PwC Actuarial Services Newsletter

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Key points in brief:

Editorial

This will mark the fourth year of our European collaboration on our Actuarial Newsletter. We want to take this opportunity to look back on an interesting year for actuaries and as well as take a glance at what awaits actuaries in the months and years ahead. New regulatory requirements have confronted European insurers in the past year. We take a closer look at how our clients deal with this paradigm shift.

Climate change is relevant for insurance industry. Greenhouse gases are accumulating in Earth's atmosphere as a result of human activities, causing surface air temperatures and subsurface ocean temperatures to rise. Temperatures are, in fact, rising. The changes observed over the last several decades are likely mostly due to human activities, but we cannot rule out that some significant part of these changes is also a reflection of natural variability.

Solvency II is living now and standard formula is a common calculation approach. A review of standard formula and give information of results quality. Discussing strengths and weaknesses of standard formula calculations provides helpful additional information for the observant reader.

Insurance companies take strategic risk management very seriously — recent surveys reveal that strategic risk management is ranked as one of their most important objectives by financial executives. Given its real-world prominence, one might guess that the topic of risk management would command a great deal of attention from researchers in finance, and that practitioners would therefore have a well-developed body of wisdom from which to draw in formulating hedging strategies.

We hope you enjoy this newsletter and we look forward to the opportunity to discuss these topics with you in the near future.

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Article #1: Update – Review of the Solvency II standard formula

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Introduction

The Solvency II regime has been in place since 2016. This, however, has not halted the process of developing and refining the regulation set forth by EIOPA.

This process includes a critical examination of the Solvency II standard formula. The underlying assumptions, methodologies and standard parameters are challenged. The European Commission will complete the review of the standard formula by December 2018. The main objective is to derive simplifications in the standard formula and to ensure the proportionate application of the requirements. Proposals made by the insurance industry and professional bodies refer to methodological consistency, the adjustment of parameters and the derivation of simplifications within the standard formula.

Timeline

Public consultation on the first set of proposals has taken place until the beginning of September 2017. It has been sent to the European Commission by the end of October 2017 and includes proposals on simplified calculations, risk mitigation techniques and undertaking specific parameters (USPs), amongst others.

Public consultation on the second set of proposals has subsequently taken place in November and December 2017. Finalized proposals and modified advises have been published by EIOPA in the beginning of March 2018.

Recalibration of standard parameters of premium and reserve risks

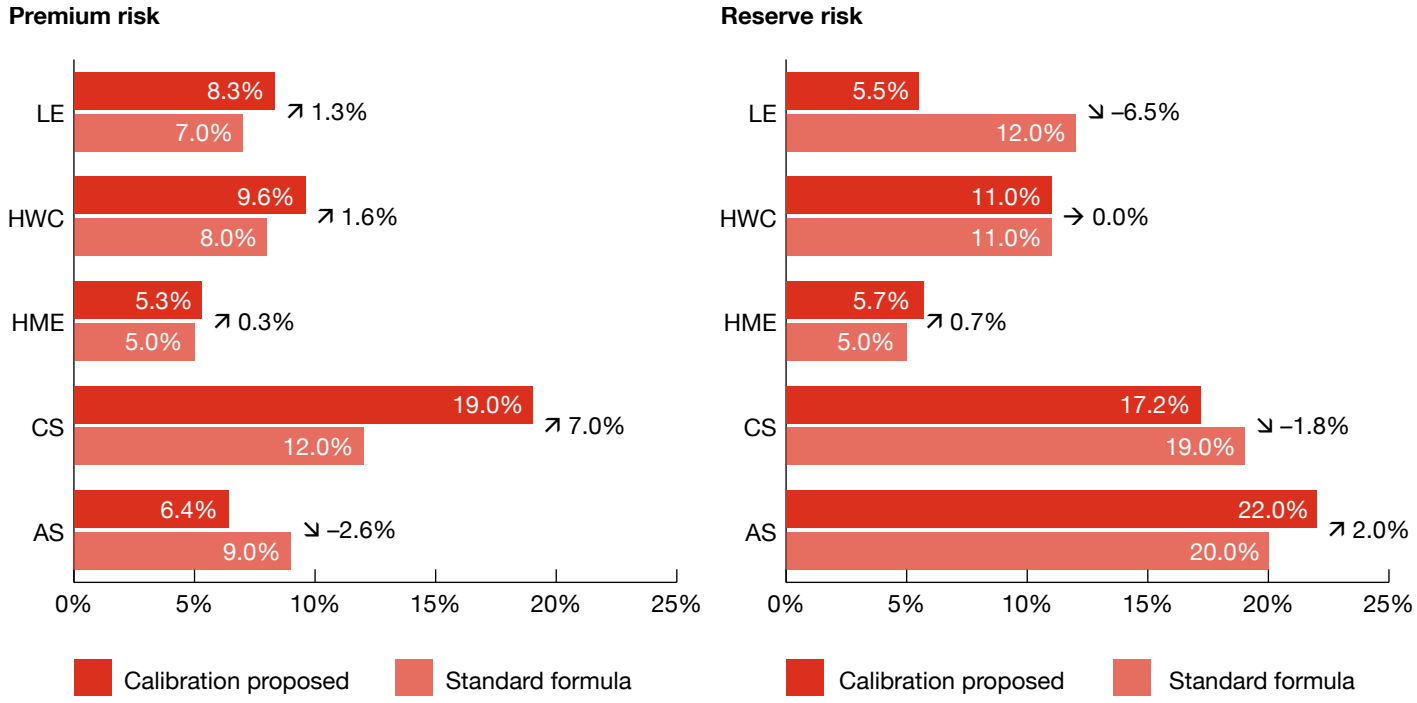
Within the review EIOPA has assessed the standard deviation for non-life premium and reserve risk as well as for medical expense risk in order to propose new calibrations. The initial calibration of the non-life premium and reserve risk standard deviation has been done by a Joint Working Group in 2011.

The recalibration addresses non-life premium and reserve risk parameters for assistance (AS), credit and suretyship (CS), medical expense (HME), workers' compensation (HWC) and legal expenses (LE).

EIOPA has collected data from December 2016 to March 2017. The methodology of the initial calibration has been maintained (based on normal parametrization, at country level by use of the policyholder approach). USPs for each insurance company and each line of business have been calculated for back-testing purposes, too.

The following charts show the comparison per line of business between the proposed calibration and the standard formula as-is:

Calibration proposed in comparison to the Standard formula



With regard to the premium risk calibration, there are modest increases in LE, HWC and HME, significant upward adjustments for CS and a modest decrease in AS. With regard to the reserve risk calibration there is a significant decrease in LE, no adjustments with respect to HWC, a slight decrease in CS and slight increases in HME and AS.

Volume measure for premium risk

EIOPA has also reassessed the appropriateness of the definition of the volume measure for premium risk.

Insurers have commented on an apparent gap that exists in the definition of future premiums. The gap relates to the exclusion of premiums being earned during the 12 months after conclusion of the contracts. Therefore, proposals suggest to remove the gap and make further adjustments on the definition of the volume measure. Other proposals opt to maintain the current definition and accept the existence of the gap.

EIOPA considers two options to reflect the lower risk related to future premiums (under the premise that the capital requirements for the period after the following 12 months are lower than the one for the following 12 months): the first option is to make no changes with respect to future premiums. The gap lowers the amount of premiums in this period and reduces the risk related to future premiums. In this case the effect of the gap is different for one-year and multi-year contracts. The resulting volume measure remains stable throughout the year. The second option is to introduce an adjustment factor on future premiums. The adjustment factor should be smaller than 1 to reflect the smaller risk related to future premiums. In this case the adjustment factor has an equal effect for one-year and multi-year contracts. The future premiums attain the maximum value at the beginning of the year and decrease to zero by the end of the year.

EIOPA has asked for feedback on the above mentioned options taking particularly into account the difference between one-year and multi-year contracts as well as the stability of the volume measure and the reflection of the risk exposure.

There have been further comments concerning the risk sensitivity of the volume measure, e.g. an insurance company with lower and inadequate premiums has lower capital requirements than an insurance company with higher and adequate premiums. EIOPA has received proposals concerning the definition of the volume measure for decreasing the dependency on pricing strategy. The approaches have been investigated as inappropriate as they lead to further complexity.

EIOPA's final advice

EIOPA's advice is to differentiate between one-year and multi-year contracts. Regarding one-year contracts there shouldn't be any modifications with respect to future premiums. For multi-year contracts the gap should be removed and an adjustment factor of 30% should be implemented.

Mortality and longevity risks

EIOPA has validated the appropriateness of the standard parameters for mortality and longevity risk in the life and health risk modules. Additionally, more granular approaches for the application of the longevity and the mortality risk are examined, while focusing on costs and benefits, especially regarding risk sensitivity and complexity.

EIOPA has selected to use the Lee-Carter and the Cairns-Blake-Dowd models as they are well-known and frequently used in the market. The Human Mortality Database has been applied in order to calibrate the models. Based on life-expectancy outcomes per age, country and model the + / - 0.5%-percentile have been determined. To better reflect the percentiles, the stress factor for the mortality risk could be increased to 25%, whereas the longevity stress should retain at 20%.

Furthermore comments have been submitted concerning an improvement of the granularity of the stresses, e.g. mortality rates per age groups could provide for a more risk sensitive calculation of the solvency capital requirement.

EIOPA's final advice

However, EIOPA's modified advice is to retain the 20% longevity stress as well as the 15% mortality stress.

EIOPA does not recommend to increase the granularity of the mortality and longevity stresses, citing the difficulties arising by more granular stresses, e.g. implementation costs and further increasing complexity.

Risk margin

In order to review the calculation of the risk margin EIOPA has carried out a valuation on the appropriateness of the methods and assumptions with regard to the changing market environment. The assessment has focused on investigating the cost-of-capital (CoC) approach.

EIOPA has received proposals concerning the level of the CoC, e.g. the CoC rate should be fixed/not fixed and determined by different market instruments. Other proposals have been received concerning the sensitivity of the CoC to interest rates.

There are several criteria for assessing and comparing the CoC-approaches, e.g. whether it reflects the economic reality, captures relevant costs or whether the underlying assumptions are realistic.

The CoC approach has been reviewed by the same approach used by CEIOPS in the technical advice on the risk margin. The CoC is driven by the cost of equity which is estimated by the capital asset pricing model (CAPM). This model contains the equity risk premium (ERP), which is defined as the difference between the return on the market and the risk-free rate. It also contains the beta factor, which is a measure of the non-diversifiable risk from owning a certain stock. Additional adjustments need to be applied in order to take into account economic aspects, which are not reflected in the CAPM.

EIOPA's final advice

For the purpose of estimating the ERP EIOPA advises to apply a historical return model ensuring methodological consistency with the initial calibration and more stability of the CoC rate over time.

The above calculations have yielded CoC rates between 6% and 8% leaving EIOPA to recommend maintaining the current CoC rate of 6%.

Interest rate risk

Besides, EIOPA has evaluated the interest rate risk module.

Comments have been received reasoning that the current relative approach is inadequate as the relative stress factor underestimates the interest rate risk in a low-interest environment (particularly in the downward scenario). Consequently the idea of a minimum downward shock has been introduced.

EIOPA has analyzed three different approaches for deriving the stressed risk-free interest rate curve. In the first approach the actual interest rate is shifted upwards and a relative stress is applied accordingly. Lastly the resulting rate is shifted downwards by the same shift amount. The second approach is a symmetric 200 basis point minimum shock with a static interest rate floor. The third approach is a combined approach of the previous mentioned approach and the affine approach.

The principal component analysis (statistical tool for capturing highly correlated data) applied in the initial calibration constitutes the basis of the analyzed adjustment.

EIOPA has deemed the currently used approach inadequate and has recommended an amendment of the method. The shifted approach has also weaknesses as it might underestimate the real interest rate risk. The minimum shock approach with a static interest rate floor and the combined approach have been taken into account by EIOPA as they are simple and appropriate adjustments to the current method.

Furthermore the currently applied data set includes historical risk-free curves for different currencies. EIOPA has regarded the data applied as appropriate for the calibrations, although feedback has been received arising concerns on too short data history.

EIOPA's final advice

EIOPA's modified advice is to model interest rate risk by using a shift approach as this is a risk-sensitive approach being used by internal model users. This approach should be gradually implemented in the Solvency II Delegated Regulation.

Outlook

The consultations will continue in the future, as the entire Solvency II framework will be further reviewed until 2021. This exercise will give insurers the opportunity to critically reflect on their own business and regulatory implications. We carry on monitoring this process by engaging with our clients and all the relevant boards, and help our clients in efficiently managing the regulatory changes as well as use them in a value-adding way.

Sources

- EIOPA-18-075-EIOPA_Second_set_of_Advice_on_SII_DR_Review.pdf
- EIOPA-CP-17-006_Consultation_Paper_on second_set_of_Advice_on_SII_DR_Review.pdf
- https://eiopa.europa.eu/regulation-supervision/insurance/scr-standard-formula-review

Article #2: Climate Change and the Insurance Industry: Taking Actions as Risk Managers and Investors

In 2017, PwC Switzerland had the pleasure to support the Geneva Association on the development of the report "Climate Change and the Insurance Industry: Taking Actions as Risk Managers and Investors" as a client engagement. This report was based on interviews (and written answers) from 62 C-level executives of the globally active insurance and reinsurance companies and offers insights into the role of the insurance industry in addressing climate change adaptation and mitigation through the two pillars of the insurance business model: firstly, the liability side, where the industry offers specialised risk transfer solutions that address the financial consequences of climate change; and secondly, the investment side, where insurers are starting to integrate climate change considerations into their investment strategies. This article is taken and adapted from the Geneva Association report.

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Climate change as a core business issue

Failure to address climate change has been identified as one of the highest potential socio-economic risks to our society. Despite this, traditionally, lack of action on climate change has only been linked to reputational risk. However, recently the financial and economic impacts are being considered in relation to physical, liability and transition risks. This marks a change in the focus of the climate change debate from mainly a scientific, environmental and social responsibility issue to one of the core drivers of socio-economic development and risk management.

Building socio-economic resilience to increasing impacts of extreme weather requires preventive risk management and adaptive strategies. Transitioning to a low-carbon economy has profound socio-economic implications for many sectors, requiring investments in critical infrastructure, labour training, education and trade. It needs to be well planned and it must follow a predictable path with strategic alignment across all layers of government as well as active engagement with the private sector and investors. Implementation will take time and may take even longer depending on existing policies and political frameworks.

Paradigm shift in addressing climate change adaptation and mitigation

Following the adoption of the Paris Agreement, there has been a burst of initiatives and activities across a wide range of stakeholders to support transitioning to a low-carbon economy. Emphasis on climate resilience and decarbonisation of critical infrastructure is rising as one of the top priorities of some governments in relation to their economic planning.

Policy and regulation

- Growing wave of climate policy and regulatory measures, but fragmented with sketchy implementation pathways
- Fragmented sectoral approaches

Technology

- Growing opportunities in clean and green technology, although still risky and volatile

Financing and markets

- Need for pipeline of investable grade opportunities, asset classification, standardisation, methodologies and expertise

Technology

- Emergence of wide range of mandatory and voluntary frameworks
- Need for standard climate risk reporting – a potential game changer

Despite growing waves of climate-related policies and regulations, governments' climate adaptation plans and national pathways for transition remain sketchy. A complex network of stakeholders (e.g., governments, policymakers, regulators, standard setting bodies, non-governmental organisations and the private sector) are working on a growing number of climate adaptation and mitigation initiatives. Yet these efforts remain fragmented. To achieve scale, the key barriers, opportunities and solutions need to be identified through more coordinated dialogue, engagement and action among key stakeholders, taking into consideration both adaptation and mitigation sides.

Increasingly, governments are recognising the role and benefits of the insurance industry as risk managers and risk underwriters and of a market-based insurance industry in carrying and transferring the risk. There is increasing evidence that countries with widespread market-based insurance cover recover faster from the financial impacts of extreme events; it is the uninsured part of losses that drives macroeconomic costs. Yet there is a large and in some places widening protection gap, indicating the benefits of the risk transfer measures are not being harnessed to their full potential.

Role of the insurance industry

The insurance industry is therefore a critical part of the solution. It is neither the polluter nor the climate policy setter, but it plays a critical role in building socio-economic resilience and enabling economic development and entrepreneurial pathways for achieving climate change goals and targets. Climate change is clearly on the agenda of the boards and the C-level executives, although with different emphasis. Just over a third of the participating companies consider climate change as a core business issue, with implications for governance, strategy, risk management, operations and asset management. For another third, climate change is evolving from a purely environmental and sustainability topic into a core business issue, while the remainder continues to see climate change as purely an environmental and sustainability issue.

The industry is contributing significantly to building financial resilience to extreme events and other physical risks by providing risk information and risk pricing expertise, offering innovative risk transfer products and services, and improving the distribution channels and pay-out mechanisms. Examples of products and services that helps customers develop climate resilience include: traditions and/ or alternative risk transfer products for weather-related extremes (such as tropical cyclones, storms, floods), crop insurance against climate risk, micro-insurance products that are being introduced in low-income countries, services that support the issuance of Cat bonds for customers such as infrastructure-related companies, specialised insurance products for renewable energy and "green buildings" insurance.

Increasingly, climate change is being considered as a risk factor and an emerging investment theme by the majority of CIOs, who recognise the importance of "climate aware investing". Furthermore, the insurance industry is increasingly integrating climate change considerations in their investment processes as part of the broader sustainability topic, using a variety of methodologies. ESG is emerging as the predominant methodology with insurers paying attention to the "E" in their role as investors, to reduce climate risks, exploit opportunities and adapt to the transition to a low-carbon economy. Insurers employ a variety of different approaches in taking ESG factors into account in their portfolio construction.

However, external hurdles limit the expansion of the insurance industry's contributions to climate change adaptation and mitigation. For example, the expansion of effective risk transfer solutions is currently impeded by limited access to risk information and lack of incentives to take up insurance due to post-disaster government aid. Additionally, the scaling-up of green investments is inhibited by factors such as a limited capacity of relevant markets to accommodate large-scale portfolio allocations, a need for well-defined asset classifications, and fragmented policy and regulatory frameworks.

Challenges and recommendations

The insurance industry wants to contribute more and for this, critical challenges need to be addressed by various stakeholders. As a first step, key stakeholders could benefit from engaging with the insurance industry from an early stage and understanding the drivers and benefits of the insurance business model. Furthermore, the Geneva Association offers three recommendations for the way forward:

Recommendation 1

Third party stakeholders such as governments, policymakers, standard setting bodies and regulators across sectors should work in a more coordinated way to address key bariers such as providing clarity on national decarbonisation policies and supporting, promoting and enabling the expasion of the pipeline of investment grade "green investments".

Recommendation 2

The insurance industry should continue to institutionalise climate change as a core business issue, expand its underwriting products and services for addressing the protection gap to natural hazards and physical risks of climate risk and integrate climate risks into investment decisions, among others.

Recommendation 3

Governments and the insurance industry should explore ways to support climate resilient and decarbonised critical infrastructure, through the industry's risk management, underwriting and investment functions.

Article #3: Run fast….but also in the right direction

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Introduction

The age of regulatory changes is continuing with e.g. upcoming IFRS17, IFRS 9 accounting rules, GDPR, and the review of Solvency II regulation. In addition, disruptions are moving from expectations and visions to reality. Telematics, semi-autonomous driving, Internet-of-Things have arrived and are increasingly changing the markets and behaviors.

PwC's latest CEO survey[1] indicated that the pace of technological changes is concerning insurance CEOs more than in other industries.

Disruptions are impacting the insurance industry in many ways:

- Technological advances disrupt insurer's operating activities
- Changing customer behavior influences go-to-market strategies
- External (environmental) changes influence the level and type of risks insurers' are exposed to (e.g. cyber and global warming)

In a fast moving and evolving world, it is not sufficient for risk management to focus on operational and financial risks. It is imperative to consider strategic risks in conjunction with performance in order to have an impact.

What is strategic risk (management)?

"Strategic risks can be defined as the uncertainties and untapped opportunities embedded in your strategic intent and how well they are executed."[2]

Strategic risks include both the downside (uncertainties) as well as the upside of risk (opportunities). Strategic risk management is about the way organizations deal with these uncertainties and opportunities.

Integrating strategic risk management and performance – COSO 2017

The importance of strategic risk management is also reflected in the new COSO 2017 Enterprise Risk Management framework (ERM). ERM helps to understand the risks related to strategy (see figure 1)[3]:

- What is the possibility that strategy does not align with the mission and vision – heading the right direction?
- What are the risks an organization exposes itself to by adopting a certain strategy – able to take on the risk?
- What is the risk of implementation a strategy (operational) – able to execute strategy?

[1] PwC's 21st CEO Survey: Insurance (2018)
[2] Sharpening strategic risk management, Armhoghan Mohammed and Richard Sykes (2012)
[3] Enterprise Risk Management – Integrating with Strategy and Performance, COSO (2017)

Incorporating strategic risk management in strategy setting helps organizations to adopt a conscious and deliberate defined strategy. This helps to mitigate biases as for example the probability of over optimism or overrely on observed trends and buzzwords in the market (availability).

Risk management within insurance companies often focuses on financial risk management and/or operational risk management. A possible reason could be the strong focus of regulation on these areas of risk management rather than strategy.

The integration of risk management with strategy and performance management becomes more important in an age where the strategic horizon shortens and communication to financial markets and other stakeholders becomes more and more important.

Contributors to strategic risk management

Strategic risk management is not only for executives. Expert staff within insurance companies such as underwriting specialists, claim managers, social media experts, actuaries, risk manager etc. can make an important contribution to the strategy setting process.

For example underwriters are in close contact with clients, intermediaries and have valuable market information at their disposal.

Data scientists and actuaries are experts with data and analyses thereof. The translation of these analyses to performance and risk helps to set a more solid strategy.

Solvency II and key functions

Solvency II institutionalized risk management practices within (European) insurance companies by prescribing four key functions in the area of risk management.

The tasks as set out in regulation predominantly consider financial and operational risk management.

Although the link to strategy is not set out in clear requirements, the existence of these functions may benefit insurers in their strategy setting process.

E.g. the actuarial function is required to give an opinion on the adequacy of the technical provisions. What are the strategic implications? Is there a trend to be considered by executive management in setting strategy?

It is not only about providing information as input for strategy setting, but also to voice an opinion and providing possible alternative outcomes and likelihood thereof.

Interfaces

The division of labor as referred to by Adam Smith[4] still echoes in insurance companies having a highly specialized labor force, each employee having expertise for an isolated area in the value chain.

A challenge is to link the various people of the value chain and deploy these in an effective and efficient way.

One element for a more integrated approach is to consider the interfaces as key areas within the organization. In addition, the integration with technology aids to open up possibilities in terms of analyses, speed etc.

This requires a different skillset than currently present within many insurers. E.g. people that are able to translate outcomes of analyses and technicalities to other stakeholders.

New ways of working, as for example agile aid to this transformation.

An important role of strategic risk management is to support the change in the operating environment and challenge the status quo.

From strategy to execution

Strategies are often, also within insurance companies, formulated at a rather high level of abstraction and not including a lot of context.

Translating strategy into daily practice and the risks involved helps to both refine strategy where necessary as well as to make actions tangible on an operational level.

Scenarios

The effect of disruptive forces is difficult to predict.

Embedding risk management in strategic processes enhances the consistency and reflection in assessing the variability of scenario outcomes. Is a particular strategy leading to a performance level with a high probability to succeed or does it include a high risk of failure. Have all relevant economic, political and operational elements been included in a realistic way?

Well known metrics that can be used in this context are Risk-adjusted Return on Capital or Economic Capital measures.

Other forms of scenarios are longer term (15-30) scenario planning which can assist organizations in preparing for change. Risk managers are well suited to ensure that these long term horizons are included in the (usually) short planning horizons.

Outcomes may not always end-up as anticipated. Do strategic choices prevent alternative courses of action?

"… the anticipated disruption from incoming competitors, like InsurTech and digital platform players, hasn't materialised like the industry initially feared. Partnership, not rivalry, with new entrants is the order of the day."[5]

Furthermore, strategic risk management helps insurers to look upon long-term (e.g. geopolitical) scenarios and to challenge short-term decision-making using derived insights.

Behavior runs the business

Decision-making in insurance undertakings is, as with other organizations, prone to biases.

Therefore, human behavior, both as individual as in groups, is an important topic for strategic risk management, especially in decision-making.

Furthermore, insurers face often complex decision-making. In this respect, the insights of Nobel prize laureate Daniel Kahneman are relevant to strategic risk management.

[4] The Wealth of Nations, Adam Smith

[5] Stephen O'Hearn (PwC)

Kahneman distinguishes two systems[6] in the way people make decisions.

- System 1 refers to decision-making based on intuition and heuristics to simplify complexity and make quick decisions. Quick decision-making is prone to biases – for example in case of lack of understanding over-simplification can lead to erroneous strategic decisions
- System 2 refers to more effortful and deliberate decision-making. This type of decision-making takes more time and may lose relevance as time passes by.

Insurers use a large number of data, models and their respective outcomes as input for decision-making. Outcomes are often not readily available but after some period of time.

[6] Thinking fast and slow, Daniel Kahneman (2011)

Strategic risk management helps decision-making by taking these behavioral aspects into account.

Steps to embed strategic risk management

In order to enhance the impact of risk management, companies should start embracing strategic risk management as part of their process and the following steps can be taken:

- Define a clear roadmap which considers alternative routes (scenarios) and perspectives:
  - Heading the right direction?
  - Able to take on the risk?
  - Able to execute strategy
- Evaluate roles of key functions and business stakeholders in strategy setting
- Develop a long-term trend monitor and scenario thinking
- Align metrics to monitor performance (KPIs) and related risks (KRIs) on different levels
- Make strategy actionable and apply this consistently in your performance measurement system.
- Evaluate behavior versus strategic direction
- Close the loop regularly to allow for steering upon trends and developments

Embedding innovation and technology in operations is imperative for success.

For a successful follow-up of strategy there is not only the necessity to combine human skills with technology, but also removing the siloes by considering the interfaces as key areas within the insurance value chain.

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