

The Journey from Model Validation to Model Risk Management

Internal Model Industry Forum Meeting

February 21st 2018

Internal
Model
Industry
Forum

Risk Dynamics is a leading global provider of model validation and model risk management services

10+ years expertise in the fields of **model validation, model risk management and model advisory**



We have **conducted 500+ model validation projects** for insurers, banks, CCPs and asset managers globally, from traditional models to cutting edge techniques



Have a **highly experienced team** of quantitative consultants with 5-25 years' experience **combining technical expertise with commercial understanding**



Our proprietary **tools and benchmarks** allow us to optimize the validation process and give greater insights from our analysis



We work with several **supervisors and regulators** in the form of training, methodological reviews and model validation projects



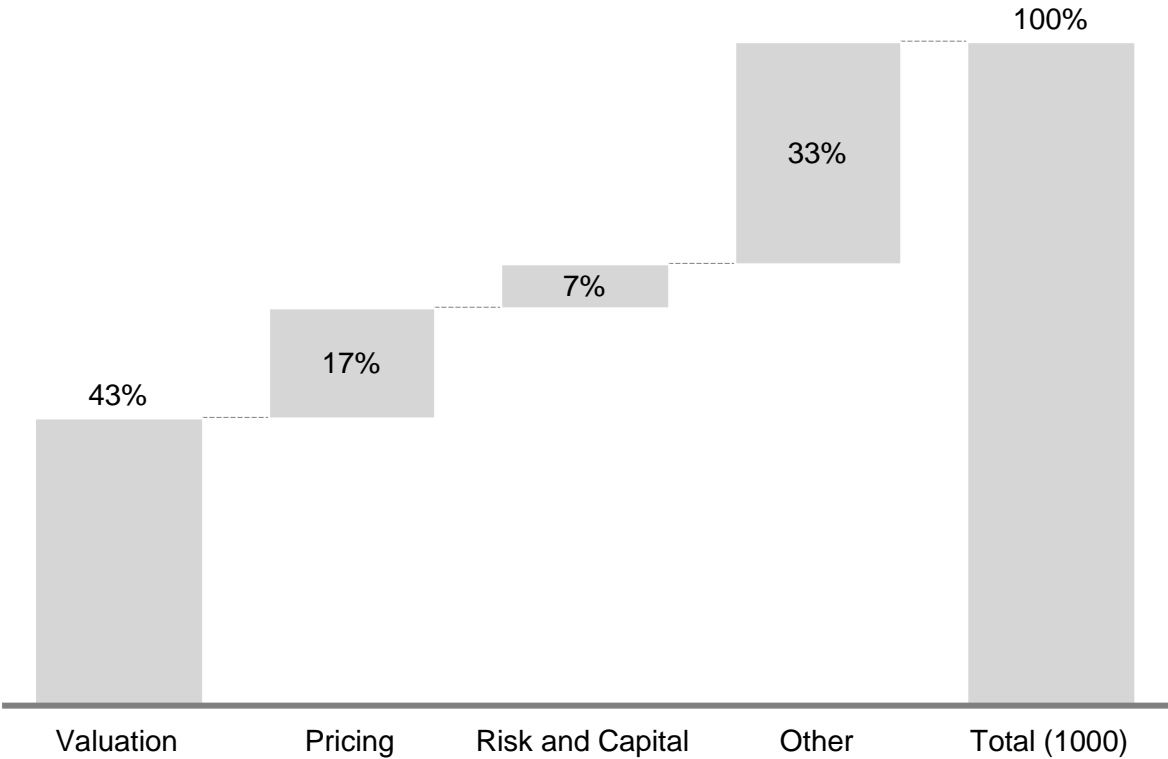
We are **independent** from the development of models or selling of software



Our thought leadership includes organizing **global surveys** and gathering senior members of the Model Risk and Model Validation community at **yearly roundtables** since 2009

Insurers face challenges due to an expanding model landscape and a lack of robust model control frameworks...

Number of models – global insurance company (example)



Model type	Valuation	Pricing	Risk and Capital	Other	Total (1000)
Example	<ul style="list-style-type: none"> Solvency TP IFRS reserves Statutory reserves 	<ul style="list-style-type: none"> Profit testing Performance measurement Value of new business 	<ul style="list-style-type: none"> EC model SII internal models ALM model 	<ul style="list-style-type: none"> Customer profiling models Fraud management models Financial planning models 	

3 key challenges....

- 1 Increasing cost** for building and maintaining large numbers of models. Models are at the heart of the insurance company, spread across all business, risks and support functions
- 2 Issues in model risk management oversight and consistency of control activities** leading to inefficiencies or wastage of resources
- 3 Financial losses and negative reputational impact** vis-à-vis external stakeholders **due to deficiencies in the Model Control Framework (MCF)**

To respond to these challenges, it becomes relevant to consider model risk as a specific risk type included in the wider enterprise risk framework

Industry Challenges

1 Increasing cost due to large numbers of models (model landscape)

- **Solvency II** pushed insurers to increase the spending on model development and maintenance. For example, the Association of British Insurers estimates the cost of the SII implementation for the UK insurance industry at **> 3 billion GBP**
- Spending on other models is substantial (e.g. Valuation models, Pricing models, customer models, fraud models, Machine Learning techniques, etc.)

2 Models oversight and consistency of control activities

- Within most insurers, the **actual structure and overall size of control functions** dealing with models is typically **not well known**
- **No standard methodologies** are in place to **rank models** and **apply adequate and consistent level of controls** (e.g. tests) in line with models materiality
- Model risk frameworks are **focused on regulated models**. Some insurers are considering extending the scope of their framework to include material non-regulated models (e.g. mainly pricing and valuation models)

3 Financial and reputational losses due to deficiencies in controls

- **Failings** in models and projections have forced some insurers to increase reserves and premiums especially for long term products such as Long Term Care, leading to **financial losses** also **reducing consumer confidence**
- A key regulatory trend is a greater focus on **consumer protection** (e.g. prevention of misselling, controls on tariffs, etc.) Therefore, stronger regulation is expected for valuation and pricing models, which are currently less targeted by supervisors

What is Model Risk?

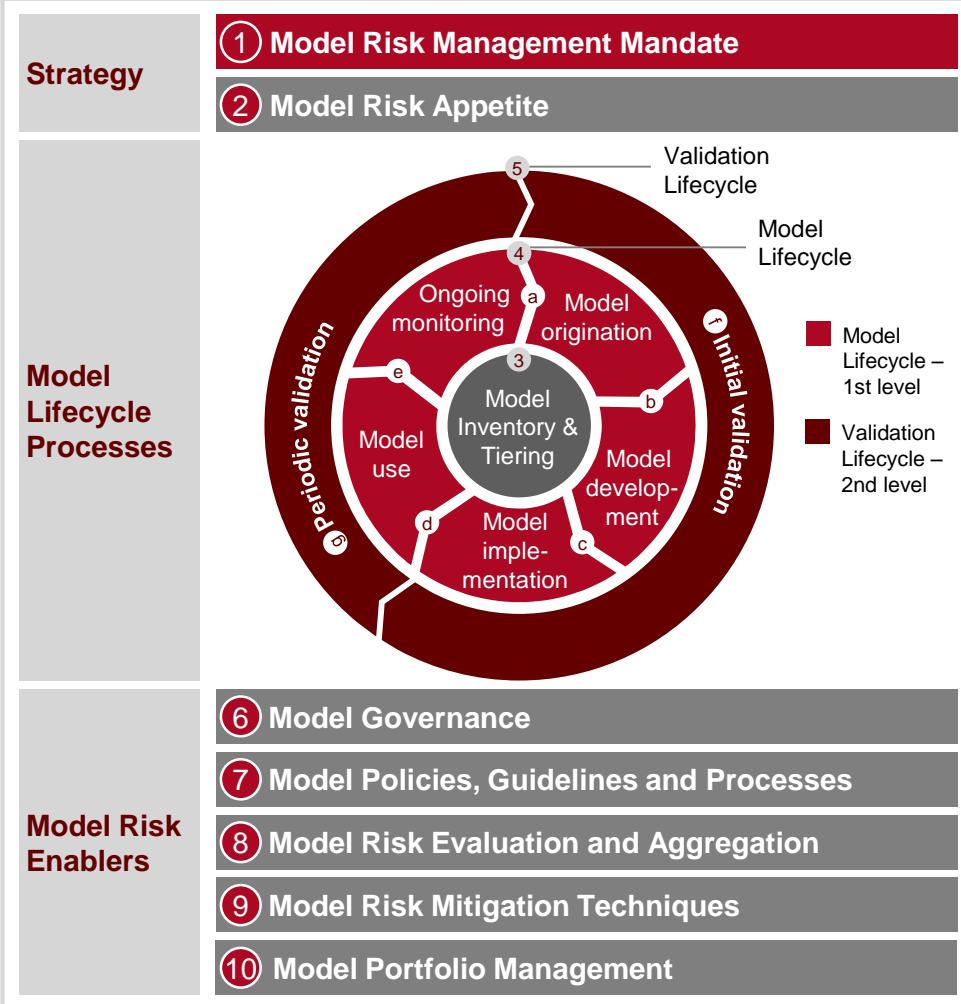
- **Model Risk** is the **risk of losses** arising from **deficiencies in model development, implementation and model misuse** within **business processes**

Why is MRM important?

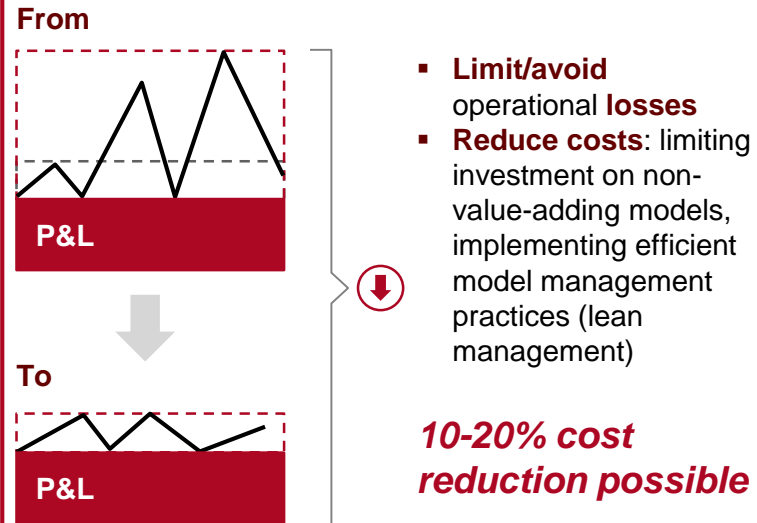
- Defining an **E-2-E Model Risk Management (MRM) framework is becoming crucial**
 - Model **costs have sharply risen** over the last years and are **expected** to further **increase**; this **trend is incompatible** with current focus on **cost reductions**
 - Model **misuses** can lead to **high P&L losses** due to increasing number of **business processes leveraging models**
 - **Regulators** are starting to expand the range of financial institutions assessed on Model Risk
 - Board **awareness** on models i.e. main drivers and limitations and understanding of key modelling processes remains **under scrutiny**

A systematic and strategic approach to model risk management can yield significant benefits for insurers

An End-2-End MRM framework ...

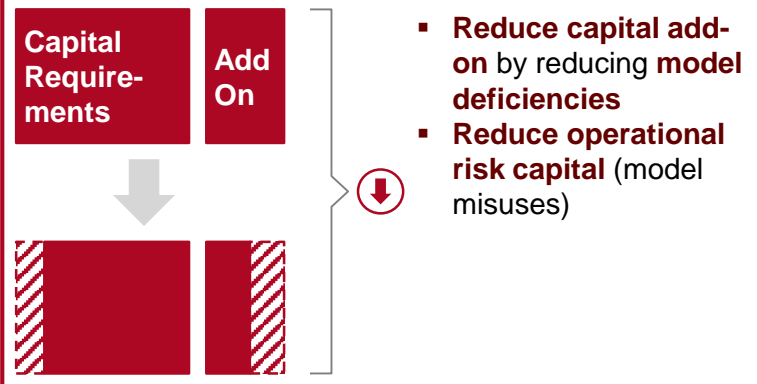


... to improve capital ratio and reduce P&L losses volatility



- **Limit/avoid operational losses**
- **Reduce costs:** limiting investment on non-value-adding models, implementing efficient model management practices (lean management)

10-20% cost reduction possible



- **Reduce capital add-on** by reducing model deficiencies
- **Reduce operational risk capital** (model misuses)

A complete model risk mandate means covering a larger set of activities compared to a traditional validation function

MRM framework

**1st LoD
Model
Owners,
Developers
and Users
(LOBs)**

MRM process

- Defines the business purpose for a model and uses the model within the business processes
- Develops and implements the model
- Implements model management frameworks e.g. documentation, testing, monitoring standards, etc.
- Monitors the model performance and model usage
- Manages model changes and keeps the model up to date

**2nd LoD
Validation /
MRM
Function**

- Performs validation of **material statistical and non-statistical models** (expert judgement based), **beyond regulatory models**
- Validation includes the model use assessment, the model implementation and monitoring.
- In some instances, the function also develops and owns model development and governance standards

**3rd LoD
Audit**

- Assesses the independently the appropriateness and effectiveness of the internal control framework on a periodic basis

Additional MRM activities on top of the validation...

**Model
risk
activities**

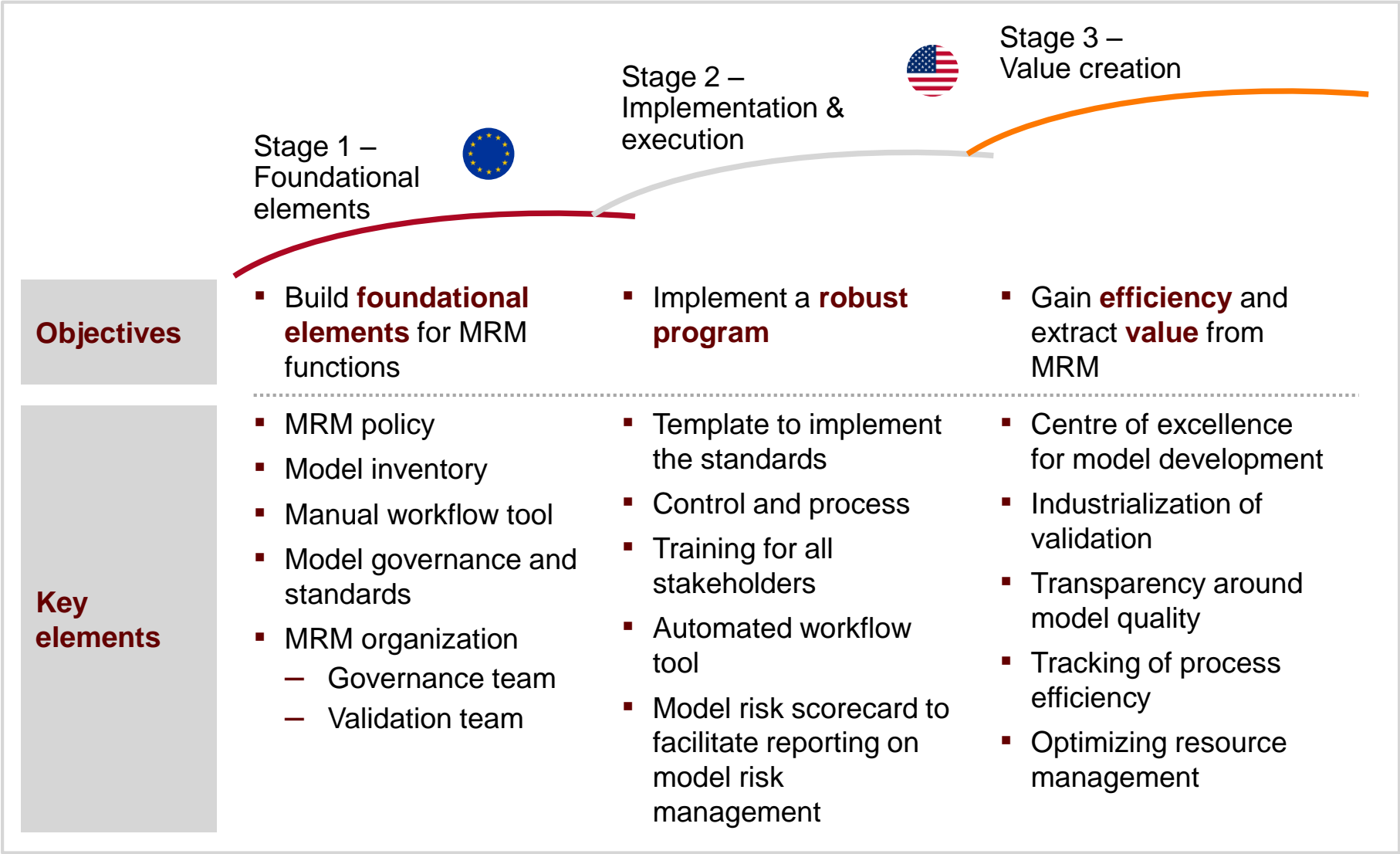
- Managing the model inventory
- Setting overall model governance standards e.g. development, testing and monitoring (incl. 1st LoD)
- Ongoing monitoring of model risk
- Reporting to the board on model risk
- Manage committee authorizing exceptions for model use
- Measuring model risk for capital purposes e.g. add-ons for model risk
- Other

The MRM mandate translates into being accountable for managing the exposition to model risk for the whole institution



LoD = Line of Defence

Perspective on banks: European institutions still setting up MRM fundamentals, lagging US banks already in implementation and execution phase



Recent model risk management initiatives in insurance

Risk Dynamics MRM survey

- Specific insurance survey leveraging insights from previous MRM surveys deployed over the last years in banking
- 33 Questions covering model governance, model control & development standards, model inventory, model risk assessment & ongoing monitoring, team management and Model risk priorities
- Survey was completed by 23 insurers i.e. Risk Dynamics Roundtable participants and IMIF members

MRM Life Insurance Roundtable Risk Dynamics

- Participants were Head of MRM / Validation
- Large life or composite insurers
- 8 participants to the Risk Dynamics MRM Survey
- Roundtable discussions covering:
 - Model risk, key concepts and definitions
 - Benefits of model risk management
 - Model governance and management
 - Model risk management in practice



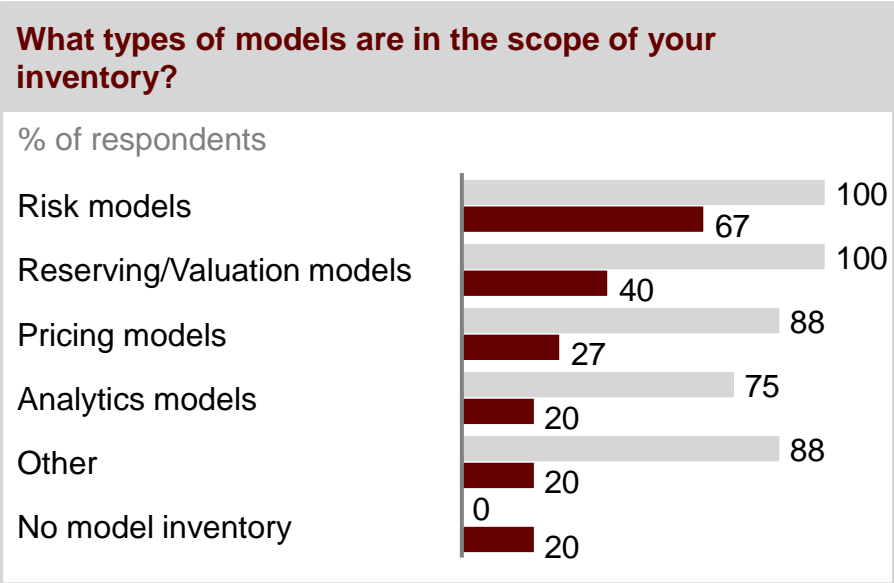
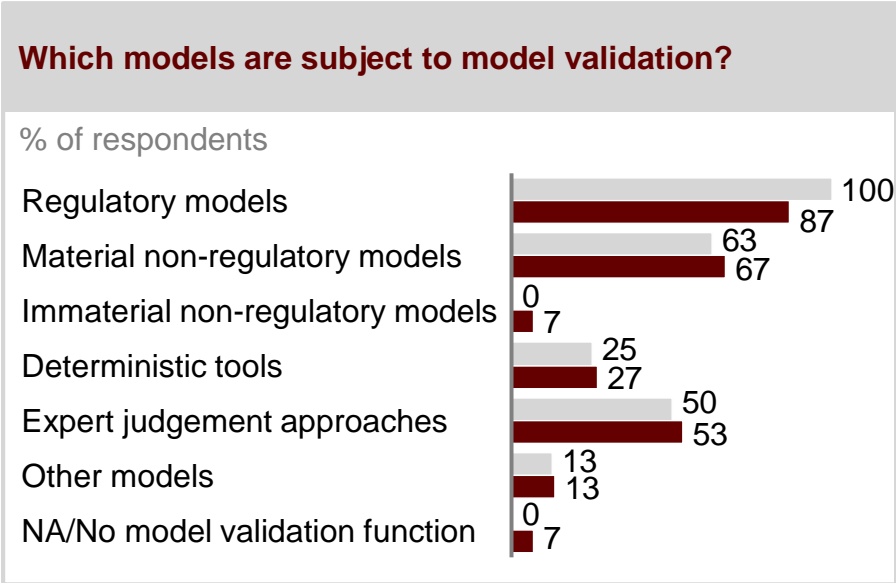
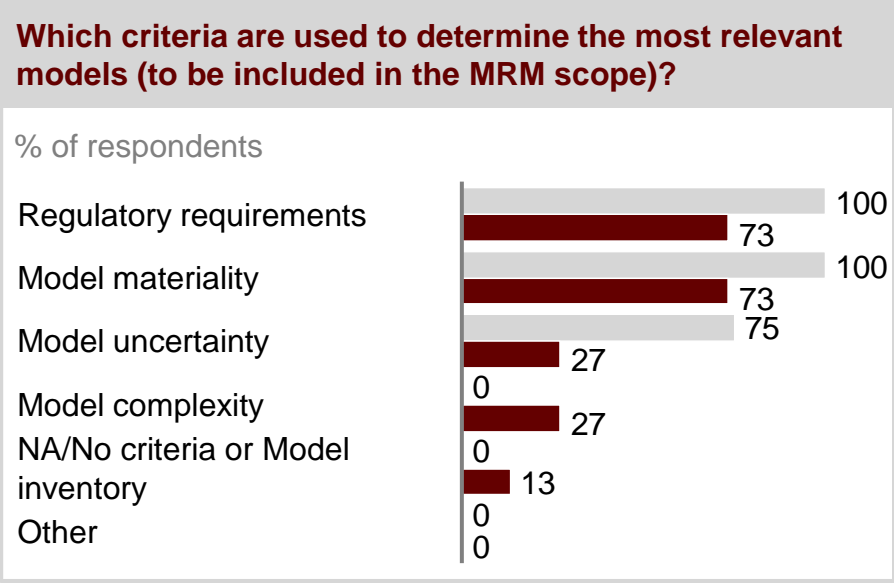
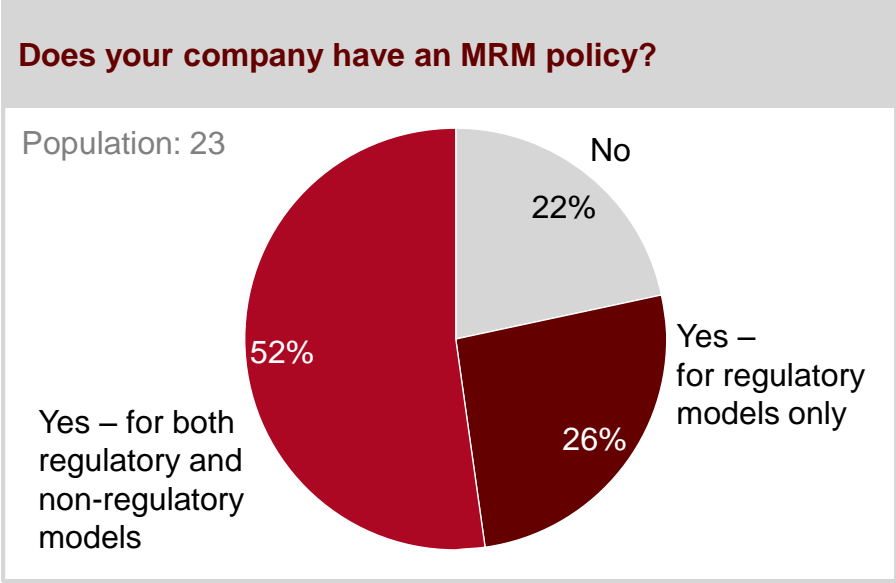
IMIF MRM Working Party Internal Model Industry Forum

- Working party of Insurance industry Risk professionals
- Mixed group of composite, life, P&C and London market insurers
- 15 participants to the Risk Dynamics MRM survey
- Group discussions of the working party
- IMIF White Paper on Model Risk Management
- Interviews with individual working party members



Key Risk Dynamics MRM survey results

■ Roundtable ■ IMIF



MRM in insurance – Current state of the market

Discussion and survey conclusions included

- 1 Model Risk Management is a new topic in the insurance industry that is **emerging on the CRO agenda**. Some **large insurers have or are looking into setting up MRM functions**. Typically this has yet to appear on the agenda of firms who are still substantially focused on an IMAP process
- 2 Most insurers remain focused on regulatory models. Large insurers have expanded their scope into mainly valuation and pricing models. Insurers involved in our discussions agree that MRM should focus on **providing assurance that all material models (not just regulatory ones) are properly controlled**
- 3 Insurers participating in our discussions acknowledge that it is in the industry best interest to **develop MRM from an industry perspective rather than to be led by regulation** (as it happened in the banking industry or for Solvency II internal model validation)
- 4 Most insurers see substantial benefit in a **proportionate approach focussed on the most material models from a business use perspective**. The list of most material models needs to be determined by the institution and will be insurer specific
- 5 All insurers prefer a **top down approach** starting from their model landscape and then identifying their most material models. Such an approach will be **more efficient and effective** in demonstrating the benefits of MRM