The evolution of model risk management (MRM)

Emerging trends and considerations in light of revised interagency guidance

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Executive Summary

Fifteen years after the publishing of SR 11-7 Guidance on Model Risk Management and OCC 2011-12 Sound Practices for Model Risk Management, on April 17, 2026, the Office of the Comptroller of the Currency (OCC), Federal Reserve Board (FRB), and Federal Deposit Insurance Corporation (FDIC) issued updated interagency guidance (SR 26-2/OCC 2026-13) on Supervisory Guidance on Model Risk Management (the revised guidance).

The revised guidance is primarily applicable to banking organizations with over $30 billion in total assets, though it may also be relevant to smaller institutions based on the prevalence, complexity and risk of their models. The revised guidance rescinds prior model risk management guidance (SR 11-7 / OCC 2011-12) and other issuances, does not set forth enforceable standards or prescriptive requirements and limits supervisory actions to violations of laws and regulations or unsafe and unsound practices.

The revised guidance acknowledges that the landscape of model risk management (MRM) continues to evolve, driven by increases in the use of modelling and analytics, and advancements in emerging technologies such as artificial intelligence (AI). The revised guidance sets forth principles including the use of risk-based approaches to model risk management that provide banking organizations added flexibility to further adapt their existing model risk management practices to their business model's size, nature and complexity. While generative AI (GenAI) and agentic AI models are not within the scope of the revised guidance, it notes that banking organization's risk management and governance practices should guide the determination of appropriate governance and controls for any tools, processes or systems, consistent with other statements from Supervisors.1

At the same time, global regulatory bodies have been intensifying their scrutiny, with new and more stringent MRM guidelines and standards released from entities such as the UK Prudential Regulation Authority (PRA), Canadian Office of the Superintendent of Financial Institutions (OSFI), Japan's Financial Services Agency and others. These regulations highlight the need for rigorous documentation, independent validation, ongoing monitoring, and oversight of models across the lifecycle. In contrast to the revised US interagency guidance, the scope of MRM guidance within other jurisdictions may include GenAI and agentic AI.

Regulatory Model Risk Management (MRM) Timeline

2001

OCC 2000-16

- Introduces regulatory definitions of models and model risk
- Results in a focus on components of model validation by industry participants and regulators

Examiner Guidance on Pricing Models

- Introduces expectation for independent validation
- Introduces expectation for periodic review

2004-2007

Basel II / U.S. Final Rule

- Expands the use / development of models
- Introduces additional validation requirements for models within advanced systems
- Requires oversight from Senior Management

2009-2011

SR 11-7 (OCC 2011-12)

- First comprehensive guidance on model risk management
- Increases regulatory expectations and focus on model risk across the three lines of defense

2012-2021

CCAR / Dodd Frank Act Stress Testing (DFAST)

- Continues to expand the development / use of stress testing models
- 2013 Range of Practice Expectations (ROPE)
- Annual CCAR Instructions
- SR 15-18 & 19

Interagency RFI on AI/ML

- Understand challenges with development, adoption and associated risks
- Goal is to assess whether additional guidance is necessary given proliferation of use cases

2012-2021

2021 MRM OCC Handbook Booklet

- Provides new/revised guidance (including AI approaches, Third-Party Risk Management, and Data Privacy/Bias)
- Emphasizes guidance on specific components (including overlays, IT Systems, and Planning)

2021 JFSA Principles for MRM

- Explains MRM expectations as key principles while highlighting the evolving nature of model risk
- Key principles include internal audit, use of external resources, governance, model development and ongoing monitoring

2023-PRESENT

PRA SS1/23

- Model risk management principles for banks
- Objective for banks to take a strategic approach to model risk management (MRM) as a risk discipline in its own right

OSFI Guideline E-23 – MRM

- Describes expectations for enterprise-wide MRM through a risk-based approach
- Highlights the development of a model risk rating approach, flexibility of policies and controls, and the importance of defined standards for monitoring
- Effective 2027

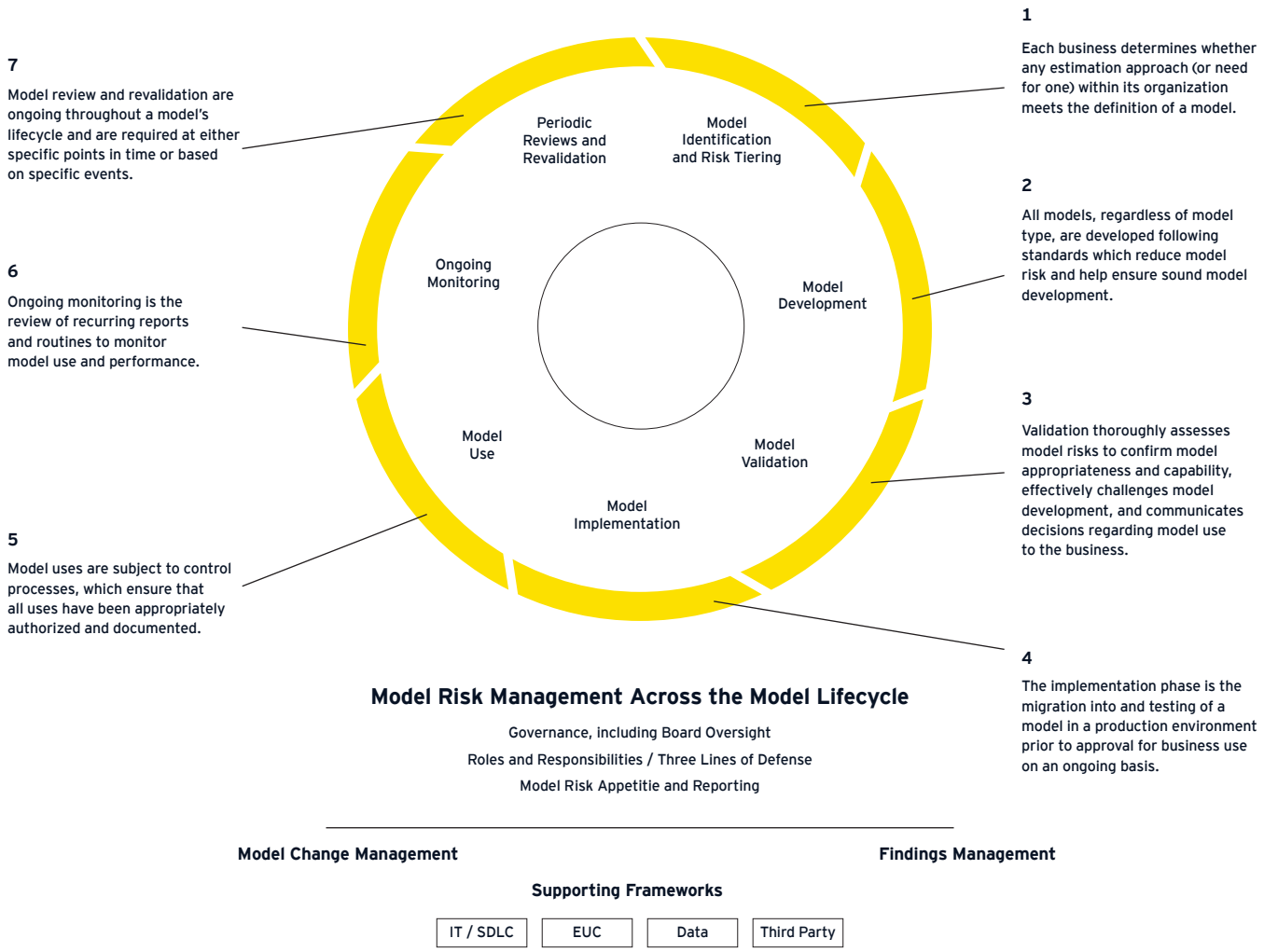
SR 26-2 (OCC 2026 - 13)

- Updated guidance on model risk management
- Rescinds prior model risk management guidance (e.g., SR 11-7, OCC 2011-12, OCC MRM Handbook)

This article explores the impact of the revised guidance on bank model risk management programs, including opportunities and considerations for establishing a credible and effective MRM framework in the absence of detailed regulatory guidance.

Introduction

In light of the revised guidance, banks are evaluating potential enhancements to their existing MRM frameworks, including how they can be further streamlined in a risk-based manner without introducing cliff effects in governance across calculations and jurisdictions. This article is structured around the sections of the revised guidance and provides key considerations and industry perspectives relevant to banking organizations as they look to update their MRM framework and associated requirements. The graphic below summarizes key components of a typical MRM framework. Each component will be discussed in the following sections.



Purpose and scope

Recently, the size and scope of MRM have continued to expand rapidly due to a broader focus on qualitative models/approaches and End-User Computing Tools (EUCTs). This expansion has been driven by supervisory feedback as well as supervisory guidance from bodies such as the PRA, which emphasize the need for more effective governance for Deterministic Quantitative Methods (DQMs) in addition to models. Additionally, the growing threat landscape and regulatory focus on Financial Crime (FinCrime) and cybersecurity have been driving an expansion in the use of models in the areas of FinCrime and cyber risk. Further, the use of AI, including GenAI and agentic AI, is rapidly expanding model inventories at many banking organizations.

SR 26-2 refines the model definition by narrowing it to "complex quantitative methods, systems, or approaches that apply statistical, economic, or financial theories to process input data into quantitative estimates," whereas previous regulatory guidance did not specifically highlight "complex." Additionally, the revised guidance highlights that simple arithmetic calculations and deterministic rule-based processes and software where there are no statistical, economic or financial theories underpinning their designs are excluded from the model definition. The narrowing of the scope to "complex" models provides opportunities for firms to refine definitions and/or the scope of their MRM frameworks. While firms are still evaluating these options and the associated impacts, initial preferences seem to lean toward not (materially) changing existing model definitions but rather focusing on right-sizing the scope of the MRM framework (e.g., excluding simple calculations, qualitative models/approaches or very low-risk internal AI productivity tools) or the processes to be covered within certain calculation types (e.g., only higher risk usages for qualitative models/approaches).

Additionally, institutions recognize that changes to model definition or scope cannot be made in isolation. Altering definitions to align strictly with the revised guidance may introduce misalignment with other jurisdictions, particularly PRA SS1/23, leading many firms to date to favor framework tailoring over definitional change to avoid jurisdiction specific definitions and inventories. Similarly, firms are evaluating potential "cliff effects" in governance of calculations and assessing whether existing frameworks (e.g., EUCT, DQM, qualitative approaches) are appropriate governance mechanisms for certain items included within the MRM scope today or whether scope changes may require new governance frameworks. For example, if MRM removes from its scope rules-based approaches used in Bank Secrecy Act (BSA) / anti-money laundering (AML), will another bank function be able to provide appropriate independent and effective challenge?

Finally, while GenAI and agentic AI models are outside the formal scope of the revised guidance, it notes that firms are still expected to apply appropriate governance and controls based on their risk profiles. Thus, most firms are currently not planning to significantly change their MRM approach toward GenAI as a consequence of the "exclusion" of the guidance and continue to believe that MRM has a role to play in the governance of AI.

Considerations

- Evaluate the model definition and intended scope of the MRM framework
- Maintain a comprehensive and accurate inventory of all potential models, DQMs, and/or EUCTs to support visibility into aggregate model risk
- Assess and avoid potential "cliff effects" in requirements that could result if items are removed from the MRM framework
- Continuously provide specialized training for staff on managing and validating diverse models to ensure they understand the unique risks and requirements associated with each model type

Overview of model risk and model risk management

SR 26-2 provides additional clarity around risk assessment noting model risk is influenced by a model's inherent risk and materiality (i.e., model exposure and purpose). Model inherent risk reflects factors such as complexity, assumptions, quality of data inputs, and data constraints, while exposure refers to the significance of the model output to a banking organization's business decisions and can be quantitatively measured (e.g., portfolio size). Model purpose is a qualitative consideration that involves the nature and importance of the models used by banking organizations.

The revised guidance acknowledges that certain models may be deemed immaterial, in which case effective MRM may be limited to model identification and monitoring of conditions under which materiality could change. It also refines expectations around effective challenge, emphasizing appropriate expertise and objectivity rather than strict organizational separation.

In practice, many firms had already begun to reconsider their approaches to model risk tiering in response to the proliferation of models, and specifically AI, prior to the revised guidance. For example, a number of banks have added new low risk/de-minimis risk tiers (e.g., for models whose output is not used directly and/or not critical for the business process it supports and the output is rather informational or just one input for decision making). In response to the revised guidance, firms are now further re-evaluating existing model risk tiering approaches (e.g., criteria) and aligning model risk activities commensurate with the underlying risk. Firms that have recently made updates are not expected to make major changes to their tiering approaches as a result of the revised guidance and may rather focus on updating their terminology to more closely align to the revised guidance (e.g., model inherent risk). Firms that have yet to make changes to their tiering frameworks (e.g., may still have 3 tiers) may consider additional low risk tiers and tailoring associated requirements (e.g., validation, monitoring) to be commensurate with model materiality.

Considerations

- Evaluate model risk assessment criteria and terminology to align to the revised guidance
- Determine whether existing model risk tiers provide sufficient differentiation to tailor model risk activities to the model risk profile

Model development and model use

The revised guidance remains largely consistent with prior expectations for model development and use, but places greater emphasis on model purpose, use and stakeholder involvement, while being less prescriptive about specific development activities. It also reinforces that testing rigor should be commensurate with model complexity and materiality.

Overall, as a result of the revised guidance most firms are expecting minimal changes to their development and use requirements. However, some firms are considering re-evaluating their model development and use requirements to provide greater discretion to model developers and owners with tailoring requirements in a risk-based manner. Specifically, firms are considering updates to the depth and rigor of model development documentation and model developmental evidence and testing requirements with increased tailoring for low-risk models.

Considerations

Evaluate model development and use requirements and include further tailoring model documentation and testing requirements for low-risk models

Model validation and monitoring

MRM functions have been focused on opportunities to become more effective and efficient and have begun to identify ways to further streamline initial validation, periodic reviews (e.g., revalidation and annual reviews) and ongoing performance monitoring activities.

Model validation and periodic reviews

Prior to the revised guidance, a number of firms had made significant progress to differentiate validation and review activities across risk tiers (e.g., depth and rigor of independent testing, model risk tier-specific templates). Additionally, leading firms have been exploring the development of central testing platforms and libraries along with access to developer infrastructure to enhance independent testing capabilities.

The revised guidance reinforces a risk-based approach to model validation and periodic reviews, providing firms with additional flexibility while maintaining expectations around rigor and effectiveness. Conceptual soundness and outcomes analysis remain the core components of validation and the guidance also recognizes that validation techniques should be fit for purpose.

In response to the less prescriptive nature of current guidance, firms are reassessing how to further tailor validation, revalidation, monitoring and annual review activities to better align effort with risk. Many institutions are reevaluating how these activities interact, particularly in light of the removal of explicit references to revalidation and annual reviews in the revised guidance. A key focus of the current analysis for firms has been reducing potential overlap in activities across annual reviews, revalidations, and ongoing monitoring to ensure that controls are efficient, risk based, and effective.

Many firms are considering the use of trigger-based approaches to annual review and revalidation (i.e., triggering reviews as well as ways to postpone reviews of sound models), with greater reliance placed on ongoing monitoring results to identify performance deterioration or other indicators that warrant deeper review. For mature models that have demonstrated stable performance over time, some firms are evaluating the ability to delay or defer annual reviews or revalidations or move certain activities into ongoing monitoring (e.g., from annual review and discontinue annual monitoring).

MRM operating model

The revised guidance emphasizes that the timing, nature and frequency of validation activities can vary based on factors such as model purpose, methodology, materiality, frequency and scope of changes, data limitations, and other practical constraints. Rather than prescribing specific organizational structures or processes, the guidance also makes clear that the quality of validation is driven by the rigor and effectiveness of the review itself as long as there is sufficient independence to maintain objectivity.

Model validation and monitoring (contd)

In response, institutions are reassessing their operating models to determine whether certain activities can and should be executed outside of the central MRM function. While still limited in practice and still requiring independence from actual developers, a small number of firms have begun performing pilots on allowing validation or revalidations to be conducted outside MRM for limited model types and risk tiers – for example, through peer reviews within the business for very low-risk or limited use AI models. However, early indications are that firms are not currently considering to further expand on such approaches given added flexibility in the revised guidance and consider MRM to be the right function to perform independent review and challenge.

Ongoing monitoring

In the revised guidance, ongoing model monitoring continues to be viewed as an integral part of the MRM framework rather than a separate or purely operational activity. Recent market events, along with the challenges associated with AI and third-party models, have increased the importance of robust ongoing model performance monitoring. The COVID-19 pandemic, rising interest rates, regional banking crisis and geopolitical events have all been recent examples of external market events that have impacts to model performance. Further, firms have placed greater emphasis on vigilance and promptness in addressing model performance issues and tracking emerging risks related to these changes in market conditions, enhancements in industry modeling practices, and/or changes to accounting and regulatory rules. To address these challenges, financial institutions have been enhancing monitoring processes through automating testing and monitoring of key performance metrics (e.g., clear primary performance metrics), with thresholds that require investigation and escalation where applicable. In combination with the expected increase of trigger-based approaches and reliance on monitoring metrics as trigger events, firms acknowledge that the ability to reduce certain activities is a function of the effectiveness and strength of monitoring controls and are, therefore, investing into further enhancing ongoing performance monitoring capabilities (e.g., more frequent and automated monitoring with better metrics).

Collectively, these trends indicate a forward-looking shift toward more dynamic, technology-enabled monitoring as the primary mechanism for identifying model risk issues, informing governance decisions and determining when more intensive validation activities are necessary. In response to the revised guidance, firms expect this trend to continue to grow. With the flexibility allowed by the revised guidance, a strong monitoring program can enable firms to scale back other periodic review activities and place more reliance on monitoring programs to identify triggers for model reviews.

Considerations

Evaluate model validation and revalidation requirements and further tailor activities to the level of model risk

- Evaluate validation operating models with consideration for activities which may be able to be performed outside of MRM
- Implement more "real-time" monitoring systems to provide validators the ability to execute more frequent oversight of model performance and enabling timely interventions when model performance deteriorates
- Automated ongoing testing with KPIs, thresholds and escalation protocols
- Streamline interaction between annual review, revalidation and monitoring to increase MRM efficiency and effectiveness

Governance and controls

The revised guidance provides firms with greater flexibility around governance and controls, allowing firms to further rationalize their processes and activities to enhance effectiveness and efficiency. The guidance emphasizes foundational principles such as clear roles and accountability, effective management of conflicts of interest, robust model inventories that support risk aggregation, appropriate documentation, and a clearer delineation between MRM and Internal Audit responsibilities (i.e., clarification that Internal Audit generally does not duplicate model risk management activities such as model development or validation). However, these principles are generally less prescriptive, including removal or references to key components of governance (e.g., board and senior management oversight, risk appetite statement, reporting, external resources, documentation and policies and procedures).

In practice, most firms are not expecting major changes to their current activities for these processes but may further tailor certain governance and control activities, including reassessing model inventory fields and refining board-level reporting.

Considerations

Evaluate and further tailor applicable governance and control activities based on added flexibility provided by the revised guidance.

Vendor and third-party products

The increased use of third-party models presents significant challenges for MRM, primarily due to limited visibility and control. While organizations continue to rely on third parties in traditional modeling areas (e.g., asset-liability management, risk management) vendors are now frequently embedding AI models in their software applications and services. These models can offer substantial benefits, including specialized expertise and cost efficiencies; however, they also introduce several challenges that need to be carefully addressed.

The revised guidance acknowledges that the widespread use of vendor and other third-party products can present unique challenges for validation and other model risk management activities by dedicating a separate section for vendor and third-party models. Nevertheless, the guidance emphasizes that the principles of model risk management remain applicable and reinforces that sound practice includes developing an understanding of vendor models and that ongoing monitoring, outcomes analysis and evaluation of customizations are key.

This is largely consistent with previous guidance and existing practices, and firms therefore see it rather as a confirmation of their current practices vs. a change in vendor and third-party product model risk management.

Considerations

- Implement robust due diligence for vendor selection and monitoring processes for third-party models, and, when available, firms should establish clear contractual agreements that outline data access and transparency requirements. Any constraints due to the proprietary nature of the model should be considered in the approval process, which may include the requirement of additional compensating controls, including restrictions.
- Use inventory management technology solutions to clearly delineate and manage third-party models, providing greater visibility and control over their use and performance
- Establish mitigating controls in cases where there is limited transparency into vendor models (e.g., increased monitoring frequency)

Jurisdiction considerations

In addition to recent changes in US regulatory guidance, global regulatory bodies (e.g., PRA, ECB, OSFI) have generally increased their scrutiny in the area of model risk management over the last few years and have released new MRM standards. With evolving global regulatory requirements, potential divergence in standards, and varying levels of scrutiny, global banks will also have to consider the balance between global MRM frameworks and jurisdiction-specific regulatory expectations when determining updates based on the revised US guidance. Sample considerations for jurisdiction-specific differences in regulatory guidance may include the following:

- Differences in model definitions and impact on model inventory
- Varying MRM framework scope, including AI-specific considerations and additional non-model frameworks similar to PRA DQM frameworks for certain calculations
- Differences in tiering approaches and impact on model risk rating (e.g., complexity criteria differences)
- Varying expectations in validation and review standards (e.g., process verification or frequency of review of certain model types) Depth and rigor of governance activities for post-model adjustments (PMAs)/model adjustments/model overlays

Conclusion

With the change to less prescriptive regulatory guidance in the US, banks will have to take more accountability of how to establish credible and effective model (and AI) governance and controls, including to substantiate their risk coverage and demonstrate that they have assessed and mitigated the applicable risks. Banks that are already in compliance with previous guidance will likely not identify any gaps or shortcomings against the revised guidance and will rather face decisions on whether existing MRM frameworks could be further streamlined in a risk-based manner for certain key components depending on a firm's risk appetite and whether new governance and control frameworks are required if the scope of the MRM framework is altered (e.g., for less complex calculations) or other existing frameworks (e.g., EUC, tools) can absorb such calculations. At the same time, banks are considering what future regulatory environments may require and may, therefore, limit significant changes in response to the revised guidance that would be hard to undo. Additionally, a number of banks had already undergone recent process reengineering initiatives to align practices in a risk-based manner and, thus, may experience limited impacts from the revised guidance.

Banks should therefore complete an impact and self-assessment of their MRM framework (e.g., policies, procedures, templates) against the revised guidance to identify the impacts and incremental requirements as applicable and consider areas to further increase effectiveness and efficiency, including:

- Determine how to maintain credible and effective model (and AI) governance and controls in the absence of detailed regulatory guidance, including substantiating risk coverage and demonstrating that they have assessed and mitigated the risks
- Reassess MRM (and AI) framework against revised guidance and identify areas for enhancements, including for effectiveness and efficiency
- Develop a change plan and timelines, including considerations for impact on regulations from other jurisdictions (e.g., PRA SS1/23) to avoid overly jurisdiction specific MRM frameworks

Firms should also explore how automation and AI can play a pivotal role in enhancing the efficiency of MRM processes. Automated tools and integrated platforms (e.g., workflow tools) streamline labor-intensive tasks such as model development, documentation, implementation, validation, monitoring and reporting, reducing manual effort and helping drive standardization and reliability. Similarly, leading institutions are actively using or piloting GenAI and agentic AI for key components of the MRM framework, including documentation drafting, testing execution, documentation quality review, and enhanced information querying.

By taking these actions, organizations can build a resilient MRM framework that not only complies with global regulatory requirements but also enhances overall risk management capabilities while being efficient and effective.

Authors

Feng Zhang
Principal
Ernst & Young LLP

Alejandro Latorre
Principal
Ernst & Young LLP

Ryan Moore
Managing Director
Ernst & Young LLP

Oliver Junker
Senior Manager
Ernst & Young LLP

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