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What is Model Vetting?

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Model risk management is a growing concern in the insurance industry. This is in reaction to the subprime crisis, which, in part, can be attributed to overreliance on a model. When calculating aggregated risk, the Gaussian copula model assumed there was independence between mortgages when in fact they were highly correlated. Due to the assumed independence, low interest rates and a high level of approval of subprime mortgages occurred. In reaction, the regulators around the world are providing guidance:

- U.S. Federal Reserve Board (FRB) set new requirements for the banking sector in 2011;
- Solvency II provided a framework for insurers in Europe;
- Basel III introduced additional safeguards against model risk and measurement error;
- North American CRO council issued the Model Validation Principles Applied to Risk and Capital Models in the Insurance Industry

They all recommended/proposed, to different extent, a framework for model risk including the creation of an independent review process.

EVOLUTION OF MODEL VETTING

Crises that occurred prior to the subprime crisis, namely the 1998 collapse of the Long-Term Capital Management hedge fund and the stock market crash of 1987, had already created concerns on the use of models for insurance companies.

In the early days, model vetting—when it existed—was not as structured as it is today. In general, the most significant models were to be documented following some documentation guidelines. In addition, there was some level of peer review.

The next phase was the creation of a model inventory. The notion of independence in the review was also introduced. The most significant models were vetted through oversight committees. The responsibilities of these committees were to:

- Ensure the ongoing integrity of the models;
- Ensure the model is in accordance with regulator/internal guidelines/standards/policies;

- Ensure the appropriateness of the change process;
- Ensure appropriate documentation exists.

These committees consisted of experts on each model component and risk management. The reviews were high level as there were no resources to do a more thorough review. For example, ensuring that appropriate documentation exists would consist in confirming that every subject required in the internal model documentation standard was covered.

Nowadays, many insurers established a model risk framework and have a team dedicated to model vetting. This team performs some independent review of the models' results using an alternative model (usually a different platform). The level of granularity of this review may vary from one insurance company to another and from a model to another. Full replication of a model is resource intensive and it may not be possible computer power-wise to process an entire block of business.

WHAT IS A MODEL?

Model risk management policies and guidelines must be clear, comprehensive, and globally applicable to ensure consistency in vetting work. Defining what a model is is not straight forward. For example:

The Board of Governors of the Federal Reserve System provided the following definition of model in its Supervisory Guidance on Model Risk Management issued on April 4, 2011: “the term model refers to a quantitative method, system, or approach that applies statistical, economic, financial, or mathematical theories, techniques, and assumptions to process input data into quantitative estimates. A model consists of three components: an information input component, which delivers assumptions and data to the model; a processing component, which transforms inputs into estimates; and a reporting component, which translates the estimates into useful business information”

The CIA Draft Educational Note issued October 2015 on the Use of Model defines model as “a practical representation of relationships among entities or events using statistical, financial, economic, or mathematical concepts. A model uses methods, assumptions, and data that simplify a more complex system. A model is composed of a model specification, a model implementation, and one or more model runs. Calculation simple enough to be effectively performed manually would not be considered a model.”

MODEL INVENTORY

Whatever the chosen definition is, an inventory containing all the models must be built. When maintained, the inventory becomes a powerful tool to assess the risk related to each model and to monitor progress. Helpful information that can be found in the inventory is (but not limited to):

- General model description (purpose, owner, last/next vetting date, any limitation);
- Materiality assessment (annual sales, IFRS reserve);
- Exposure to errors assessment (based on pre-selected criteria);
- Unresolved issues from last vetting.

VETTING PROCESS

The vetting process is a collaborative work between the vetting team and the model owner(s). The first step is to meet with the model owner(s) and discuss what is needed by the vetting team in order to perform their work. A vetting plan must be developed to formalize the different milestones of the project: time constraints, order in which the model should be vetted and to what extent, or performance testing. It can also be used to address some concerns about the model that the model owner has. If required, the model owner can provide an overview of the model.

The next step is to get familiar with the product(s) linked to the model. A review of the marketing documentation as well as the model documentation is required. Particular attention must be given to the product features and model limitations.

Then, it is time for programming. An independent tool must be built to reconcile the results based on the requirement of the vetting plan. Any change to the plan must be communicated to the model owner. When issues are identified, the feedback of the model owner is required.

The final step is to prepare a report describing the review performed, the findings including the comments of the model owner and an opinion on whether or not the model is valid for

its documented purpose. The report should be approved by an independent, appropriate member of management (e.g., a VP of Risk) and distributed to all the stakeholders.

FUTURE CHALLENGES

Whenever a model is used there is model risk. Model vetting practices have changed through time. The pace of the changes has increased recently. In order to maintain the insurance companies' models sustainability, efficiency and integrity, the model vetting teams will have to:

- Enforce the model risk culture within the insurance company outside of the risk department. Roles and responsibilities of every stakeholder must be clearly defined.
- The vetting process must be disclosed to the model owners so they can more accurately provide documentation/information.
- Align the vetting work with other model risk reviews such as SOX to avoid duplication and/or gaps.
- Determine a balance between work details and associated risk to optimize the use of resources.
- Develop an appropriate way to demonstrate to management how their work helps reduce the model risk the company is facing. This is especially important as, unlike other risks, model risk cannot be monitored with the use of quantifiable limits. The "amount" of model risk is mostly based on judgement. ■



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