



# Changing the game in Model Risk Management

PS6/23 & SS1/23: The PRA's five principles for elevating and future-proofing Model Risk Management







**After an extensive consultation period, the PRA published its long-awaited Policy Statement (PS6/23) on model risk management (MRM) for banks. The PS and the accompanying Supervisory Statement (SS1/23) set out in detail the PRA's five principles and relevant guidance.**

The principles contain the key elements that the PRA considers necessary in an effective MRM framework. In the first instance they will apply to all regulated UK-incorporated banks, building societies and PRA-designated investment firms with internal model (IM) approval to calculate regulatory capital requirements.

The PRA will provide an update on the approach for 'Simpler-regime firms' once the definition of these firms has been finalised. The PRA notes, however, that irrespective of the scope of application of SS1/23 and regardless of size, all firms are already expected to manage the risks associated with models.



## Why has the PRA published these principles?

The principles are intended to elevate the standard of MRM practices at UK firms, support the safe adoption of developing technologies and ensure consistency of approaches across firms.

In its 2022 consultation, the PRA noted the increasing importance of sound model governance, driven primarily by firms' growing reliance on ever more complex models and scenario analysis for a wide range of business decision-making.

Past regulatory reviews identified shortcomings in firms' existing MRM practices relating to capital, financial reporting and stress testing models. The PRA also recognised the emergence of novel model types (e.g. climate and financial crime models) and increasing adoption of advanced analytical models using artificial intelligence (AI) and machine learning (ML) techniques.

PS6/23 and SS1/23 now deliver the overarching framework within which model risk can be managed across all model and risk types. Going forward, the PRA intends firms to take a strategic approach to model risk 'as a risk discipline in its own right'. The role of the Model Risk function is an important aspect of this strategic approach.

## When will the principles come into force and who will they apply to?

The principles will come into force on 17 May 2024 and will initially apply to banks, building societies and PRA-designated investment firms **with approval to use internal models (IM)** for regulatory capital purposes. Firms that are in the process of gaining IM approval will have 12 months from the date of approval to comply with the regulatory expectations in the SS. Although these principles apply to the UK banking industry, they may well set the benchmark for model and tooling governance across all industries and sectors in the future.

Non-IM firms will have to wait to find out how the principles will apply to them, in line with the PRA's commitment to proportionate implementation of regulation. Once the PRA has finalised its definition of a 'Simpler-regime firm' it will provide a further update.

However, the PRA reiterates that all financial services firms, such as insurers, regardless of size, should manage the risks associated with models and continue to apply the supervisory expectations relevant to them and their particular models. For some firms, managing legal entity views in comparison with the Group will also be important.

SS1/23 is also relevant to external auditors, who have a vested interest in MRM effectiveness for financial reporting, for example assessing expected credit loss under IFRS 9. Additionally, it can act as a guide for model vendors, as it sets out the PRA's minimum MRM expectations for third-party models. Credit unions, insurance, and reinsurance firms are out of scope.

The principles cover all elements of the model lifecycle, from model development and validation to performance monitoring and model risk reporting. They also apply to all types of models used to inform key business decisions, including models used for financial reporting purposes.

## What are the key changes?

While much of the PRA's policy has been shaped by decades of overseeing MRM in banks, and builds largely on leading global practices, there are four key areas where new approaches are introduced. Further detail on each of the five principles and KPMG's view is provided in the latter pages of this article.

- **Financial reporting** – firms are expected to produce a report on the effectiveness of MRM for financial reporting to their audit committees to help inform external statutory audits. The PRA noted in CP6/22 that it derives considerable value from discussions with external auditors on firms' MRM. Whilst many MRM teams are already engaging with their firms' external auditors to facilitate understanding of financial reporting models, this expectation, as set out in SS1/23, formalises the arrangements and results in a new stakeholder for MRM teams. The MRM team will also need to support audit committee members to develop a general understanding of model risk so they can exercise effective oversight.
- **Senior Management Function (SMF) holder(s)** – one or more suitable SMFs should be appointed with overall responsibility for ensuring the effectiveness of the MRM framework. SS1/23 clarifies the expectations of the SMF(s) and also recognises that, with the proliferation of modelling across various departments within firms and the synergies required for the robust development and implementation of models, firms need the flexibility to appoint more than one SMF.
- **Future-proofing** – the PRA recognises the increasing use of AI technology and ML methods and has sought to future-proof the principles in relation to more sophisticated modelling techniques. This is a particularly welcome addition, as firms are looking to regulators, amongst others, for guidance to ensure that AI and ML are adopted responsibly and in a compliant manner across the banking industry.
- **Non-models** – although the US Federal Reserve Board's SR11-7<sup>1</sup> put in place additional definitions for models that meant that firms in scope needed to look at a wider landscape, the SS1/23 rules for deterministic quantitative methods and other non-models are new requirements in the UK. Identifying and managing these non-models will be a challenge for many firms, particularly because many of the processes in place for non-models (e.g. End-User Computing (EUC) and calculators) have been embedded in firms' systems for a long time, and may not be easily identifiable or documented properly.

<sup>1</sup> Board of Governors of the Federal Reserve System Office of the Controller of the Currency (2011). *Supervisory Guidance on Model Risk Management*. SR Letter 11-7.

# Challenges for firms

Our view is that firms should leverage SS1/23 to enhance their modelling and model risk management capabilities across all aspects of the model lifecycle in a comprehensive and sustainable manner. Adopting a strategic mindset to this transformation will help firms future-proof their MRM practices and create a scalable solution capable of accommodating new model and risk types as they emerge.

**However, there are some challenges that need to be overcome for this to be a success:**

- **Identification of complex and material deterministic quantitative methods** – firms are asked to identify ‘non-models’ that are critical to business decisions and start governing them to higher MRM standards. This poses a number of challenges, ranging from firms’ ability to identify these ‘non-models’, criteria for determining complexity and materiality of ‘non-models’, and enhancing existing controls around these ‘non-models’.
- **Aggregation of model risk** – firms are asked to provide an aggregated view of model risk at a Group level. This is not always easy, as identifying direct and indirect model interdependencies is often hard to assess, which is a significant driver of overall model risk.
- **Resources** – firms are asked to bolster their three lines of defence with respect to model risk management. They will need to reconsider the size and experience of their teams and may need to think innovatively about headcount through direct recruitment and managed services.
- **Board expectations and requirements** – firms’ boards are expected to set the strategic direction of MRM and challenge material models. This will require careful consideration of what boards can delegate, appropriate metrics for boards to monitor MRM effectiveness and education on technical matters as required.
- **Data** – firms’ MRM SMFs are expected to take a more active role in ensuring robust data for models. The scope of MRM in relation to data has long been debated and, in the absence of effective collaboration and alignment, there is potential for duplication of work.
- **Post-Model Adjustments (PMAs)** – firms are expected to strengthen governance around PMAs and other model risk mitigants. This creates challenges in terms of setting materiality thresholds for PMAs, documenting PMAs and their impact, especially in interconnected models, and quantifying, aggregating and reporting the impact of PMAs on a common basis at a firm-wide level.
- **Model documentation** – firms are asked to enhance model documentation for both internally developed models and third party vendor models. Even the relatively simple requirement of model replication will create the need for considerable uplift for a number of model types. Meanwhile, the need to ensure third party models’ appropriateness for their intended use will lead to revised documentation requirements.

## Culture is key

Firms will need to foster a culture where significantly more attention is paid to model risk and all staff are encouraged, as well as educated, to take an active role in its management. The tone needs to be set at the very top by boards who understand model risk and who have the ability to challenge models. Appreciation of model risk and the capability to manage it needs to be embedded across all three lines of defence. An uplift of governance and frameworks across the model lifecycle will also nurture greater cultural awareness and change.

**Having a positive and all-inclusive model risk culture in place is a fundamental step toward successfully embedding robust MRM practices.**





# ▶ Next steps

The requirements specified in PS6/23 and SS1/23 will be effective from 17 May 2024, giving firms less than a year to ensure their model risk management framework has been assessed against regulatory expectations, with remediation plans prepared to address identified gaps.

**In-scope firms need to act sooner rather than later** to identify their full range of models and complex material non-models, ensure that they are accurately captured in model inventories and apply some form of independent review in line with their materiality and complexity. Firms not captured in the initial scope of application, but likely to be impacted down the line, should also consider taking action.

**There are five key next steps for firms by May 2024:**

## 01

Conduct a regulatory gap analysis against the requirements or update the gap analysis previously carried out against the PRA's consultation paper. Review and prioritise gaps, identify quick wins and develop plans to address those gaps that will require significant implementation effort. This will include looking at team size and experience, relative to the work required.

## 02

Set up cross-functional steering and working groups to address gaps against the regulatory requirements, ensuring that this covers all areas of the bank that could be impacted by the broader definition of an in-scope model.

## 03

Deliver training to the board and senior management and develop broader communications for all colleagues impacted by the new requirements.

## 04

Review the operating model for the MRM function, designate the relevant SMF role(s) and design the governance approach to provide effective oversight across the various teams that produce models.

## 05

Conduct exploratory analysis of in-scope models across all business areas to help inform the production of an internal model inventory. Non-models also need to be considered as part of this exercise, to determine what requirements should be in place for them.





## The five principles

The PRA sets out five core principles to be adopted by firms, each with several more detailed sub-principles. The PRA considers that, taken together, the proposed principles and sub-principles provide an effective overarching MRM framework, to which firms can be held accountable.

# Principle 1 – Model identification and model risk classification

**Firms should have an established definition of a model that sets the scope for MRM, a model inventory and a risk-based tiering approach to categorise models to help identify and manage model risk.**

### The three sub-principles focus on:

- **Model definition** – providing firms with a model definition, whilst allowing for ‘material deterministic quantitative methods, such as decision-based rules or algorithms’ to be subject to firms’ MRM;
- **Model inventory** – firms should have a comprehensive, centrally-maintained model inventory that captures key information relating to model purpose and use, model simplification and limitations, validation findings, and ownership and governance details; and
- **Model tiering** – ensuring a consistent, firm-wide risk-based model tiering is used to prioritise validation activities. The tiering should consider both model materiality and model complexity. Complexity should be aligned with a model’s inherent risk arising from a diverse range of factors, such as the nature and quality of data, choice of methodology, the requirements and integrity of implementation and the extensiveness of use of the model for business decisions.

### KPMG View

Principle 1 sets a model definition that considers the proliferation of novel model types (e.g. **climate and financial crime models**) and more sophisticated modelling techniques (**AI and ML**). At the same time, the PRA acknowledges that ‘deterministic quantitative methods’, i.e. non-models, are becoming more complex and statistically orientated because of advances in technology and data processing power.

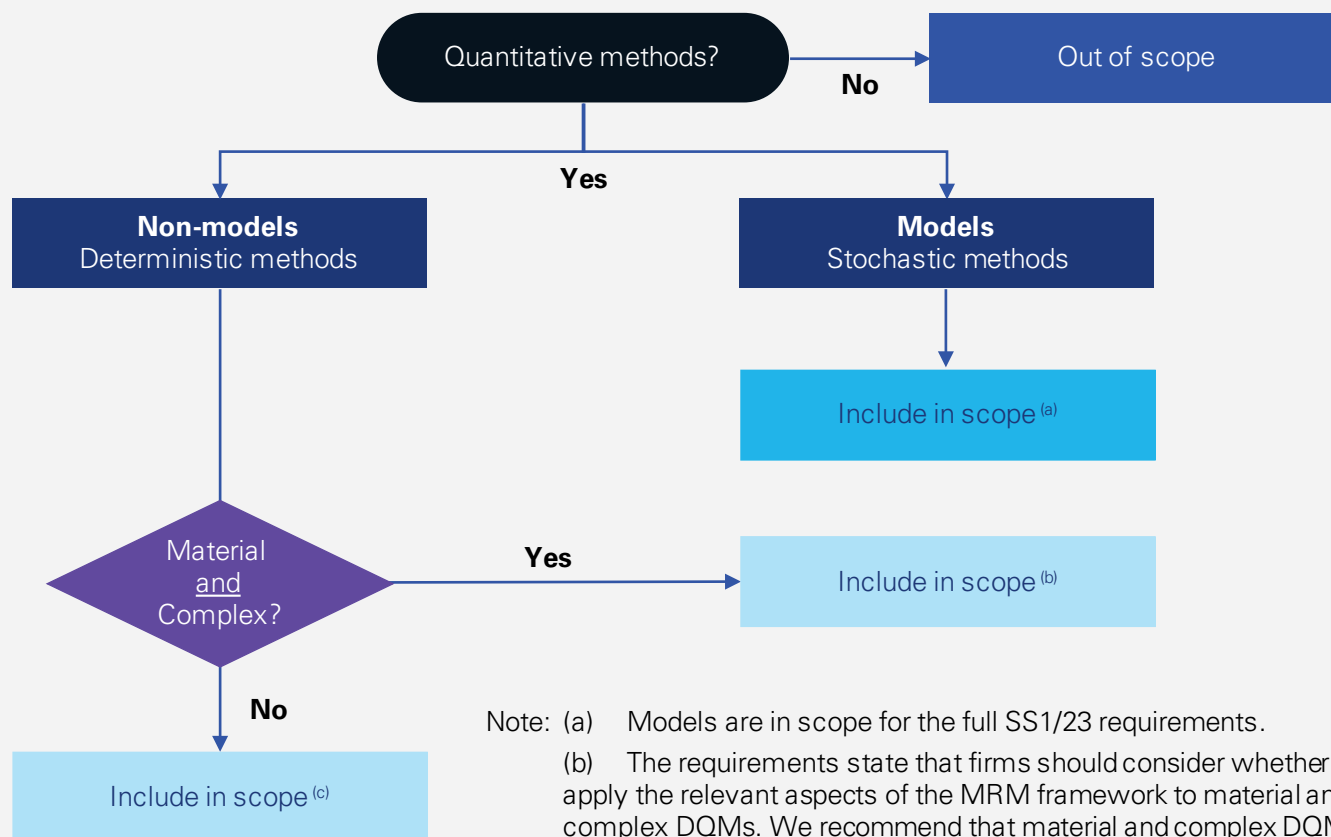
Firms will have to navigate the new formal definition with caution in their effort to identify an appropriate threshold condition for model recognition that fulfils regulatory expectations. Such an exercise is bound to increase the model estate, and also identify a significant number of material and complex non-models.

The requirement to capture pertinent details of models in a centralised model inventory may prove challenging to firms, as identifying the new universe of models may be both time and resource intensive and could require additional investment in updating model inventory systems. This will require not only MRM teams being more proactive in identifying models in firms, but also relevant business teams leading the registration of models to enable effective MRM. As model risk increases with larger numbers of inter-related models, an important aspect of the model inventory will be capturing dependencies.

In addition, finding and capturing information on complex non-modelling processes (e.g. **End-User Computing (EUC), calculators**) that have a material bearing on business decisions presents its own difficulties. Many of these processes have been embedded in firms’ systems for a long time, lack the appropriate governance and may not be easily identifiable or documented properly. Determining the boundary of these non-modelling processes will be important and there is a risk associated with getting it wrong. Firms will also need to determine what the appropriate principles are, if any, to apply to these deterministic quantitative methods in a way that balances additional workload with effective governance.

Finally, the PRA’s expectation regarding a firm-wide, consistent model tiering system will be a challenge for firms. They will need to apply such a system to an ever-increasing range of quite disparate models, including deterministic quantitative methods that they may want to incorporate in their model inventories, and also be able to identify, and in some cases quantify, appropriate risk factors to represent materiality and complexity.

# Classification and regulatory expectations for models and deterministic quantitative models



- Note: (a) Models are in scope for the full SS1/23 requirements.  
 (b) The requirements state that firms should consider whether to apply the relevant aspects of the MRM framework to material and complex DQMs. We recommend that material and complex DQMs are subject to the same level of governance as models.  
 (c) DQMs that are not both material and complex should have sound and clearly documented management controls in place.

## Identifying models and complex non-models

Until now, model risk management has dealt exclusively with models, specifically quantitative methods whose outputs include elements of randomness. Put simply, models are imperfect representations of reality, as reality is full of unexpected, random events. For example, a derivatives valuation model utilising the Monte-Carlo method introduces uncertainty using simulations and ultimately has a financial reporting impact.

However, SS1/23 brings into scope ‘deterministic quantitative methods’, i.e., non-models, which determine future events exactly without the involvement of randomness. Whilst these methods will always yield the same result, the impact of getting the inputs wrong is significant and could prove material for many firms. For example, the calculation of risk weighted assets as a step to determining minimum capital requirements requires combining the necessary risk parameters in a formula that will always yield the same result given the same inputs.

The PRA, however, acknowledges that non-models are becoming more complex and statistically orientated due to advances in technology and data processing power. As an example, firms in the UK use estimates of household expenditure as an integral part of their credit granting decisions. The absence of actual expenditure information provided by the credit applicant,

however, poses a real risk in assessing affordability. As such, the potential of an incorrect credit decision driven by inaccurate affordability assessment introduces conduct risks. Firms also face a real challenge in identifying where non-models are used, but will have to do so, especially where they contribute materially to business decisions.

One could argue that the borders between models and non-models are getting progressively more blurred from both a technical and governance perspective. Non-models may share similar features with models and, hence, very similar model risks. Also, the regulator asks firms to apply the relevant aspects of the MRM framework to material and complex non-models; thus elevating their governance to standards similar to those used for models.

There are multiple implications for firms:

- They will have to register many more new models because of the wider model definition prescribed in SS1/23.
- Efforts in capturing non-models will need to be intensified, especially the more material and complex ones.
- They will need to think carefully as to whether to align key processes, such as tiering, across models and non-models, which will share similarities, but also have many differences.
- Robust governance for non-models will need to be put in place after applying the relevant aspects of the MRM framework.





## Principle 2 – Governance

**Firms should have strong governance oversight with a board that promotes an MRM culture from the top by setting clear model risk appetite. The board should approve the MRM policy and appoint an accountable individual to assume responsibility for implementing a sound MRM framework that will ensure effective MRM practices.**

### The six sub-principles focus on:

- **Leadership** – the demonstration of leadership by a firm’s board in relation to MRM, including setting the MRM framework, a suitable risk appetite and challenging the outputs of the most material models;
- **SMF** – the appointment of one or more appropriate SMF(s) with a holistic view of model risk across a firm who provide overall oversight of the MRM framework;
- **MRM framework** – the formalisation of the MRM framework through comprehensive policies and procedures, which should cover the interaction of MRM with a firm’s wider risk framework and all aspects of the model lifecycle, including model tiering, model development, use of data and its quality, model validation, model performance monitoring, model mitigants, and model approval and change;
- **Roles and responsibilities** – the allocation of roles and responsibilities to people with appropriate skills, experience and expertise for each stage of the model lifecycle, with an emphasis on ensuring the separation between development and validation roles;
- **Third-party models** – the accountability of firms for the model risk associated with third-party vendor models; and
- **Internal audit review** – the requirement for Internal Audit to assess the effectiveness of the MRM framework and its controls periodically.

### KPMG View

Principle 2 aims to ensure that a firm’s board of directors sets the strategic direction and priorities for MRM and has a clear high-level view of model risk against a set model risk appetite.

This might change existing structures within firms, with some already having designated committees for this purpose. The expectation that boards challenge the output of material models may result in a requirement for considerable training to understand more technical aspects of modelling, including model drivers, assumptions and uncertainties.

Against the backdrop of an expanded scope for the MRM framework and given the need for various teams (e.g. data, modelling, IT, etc.) to work together to produce robust models, significant changes to existing governance and operational structures may be required. This will involve finding the right SMF(s) to have oversight of model risk across the entire organisation and ensuring a joined-up and effective approach to MRM.

Establishing effective firm-wide policies will require some firms to think about how this can be achieved over many different model types with varying degrees of materiality, not to mention multiple geographies and regulatory jurisdictions.

The separation of roles and responsibilities between development and validation will not only require relevant teams to be resourced with distinct skillsets but will also entail a cultural shift in many cases to ensure the impartiality and objectivity required. Interestingly, the requirements for model owners and model users will drive greater collaboration with model developers and validators, as both are expected to have a closer understanding of the modelling work involved.

Lastly, the PRA has clarified that it expects firms to ensure that the level of detail in the documentation of third-party vendor models is sufficient to validate their use. Firms will have to engage with model vendors to address any information gaps arising from this expectation, while vendors will have to balance the provision of sufficient information to firms with the retention of intellectual property.





## SS1/23 on Artificial Intelligence/Machine Learning models

To date, traditional MRM practices have not accounted for AI/ML modelling, which is capable of not only amplifying existing risks, but also introducing new risks (such as biased decision making and opaque accountability).

The publication of SS1/23 now addresses this gap in regulatory guidance. For example, the framework's tiering complexity assessment includes risk factors most associated with AI/ML models, including interpretability, explainability and bias.

Additionally, the framework considers areas like compliance with data privacy regulations to address the extensive use of personal data.

While not explicitly stated in SS1/23, PS6/23 references the alignment of MRM policy to the BoE/PRA/FCA joint discussion paper on AI (DP5/22).

Although the MRM principles are considered broadly sufficient for now, further AI/ML guidance may be released once responses to DP5/22 (and the associated results of the 2022 ML survey) have been fully analysed. While activity currently remains at the discussion stage, financial regulators are focused on emerging opportunities and risks. Interim leading practice guidance is centred on:

- Robust testing and development frameworks for AI and ML models, including ongoing testing;
- Clear documentation of methods and processes for identifying and managing bias in inputs and outputs;
- The importance of transparency and explainability to stakeholders, e.g. internal control functions, regulators/supervisors and consumers; and
- The need for human oversight and accountability for models.



## Principle 3 – Model development, implementation and use

**Firms should have a robust model development process with standards for model design and implementation, model selection and model performance measurement. Testing of data, model construct, assumptions and model outcomes should be performed regularly in order to identify, monitor, record and remediate model limitations and weaknesses.**

### The six sub-principles focus on:

- **Model purpose** – all models should have a clear statement of purpose and design before model development commences;
- **Data expectations** – data being used in model development should be suitable, not inappropriately biased, consistent with the chosen methodology and representative of the population to which the model will be applied. The types of data and any adjustments made to data should be clearly documented and an assessment of their complexity should inform the model tier;
- **Testing** – model development testing should be undertaken to demonstrate that a model works as intended;
- **Model adjustments** – model adjustments, including the use of conservatism and application of expert judgement in models, should be clearly linked to model limitations, adequately justified, clearly documented and appropriately governed;
- **Model documentation** – documentation should be comprehensive, up-to-date, enable readers to understand how the model operates, its key assumptions and limitations, and allow an equivalently trained practitioner to rebuild the model; and
- **Implementation** – models should be implemented in information systems or environments that are fit for purpose.

### KPMG View

While Principle 3 formalises concepts and processes that firms have been following for quite some time, it also introduces some new considerations. For example, firms will have to enhance their data quality testing procedures not only to establish data lineage and robustness but also to ensure that data biases are identified and managed appropriately during model development.

Principle 3 also offers some insights into what the PRA perceives as good model tiering drivers inspired by model development. Data interconnectedness and use of unstructured data, for example, might pose risks and will have to be reflected in a model's complexity rating. In addition, the principles discuss the use of challenger models, which will not only increase model development workloads, but also contribute toward quantifying model uncertainty, and, thus, prove a useful complexity driver.

The PRA expects testing to become more forward-looking and responsive to the economic environment. Model developers will need to think about what scenarios they can run to test the operating boundaries of their models.

There is a regulatory expectation that material model adjustments linked to model limitations will be temporary and firms should invest time and resource to address the underlying limitations through re-calibrations or re-developments.

Even with seemingly straightforward aspects, such as ensuring model documentation is kept up to date, firms may struggle if robust processes are not already in place. For example, the most fundamental principle of model replication of parameter estimation and/or model results will require firms to undertake an in-depth impact assessment of any systems/processes updates on the structure and robustness of models.

The introduction of material and complex 'non-models' into the MRM mix will also require firms to consider a wide range of development-related topics, ranging from the production of firm-wide development standards that are general enough for the wide range of such non-models, to the formal documentation of these non-models, albeit to a level less granular than that for models.

The goal of ensuring that models are deployed in fit for purpose information systems will present opportunities for model developers, validators, and technology professionals to work together.

In conclusion, although Principle 3 has largely been embedded in firms, the PRA's expectations across the wider range of models captured by the enhanced model definition, and material and complex non-models, will keep firms busy recording information and demonstrating compliance with relevant policies.





## Principle 4 – Independent model validation

**Firms should have a validation process that provides ongoing, independent and effective challenge to model development and use. The individual/body within a firm responsible for the approval of a model should ensure that validation recommendations for remediation or redevelopment are actioned so that models are suitable for their intended purpose.**

### The five sub-principles focus on:

- **Robust independent validation function** – firms should have an independent validation function with sufficient organisational standing to undertake independent reviews of models;
- **Scope of validation** – all models should be subject to an independent review covering model inputs, calculations and reporting outputs, the nature and extent of which is to be determined by the model tier;
- **Review of implementation** – appropriate verification of model processes and systems implementation should be undertaken to ensure that models are operating effectively and have been implemented as intended;
- **Model monitoring** – model performance should be monitored to ensure that it remains acceptable; and
- **Re-validation requirements** – firms should undertake regular independent re-validation of models consistent with their tiers.

### KPMG View

Principle 4 sets out good practice recommendations for firms' independent model validation functions. It also proposes some subtle innovations, such as the potential expansion of the scope of an independent review to cover reporting outputs, management information and systems implementation.

Although some firms' validation functions may already be aligned, others will have to expand to encompass implementation and usage in production, which has not always been the focus to date. In addition, validation teams will have to become even more outward facing, as they will be required to assess whether a model has been used beyond the intended use and whether this use has delivered acceptable results. To complete this task, second line teams will most likely need to establish new networks and lines of communication with teams they might not have collaborated with in the past.

Principle 4 also states that all models should be subject to an independent review, the extent of which is to be determined by the model tier. Therefore, model validation functions will inevitably pick up more work, including ensuring that sufficient model risk controls are placed on lower tier models, which is an arduous task.

With more models coming into scope, independent validation teams will also have to (re)consider the frequency of periodic revalidation, which would inevitably be linked to model tiering, but also needs to consider the dynamic nature of certain models and regulatory requirements of others. Hitting the 'sweet spot' will help lower costs and improve efficiency. However, documenting these validations, especially for different types of models, will require significant uplift for firms.

Independent validation teams will also have to establish processes for how they would like to engage with material and complex 'non-models'. While SS1/23 stipulates that such 'non-models' should be tested for correct implementation and use, there may be opportunities for validation teams to reconsider their practices in terms of capturing and reporting on inherent risks of such deterministic quantitative methods.

The requirement for model performance monitoring creates potential for replication of key model performance metrics by validation functions that will further add to their workload. It does, however, present a prime opportunity to invest in automation of such tasks across the model estate.

The PRA makes frequent references to validation recommendations being satisfactorily addressed. Firms will have to reconsider their appetite for the duration that validation actions can remain outstanding, and validation functions will need to enhance their processes to ensure timely follow-up of open actions and appropriate escalation where necessary.



## Principle 5 – Model risk mitigants

**Firms should have established policies and procedures for the use of model risk mitigants when models are under-performing and have procedures for the independent review of post-model adjustments.**

### The three sub-principles focus on:

- **Post model adjustments (PMAs)** – firms having consistent firm-wide processes for applying PMAs that correspond to the model type and compensate for model limitations, are applied in a transparent and systematic manner, are documented appropriately, and are subject to independent review that is commensurate to the materiality of the PMA;
- **Model restrictions and thresholds** – consideration of restrictions on model use depending on validation findings and/or model performance breaching acceptable thresholds; and
- **Exceptions and escalations** – consideration of exceptions for use for material models, which should be temporary, subject to PMAs, reported to and supported by senior management and escalated to key stakeholders through the appropriate channels.

### KPMG View

Principle 5 introduces the requirement for firms to establish robust processes for model risk mitigation. At the heart of this are PMAs; capturing risks and uncertainties not adequately reflected in models.

Firms are asked to present model results with and without PMAs, which will require effort to achieve from a systems and reporting perspective, especially when firms have many inter-connected models, but is crucial for decision makers. Also, firms need to consider whether PMAs should feature in their model tiering process, either as an independent criterion or as an element of either dimension of materiality or complexity.

The PRA further clarifies the distinction between model adjustments, which need to be reflected in model development documents and assessed explicitly as part of validation activity, and PMAs that have a broader scope and require a robust governance procedure.

Most firms will likely have to improve their model documentation and inventory systems to capture information on model limitations, restrictions, exceptions and escalations in addition to strengthening their governance around PMAs. The SS requires PMAs for material models or portfolios to be documented and approved by the relevant committee(s). Moreover, firms will need to know where their material models are used to be able to compile a list of exceptions; this is not always an easy task. In addition, firms will need to arrive at a definition of a 'temporary exception' that allows them sufficient time to address model weaknesses without taking too long. This may be the catalyst for firms to push for further efficiencies in the modelling process.

Principle 5 poses other challenges to firms:

- Firms will require a clear framework that distinguishes between drivers of model adjustments (Principle 3, sub-principle 3.4) and PMAs to ensure that model deficiencies are addressed in a timely and proportionate manner.
- The requirement for an 'independent' review of PMAs might require action by functions other than model validation, for example business oversight, internal or even external audit, who possess appropriate levels of skill and expertise to do so.

The principle asks firms to carefully consider the balance between placing restrictions on and allowing exceptions to **(material)** models, as the two could arrive at conflicting conclusions and any tension between them will need to be managed appropriately.



# Conclusions

The principles and sub-principles in the PRA's policy aim to elevate the standing of MRM in firms and recognise it as a risk discipline in its own right, through a future-proof framework designed to accommodate novel model types and sophisticated modelling techniques.

The regulator is asking firms to apply relevant aspects of the MRM framework to material and complex non-models. Bringing additional models and non-models within the perimeter of formal governance is likely not only to stretch existing teams but also to require new governance and operational structures to be established to ensure that firms are addressing the spirit of the principles. All the above will need to be supported by a raft of policies that need to be either reviewed or produced for the first time to ensure that the principles are embedded correctly. It will also be important for firms to elevate model risk to a principal risk within the organisation, if that has not already been done.

It is likely that interpretation of the principles will be different across firms. A coordinated industry approach will be needed to identify and implement good practices without allowing group-think to influence any decisions and actions going forward.

We welcome PS6/23 and SS1/23, as they will pave the way forward for strong model risk management in the UK. However, firms have a challenging journey ahead to meet all of the requirements in a robust way.

Finally, whilst the PRA's expectations are aimed specifically at financial services firms, there is potential for these or similar principles to be applied across other sectors and industries. Models are used extensively in other settings, including large corporates, SMEs and government departments. The scope for wider application of good practice in the MRM universe is vast.

**The future looks bright for MRM – but it will take time, effort and expertise to achieve the PRA's vision.**





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