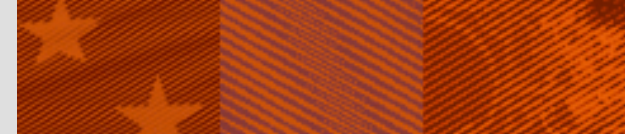# CHALLENGES FOR EFFICIENT INTERNAL MODEL VALIDATION

Luis González Mosquera
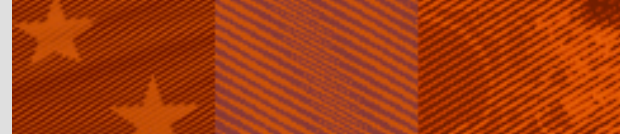
12th Central Bank Risk Managers' Conference

Mumbai, 17-18 November 2016

FINANCIAL RISK DEPARTMENT

AGENDA

- **Why is the internal validation function necessary in a Central Bank?**

- **Organizational aspects**

- **Scope of model validation**

- **Validation plans and reports**

Why internal validation is needed in a CB

- Private bank vs. Central Bank

    - Supervisory requirement

    - Conflict of interest

- Four eyes principle: avoid mistakes

- Model replication and challenge of the assumptions:

    - Independent replication of critical processes

    - Independent review of methodological assumptions

    - Monitoring of outcomes and assumptions

Organizational aspects

- Organizational role approved at the appropriate level

- Formal independence from the units in charge of developing models

- Role in the approval of new models

- Recommendations & Action Plan

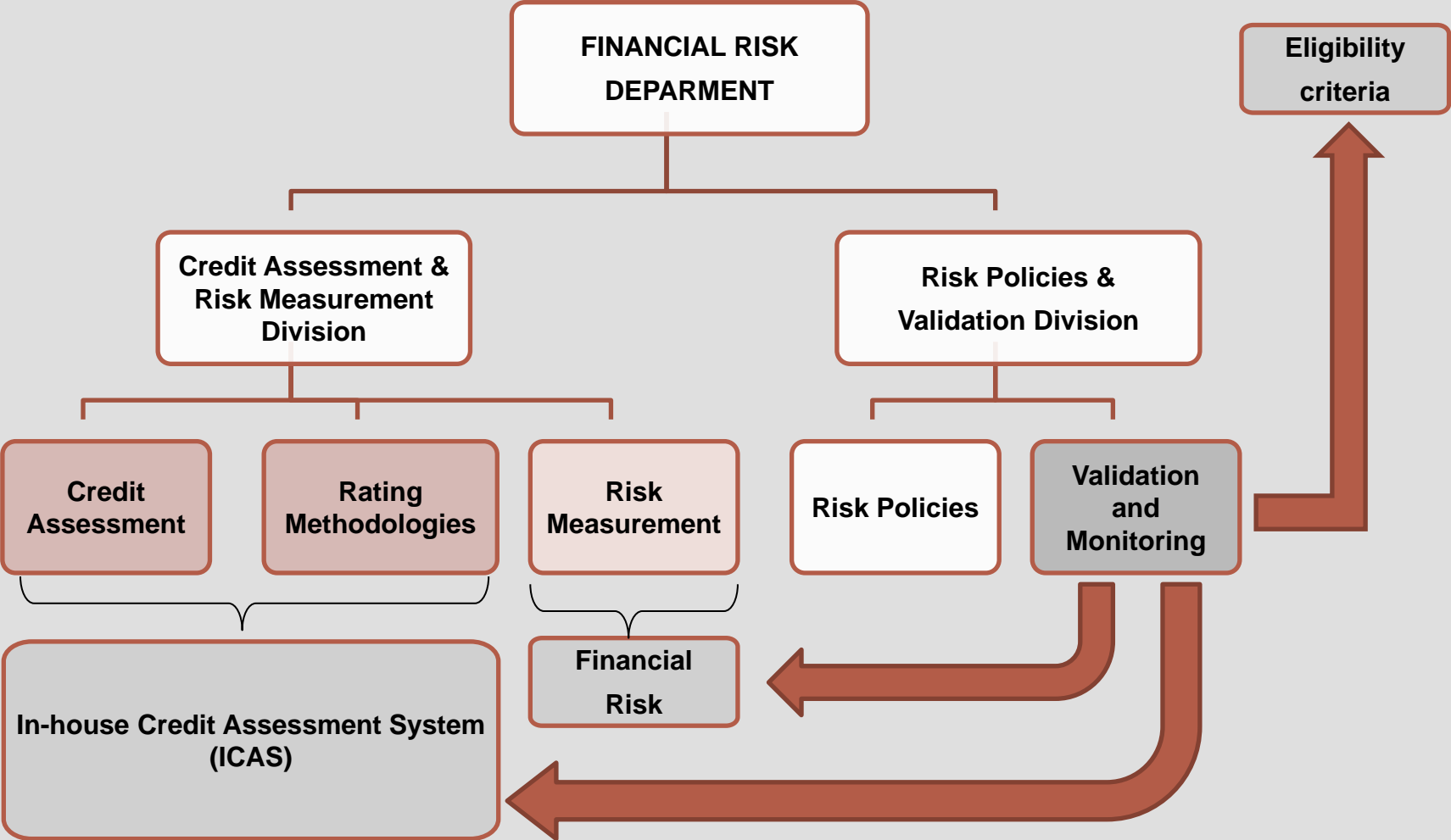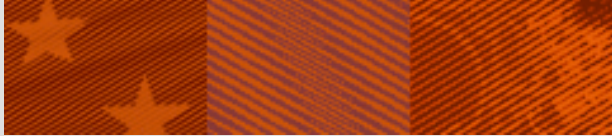   - *Explicit opinion*

    - *Deadline*

BANCO DE ESPAÑA
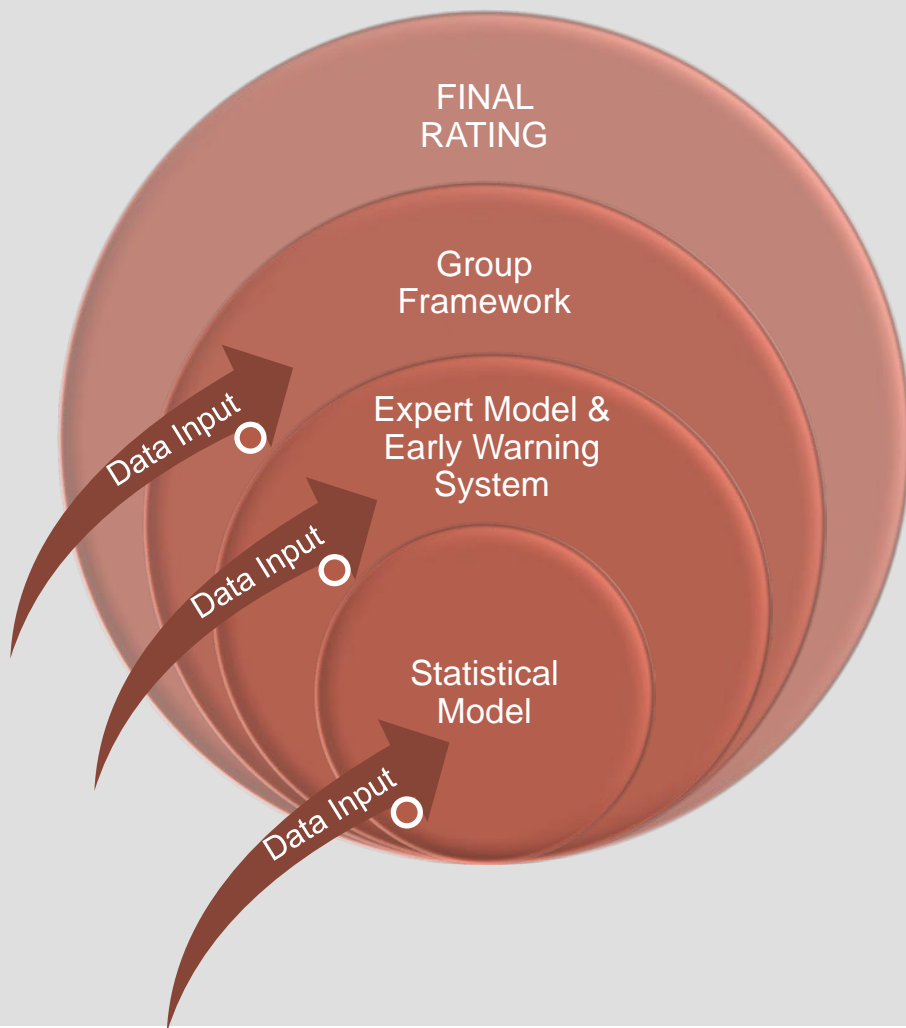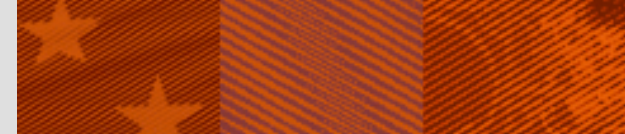Eurosistema

Organizational aspects

- **Resources:**

  - Sufficient resources (human & IT)

  - Specialised resources (multidisciplinary team)

    - *Constructive criticism*

    - *Technical skills*

  - Outsourcing?

    - *Knowledge should be effectively transferred*
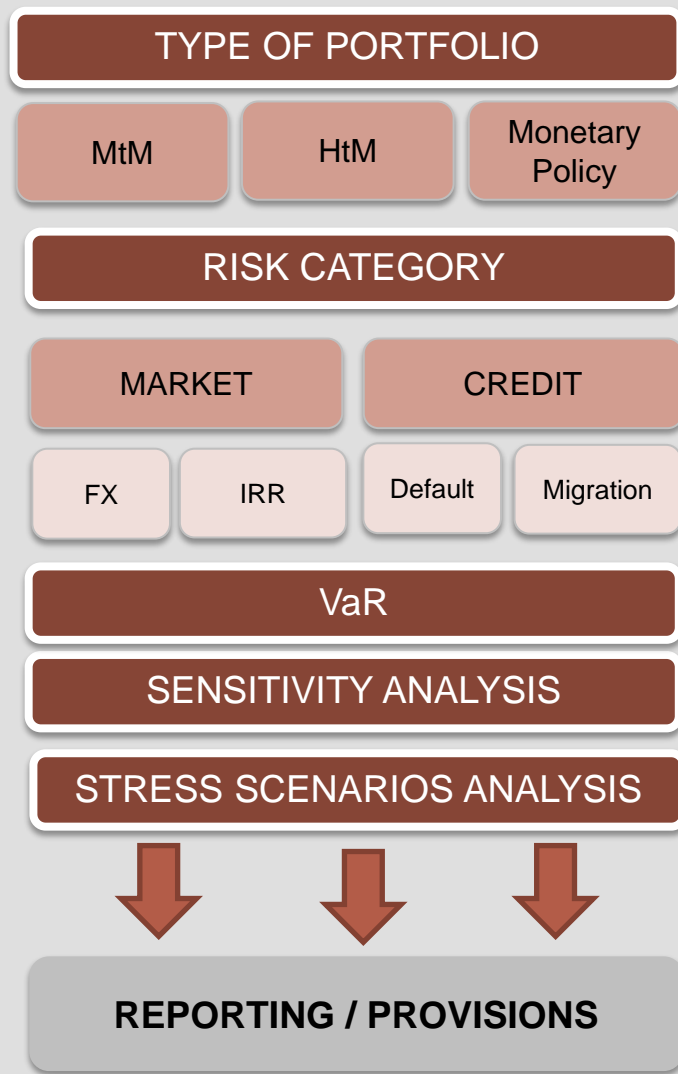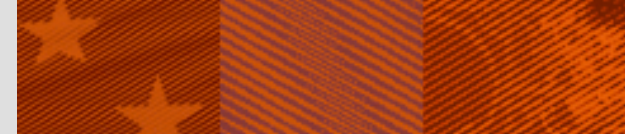
Organizational chart

ICAS validation

FINAL RATING

Group Framework

Expert Model & Early Warning System

Statistical Model

Data Input

Data Input

Data Input

- ICAS: In-house credit assessment system mainly used for assessing non-marketable collateral

- Internal Validation:

  - replicates quantitative rating (pool segmentation, variables, model choice,…)

  - runs statistical tests for risk differentiation (ODF by rating, Gini and ROC curve,…)

  - monitors and analyses cyclical properties of the rating (using ODFs and transition matrices)

- Validation of the expert model will be based on expert judgement and the statistical monitoring of the expert model contribution to risk differentiation

BANCO DE ESPAÑA
Eurosistema

Financial risk validation

TYPE OF PORTFOLIO

MtM	HtM	Monetary Policy

RISK CATEGORY

MARKET	CREDIT

FX	IRR	Default	Migration

VaR

SENSITIVITY ANALYSIS

STRESS SCENARIOS ANALYSIS

REPORTING / PROVISIONS

- Internal Validation:

  - replicates monthly credit and market risk estimations (currently performed with an external tool)

  - validates the adequacy of all inputs:

    - ✓ *transition matrices*

    - ✓ *spreads*

    - ✓ *correlation parameters*

    - ✓ *internal rating calculation*

  - benchmarking

Scope of model validation

- **Opinion on:**

  - Methodologies

  - Documentation

  - Data used ➡️ **REPLICATION OF RISK ESTIMATIONS**

  - Quantitative aspects ➡️

  - Qualitative aspects: Use & Reporting

  - Technological environment

Importance of replication

- **Not only**

  - *To check compliance with the approved methodologies*

- **But also**

  - *To have a complete understanding of the methodologies*

  - *To find the main assumptions*

  - *To obtain a critical view of the methodology*

- **Common findings:**

  - Implementation errors

  - Documentation weaknesses

  - Data problems

Validation plans and reports

- **Give an opinion**

  - Models work as predicted

  - Results are suitable for their purpose

- **IV Report**

  - Summarize the work done

  - Opinions of IV on the essential elements

  - Identify weaknesses and their consequences: Impact?

  - Action plan

- **Continuous monitoring of the models**

THANK YOU FOR YOUR ATTENTION

BANCO DE ESPAÑA
Eurosistema