JULY 2023

Risk Management Association

The Risk Management Association Survey of Model Risk Management

Executive Summary

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Executive Summary and Key Findings

This report paper marks the second year in a continuing RMA longitudinal study designed to highlight current hot topics and to measure and describe the development of models and model risk management practices in banks and other financial services firms over a much longer term. In the latest survey, launched in September 2022, 53 firms participated over three months. The respondent pool represented a cross-section of the industry along the dimensions of asset size and primary prudential regulator.

The 2022 survey confirms many of the insights from the 2021 survey, in some cases with improved precision. Total quantitative and qualitative model counts remain, of course, highly correlated with total asset size. In this year's enhanced survey, nomenclature has been clarified referring to non-model quantitative tools as "critical calculators, end-user computing tools, and key spreadsheets." As a result, questions on inventory composition benefit from increased standardization in responses, with some evidence that control practices continue to improve at this end of the model/non-model spectrum. In addition, off-line anecdotal evidence indicates that smaller firms continue to invest relatively intensively for their size, both to achieve internal model risk management objectives and to meet regulators' heightened expectations.

The 2022 survey also confirms the high correspondence between a firm's asset size, its model count, and its model risk management staff. For the first time, RMA asked about model *development* staff full-time equivalents. The median ratio of model-development staff to model validation staff is 2x overall. Individual asset-size cohort ratios differ but fall within a relatively tight range from 1x to 2.6x.

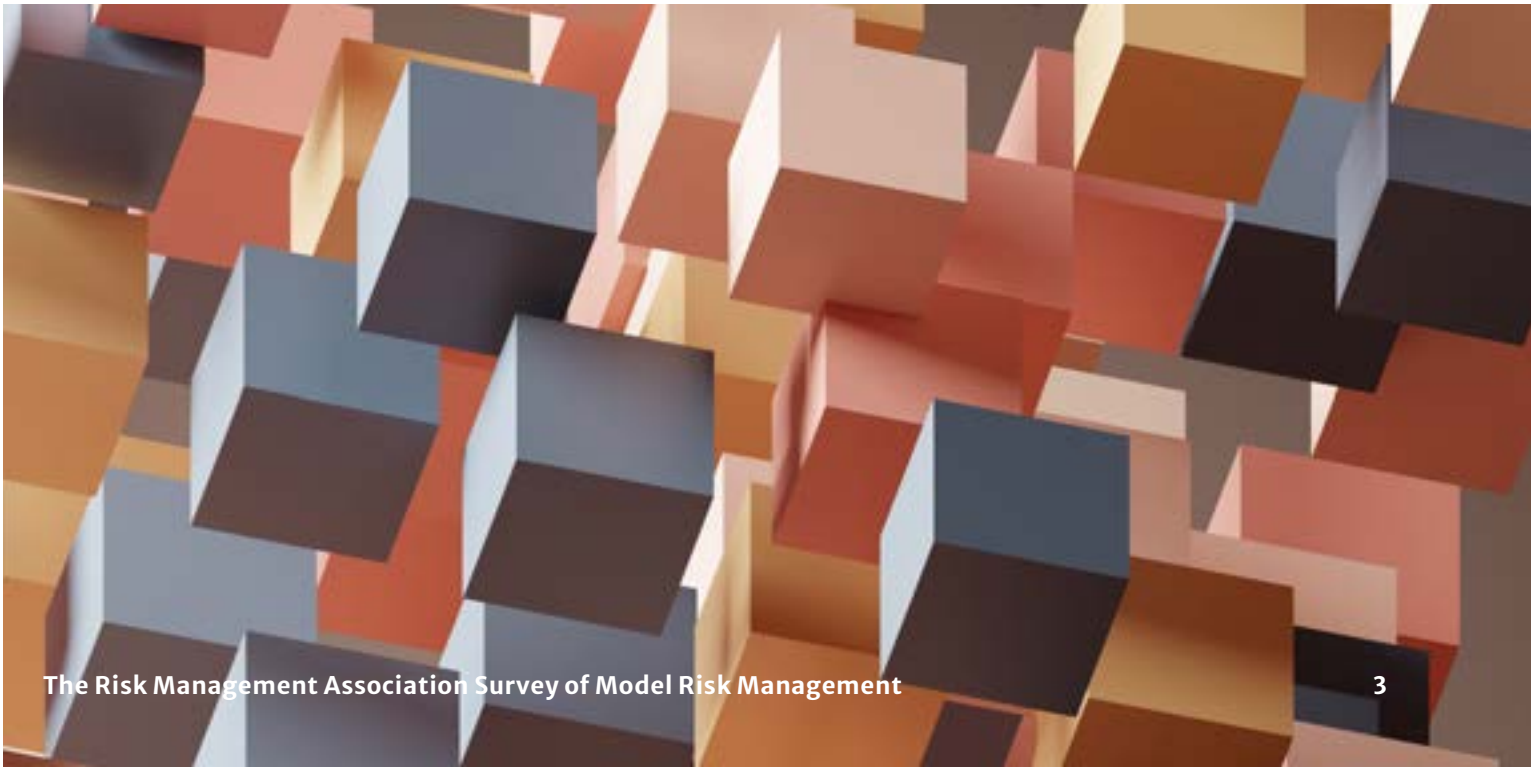
The use of vendor models continued apace in 2022, and as in 2021, firms acknowledged concerns remain regarding the transparency provided by vendor-model documentation. Top challenges, similar to 2021, were: model design and analytics, assumptions and limitations, theory and conceptual soundness, data, inputs, parameter values, and developmental testing. Of some concern, the proportion of respondents that reported having contractual terms requiring vendors to provide documentation and testing that would be useful to validate the model slipped from 64% in 2021 to 45% in 2022. While this decrease may be due to sampling, we do think the continuing low proportion is worrisome. Firms do well to specify model risk management requirements to vendors up-front. Contractual terms do not guarantee fulfillment, but they provide a context for constructive dialogue. The better articulated MRM requirements are, the more broadly vendors will be expected to recognize and to conform to industry standards.

Several new questions in the 2022 survey explored the edges of existing model risk management practices and emerging model classes. Regarding model risk management practices, 65% of respondents reported using a model risk management IT application to manage some part of the model development and validation lifecycle. Top uses cited were: model inventory, issue management, model rating/scorecard, model identification, and model risk reporting. Internally developed tools were also prevalent.

Regarding expanding or emerging model classes, 73% of firms reported using artificial intelligence and machine learning (AI/ML) models or tools. The top five AI/ML uses cited were fraud detection, marketing, underwriting, risk modeling, and security. The top five challenges cited with respect to validating AI/ML models were explainability, theory and conceptual soundness, fairness, interpretability, and documentation. In subsequent conversations, firms have elaborated on challenges regarding fairness, such as fair lending or fair access to services. While they are not altogether new, some firms indicated heightened concerns triggered by the increased adoption of AI and ML models for marketing and underwriting.

When it comes to other new or expanding model classes, 67% of respondents reported having cybersecurity models. Penetration is significantly higher among larger firms, but we expect use to extend to firms of all sizes in the future. Hence, cybersecurity is expected to be a topic for deeper inquiry in future surveys.

Finally, only 13% of respondents reported using climate risk models. We do expect climate risk model use to expand in the future, as regulatory requirements are defined and extended to all levels of the market. However, only the largest firms have adopted models so far, making climate risk modeling a more distant concern for the industry as a whole, but one that will increase steadily in the years to come.



Key Findings

- **Model-related FTE**
  - 2022 dedicated MRM validation and MRM support FTE counts were similar to 2021.
  - Dedicated model developer FTE counts were reported for the first time in 2022. Median proportion of developers to validators was 2:1.
- **MRM IT Solutions:** 65% of firms reported using some form of MRM IT application to manage the model lifecycle. The top five MRM IT application uses were:
  - Model inventory (87%)
  - Issue management (73%)
  - Model rating/scorecard (55%)
  - Model identification (55%)
  - Model risk reporting (55%)
- **AI/ML:** 73% of firms reported using artificial intelligence and machine learning models or tools.
  - Top five AI/ML uses were:
    - Fraud detection (84%)
    - Marketing (41%)
    - Underwriting (32%)
    - Risk modeling (27%)
    - Security – virtual/electronic (24%)
  - Top five challenges in validating AI/ML models included:
    - Explainability (69.4%)
    - Theory and conceptual soundness (52.8%)
    - Fairness (52.8%)
    - Interpretability (52.8%)
    - Documentation (44.4%)

- **Other Emerging Model Classes**
  - **Cybersecurity:** 67% of firms reported using cybersecurity models or non-model analytical tools. Cybersecurity is a class of models that is expected to grow.
  - **Climate:** Only 13% of firms—all in the largest size cohorts—reported having climate models or non-model analytical tools. Climate risk models are also expected to grow as a class of models, although concentrated for the next two to three years in the largest firms.
- **Vendor Documentation Challenges:** Firms continued to report model validation challenges with respect to transparency in vendor-model documentation. The top five challenges were:
  - Model design and analytics (68%)
  - Assumptions and limitations (57%)
  - Theory and conceptual soundness (53%)
  - Data, inputs, and parameter values (43%)
  - Developmental testing (43%)

*A detailed paper with further analysis and details on the results of each question will be available to survey participants. For more information, contact RMA Senior Manager, Risk Products Will Kutteh at wkutteh@rmahq.org or RMA Risk Consultant Thomas Gregory at tgregory@rmahq.org.

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About Risk Management Association (RMA)

For more than 100 years, RMA has been laser focused on one thing: helping its members in the world's financial institutions better understand and address risk. As a trusted partner, RMA has weathered the many economic ups and downs of the last century alongside its members, which now number 1,600+ financial institutions of all sizes, from multi-nationals to local community banks. These institutions are represented by over 41,000 individual RMA members located throughout North America, Europe, Australia, and Asia.

Our members rely on us to keep them abreast of important industry trends and prepare them to face new challenges head-on. Our sound risk management principles are developed for members, by members, and help to build safer, stronger financial institutions, impacting local communities and the global economy.

All of this makes RMA unique - we are the only comprehensive source of risk management tools and education that has spanned the last 100 years. And we look forward to the next 100 as we help the industry come together on the transformative issues of climate, cyber, culture, technology, and more.