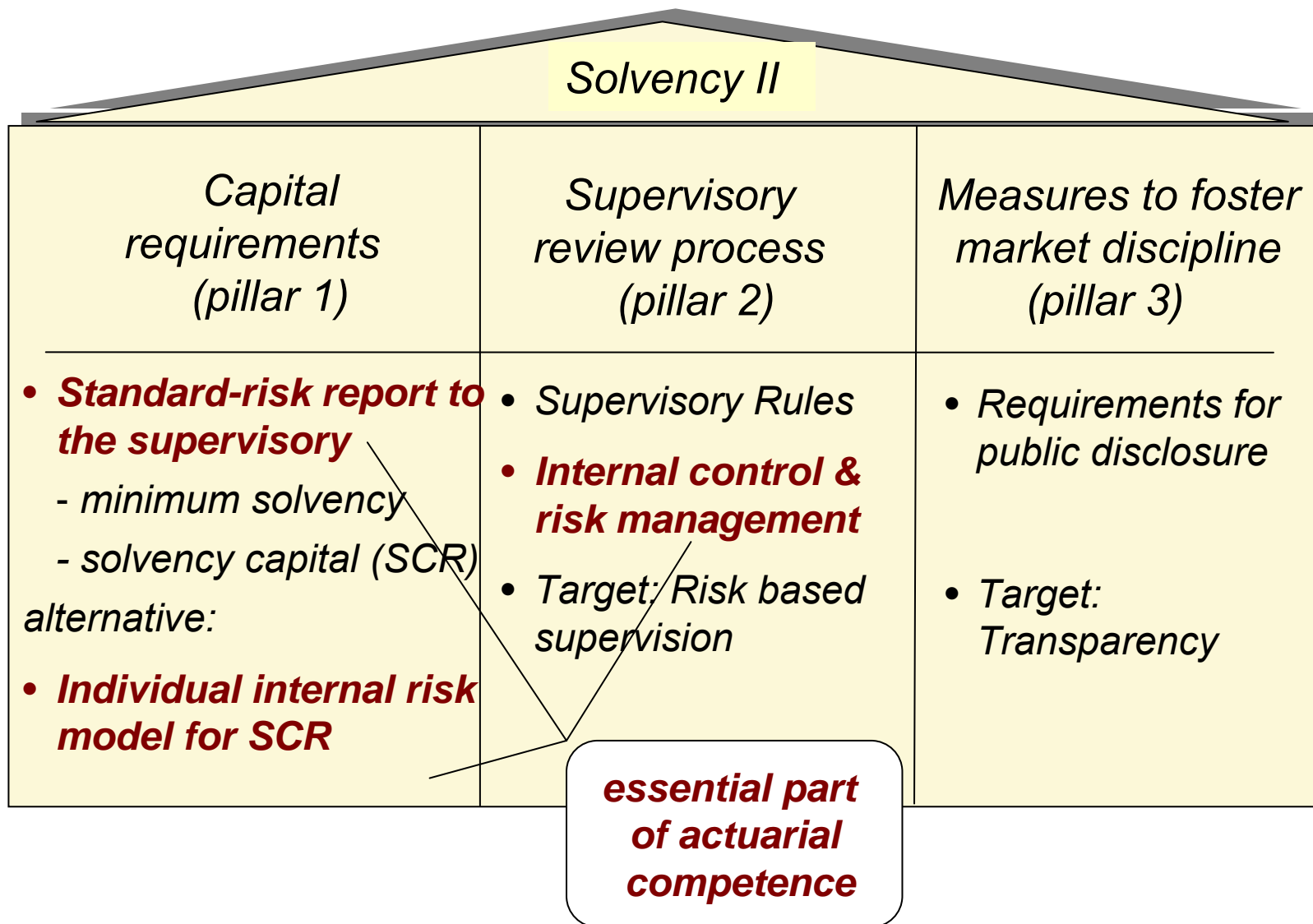
Further practical requirements:

- *monitoring the adequacy of reinsurance*
- *monitoring asset-liability-management*



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Solvency II

Principal question:

How many capital do I need at the beginning of the year in order to be able to cover the liabilities at the end of the year with 99,5% probability ?

Principal requirement:

Target capital (SCR) \leq Risk bearing capital

Solvency Capital Requirement (SCR):

*Measuring the risk potentials of assets and liabilities by actuarial methods
(factor based or scenario based methods)*



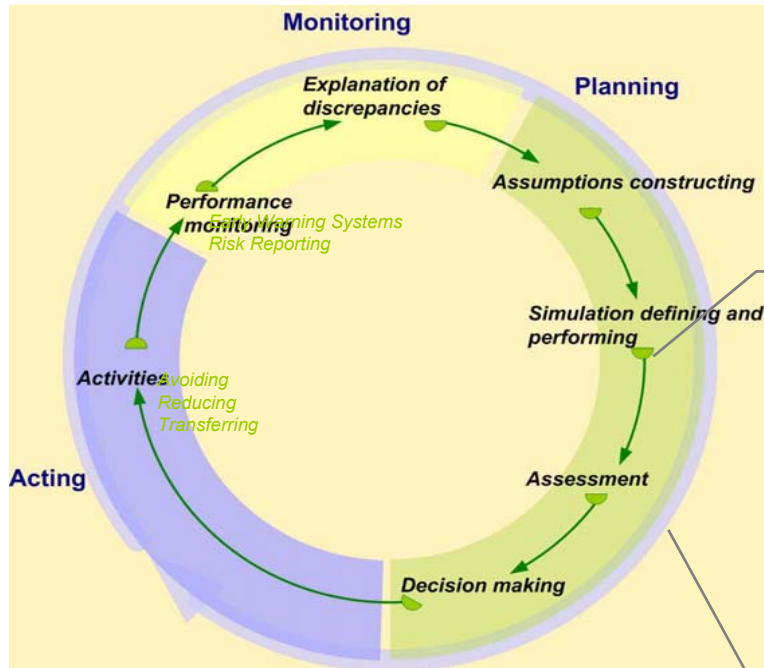
Actuarial competence used in the calculation of SCR

- *determining scenarios within Solvency II*
- *determining risk factors used in Solvency II*
- *stochastic and deterministic modelling assets and liabilities*
- *structuring and evaluating datas*
- *determining fair value/best estimate of technical provisions/claims reserves*
- *servicing actuarial kernel*
- *participation in comprehensive risk management*
- *understanding the legal and economical enviroment*

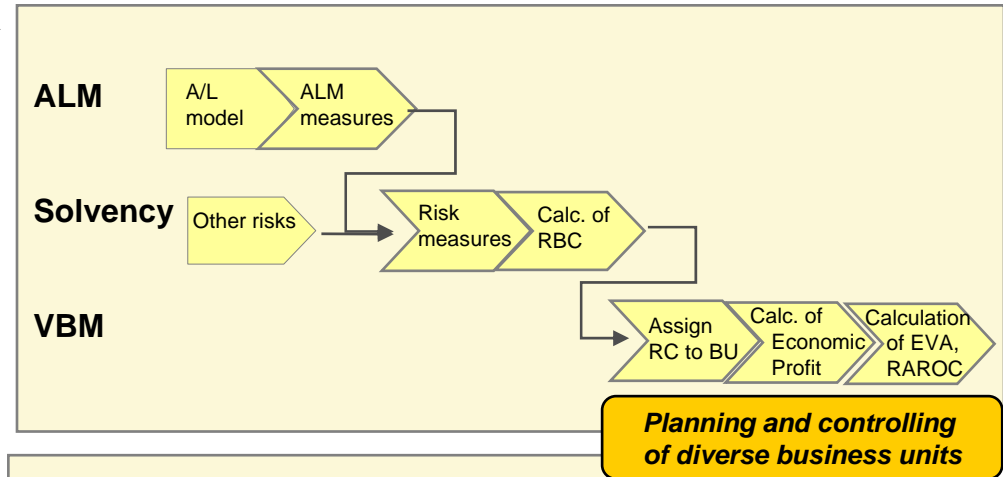


Comprehensive Risk Management Process

SAS Institute (Balleer/ Starcewska)



Traditional cash-flow analysis
Solvency II
Value based management



Planning and controlling of diverse business units

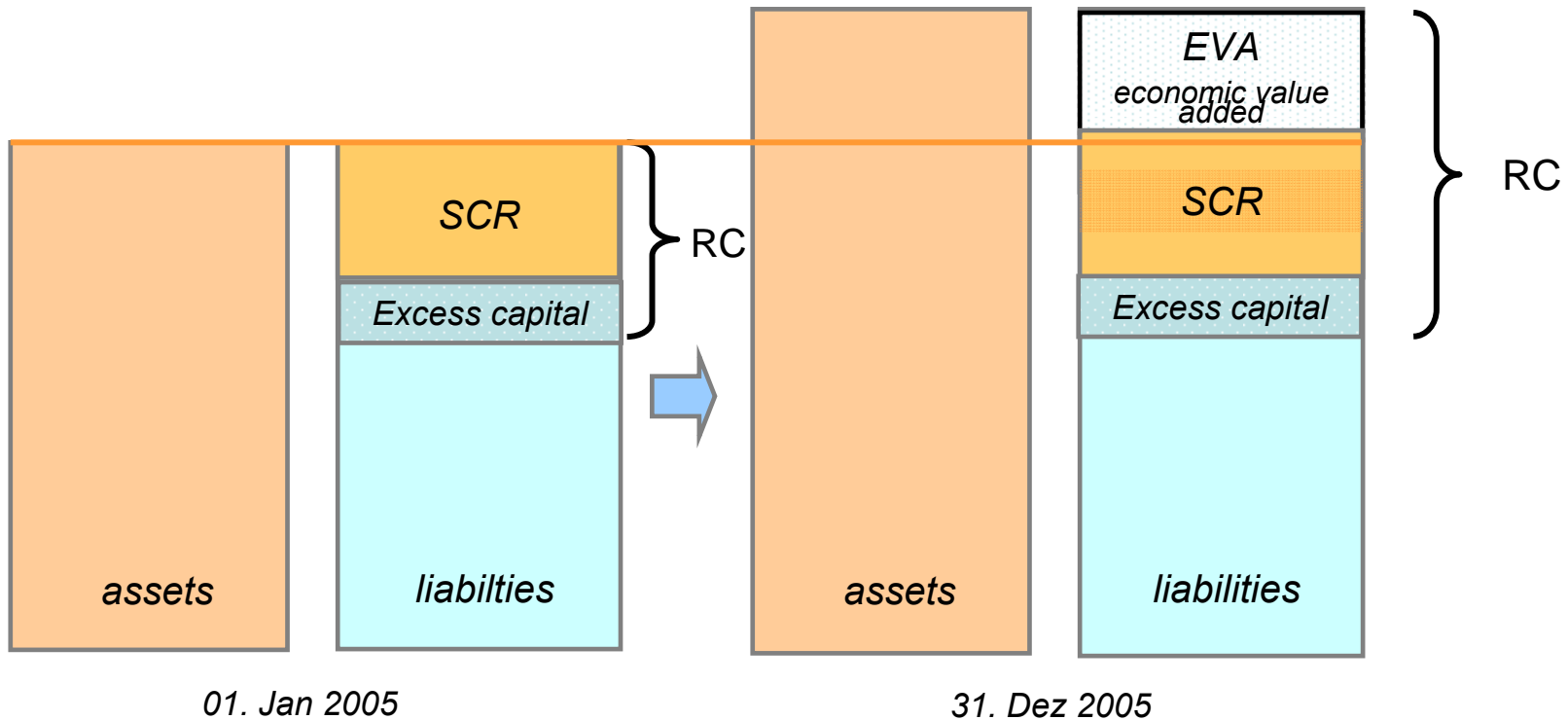
- CRO function**
- developing internal risk management system
 - coordinating reporting system
 - integrating involved responsibilities (actuarial, financial, accounting, controlling, product management, asset management etc.)

- Actuarial involvement:**
- Measuring risk potentials on the asset/liability side
 - Valuing technical provisions for different product lines
 - Integrating reinsurance
 - Developing/structuring datas
 - Solvency reporting
 - Others...



Example: Value based management

from solvency to value based management:



Rentability of a company expressed by the increase/decrease of RC (= economic value added = EVA)

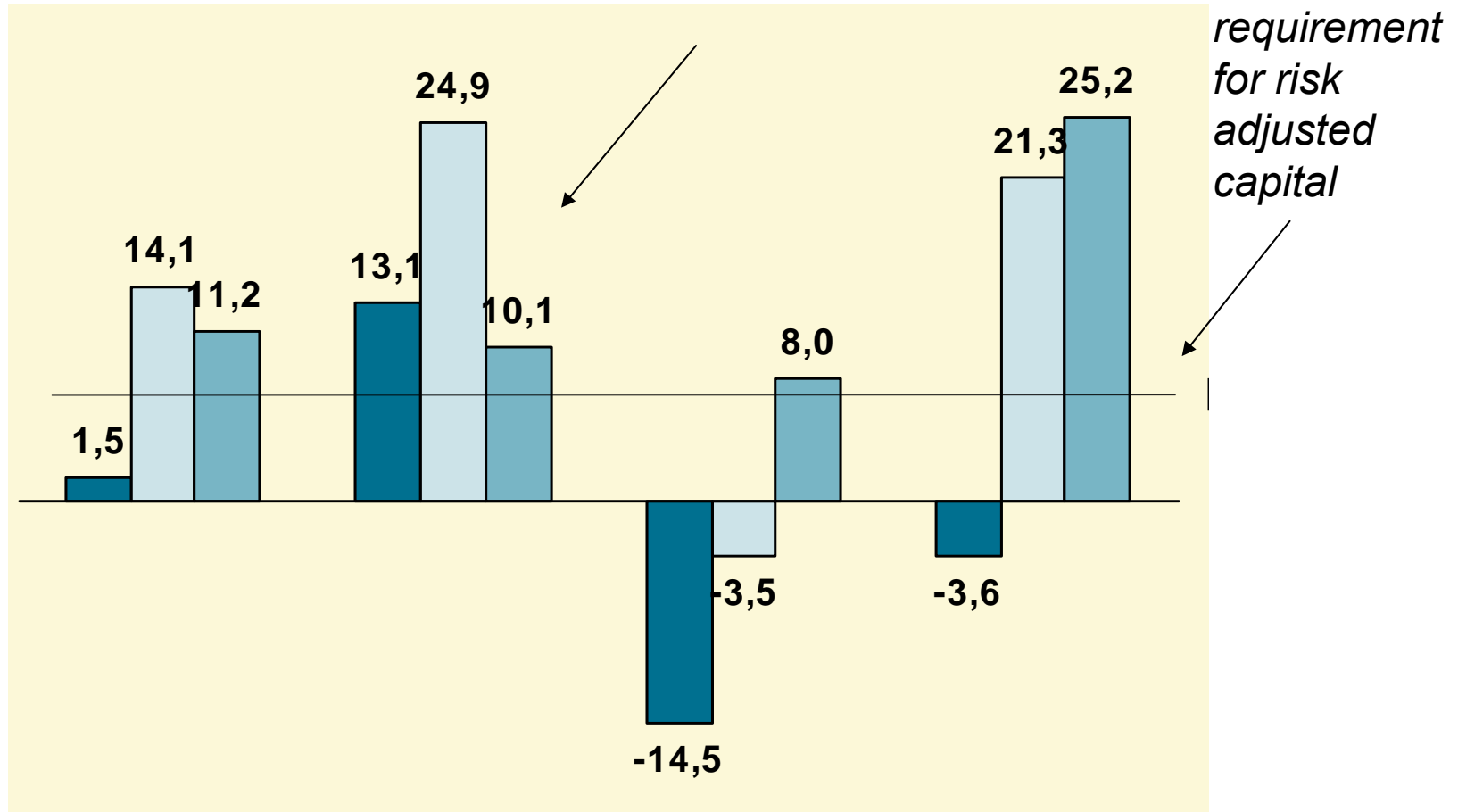
$$RoRAC = EVA / SCR$$

(= return on risk adjusted capital = measure for profitability, can be allocated to different business lines)



Example: Value based management

Example: Realized return on risk adjusted capital (RoRAC)



Business line:
total

I

II

III



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General governance requirements (Article 41,42)

- *to install an „effective system of governance which provides for sound and prudent management of the business“ by
 - *transparent structures*
 - *clear allocation and appropriate segregation of responsibilities*
 - *an effective system of information**
- *to develop a clear and transparent documentation of the policy regarding solvency*
- *to require professional qualifications, knowlege and experience of the persons involved in solvency enabling „sound and prudent management (fit)“ and having achieved „the highest repute and integrity (proper)“*



Risk management (Article 43)

- *to install an „effective risk managements system comprising strategies, processes and reporting procedures“*
- *to provide for a risk management function within the organizational structure of the companies*
- *(if used an internal model) to cover the design, implementation, test, validation, documentation of the model and to analyse its performance*



Own risk and solvency assessment (Article 44)

- *To conduct its own risk and solvency assessment by*
 - *valuing the overall solvency needs*
 - *to comply, on a continuous basis, with the capital requirements*
 - *to identify the extent „to which thwe risk profile ...deviates significantly from the assumptions*
 - *to implement business „processes which enable it to properly identify and measure the risks it faces in the short and the long term and also to identify possible events or future changes in economic conditions that could have unfavourable effects on its overall financial standing.“*
- *to implement ORSA as an integral part of the business strategy and an ongoing basis in the strategic decisions of the companies*



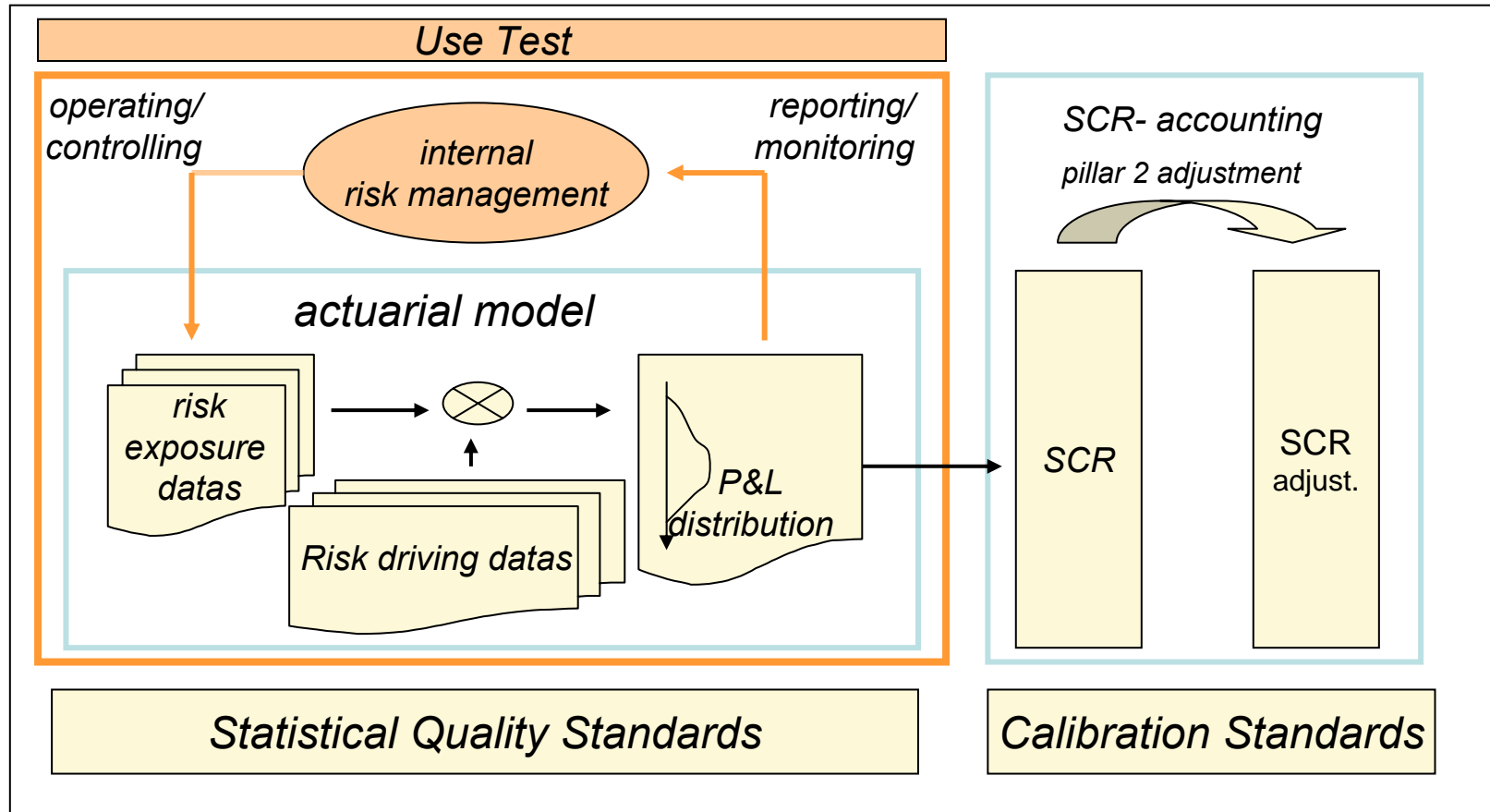
Actuarial Function (Article 47)

- *to value the technical provisions*
- *to express an opinion on the overall underwriting policy*
- *to express an opinion on the adequacy of the reinsurance*
- *to contribute to the effective implementation of the risk management system, „in particular with respect to the risk modelling underlying the calculation of the capital requirements...“*
- *to ensure, that „the actuarial function shall be carried out by persons with sufficient knowledge of actuarial and financial mathematics and able...to demonstrate their relevant experience and expertise with applicable professional and other standards.“*



Requirements for internal models

Model Change Policy



Dokumentation Standards

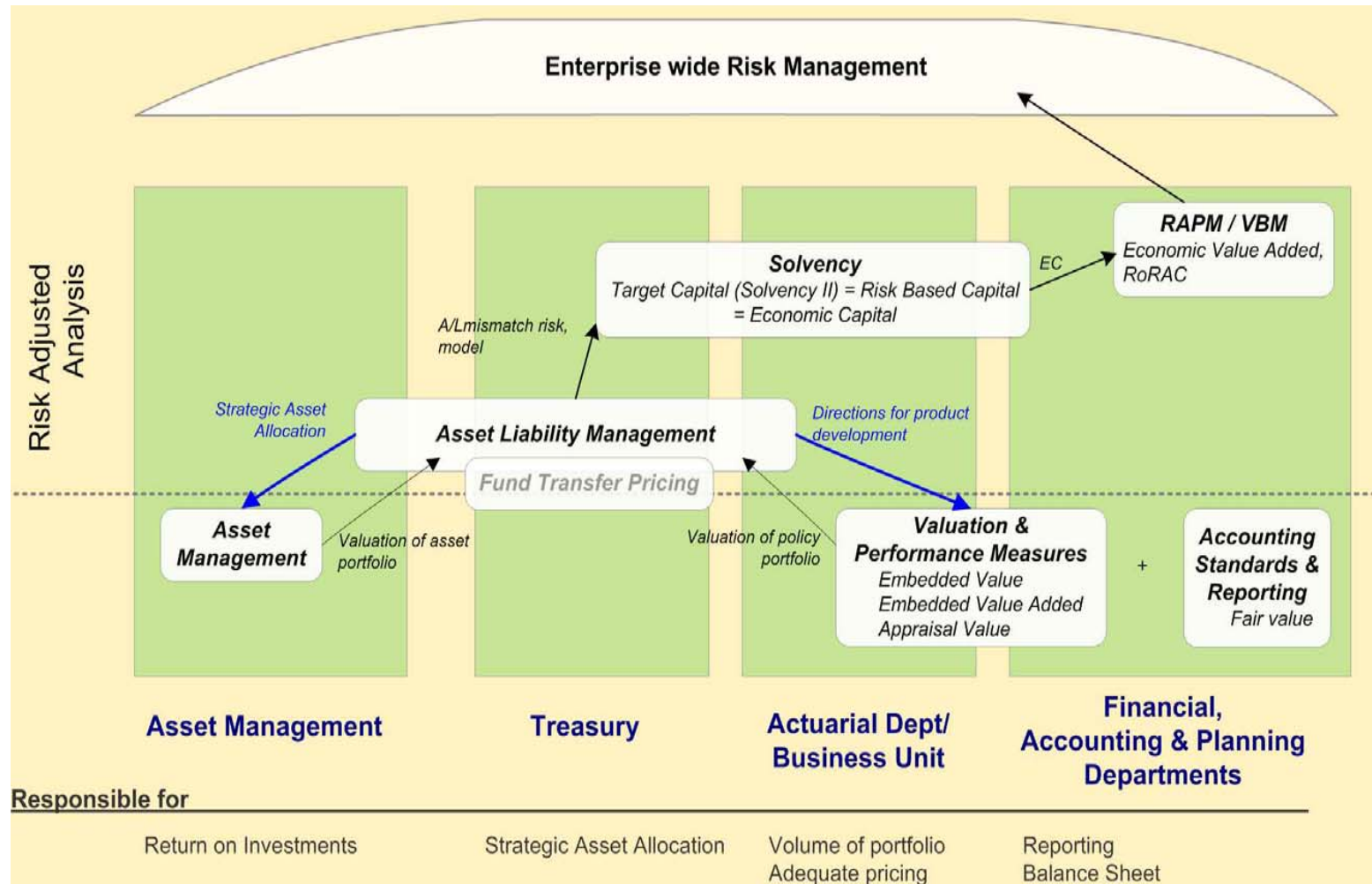
Validation Standards



- *The (draft) version of the Directive hasn't defined*
 - *the institutional role of an acturay*
 - *the formal reporting requirements*
- *Implementation of institutional roles of the actuary and its requirements are delegated to national legislation and practice*
- *System of a „Responsible Actuary“ has been installed in many countries to cover special responsibilities with regard to actuarial prudence and seriosity*
- *Key question: What kind of institutional function an actuary should cover within Solvency II ?*



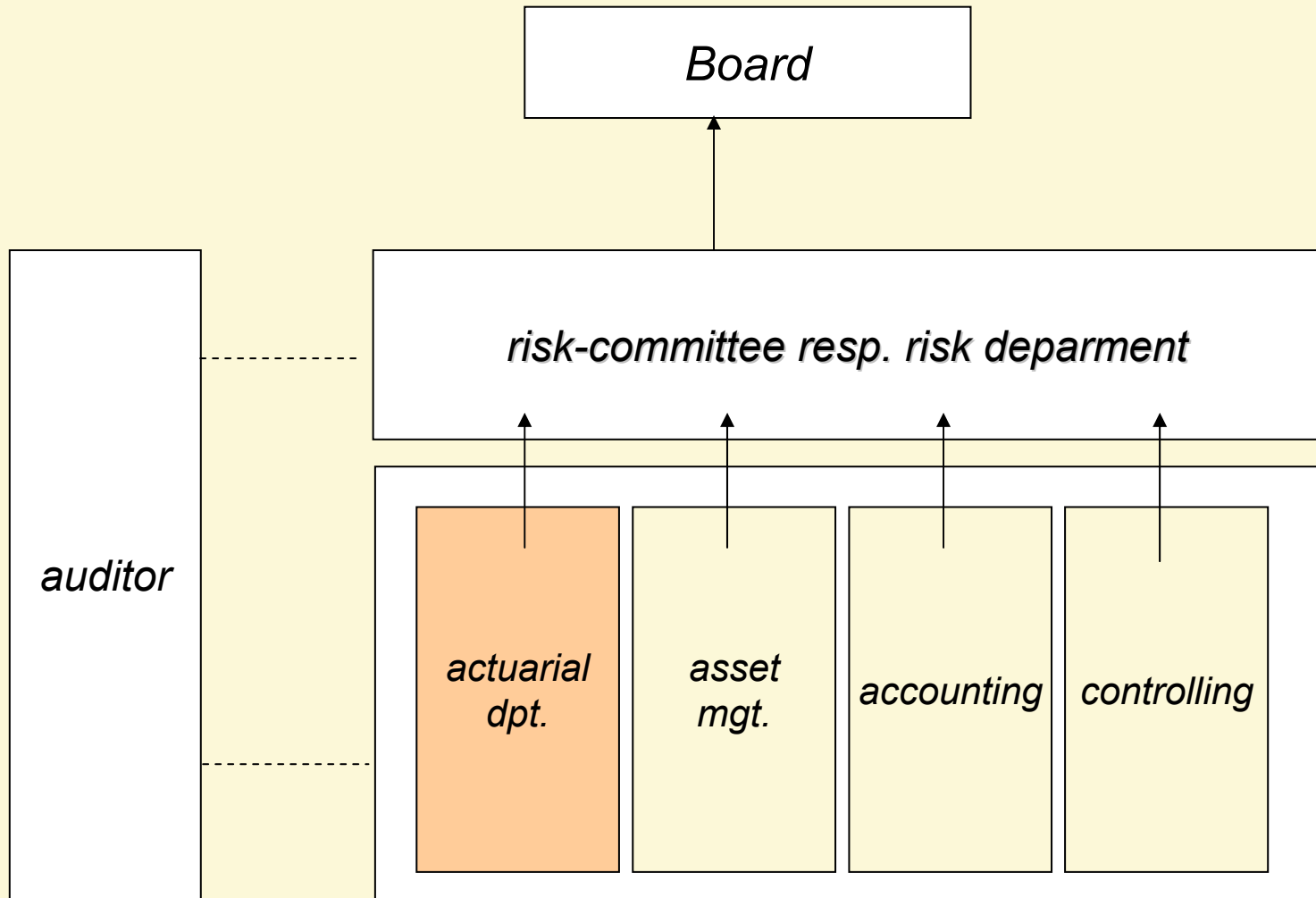
Comprehensive Risk Management Process





Corporate Governance

Corporate governance





Potential (minimal) institutional functions of actuarial experts within Solvency II:

- *certification of technical provision / claims reserves*
- *certification of modelling and calibrating assets / liabilities*
- *certification of suitable data structure (biometrics,...)*
- *certification of of actuarial models and suitable scenarios within internal models*

Possible function:

- *Responsible Actuary with comprehensive responsibilities with regard to Solvency II (actuary as a risk manager)*



Responsible Actuary: 2 alternative versions in the markets:

- *Responsible Actuary as independent function outside the company*
 - *avoiding conflict potential between management and actuarial responsibility*
 - *auditing wrong development (ex post function); overlap with auditing functions*
 - *splitting actuarial resources of the company*
- *Responsible Actuary integrated in the companies' management (preferable version)*
 - *anticipating and avoiding wrong developments by powerful function (ex ante function)*
 - *implementing single actuarial competence within the company*
 - *generating potential conflicts with management responsibilities (can be reduced by strong requirements on the appointing the actuary and actuarial reporting)*



- *Undoubtedly: Increasing actuarial skills will generate important functions within the companies because of Solvency II*
- *But: The functions might be seen more and more as a very specific technical expertise under the responsibility of the CRO and might reduce the chances to get more comprehensive responsibilities (board of directors, CRO, general manager)*
- *Conclusion: The actuaries have to enhance their knowledge of the business environment, especially of economics in order to achieve a better position in risk management.*



In any case...

...the future is opened for the actuaries !

Thank you for your attention!

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