

# Insights

## Model validation

### Effective model validation – embedding trust

#### Introduction

Despite the fact most recent model validation activity, particularly in Europe, has undoubtedly been compliance driven, the purpose of a validation process is to provide the board and senior management, and by extension investors and rating agencies, with confidence in the robustness of a model and its results. Management's trust in models is, after all, a key component in the embedding of risk management practices that evolve from them. It is only when senior management trusts the model that they are likely to use it to support their decision making processes. From an external perspective, this is hardly an unrealistic expectation. What would be the reputational impact for a business that for example, took strategic or critical business decisions on the basis of information that they did not know to be valid or the extent to which it could be relied upon?

Both the process and the results of a validation exercise enable the insurer to better understand a risk model's capabilities and limitations, and to confirm that the model and processes supporting it are adequate and appropriate for its use.

Model validation also promotes a continuous model improvement process, confirming areas of strength in the model and identifying model weaknesses and limitations in the calculation methods, assumptions and/or key processes supporting these calculations.

#### Continuum of model value

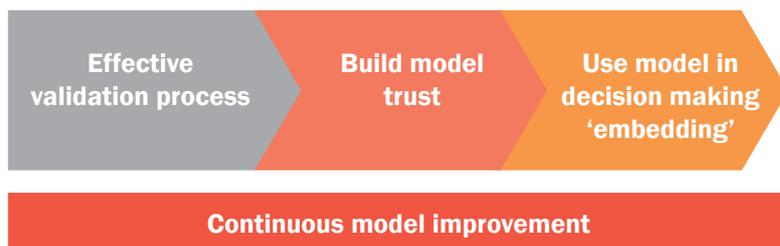
With the deliberations over the final Solvency II rules and implementation date continuing, insurers have a fresh opportunity to generate extra value from the compliance work already undertaken and move the model validation regulatory standards further into 'business as usual' practices. After all, to review and validate that the appropriate risk and capital management processes are in place, is good business practice.

On the same basis, this principle also holds true for the Own Risk and Solvency Assessment (ORSA). Is this not to be relied on? It is true that the burden of proof is not required to be as high. However, that does not invalidate the principle.

Validation is described by the European Insurance and Occupational Pensions Authority (EIOPA) in the Solvency II context as a 'set of tools and processes used by the undertaking to gain confidence over the results, design, workings and other processes within the internal model.'<sup>1</sup>

More broadly, we believe that for validation to contribute to the generation of model value, it has to consider the stages shown in **Figure 01**.

**Figure 01. Continuum of model value**



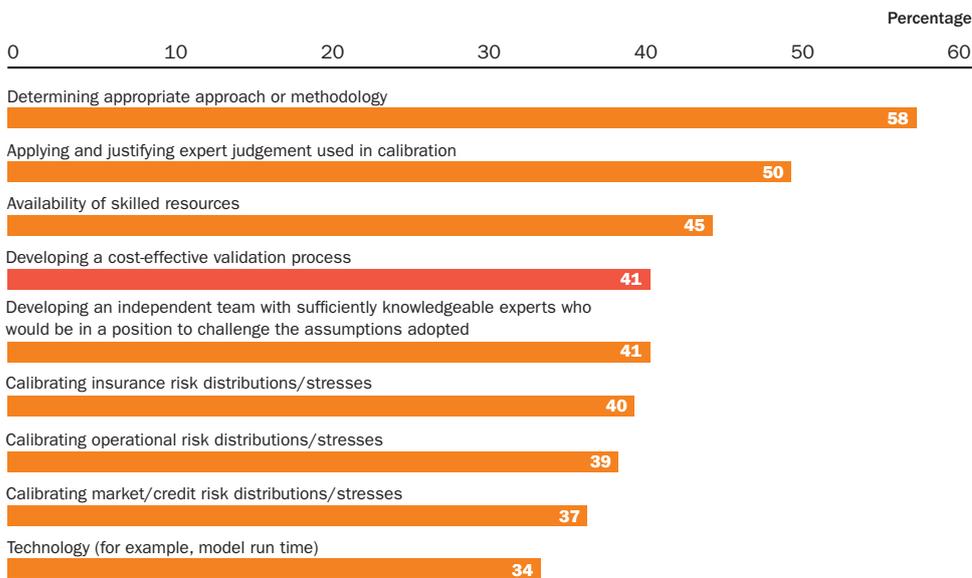
These four stages are described below.

**1. Effective validation process**

The need to demonstrate compliance with regulatory Solvency II standards and justify the selection and design of validation tests has proved a challenge for many insurers.

According to the Towers Watson *Global ERM survey* (see **Figure 02**), more than 40% of respondents listed it as a key issue in the implementation of their economic capital methodology.<sup>2</sup>

**Figure 02. What do you see as key challenges in the implementation of the economic capital methodology/model?**



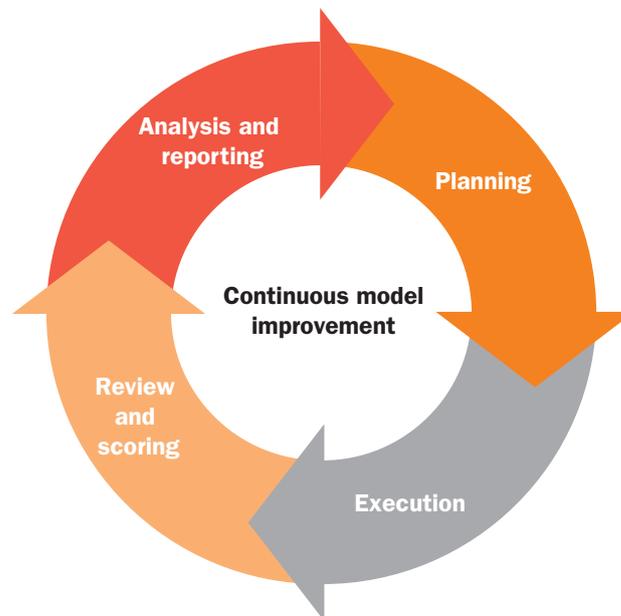
Source: Seventh biennial *Global Enterprise Risk Management Survey*, Towers Watson, November 2012

Effective validation requires a consistent approach across all validation aspects of the model. However, to make this both of value and practical, it will need to give due consideration to materiality and proportionality based upon business complexities.

We know from our experience over many years that insurers’ models frequently have complex and unique features, reflecting the nature of their individual business models. Furthermore, in many cases, iterative development and improvement cycles of risk and capital models have taken place. The resulting complexity, overlaid with the multiplicity of tests required can create a daunting prospect. Frequently, this leads to an over-complication of the validation process itself which may result in an inefficient approach or, in the worst case scenarios, the need for a complete re-think.

Towers Watson has developed a robust practical process which provides a straightforward route through multi-dimensional validation requirements, providing a clear line of sight from the compliance and wider business applications to the Board sign-off of the model (see **Figure 03**). Importantly, the process is underpinned by a validation management tool that supports the planning, design, execution, review and reporting stages.

**Figure 03. Validation process cycle**



### The planning phase

The process starts with the definition of the scope of the model validation which is driven by the scope of the risk model, the validation policy and the business and compliance requirements. This in turn is the basis for the development of the validation plan. The plan is critical to success as it will guide the validation effort and assist in demonstrating validation of key model components in accordance with the validation policy and the regulatory requirements.

During this phase, we will normally define and document quantitative and qualitative tests for each validation aspect, by risk model, with explicit reference to any business metrics and regulatory requirements. A pass/fail criterion will be set for each test to ensure that a robust and consistent approach is applied throughout the validation process.

### The execution phase

This focuses on the execution of the tests, both quantitative and qualitative, in relation to the pass/fail criteria specified. The execution of the validation will be performed according to the validation testing plan. Normally, the quantitative testing tends to be executed by technical members of staff, for example, actuaries, due to the skills required to understand and challenge independently the methodologies behind the calculations. The qualitative testing is normally performed by the risk team and/or the internal audit team.

An important consideration during the execution of the testing is independence; independence from model design, build, parameterisation, operation and use of the risk model. This is not only a regulatory requirement but provides independent challenge to modelling processes, inputs and outputs.

The execution of the validation process can be a lengthy process, taking up to several weeks, depending on the scope and complexity of the model, the availability of resources and the completeness of the documentation. To ensure that this process remains focused and that identified issues are raised and acted upon early, a regular monitoring of the validation activity is recommended.

### The review and scoring phase

This is aimed at reviewing the results of the validation tests executed and scoring them according to the pass/fail criteria set up at the planning phase. Any 'fail' results and recommended actions will be recorded and escalated according to the procedures set up in the validation policy.

### The analysis and reporting phase

This focuses on the documentation of the results of the validation process in the form of a detailed validation report and possibly, an executive summary report. The detailed validation report will include: confirmation statements, scope of the validation process, validation governance, results of the validation process, validation tests applied, any limitations identified and recommendations for model improvement.

Reporting also needs to recognise that validation is an iterative process, rather than a one-off event, designed to periodically refine validation tools in response to changing market and operating conditions.

### 2. Build model trust

As the whole purpose of validation is to build trust in the model with the people who use it and will need to rely upon it, communication is key.

This will be helped by demonstrating and communicating that model validation is an asset to the business and not just a regulatory hurdle. Due to the multi-disciplinary nature of the validation process, it is not just the actuarial and risk teams who will need to be involved. For example, evidence of model discussion, challenge and use will be essential, which could require input from a wide range of people across the business, including company secretaries to provide agendas and minutes of key meetings, product and pricing teams to articulate how they use model output to support their decision making process, and so on. This process will improve the wider business buy-in and understanding of the model's strengths and its limitations.

The validation report is a particularly important tool to improve senior management's understanding of and trust in the model. The validation report will detail the work carried out to confirm the robustness and adequacy of the internal model for the calculation of the company's solvency capital requirements. Areas such as methods, data, assumptions, governance, systems and IT, documentation and model use will be assessed not only against Solvency II standards but also in relation to the insurer's intended use of the model and the nature and materiality of its risks. As this report is aimed at senior management and not only at the regulator, the target audience needs to be considered in the production of the report and therefore, the validation report cannot be unnecessarily technical or complex.

The validation results should provide senior management and the wider business with confidence on the appropriateness of the model to be used as intended. As we mentioned earlier, the validation process is not a one-off event but an iterative process that will have to take place at least once a year, improving the model and the processes around it. As this process is repeated, the wider business will become more familiar with the validation processes and practices, improving its understanding and trust in the model as a useful tool to provide new insights into the decision-making processes.

### 3. Use model in decision making – ‘embedding’

Validation is a key component of the internal model governance and plays a critical role in the business wide buy-in of the model to support key business decisions. After all, if senior management is not confident in the robustness of the model inputs, adequacy of the methodologies applied, and appropriateness of governance structures, they are unlikely to make any material use of the information coming out of the model to inform their decisions. Risk models, whether they be specifically developed to meet a regulatory need or for a broader business application, will be of limited value if the wider business does not use it to improve their risk management to drive potential financial benefits and gain competitive market advantage. However, to embed a risk model in the business requires time. Back in 2007, the FSA said that it would take up to five years to fully embed an internal model in an organisation.<sup>3</sup> So in theory, an insurer that started such a process at the time of this statement should now have a fully embedded model. But is this really the case? In our experience, the process is iterative and thinking about the approach to validation as early in the process as possible can add value even in the model design stage by challenging initial preconceptions.

Embedding a model is a significant change programme that requires the early engagement of senior management in understanding the model and its role in the business. A robust validation programme helps to build their trust in the model and its results.

### 4. Continuous model improvement

Validation plays a key role in model improvement and on-going development programme, as it will help to highlight weaknesses and shed light on its limitations.

This helps not only to set the context for the reliance that decision-makers should place on the model but also to reinforce the foundation principle of the Solvency II Use Test that ‘the undertaking’s use of the internal model shall be sufficiently material to result in pressure to improve the quality of the internal model’.<sup>2</sup>

Creating a ‘virtuous circle’ of model improvement and validation improvement therefore helps to generate greater efficiencies in the validation process itself, which enables it to evolve alongside changes in the model to address different areas. This should help the insurer to hone its model towards areas of greatest value to the business, both for its risk profile and to assist in identifying and assessing business opportunities, and so to maintain a competitive edge.

Solvency II is therefore a start point rather than an end point for effective validation. The sooner the validation process and wider model processes are adopted into ‘business as usual’ the more efficient this will become.

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## Conclusion

Validation provides an excellent opportunity to build and improve the trust in a model by the wider business. The Board and senior management need to be confident that models comply with all requirements such as regulatory and supervisory rules (model standards or standard models) including conditions required subsequent to approval, internal policies, and professional guidance. But they also need the confidence to use the model effectively in decision making to add value to the business through risk and reward optimisation and to pass the Use Test.

In isolation, the process of demonstrating that an internal model meets the requirements of the Solvency II Directive could become overcomplicated and costly. Therefore, it is important that a practical and effective process is applied, involving senior management from

the outset and ensuring that companies do not lose perspective of the ultimate target of this process, which is ‘to demonstrate that the model is fit for purpose and reflects the insurer’s risk profile’.

Validation is a key step towards approval to use an internal model. If properly designed and implemented, the validation process has the potential to enable continuous improvement and enhancement of the internal model and, as a consequence, improving the company’s understanding and management of risks.

Viewed in this way, Solvency II compliance is almost a by-product of effective validation (even though it must be explicitly carried out). The real value to the business is the creation of an effective and efficient framework for enabling greater – and justifiable – trust in the model to enable better informed decision making and better value for the business.

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## How Towers Watson can help your company

Towers Watson has extensive experience in assisting clients in the UK and in Europe validating their risk models and contributing to build senior management trust in model results. Our approach to validation can be tailored to meet clients' needs. We can assist our clients in the following roles:

- Designing and implementing an 'end-to-end' validation framework and process.
- Supporting quantitative and/or clients' validation processes.
- Independently validating target model components, such as market risk, insurance risk, data, and documentation.
- Documenting validation testing, including drafting of the validation policy and validation report.

## Why Towers Watson

- **Pragmatic, tried and tested validation approach.** It is easy to overcomplicate validation. Our approach has been applied in Lloyds of London firms who have already submitted internal models for approval. What does this mean? Certainty that the validation exercise will deliver efficiently, covering all aspects required in a cost-effective manner.
- **Validation tools.** We have invested in tools that have mapped the Solvency II Directive to activities and developed tests that can be performed to validate compliance with each element of the Directive. What does this mean? Certainty that the work will focus on the line of sight from the business and regulatory objectives to the required work.

- **The right experts for the right task.** We are able to draw on specialists in each relevant area requiring validation, including investment professionals to review market risk. This leads to certainty that the right level of expertise, judgement and experience is being deployed to the validation exercise.
- **Thought leadership.** We invest and innovate constantly for the benefit of our clients, such as the development of methods to validate proxy models. This ensures certainty that the validation is supported by the most up-to-date knowledge of best and typical practice, ensuring no surprises.

## Further information

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## Footnotes

- 1 Advice for Level 2 Implementing measures on Solvency II: Articles 120 to 126 Tests and Standards for Internal Model Approval.
- 2 Seventh biennial *Global Enterprise Risk Management Survey*, Towers Watson, November 2012.
- 3 FSA, Insurance Sector Briefing, ICAS – Lessons learned and looking ahead to Solvency 2, Section 4.20, October 2007.
- 4 CEIOPS-DOC-48/09, Level 2 Implementing Measures on Solvency II, Articles 120 -126, Foundation Principle, Use Test, October 2009.



## About Towers Watson

Towers Watson is a leading global professional services company that helps organisations improve performance through effective people, risk and financial management. With 14,000 associates around the world, we offer solutions in the areas of benefits, talent management, rewards, and risk and capital management.

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