Qualitatives Risikomanagement in der Versicherung

Gerhard Stahl
Ulm, Juni 2015
Dates

1. Freitag, den 5. Juni 10:00 bis 17:00 Uhr

2. Samstag, den 6. Juni 10:00 bis 17:00 Uhr

3. Freitag, den 19. Juni 10:00 bis 17:00 Uhr

4. Samstag, den 20. Juni 10:00 bis 13:00 Uhr
Bibliography

1. ISO-Norm zu Risikomanagement
2. Luhmann, Soziologie des Risikos
3. Aven, Quantitative Risk Assessment
4. Aven et. al., Uncertainty in Risk Assessment
5. Hood et. al., The Government of Risk
6. Carrel, The Handbook of Risk
7. Diebold et. al., The Known, the Unknown and the Unknowable
8. Chapman, Simple tools and techniques for enterprise risk management

9. Rebonato, Plight of the Fortune Tellers

10. De Weert, Bank and insurance capital management

11. Dembo; Fremann, Die Revolution des finanziellen Risikomanagements

12. Lam, Enterprise Risk Management

13. Scandizzo, Risk and Governance

14. Tarantino, Essentials of Risk Management in Finance

15. Lyotard, Das postmoderne Wissen
Content

■ SPAN
■ Aven’s approach
■ ISO Norm of risk management in Aven’s perspective
■ Applications to Solvency II
Def.35: Risk analysis is a process to comprehend the nature of risk and to determine the level of risk.

Remarks:

1. The term process refers to the governance system; i.e. the process has to be documented, a framework has to be available, the results have to be communicated adequately and a clear escalation procedure with respect to risk committees has to be in place.

2. The term nature refers to the substance of sources of risk. Here, risk categories are coming into play which are different by their very nature, e.g.: NatCat and market risk.
Terms and definitions

3. The term level refers among others to the risk parameters within \((A, C, U, P, K)\); i.e. it provides a risk description or risk estimation.

4. Risk analysis is the input for the risk evaluation process and provides insights and information about risk treatment.

[Def.36:] Risk criteria give terms of reference against which significance of risk is evaluated.

Remark:

1. Risk criteria are based on organizational objectives and external and internal context.
**Talanx in a nutshell – Strategic group pillars**

Focus of the Group is on long-term increase in value by sustainable and profitable growth and vigorous implementation of our B2B-expertise

<table>
<thead>
<tr>
<th>Profit target</th>
<th>Capital management</th>
<th>Risk management</th>
<th>Growth target</th>
<th>Human resource policy</th>
</tr>
</thead>
<tbody>
<tr>
<td>RoE(^1) &gt; Ø TOP 20 European insurers</td>
<td>Fulfill S&amp;P “AA” capital requirement</td>
<td>Generate positive annual earnings with a probability of 90%</td>
<td>50% of primary GWP from foreign operations</td>
<td>Continuous development and promotion of own workforce</td>
</tr>
<tr>
<td>RoE(^1) &gt; risk-free interest rate(^2) + 750 bps</td>
<td>Efficient use of available financing instruments</td>
<td>Sufficient capital to withstand at least an aggregated 3,000-year shock</td>
<td>Selective profitable growth in Retail, Germany and Reinsurance</td>
<td>Individual responsibility and entrepreneurial spirit</td>
</tr>
</tbody>
</table>

\(^1\) In accordance with IFRS
\(^2\) Risk-free rate is defined as the 5-year rolling average of the 10-year German government bond yield

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**Group and divisional strategies define goals and actions to be taken**
Remarks

1. The profit target refers to the group of top 20 European insurers - external context in form of competitors - and to the risk-free interest rate, also external context referring to an economic aggregate that comprises the whole financial industry but also the economic strength and growth of a global economy; i.e. $K, R$

2. Risk management refers to the internal model by requiring a capitalization that survives a 3000-year shock which equals a 99.97 level of significance; i.e. exemplifying consequences in $C, R$.

3. The investment risk is kept to 50% which exemplifies the risk appetite with respect to a specific risk category; i.e. restrictions on $A$. 

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Remarks

1. Positive annual earnings refer to IFRS and are hence close to but not identical with the variable of interest as defined under Solvency II because goodwill is not included in the Solvency II balance sheet. Here comes $K,R$ into play.

2. The human resource policy clearly relates to organizational objectives; $Ø$.

3. Note that Solvency II requirements are included implicitly by means of side conditions. This means the firm specific targets go beyond the regulatory requirements.
Terms and definitions – the backbones of the ISO framework

[Def.37:] Level of risk denotes the magnitude of a risk or combination of risks expressed in terms of the combination of consequences and their likelihood.
Remarks:

- With respect to the magnitude of risk it is important to note that under Solvency II the SCR is defined by

\[ SCR := \mathbb{E}(X_{t+1}) - \text{VaR}(X_{t+1}) \] (1)

If \( X \) denotes the aggregate claims of an insurance portfolio over a given reference
Terms and definitions – the backbones of the ISO framework

period and $P$ denotes the aggregate premium for this portfolio than $VaR(X) - P$ is the smallest additional capital required such that the insurer becomes technically insolvent with a small probability. Hence this approach applies implicitly the following risk axiom, where premia are treated as capital! This is adequate, due to the fact that premia are given in cash.

**Axiom D1.** Positiv homogeneity and translation invariance

$$\hat{\rho}(a\tilde{x} + b\mathbf{1}) = a\hat{\rho}(\tilde{x}) + b, \forall \tilde{x} \in \mathbb{R}^n, a \geq 0, b \in \mathbb{R}$$

where $\mathbf{1} = (1, 1, \ldots, 1)^T \in \mathbb{R}^n$

- By their very definition SCRs under Solvency II are defined at $C$ and include defined by the level of significance associated likelihoods. Note that in the most cases the likelihood is however understood as probability, i.e. implicitly a framework $(A, C, \widehat{P}_f, P(P_f), K)$. 

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Terms and definitions – the backbones of the ISO framework

Note that closely related to the levels of risk which are an important tool to formulate the risk-bearing capacity which serves as an input to the limit and threshold system and financial targets formulated within the intrinsic value creation process.
Terms and definitions – the backbones of the ISO framework

[Def.38:] Risk evaluation refers to a process that compares the results from risk analysis with risk criteria in order to determine whether the risk and/or its magnitude is acceptable or tolerable.

Remarks:

- Risk analysis is contributed by the independent risk management function. The risk criteria are in general formulated in the risk strategy by the board of management. The decision whether risks are acceptable or not is realized by risk takers and hence not by the risk management function.

- Note that the validation as well as the ORSA process intervene with the risk analysis.
[Def.39:] Risk treatment is understood as a process to modify risk.
Remarks:

- In a traditional framework risk would be related to \((A, P, C)\), i.e., its treatment might involve the risk source, the likelihood or the consequences. However, as we emphasized Aven’s perspective which is very much in the spirit of Solvency II would focus on \((A, C, U, P, K)\) which is mirrored among others in our definition of an internal model

\[
F(X_{t+h} \mid J_t, Z_t, \mathbb{R}, \mathbb{O}). \tag{2}
\]
Terms and definitions - the backbones of the ISO framework

[Def. 40:] Under control we understand measures that modify risk.

[Def. 41:] Under residual risk we understand the risk that remains after risk treatment.

Remarks:

- Sometimes residual risk is also denoted as retained risk.

- Residual risk can contain unidentified risks. An example might be basic risks in the context of hedging. Also model risk comes into play here. Note furthermore that especially regulatory standardized methods are exposed to a significant amount of unidentified risks.
[Def.42:] Monitoring denotes the continual checking, supervising, critically observing or determining the status in order to identify change from the performance level required or expected.

Remarks:

■ Monitoring can be applied to the risk management framework, risk management process, risk or control. The most general approach is taken by considering a model in a wide sense.

■ Validation activities as well as the profit and loss attribution and the use test are closely related to monitoring activities.
Terms and definitions - the backbones of the ISO framework

[Def.43:] Under review we understand an activity undertaken to determine the suitability, adequacy and effectiveness of the subject matter to achieve established objectives.
Remarks:

- Again, review can be applied to a model in a wide sense.

- Validation activities as well as the profit and loss attribution and the use test are closely related to review activities.