

Model Risk Management Framework

ABI – Supervision Risk & Profitability

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Agenda



Model Risk Assessment methodologies



Mitigation framework



Outcomes and challenges



Know your models, know your risks

1 2 3



In 2019 Model Risk Management project was launched in UniCredit to overcome the absence of “an overarching model risk management framework”, highlighted by ECB as a deviation from Supervisory Review and Evaluation Process (SREP) Guidelines and TRIM Guide

What is Model Risk?

It is defined as the **potential loss** the Bank may incur, **as a consequence of** decisions that could be principally based on the output of internal models, due to **errors in the development, implementation or use of such models**

What are the challenges?



Understand the risks and discover models

What is a model? How can all models across the Group be included in MRM scope?



Create an inventory of all models

How to collect information and implement a unique register of all models?



Assess model risk

Which are the sources of model risk? How can they be assessed?



Share our know-how and influence decisions

How can we share information on model risk? How can we use the assessment to support decisions?



Methodological approach to Model Risk Assessment

Model Risk Rating

Inherent Risk

+

Audit/ ECB Rating

(1st line of defense)
2nd line of defense

+

3rd line of defense /
4th line of defense

- **Structured objective assessment performed at model level as a combination of**
 - Materiality (i.e. materiality of the model usage)
 - Uncertainty-complexity-compliance measured through validation assessment where available
- In case of missing or outdated validation assessment, the assessment of uncertainty-complexity-compliance must be re-performed by acquiring the information from scratch from the model owner through use of a self assessment questionnaire
- This is the **key component of the model risk assessment**

- **Assessment that represents the evaluation of internal/ external independent reviewers (internal Audit, external Audit firm, ECB) on model risk**
- This assessment could only **downgrade** the Inherent Risk Rating

Mitigation Rating

Model Risk Mitigations

=

Residual Risk

1st line of defense /
2nd line of defense

=

2nd line of defense

- **Assessment that defines the effectiveness of the mitigations to address the Model risk**
- Mitigants of model risk include:
 - Model maintenance
 - Model monitoring
 - Data quality
 - Model validation
 - Data validation
 - IT validation
 - Process validation
- This could upgrade the Model Risk Rating of maximum 1 notch

- Assessment of the residual risk derived as combination of
 - MR Rating
 - Mitigation efficacy
- This is the final output of the model risk assessment



Model inventory: important enabler

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- **Model Risk Management tool as single point of reference for model information**, supporting massive download and **automatic upload** of different information cross-models



- **Integration with other IT systems for automatic update of model information**, leveraging on internal processes, such as: findings' tracking tool, modeling and validation planning, rating register of model changes in order to speed up the model risk assessment phase



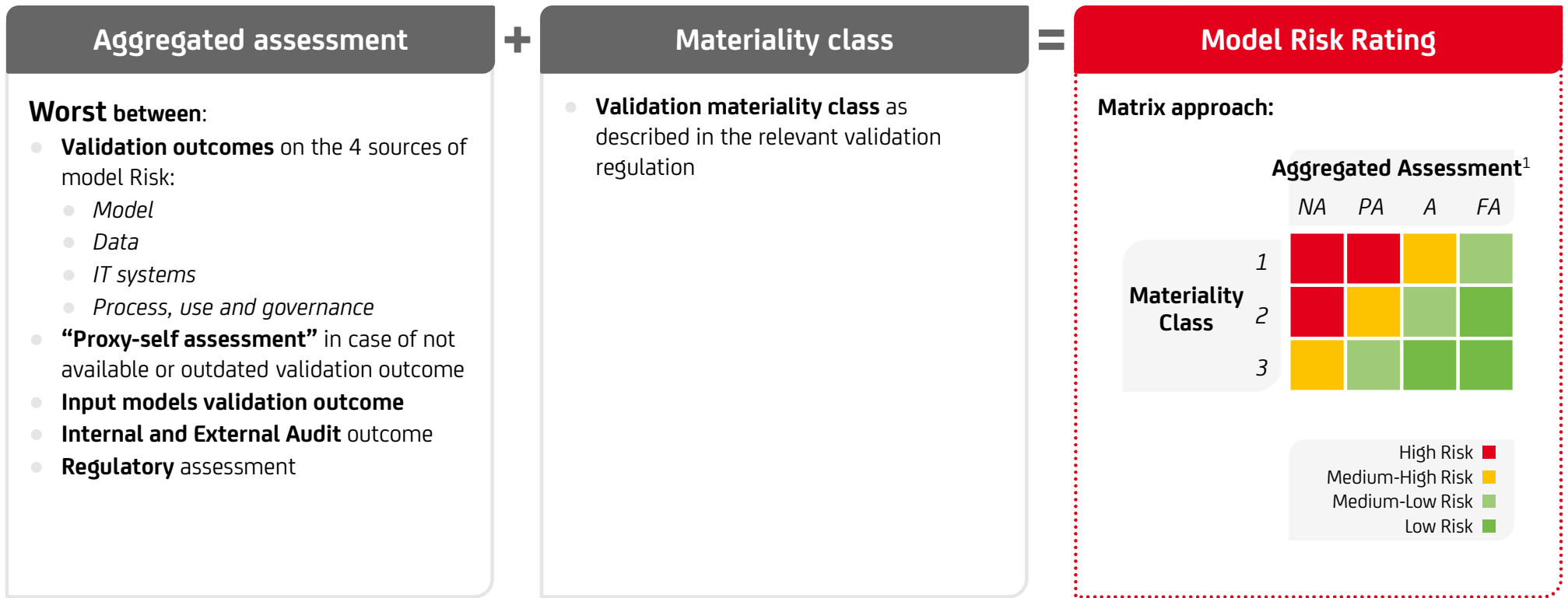
- **Automatic data controls** covering completeness, coherence and exactness (e.g. double-check with finding tool)



- **Support to other functions**, leveraging on a large and fast-available variety of information included in the model inventory (planning, materiality information, support to benchmarking projects and to Audit/ECB inspections)



Assessing risks through Model Risk Rating

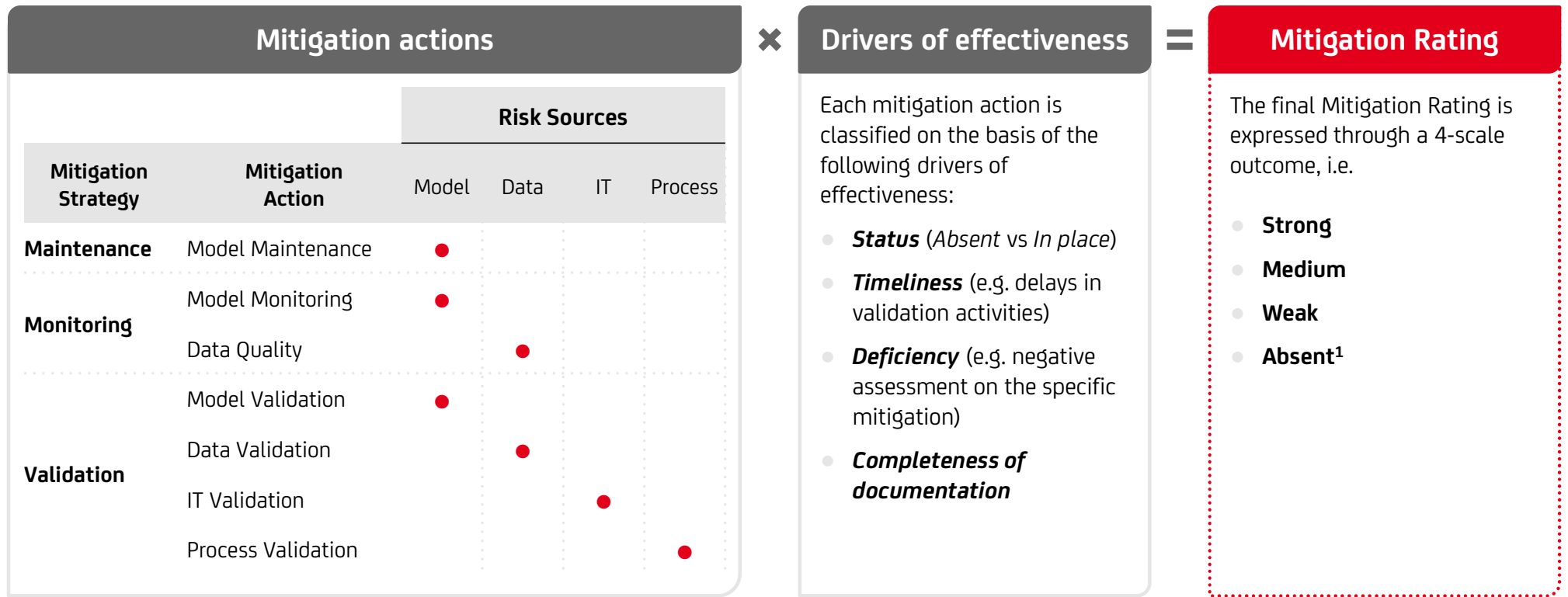


1. NA = Not Adequate, PNA = Partially Adequate, A = Adequate, FA = Fully Adequate

6 Disclaimer: the opinion reported in the presentation are the ones of the author



Mitigation Framework



1. If all mitigation actions are absent

7 Disclaimer: the opinion reported in the presentation are the ones of the author



Mitigation Rating – Example on Maintenance

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Types of maintenance:

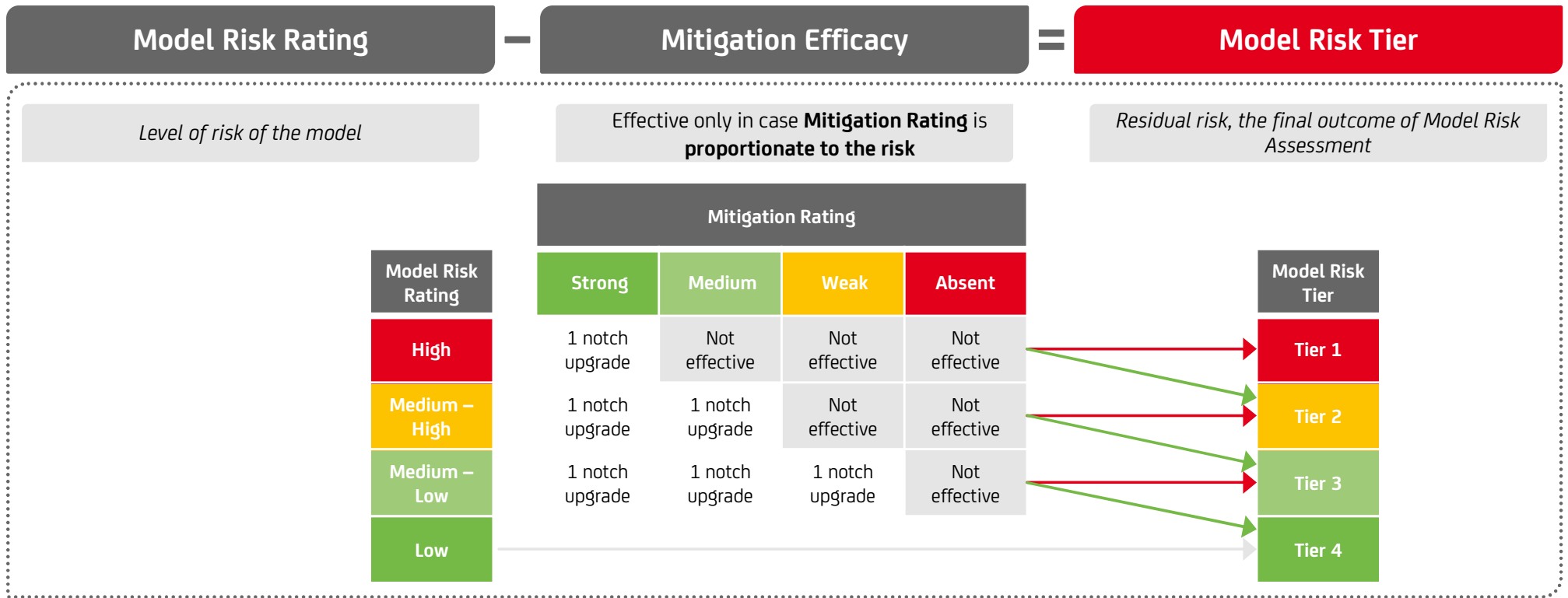
1. **Update of the model over time**, based on the latest data available, avoiding the model being based on obsolete parameters and fed with outdated information
2. **Constant improvement** of the model, considering internal and external feedback (e.g. validation, Audit and ECB findings, model monitoring results) as well as changes in business or regulatory framework

➤➤ Relevant instrument is a self assessment questionnaire that translates feedback from Validation, Audit, ECB, business needs, regulatory changes and model owner quantitative analysis into actions: redevelopment, recalibration, application of MoC, etc.

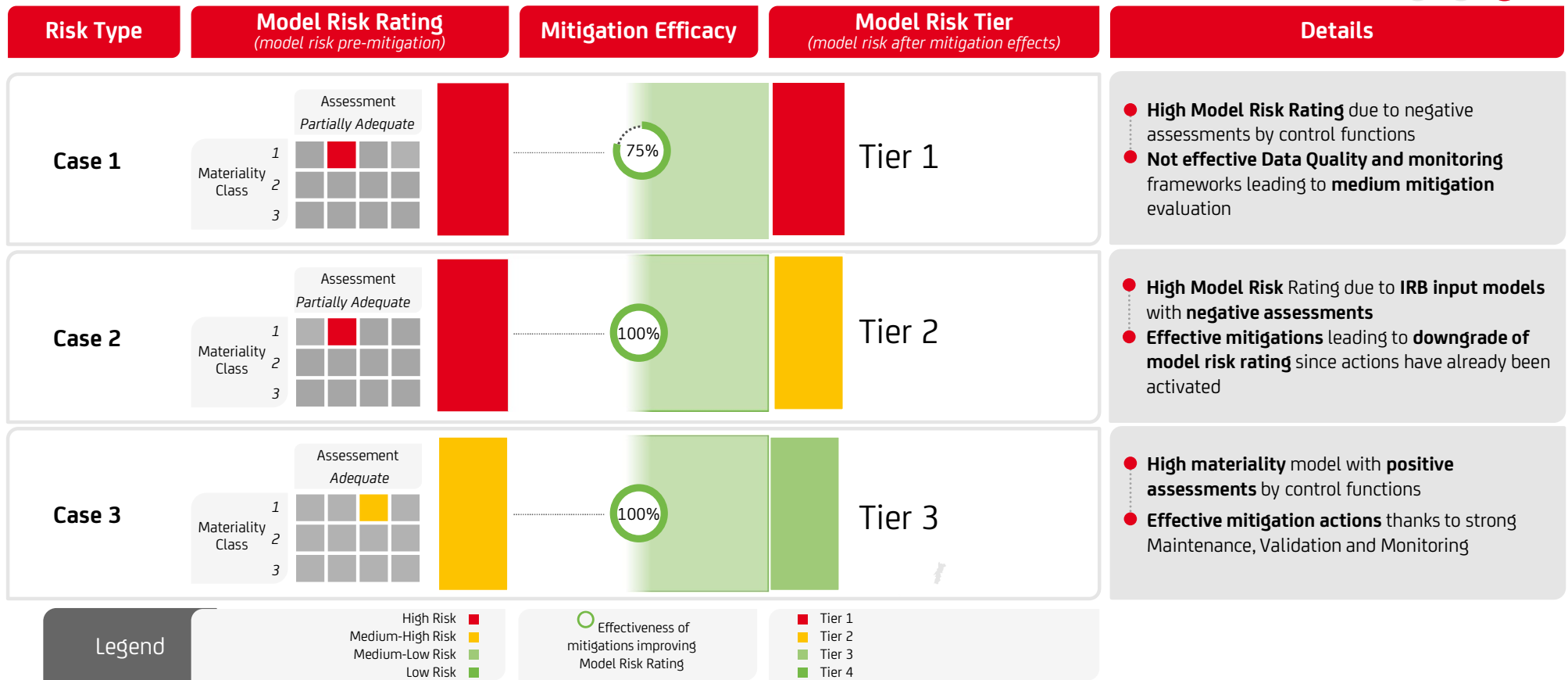
➤➤ Depending on type of risk/model usage, expected actions can be different. As an example calibration of IFRS9 models is expected to be more frequent than calibration of IRB models



Tiering: final Model Risk Assessment



Practical examples of model risk assessment



Opportunities and challenges

An expanding framework supporting the bank

- Inclusion of Model Risk Tiering to **quantify add-on** on top of the **Economic Capital** Pillar 2 estimations
- Model risk assessment presented to managerial committees, BoD, Board of Statutory Auditors and shared with Group and local CROs
- Active challenge on how to **improve the effectiveness of mitigations** also based on **proportionality principle**
- As an example, strategic decision to roll **data quality framework and monitoring activities** on portfolios previously not covered
- MRM framework creating **awareness** of risks, **knowledge** of models and favouring **coherence** between methodological standards
- Multiple owners and scope extension outside Risk / validation perimeter posing a number of challenges, both methodological and in making the owners aware of the added value of the project



Synergies between several functions

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➤ Model Owner Development functions

Model owners and developers are responsible for ensuring that models are properly developed, documented, implemented and used

➤ Model Users Various

Use the output of the models and perform an effective challenge

➤ Model Validators Validation functions

Performs the validation activity and verify whether the models are properly developed, implemented and used, for models in the validation scope

➤ Model Auditor Audit functions

Responsible for carrying out audit activities and specific investigations

➤ Model Risk Manager Model Risk function

Responsible for assessing and monitoring model risk, confirming the mitigation strategies and communicating the model risk metrics to the senior management

➤ Others Various

Others functions, Including Governance, IT functions, etc.

