

Actuarial Spotlight on Economic capital modeling

Internal models of economic capital are a key to success

Economic capital allows a company to examine the capital needed to support its business operations within a pre-determined risk profile, based on a modeled assessment of the financial impact of various risks over a given time period. Internal economic capital models are continuously gaining in importance due to a variety of regulatory and business drivers:

- **Regulation**

The adoption of sophisticated capital requirements is underway in Europe with Solvency II, and such pressure is on its way in other jurisdictions as well. There will be incentives for firms to invest in internal models that accurately reflect their individual risks and mitigation strategies.

- **Rating agencies**

The insurance industry is expecting that internal economic capital models will become part of the key criteria used by rating agencies to assess the effectiveness of an insurer's Enterprise Risk Management framework.

- **Risk and return optimization**

Internal models are not just about regulatory capital. They can provide information on risk-adjusted returns on capital to support key business decisions around capital allocation. Models can also support such activities as pricing, active portfolio management and concentration analysis. Integration of such models into business processes and decision-making should lead to better risk management and facilitate the implementation of controls. This can result in enhanced business management and competitive advantage.



Summary case study

The issues

A client asked KPMG's Global Actuarial practice to review their economic capital assessment as part of a co-sourced internal audit to provide information to their audit committee and client management. The scope involved consideration of the robustness of the model, whether the model met relevant standards and whether it was being embraced within the business units.

The approach

- The analysis followed KPMG's economic capital model validation diagnostic approach.
- A launch presentation was held to achieve buy-in from key stakeholders. The audit committee and client management received a briefing on the review process.
- Testing was undertaken to identify issues. These were then assessed for materiality and considered against both leading practices and regulatory requirements.
- KPMG member firms' professionals communicated findings with key stakeholders on a regular basis.

The benefits

- KPMG identified a number of improvement opportunities relating to both methodology and to its integration into decision making within the business units.
- KPMG provided an objective view of the model and its effectiveness.

The challenge of modeling economic capital: the role of the actuary

Insurers face a variety of risks – including insurance risk, credit risk, market risk and operational risk. In many of these areas, there is a wealth of historical data and well-established methodologies exist. But other areas, most notably operational risk, are less well-understood and historical data are scarce. In all areas of risk modeling, the probabilistic and quantitative abilities of the actuary are vital. And it is not enough simply to model individual risks. The interdependencies also need to be understood to manage correlated risks and to plan for knock-on effects.

Many major insurers have developed highly complex and company-specific internal models that reflect their individual business plans, market views and management assumptions. On the one hand, these features are part of their appeal. On the other, they can make it difficult for senior management to assess their quality and accuracy. Given the importance of internal models, proper quality assurance is essential.

Board and senior management members will value the knowledge that the model on which they plan to base far reaching decisions has been objectively reviewed and validated to a high professional standard. This is where KPMG's global network of professional actuaries can apply their skills, experience and understanding of the risks insurers face, the ways in which they can be modeled and how these risks interact.

Our approach to model validation

KPMG's model validation is intended to help insurers:

- assess the appropriateness of their modeling methodology for their objectives.
- benchmark their modeling against leading practices, both current and expectations for the future.
- identify errors, risks or limitations in the implementation of their models.
- identify value-adding opportunities to achieve business benefits by enhancing their models.

In particular, our seven-step approach (see Figure 1) addresses the following questions:

What decisions are to be modeled?

The analysis of *objectives* is a fact-gathering step identifying the business environment the model is to be used in, the types of decisions it will support, and the benefits and value it is expected to create.

How is the model fit for purpose?

The verification of structure and *methodology* considers whether the model is 'fit for purpose' in terms of what it is trying to do and how management wants to use it.

How does the input data support the model?

The validation of *data integrity* addresses the adequacy of the data gathering process for the purpose of the model. It also checks that the interpretation of data in the model's methodology is consistent with the data collected by the insurer and that the data used in the modeling are consistent with the data used for business planning and other financial reporting.

How are parameters derived?

Model parameters are derived from collected data. Since collected data can be scarce, *parameterization* often requires actuarial judgment as a decisive component. The objective of this step is the assessment of the quality of the process used for choosing parameters.

How is the methodology implemented?

The *logical integrity* of a model is distinct from its methodology and refers to the physical implementation of the model's logic in a computer program or simulation. The objective of this step is to validate that the physical implementation matches the intended methodology.

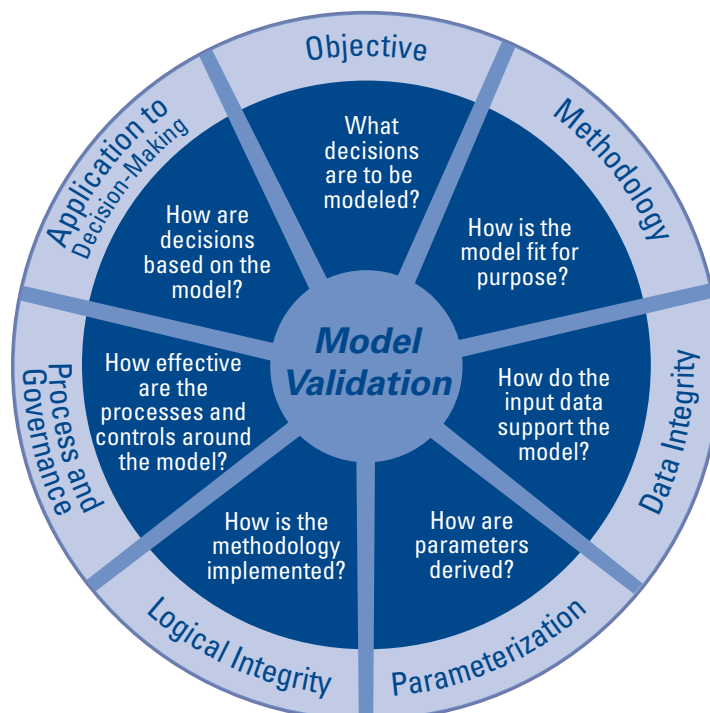
How effective are the processes and controls around the model?

Modeling and usage of models is by itself an extensive *process* that requires clear *governance*. The objective of this step is to assess the processes and governance covering the models, including model build and development, and the use of the models in the organization.

How are the decisions based on the model?

In the final step, the *application to decision-making* is analyzed and any gaps between the objectives of modeling, the perceived implementation, and its actual use are identified. In this way, the client can demonstrate to regulators and rating agencies that the model is more than a 'black box' that is dusted off once a year to calculate a capital number.

Figure 1 KPMG member firms' seven-step process to validate economic capital models



Potential benefits

At the minimum, economic capital models can help to ensure optimal levels of regulatory capital. But their potential benefits go far beyond that. They are fundamental to an insurer's pricing, financing, and capital decisions. With KPMG member firms' professionals help, our clients can answer key questions about their business:

- Is our product design and pricing generating appropriate returns for the levels of risk?
- Are our company models robust enough to get quantitative recognition from the rating agencies or qualify for capital relief from future regulation?
- What is our model telling us about our capacity to absorb losses, given the complexity of risks we are assuming in our portfolio?
- How does our model help us define our risk tolerance and corresponding risk mitigation strategies?
- What is our model telling us about the strategic options of trading-off one risk type against another?
- How is our model being used to help us manage extreme events and anticipate emerging risks?

Please visit www.kpmg.com/financial_services to learn more about KPMG's Global Financial Services practice.

Contact

Jörg Hashagen

Managing Partner Advisory
Global Head Advisory Financial Services
KPMG in Germany
Tel: +49 69 9587 2787
e-Mail: joerghashagen@kpmg.com

Aaron Halpert

Principal
Chair, KPMG's Actuaries Global Group
KPMG in the U.S.
Tel: +1 212 872 6881
e-Mail: ahalpert@kpmg.com

The information contained herein is of a general nature and is not intended to address the circumstances of any particular individual or entity. Although we endeavor to provide accurate and timely information, there can be no guarantee that such information is accurate as of the date it is received or that it will continue to be accurate in the future. No one should act on such information without appropriate professional advice after a thorough examination of the particular situation.

© 2007 KPMG International. KPMG International is a Swiss cooperative. Member firms of the KPMG network of independent firms are affiliated with KPMG International. KPMG International provides no client services. No member firm has any authority to obligate or bind KPMG International or any other member firm vis-à-vis third parties, nor does KPMG International have any such authority to obligate or bind any member firm. All rights reserved. KPMG and the KPMG logo are registered trademarks of KPMG International, a Swiss cooperative. Designed and produced by KPMG LLP (UK)'s Design Services
Publication name: Actuarial Spotlight on Economic capital
Publication number: 308-726
Publication date: October 2007