

# The new regime

Full implementation of Solvency II may have been postponed until the end of 2012 but insurers should make the most of the extra time they have been granted, say **Frank Achtert**, **Richard Shaw** and **Susan Witcraft**. Integrating an internal capital model into key enterprise business processes can turn this regulatory burden into a competitive advantage

On July 10, 2007, the European Commission published its proposal for a groundbreaking revision of European Union (EU) insurance law designed to protect policyholders and the stability of the financial system as a whole. This proposal is often referred to as the Framework, or Draft Directive, of Solvency II. In essence, the Draft Directive follows the proposals developed previously by the Committee of European Insurance and Occupational Pensions Supervisors (CEIOPS), such as market consistent valuation of assets and liabilities and the calibration of the Solvency Capital Requirement (SCR) to a 99.5% Value at Risk (VaR) combined with strong emphasis on sound risk management and robust internal controls.

The Framework suggests a two-tiered approach for determination of regulatory capital adequacy. The first tier is the minimum capital requirement (MCR), the threshold below which an insurer will not be able to write business. The second is the SCR (*see box above*), which an insurer will likely need to discuss remedies with the regulator.

### SOLVENCY CAPITAL REQUIREMENT (SCR)

Under Solvency II, companies will be required to hold a level of available capital (on an economic basis) such that the probability for technical insolvency during the coming year is less than one in 200. The solvency capital requirement is hence defined by:

- The risk measure Value at Risk (VaR)
- The solvency risk assessment horizon of one year
- The confidence level of 99.5%.

### THE STANDARD MODEL

Under the Solvency II standard model, the capital requirement is evaluated for the separate risk classes via a combination of stress tests, scenarios and factor-based capital charges. The model includes underwriting, market, credit default and operational risks, based on aggregations of sub-risks such as market interest rate risk and non-life underwriting cat risk. Capital charges are determined using a bottom-up approach, where the capital required to support a 1-in-200 year adverse event is first calculated for each sub-risk, followed by a final aggregation to a company total SCR using a prescribed correlation matrix. The goal is that the standard model will assess the company's net risk and calculate the capital requirement after all risk mitigation has been recognised.

To calculate the SCR, companies will have the choice of the standard model, an internal capital model or a

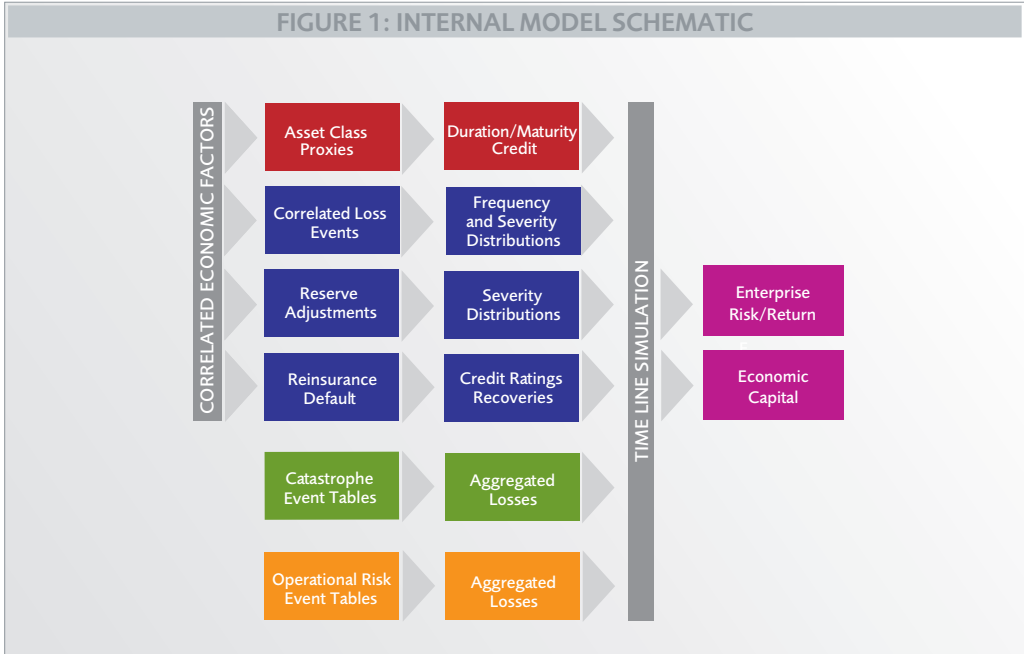
combination of both. The standard model will be easier to implement and will treat risks consistently across companies. For smaller companies without complicated or highly unique risks, this approach may be adequate. However, the standard model will not reflect characteristics specific to a company or its jurisdiction, such as:

- A focus on particular business niches and/or risk mitigation strategies
- The structure and nature of the reinsurance programmes, be they proportional or excess of loss, yet alone any features such as profit commissions, caps, indexes or corridors
- Any changes over time in business strategy.

### THE INTERNAL MODEL

As noted, an internal model or one or more partial models are alternatives to the ▶

FIGURE 1: INTERNAL MODEL SCHEMATIC



standard model for deriving Solvency II capital adequacy requirements. An internal model involves the identification, measurement and modelling of a company's key risk components and their correlations. That is, the risks incorporated into an internal model are likely to be the same or very similar to those included in the standard model. *Figure 1 (above)* shows a schematic of a full-featured internal model.

The partial model option allows companies to use limited-scope models to derive the 1-in-200 adverse-event

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values for selected risk components. These values are then combined with the standard model results for the remaining risks and are correlated using either the standard-model or company-derived correlation factors.

There are three primary differences between the standard and internal models: the extent to which company-specific data is used to parameterise the model, the use of simulation in place of factors and stress tests to quantify risk and the effort required to derive the capital requirement.

An internal modelling

framework works best with proper data management, actuarial and stochastic modelling expertise and a powerful simulation platform. The simulation platform should have several key capabilities. These include quantitative modelling of all material risk categories (including their correlations), recognising and modelling risk mitigation structures, calculating the resulting capital requirement and, finally, providing transparent reports - including sufficient detail to compare capital requirements for each risk and sub-risk to those in the standard model.

The goal should be to create a stochastic model with structures and relationships that best depict the company's unique business. For the company's own flexibility, economic capital should also be calculable using various risk measures, including Value at Risk (VaR) and Tail Value at Risk (TVaR), levels of confidence, time horizons for solvency assessment and risk assessment, as well as the possible inclusion of other risk classes not recognised in the regulatory model.

### INTERNAL MODEL APPROVAL

The Solvency II regulators will

#### SUPERVISORY APPROVAL

There are three tests anticipated before supervisory approval will be given:

- The 'Use Test': The insurer will have to show that the model is used as a decision tool in the company's daily risk management work
- The 'Calibration Test': The model must be calibrated using the risk measure and calibration level defined under Solvency II
- The 'Statistical Test': It must be demonstrated that the model is based on relevant and quality assured data.

The simulation tool should be able to aggregate risk metrics to the level required by the supervisor, provide easily understandable financial statements and be transparent in its calculations, such that every event impacting the capital requirement can be traced and verified by the model approver.

likely more favourably view companies that increase their risk management capabilities by measuring and modelling risk internally. However, under the Framework Directive, before a company will be allowed to replace the standard model for regulatory capital requirement calculation with the output from an internal economic capital model, prior approval from the supervisor will be required (*see box above*).

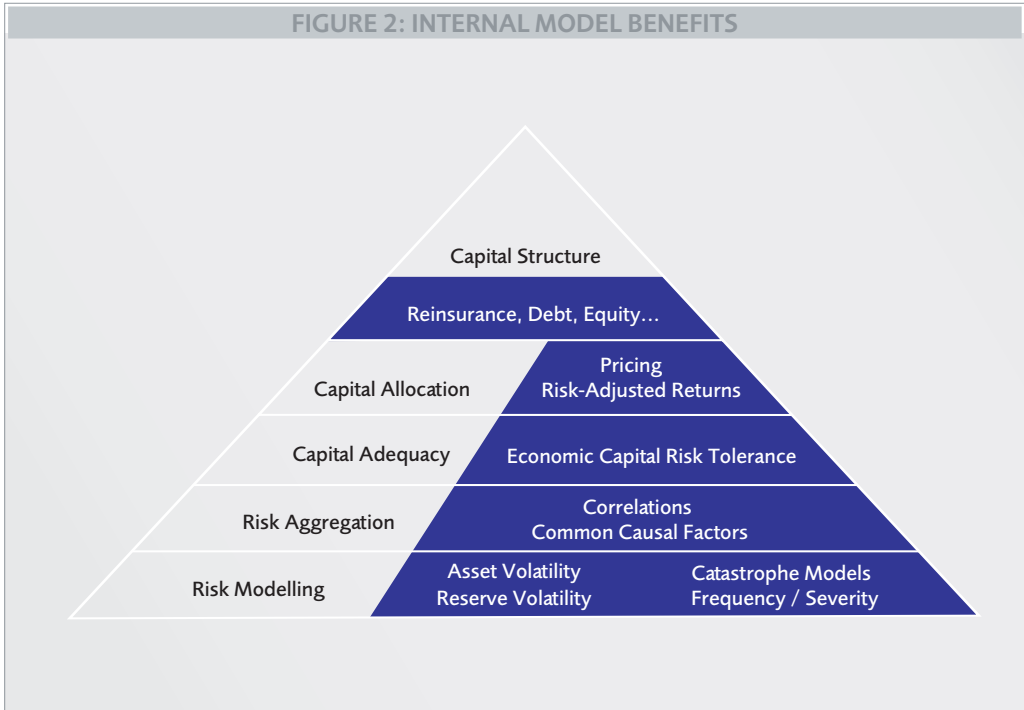
### INTERNAL MODEL ADVANTAGES

Insurance companies with full internal models have the possibility of running their businesses more effectively, thereby focusing on the more profitable areas. They are more

likely to have cost-effective risk mitigation solutions in place in light of the company's qualitative and quantitative goals. With such a framework, the company also can evaluate the level of capital needed to protect against adverse events. They know that risks are being measured appropriately and thus are more likely to be managed efficiently and effectively. A full internal model will be able to assess numerous effects that would not be easily quantified using a simpler standard model. *Figure 2 (on page 44)* illustrates the hierarchy of benefits that can be achieved from an internal model.

In summary, there are many advantages, over and above ►

FIGURE 2: INTERNAL MODEL BENEFITS



satisfying the regulatory solvency requirements, of having an internal model embedded within a company's enterprise risk management process. Among other things, it can be used for evaluating the company's risk profile and related reinsurance and investment strategies in the context of its risk appetite. It also can be used for discussing capital management with other external parties, such as rating agencies, or evaluating returns on risk-adjusted capital for individual business segments.

In addition, it can be used in understanding the relative contribution of the major categories of risk (non-cat losses, catastrophes, reserve, credit and market) to the company's risk profile or providing quantitative input into the M&A process. <sup>®</sup>

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