A Change of Paradigm for the Insurance Industry

presented by

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The Insurance Industry

- The insurance industry has a *long history*
- Her contribution to the economic expansion in Europe and America has been very significant in the XIXth and XXth century
- Today, a healthy insurance industry is essential to the good functioning and the development of the economy
- For many years, the management of an insurance company was limited to cashflow management
- As long as the received premiums and the financial return exceeded the claim payments and expenses, the company was considered to be profitable and thus solvent

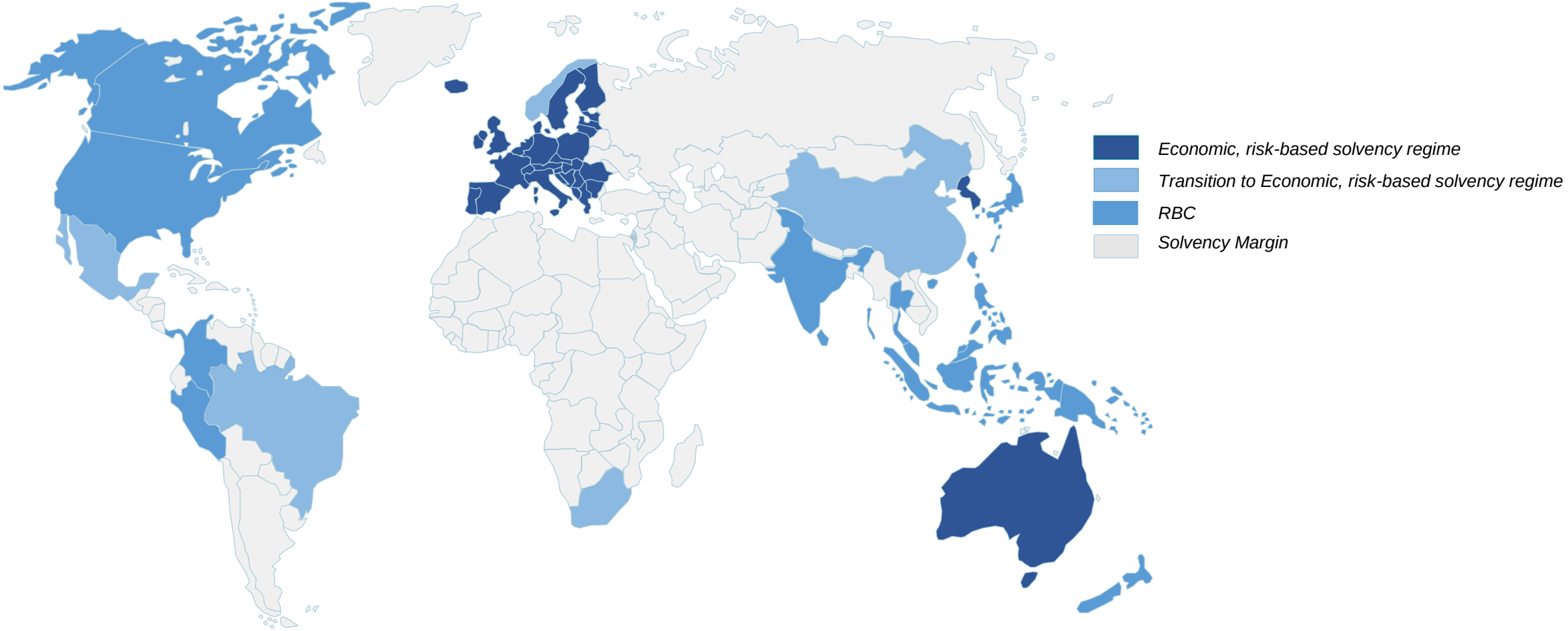
Traditional Performance Measures

- The performance measures derived from this approach were and still are:
  - The *combined ratio* in P&C: $\frac{Loss+Expenses}{Premium}$
  - The *profit* (or technical) *margin* in Life: $\frac{Operating\ Profit}{Premium}$
- Both measures allow easy comparison between companies and products
- However, they do not reflect the timing of profit or losses, the cost of capital and the riskiness of the business
- They are typical *accounting performance measures* and are even today paramount in corporate communication and media coverage

The Risk Based Solvency

- European insurance companies are implementing *Solvency 2*, while the Swiss companies have been using the *Swiss Solvency Test* (SST) since a few years
- Both regulation are intended to be *risk based* and they are followed by many more countries: C-Ross in China, Korea, Singapore, …
- Discussions are turning around certain parameters and models but do not put in question the fact that solvency should be based on a *quantitative assessment of the risks*

There is a global trend towards economic risk based solvency regulation



Performance and Risk

- As soon as companies are required to produce solvency figures based on risk evaluation, the pressure is high to produce *performance* measures *related to the risk* taken
- *Return on Equity* (ROE), which has become a *standard requirement* of bank analysts as representing the shareholders or potential investors, is directly related to the risk taken
- The publication of the *Risk-Adjusted Capital* (RAC) required by Solvency points out to the need to also look at the performance related to it: the *Return on Risk Adujsted Capital* (RORAC)

Capital as a Basis to Quantify Risks

- *Capital* is used by insurance companies as *a guarantee* that they will pay the policyholder beyond the average claim for this type of policy but only up to a certain pre-determined limit which has a very low probability
- This means that determining the *capital* is a *way to assess the risk* of a contract
- The capital becomes the *monetary value* of a company that it must have, given the risk assessment of the company by a stakeholder or his agents (rating agencies, regulators, investors, management)

A Change in Paradigm*

- Both the financial markets and the new regulations push the insurance industry into *new territories*: we move from a management based on accounting and cash-flow metrics to a management *based on risk/return* and on capital allocation

- This is a *change in paradigm* that has profound influences in the way insurance business will be judged in the future: premium will have to reflect the risk underwritten in the contract

- Combined ratio and technical return are not anymore going to be the only metrics to measure the performance of P&C and Life respectively

- Return on capital allocated to the risk (*RORAC*) needs to be taken into account as it will be reflected in the *ROE*

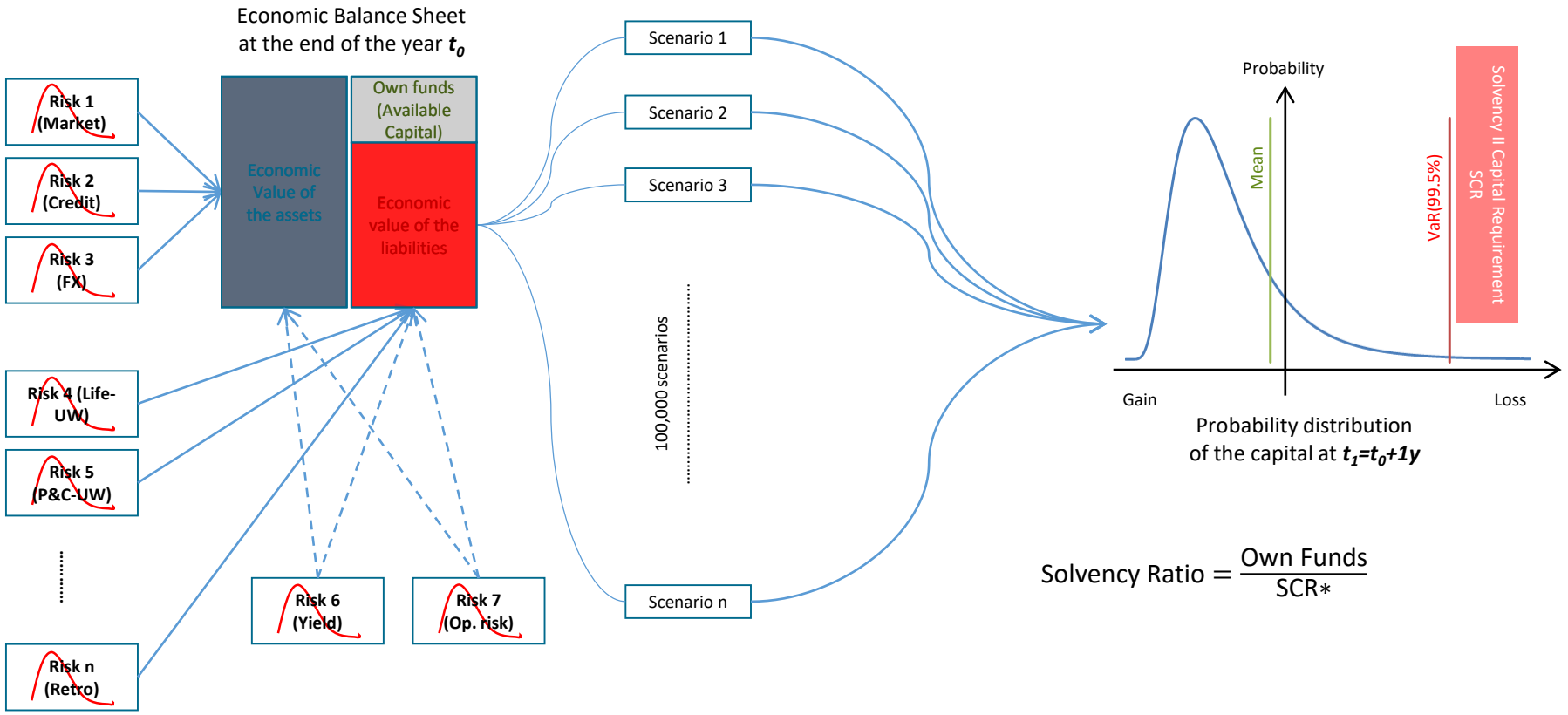
*) The paper is available at SSRN: http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2692525

Determining Risk-Adjusted Capital

- The *Risk-Adjusted Capital* (RAC) of an insurance company is evaluated on the basis of a *quantitative model* of its different risks
- We first need to identify the *various sources of risk*. One usually distinguishes four large risk categories:
    1. Underwriting risk (or liability risk),
    2. Investment risk (or asset risk),
    3. Credit risk (or risk of default),
    4. Operational risk
- Generally insurance companies *have the know-how* to manage and model their liability risk and are able to model the next two categories as well using standard finance models

What is an Internal Model?

An internal model is here to assess *the risk* of the economic balance sheet of the company



$$\text{Solvency Ratio} = \frac{\text{Own Funds}}{\text{SCR}*}$$

*) Measured at t_1 but discounted at t_0

Historical Evolution of Internal Models

Mortality Tables ~1860

De Finetti* 1940

Risk Based Solvency 1995-2000

Capital Management ~2005

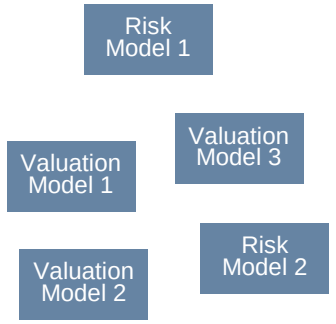
Value Protection → **Value Sustainment** → **Value Creation**

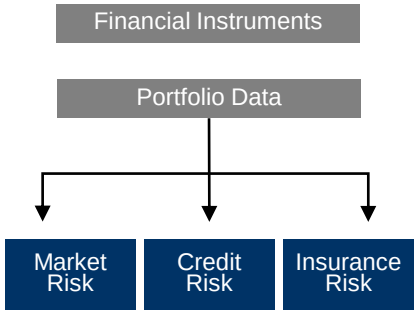
Collection of sub models quantifying parts of the risks

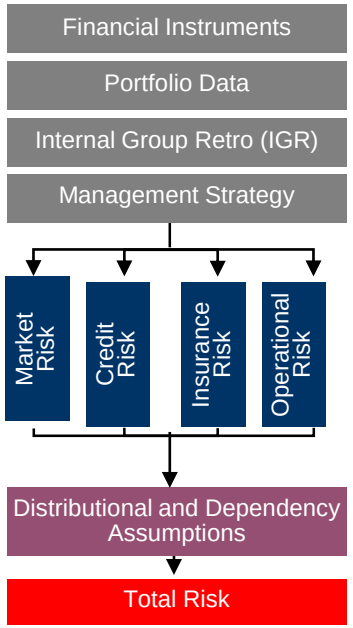
Quantification of different risk types with portfolio effects

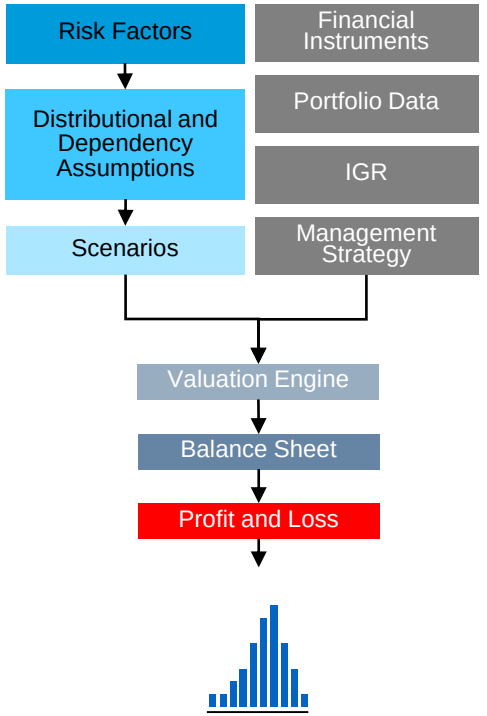
Risk types are combined to arrive at the company's total risk

Modelling of underlying risk drivers and emphasize on the whole distribution









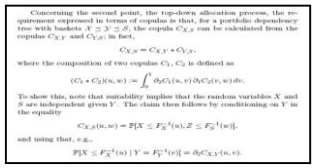
Slide inspired by Philipp Keller

Internal Model Developments

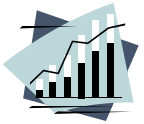
Reality

Simplification

Model (abstraction)



Methodology

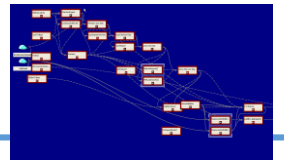


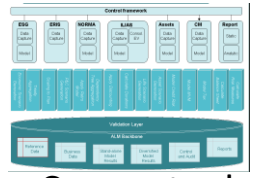
Data

Assumptions

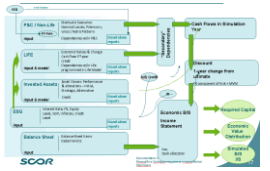
Industrialization

Model realization

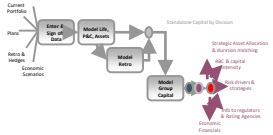




Conceptual Framework



Implementation Framework



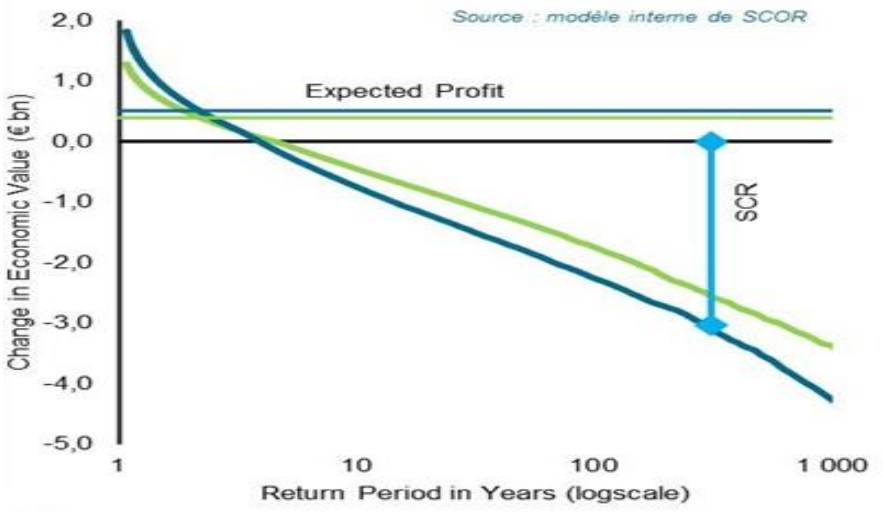
Processes

It all starts with the definition of an insurer's risk appetite

- An insurer's risk appetite defines the risks it will and will not take
- Risk appetite is personal and business specific

- Setting the *risk appetite* framework comes within the competency of the *board of directors*

Profitability according to risk scenarii depends on risk appetite



- A higher risk appetite leads to a higher profitability gap between favourable and adverse scenarios
- The blue curve corresponds to a higher risk appetite than the green one

Consequences for Companies and Society

- The importance and *value of data* collection to assess risks is increasing: "big-data", *machine-learning* methods to make use of their abundance
- *Quantitative methods* are *here to stay* and become even more sophisticated with "machine learning" algorithms
- *Risk management* sees its status within companies enhanced and changed from game stopper to *business optimizer*
- Progress in the understanding of *long-term liabilities* and *capital allocation to time* will have to be made
- We need to make progress in understanding the implication of risk management to individual risks: *link* between *societal risk* and *individual risks*