

Top Issues

Model risk management 2.0

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Model risk management (MRM) is relatively new as a formal, structured undertaking in the insurance industry. A survey we recently conducted in the US indicated that among the 58 respondents, which included the major players in the life and P&C sectors, the first formal MRM program was established in 2010, less than ten years ago. At the end of 2016, nearly 60% had a program in place. And based on participants' survey responses we expect the number is now over 85%. Though the survey included some companies with head offices in other jurisdictions, progress in other parts of the world varies. In Europe for example, the emphasis has been on Solvency II internal models, with some initiatives among larger insurers to expand to other model types.

Despite this recent rapid growth - or perhaps because of it - insurers continue to refine and improve their MRM capabilities. Four trends that we expect will shape model risk management's future define this evolution:

1. Revisiting the definition of "model,"
2. Shift to validating new models,
3. Rationalizing the three lines of defense, and
4. Seeking cost efficiencies.

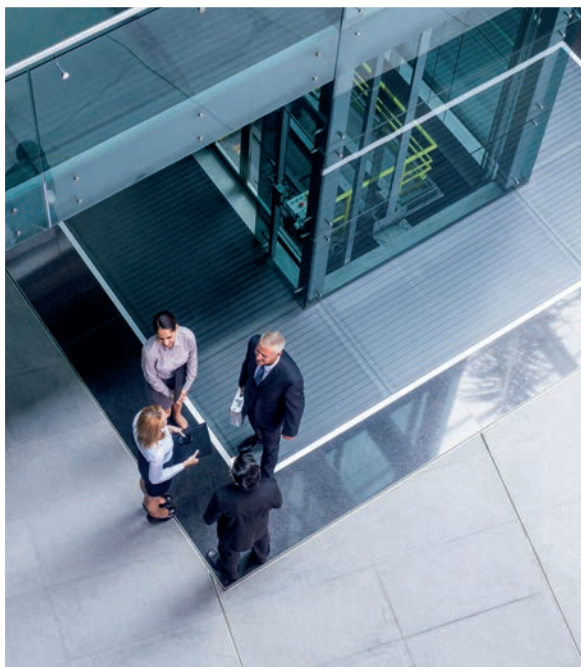
The first level: Model risk management 1.0

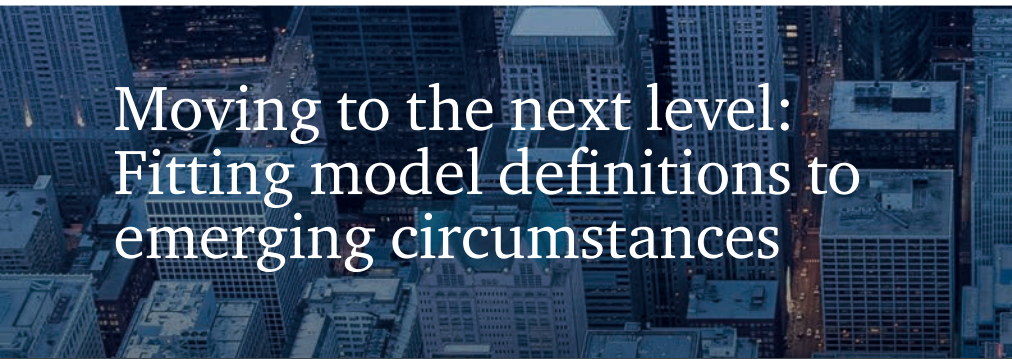
Before we explore the trends leading to MRM 2.0, let's take a look at key characteristics of the first level, MRM 1.0. The programs that insurers have developed over the last few years share a number of things in common:

- An MRM leader has been identified and an operational team has been established. This team is almost always part of the ERM function.
- The organization has developed and agreed upon a framework for MRM, including policies and procedures. The framework usually includes a standardized validation approach illustrated in a template validation report or a validation playbook. The validation approach typically covers models end-to-end, from data and assumption input; through methodology, soundness, and calculation accuracy; to output transmission and proper usage.
- There is an inventory of models. For most US insurers, the inventory is universal and covers models from all parts of the company. Models in the inventory are sorted in terms of their riskiness to ensure timely and extensive assessment of high risk models.
- Early validation efforts focused on existing, legacy models. Many MRM functions have completed assessing high risk models and are well on the way to looking at the lower risk ones. Some models have been through a second validation. With this experience in hand, insurers have developed practical perspectives on what works well and what doesn't. This practical perspective is shaping how they are refining their MRM programs.

There have been some recent changes in the regulatory landscape in the US. The three former non-bank SIFI insurers no longer subject to Federal Reserve Board oversight, and they accordingly have considered how best to reflect this change in many parts of their operations, including MRM. Other insurers that have not been directly impacted by these regulatory developments are observing the progress and effectiveness of these operational changes.

Lastly, we note that the types of models insurers use continue to evolve. In particular, insurers are making more extensive use of advanced analytics throughout their operations.





Moving to the next level: Fitting model definitions to emerging circumstances

Changing model types is a significant factor in insurers revisiting their definition of a model.

The Federal Reserve Board's Supervisory Guidance on Model Risk Management (SR 11-7) provides a relatively precise definition: "a quantitative method, system, or approach that applies statistical, economic, financial, or mathematic theories, techniques, and assumptions to process input data into quantitative estimates". Many insurers use this definition as a starting point and tailor it to fit their organization's circumstances. At the other end of the spectrum, we find that some insurers use a different starting point and a more expansive definition, for example, "algorithms used to make business decisions."

With the advent of advanced technologies such as robotics, predictive modeling, big data, and enterprise-wide automation, insurers are now looking to de-mystify the technologies' black box reputation and enhance their model definition and practice of model risk management as necessary.

The key questions that insurers need to address in this changing landscape are:

- Does the company have a clear definition of model risk? This could aid in moving from placing sole reliance on the current model definition and include other models under the MRM umbrella (e.g., robo-advisors, call bots) that pose other types of risk, such as litigation, reputational, etc.
- Does the board understand and support these new types of models and their associated risks?
- How much reliance does the company place on the models' results and what weight does it carry in making strategic decisions?

Turning attention from legacy to new models

As insurers conducted the first validation of the models in their inventory, they often encountered models with little or no documentation. Moreover, the documentation that was available was often incomplete and varied considerably in design and detail from one model to the next. Documentation seldom addressed conceptual soundness.

When these legacy models were built, it is likely some calculation testing may have taken place using an independent checker model. However, this testing work was seldom recorded and the results verifying the calculation's accuracy usually have been lost (or never existed in the first place).

Faced with these shortfalls, the model risk management department has had to undertake work that typically would fall to the model developer. Some minimum amount of model documentation had to be completed in order to establish a meaningful description of what was being tested in the validation. MRM typically had to invest time and effort in guiding model owners through the documentation development process and assisting them with the work. Where calculation checking was not recorded, it typically fell to the validator to re-do and document this work.

However, for new models, the validator and developer can better influence how calculation checking should be completed. Normal practice would be for the model developer to conduct testing to ensure the model calculation code is performing as expected. There is no need for the validator to completely re-do this testing. Instead, the validator should establish and agree with the developer on the type and amount of testing the developer should complete. Then the validator would confirm testing was conducted (and documented) and undertake any additional follow up checking that might be warranted.

The same is true for conceptual soundness. For new models, developers should undertake and document their selection of the methodology, describing other options they considered, and explaining why they chose the option they did. The validator should be reviewing – not re-doing – this work.



Coordinating the three lines of defense

As the model developer and validator find themselves sharing tasks, it becomes necessary to plan how they will work together. And this planning also can include coordination with the third line of defense: internal audit and, if appropriate, external audit.

For best results, planning for new models should occur at the start of the model development process. With a clear perspective of what the validator is expecting, the model developer can organize development testing and documentation to fit those expectations. For large modelling initiatives, it often makes sense to seek interim validation feedback so that the model developer is assured that the model stays on track with little chance of significant cost and effort to redo non-conforming work.

Similarly, some natural ordering of activity can be built into the model development plan. For example, it typically makes sense to establish the concept and confirm conceptual soundness before proceeding to code and checking the calculations. Developing a validation test plan appropriate to the model under development can promote effective planning of activity order and allocation of work across the three lines. In this way, tasks and timing of deliverables, such as interim reports, can be agreed on ahead of time.

Close cooperation and coordination across the three lines does raise the need to manage and maintain appropriate independence. For example, validators, especially when delivering an interim report, should not take it upon themselves to decide how to fix any shortfalls.

Focus on cost efficiencies

Building and working through the inventory at the outset, from identifying models, collecting information on each, and validating them, is a one-time activity. That this set-up activity need not be repeated should have a favorable impact on costs.

Better coordination across the three lines of defense also should reduce cost by eliminating unnecessary overlap and duplication. For new models, building in interim feedback can reduce overall modeling costs by minimizing the need for excessive re-building to correct shortfalls.

Some insurers have found that, by taking a closer look at their inventory of models, they are able to identify some models they no longer actively use. They often identify other models that perform essentially the same task but in a different way. Insurers have found it worthwhile to establish a single, core “best practice” approach with a lower cost than maintaining multiple duplicative versions.

Similarly, companies encounter multiple platforms where the modeling component is essentially the same but multiple operating systems that conduct the same modeling activity magnify ongoing resource requirements and operating costs. Transforming these multiple versions to a single modernized operating platform can reduce both costs and model risk.

What should insurers do next?

The elimination of SIFI imposed obligations further highlights the need for MRM to add business value. We believe that a transition to MRM 2.0 provides an opportunity for insurers to increase their MRM effort's value to the organization while reducing costs.

To take advantage of this opportunity insurers will need to:

- Remain current on their model definition, inventory, and risk rating, and focus on models where the risk of error represents significant financial and reputational damage
- Address and clarify the roles of their three lines of defense related to MRM. In particular, they should look to eliminate duplication and overlap while maintaining effectiveness and independence consistent with adding business value.
- Especially for new models in development, specify how developers and validators should coordinate their efforts.
- Establish an effective model risk management culture throughout the organization that seeks to reduce risk in a cost effective manner.

For more information

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