THE AUDITOR AND MODEL RISK MANAGEMENT

Attributes of a Strong Model Risk Management Audit Process

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What do I want to know?

- Defined parameters for each model level
- How do you manage exceptions
- Process to test the logic of the model
- Compliance aspects of the model – ERISA, SEC, OCC
- Outcome is meaningful
- Does the Model fit the Organization
- Black Box
- Assumptions – are they right and how do they work
- Apply the model correctly
- Validation Process
A definition: the term *model* refers to a quantitative method, system or approach that applies statistical, financial, or mathematical theories, techniques and assumptions to process input data into quantitative estimates.

**Take Away # 1**
Define what a model is so that everyone in the organization has the same understanding.
Reasons that Model Risk Occurs

(1) a model may have fundamental errors and produce inaccurate outputs when viewed against its design objective and intended business uses:
(2) a model may be used incorrectly or inappropriately or there may be a misunderstanding about its limitations and assumptions.

Model risk increases with greater model complexity, higher uncertainty about inputs and assumptions, broader extent of use and larger potential impact.
Audit Scope

Should include:
- Development, Implementation and Use
- Validation
- Governance, Policies and Controls
- Role of Internal Audit
- External Resources
- Model Inventory
- Documentation

Take Away #2
Broaden the scope to include all aspects of model risk management
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(1) a model may have fundamental errors and produce inaccurate outputs when viewed against its design objective and intended business uses

(2) a model may be used incorrectly or inappropriately or there may be a misunderstanding about its limitations and assumptions.

Governance, Policies and Controls
Role of Internal Audit
External Resources
Model Inventory
Documentation

Development,
Implementation
and Use
Model Validation

Take Away #3
Align audit coverage to the reasons for model risk
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Development

Clear statement of purpose
Design, Theory and logic should be well documented and supported by published research
Developers have to ensure component work as expected
There should be comparisons with alternative theories and approaches

Data is critical – rigorous assessment of data quality and relevance

Testing is integral

Substantial Investment in supporting systems
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Use

Model users can provide valuable business insight during the development process.

Reports used for business decision making play a critical role in model risk management!

An understanding of model uncertainty and inaccuracy and a demonstration that the bank is accounting for them appropriately are important outcomes of effective model development, implementation and use.
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Model Validation

SEE BLACK BOX
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The Black Box
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The Black Box

Take Away #4
Know what you need to Audit – hint: it is more than the Black Box
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Governance

A strong governance framework provides explicit support and structure to risk management functions through policies defining relevant risk management activities, procedures that implement those policies, allocation of resources, and mechanisms for evaluating whether policies and procedures are being carried out as specified.

Board of Directors have a role
Policies and Procedures
Roles and Responsibilities
Role of Internal Audit

- Assess overall effectiveness of the model risk management framework
- Very acceptable policies are in place and are being complied with by staff
- Ensue that validation work is conducted properly
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External Resources

When using external resources the bank must specify the activities to be conducted in a clearly written and agreed upon scope of work.
Model Inventory

HAVE ONE
Documentation

Without proper and adequate documentation, model risk assessment and management will be ineffective.
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Important to understand to a model’s capabilities and limitations given its simplifications and assumptions

Model Quality

Measured by:
✓ Precision
✓ Accuracy
✓ Discriminatory power
✓ Robustness
✓ Stability
✓ Reliability
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REMEMBER!!!!

Model governance standards should be applied across the entire enterprise. This ensures consistent practices for model development, documentation, validation, calibration and monitoring in all business units. Defined model standards enable organizations to react quickly and uniformly in response to major market events or systemic crisis.
Governance structures should ensure assumptions and model limitations are updated, properly addressed in implementation, communicated, and more importantly, understood by management, business users and stakeholders. A basic, yet critical, first step in this effort is establishing an enterprise definition of a model.
REMEMBER!!!!

Banking organization should be attentive to the possible adverse consequences (including financial loss) of decisions based on models that are incorrect or misused, and should address those consequences through active risk model risk management. SR 11-7 Board of Governors Federal Reserve System
A guiding principle throughout is that managing model risk involves “effective challenge” of models. Effective challenge depends on a combination of incentives, competence and influence.
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Regulatory Resources

OCC 2011-12
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THANK YOU