



Financial  
Performance

Regulatory  
Compliance

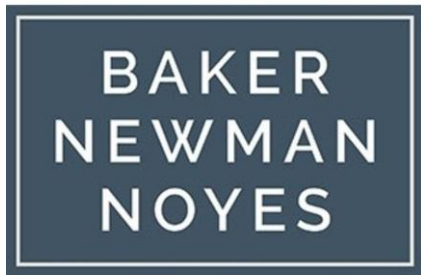


◆ Risk Management Strategy & Solutions ◆

# Baker Newman 2022 Annual Accounting & Business Update

*A Validator's Perspective on CECL Implementation Success*

October 19, 2022



**Mark Haberland, Managing Director**

✉ [mhaberland@darlingconsulting.com](mailto:mhaberland@darlingconsulting.com)

☎ (508) 237-2473

in [www.linkedin.com/in/markhaberland/](https://www.linkedin.com/in/markhaberland/)

## Implementation Phase

- Governance, policies, etc.
- Data assessment
- Model or vendor selection
- Segmentation
- Methodology selection
- Forecast horizon
- Reversion period
- Assumption development
- Q-Factor framework
- Documentation
- Education

## Testing Phase

- ALLL/ACL parallel runs
- Performance testing
- Assumption tuning and sensitivity testing
- Refine qualitative factoring
- Define ongoing performance monitoring
- Establish ongoing production process
- Update documentation

## Pre-Production Phase

- Model validation
- Remediation
- Independent audit
- Stakeholder education

## Implementation Phase

- Governance, policies, etc.
- Data assessment
- Model or vendor selection
- Segmentation
- Methodology selection
- Forecast horizon
- Reversion period
- Assumption development
- Q-Factor framework
- Initiate documentation
- Education

## Testing Phase

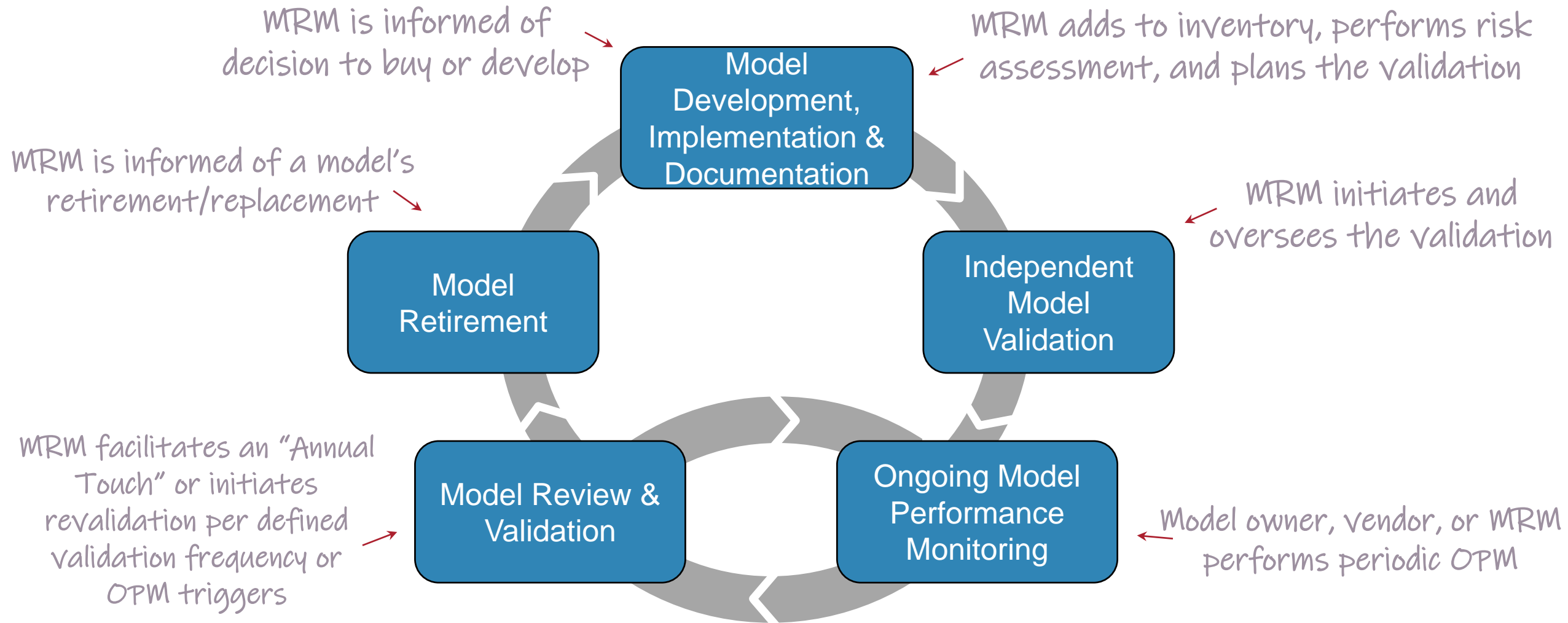
- ALLL/ACL parallel runs
- Performance testing
- **Assumption tuning and sensitivity testing**
- **Refine qualitative factoring**
- **Define ongoing performance monitoring**
- Establish ongoing production process
- **Complete documentation**

## Pre-Production Phase

- **Model validation**
- Remediation
- Independent audit
- Stakeholder education

# MRRM is Really About Model Lifecycle Management

## Institutional “Cradle-to-Grave” Model Management & Oversight



### Control Environment 6

- Access Control 1
- Change Management 4
- Version Tracking 1

### Governance 39

- Policies & Procedures 14
- Roles & Responsibilities: 1st Line of Defense 3
- Roles & Responsibilities: 2nd Line of Defense 8
- Roles & Responsibilities: 3rd Line of Defense 14

### Inventory & Documentation 21

- Development Documentation 11
- Model Inventory 7
- Validation Documentation 3

### Model Development 35

- Dataset Creation 4
- Design 4
- Implementation & Use 11
- Specification 2
- Testing 7
- Third-Party Models 7

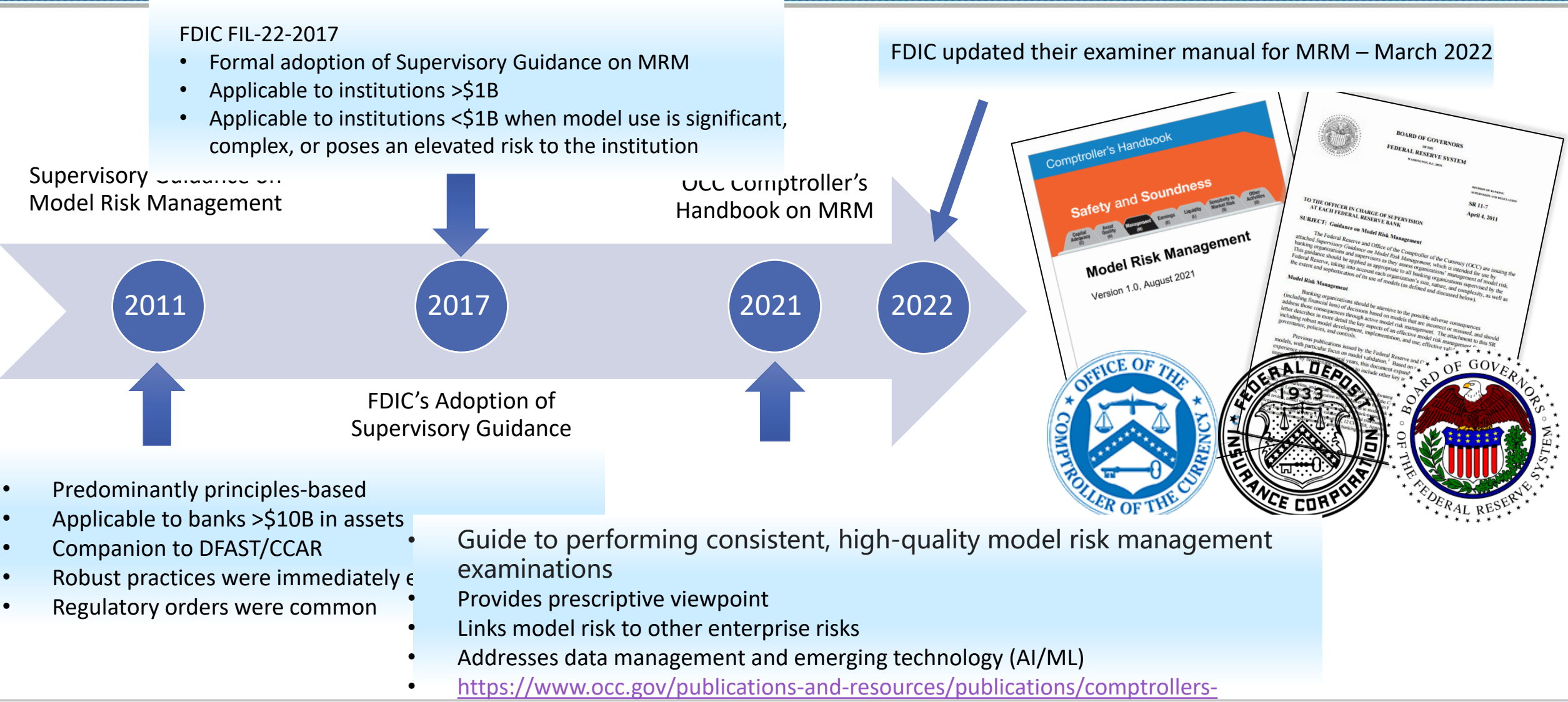
### Ongoing Monitoring 14

- Benchmarking 4
- General 5
- Overrides 2
- Sensitivity & Stability 3

### Risk Assessment & Validation 75

- Annual Reviews 2
- Conceptual Soundness and Model Design 10
- Effectiveness 28
- Implementation and Process Verification 3
- Outcomes Analysis 15
- Sensitivity Analysis 4
- Third-Party Models 6
- Third-Party Validators 7

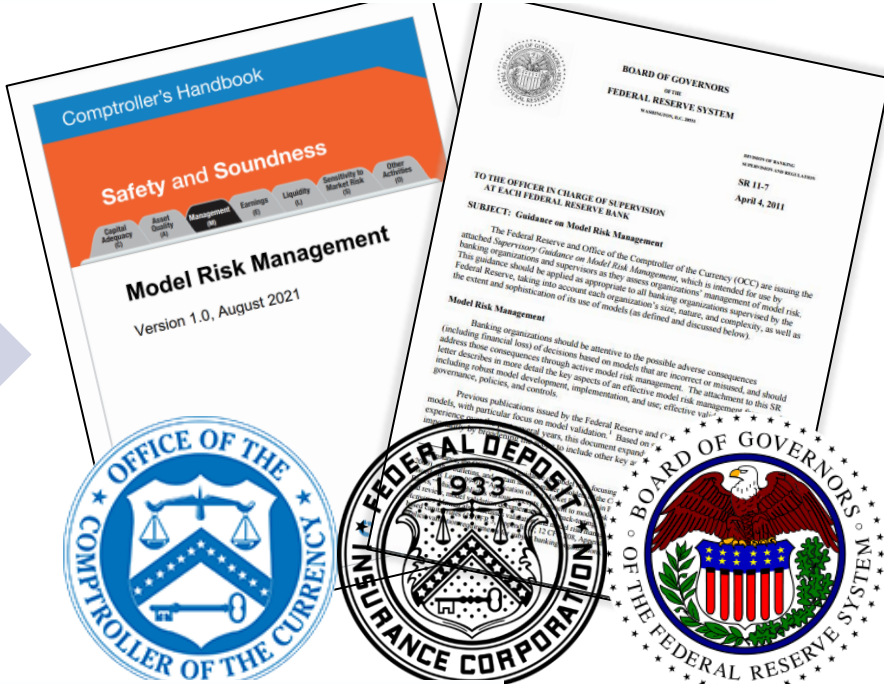
# MRM Has Been Expanding in Practice



FDIC FIL-22-2017

- Formal adoption of Supervisory Guidance on MRM
- Applicable to institutions >\$1B
- Applicable to institutions <\$1B when model use is significant, complex, or poses an elevated risk to the institution

FDIC updated their examiner manual for MRM – March 2022



## Implementation Phase

- Governance, policies, etc.
- Data assessment
- Model or vendor selection
- Segmentation
- Methodology selection
- Forecast horizon
- Reversion period
- Assumption development
- Q-Factor framework
- Initiate documentation
- Education

## Testing Phase

- ALL/ACL parallel runs
- Performance testing
- **Assumption tuning and sensitivity testing**
- Refine qualitative factoring
- Define ongoing performance monitoring
  - Establish ongoing production process
  - Complete documentation

## Pre-Production Phase

- Model validation
- Remediation
- Independent audit
- Stakeholder education



- ◆ Not a “set it and forget it” exercise
- ◆ Plan for formalized assumption review and approval
- ◆ Periodic sensitivity testing will be expected
- ◆ Thoroughly document development and management
  - Define all the key assumptions
  - Include quantitative and qualitative support
  - Describe ongoing review and approval procedures
  - Define ongoing monitoring and sensitivity testing

Key assumptions include:

- ✓ Forecast horizon, scenarios, and probability weightings
- ✓ Mean reversion period
- ✓ Prepayments (consistency with other models)
- ✓ Q-factors



## Implementation Phase

- Governance, policies, etc.
- Data assessment
- Model or vendor selection
- Segmentation
- Methodology selection
- Forecast horizon
- Reversion period
- Assumption development
- Q-Factor framework
- Initiate documentation
- Education

## Testing Phase

- ALL/ACL parallel runs
- Performance testing
- Assumption tuning and sensitivity testing
- **Refine qualitative factoring**
- Define ongoing performance monitoring
- Establish ongoing production process
- Complete documentation

## Pre-Production Phase

- Model validation
- Remediation
- Independent audit
- Stakeholder education



ASC 326-20-55-4

- ◆ Similar concept to the previous standard
- ◆ Expectations: Less of them, less impactful
- ◆ Qualitative framework should be clear, repeatable, and have a sound basis
- ◆ Don't forget about sensitivity testing

- a. The borrower's financial condition, credit rating, credit score, asset quality, or business prospects
- b. The borrower's ability to make scheduled interest or principal payments
- c. The remaining payment terms of the financial asset(s)
- d. The remaining time to maturity and the timing and extent of prepayments on the financial asset(s)
- e. The nature and volume of the entity's financial asset(s)
- f. The volume and severity of past due financial asset(s) and the volume and severity of adversely classified or rated financial asset(s)
- g. The value of underlying collateral on financial assets in which the collateral-dependent practical expedient has not been utilized
- h. The entity's lending policies and procedures, including changes in lending strategies, underwriting standards, collection, writeoff, and recovery practices, as well as knowledge of the borrower's operations or the borrower's standing in the community
- i. The quality of the entity's credit review system
- j. The experience, ability, and depth of the entity's management, lending staff, and other relevant staff
- k. The environmental factors of a borrower and the areas in which the entity's credit is concentrated, such as:
  1. Regulatory, legal, or technological environment to which the entity has exposure
  2. Changes and expected changes in the general market condition of either the geographical area or the industry to which the entity has exposure
  3. Changes and expected changes in international, national, regional, and local economic and business conditions and developments in which the entity operates, including the condition and expected condition of various market segments.

MRM caution: ongoing, consistent dependence on an overlay or override may be discouraged



- ◆ Each qualitative adjustment factor is reviewed for adherence to requirements, impact on total loss, reasonableness (vs. history)
- ◆ Empirically-derived qualitative factors are replicated during the validation
- ◆ All qualitative adjustments are reviewed to ensure they are sufficiently sensitive in future periods
- ◆ Confirmation that model documentation sufficiently describes the qualitative factor logic and use
- ◆ Confirmation that CECL policy defines the ongoing review and approval processes

## Implementation Phase

- Governance, policies, etc.
- Data assessment
- Model or vendor selection
- Segmentation
- Methodology selection
- Forecast horizon
- Reversion period
- Assumption development
- Q-Factor framework
- Initiate documentation
- Education

## Testing Phase

- ALL/ACL parallel runs
- Performance testing
- Assumption tuning and sensitivity testing
- Refine qualitative factoring
- **Define ongoing performance monitoring**
- Establish ongoing production process
- Complete documentation

## Pre-Production Phase

- Model validation
- Remediation
- Independent audit
- Stakeholder education

- Model performance will deteriorate no matter how good a model is—real-world conditions change compared to historical observations
  - ✓ Performance monitoring **is** about observing how model predictions are performing against actual experience as it happens
  - ✓ Performance monitoring **is not** about how well the models fit the historical model build sample!

1. Benchmark predictions against what actually happened
2. Peer group benchmarking analysis
3. Sensitivity testing—identify key modeling/assumption decisions that have the greatest impact
4. Monitor appropriateness of segmentations
5. Monitor changes in life of loan, especially in evolving, growing, or newly acquired business lines
6. Monitor validity of assumptions
7. Long term: review past years' model forecasts



- ◆ Universally, the weakest component
- ◆ Institutions with well-established MRM programs better prepared
- ◆ Testing should be performed initially and on an ongoing basis
- ◆ Pre-define performance indicators, thresholds, escalation
- ◆ Monitoring can be performed internally or externally
- ◆ An experienced validator will provide ideas
- ◆ Do not leave it until the end to determine

**Input-Output Testing**

- Population stability
- Characteristic stability

**Backtesting**

- In-sample goodness-of-fit
- Out-of-sample goodness-of-fit

**Sensitivity Tests**

- Outliers
- Leverage points

**Model Updates**

- Old vs. new
- Documentation

**Monitoring Plan & Governance**

- Performance indicators
- Thresholds
- Escalation

## Implementation Phase

- Governance, policies, etc.
- Data assessment
- Model or vendor selection
- Segmentation
- Methodology selection
- Forecast horizon
- Reversion period
- Assumption development
- Q-Factor framework
- Initiate documentation
- Education

## Testing Phase

- ALL/ACL parallel runs
- Performance testing
- Assumption tuning and sensitivity testing
- Refine qualitative factoring
- Define ongoing performance monitoring
- Establish ongoing production process
- **Complete documentation**

## Pre-Production Phase

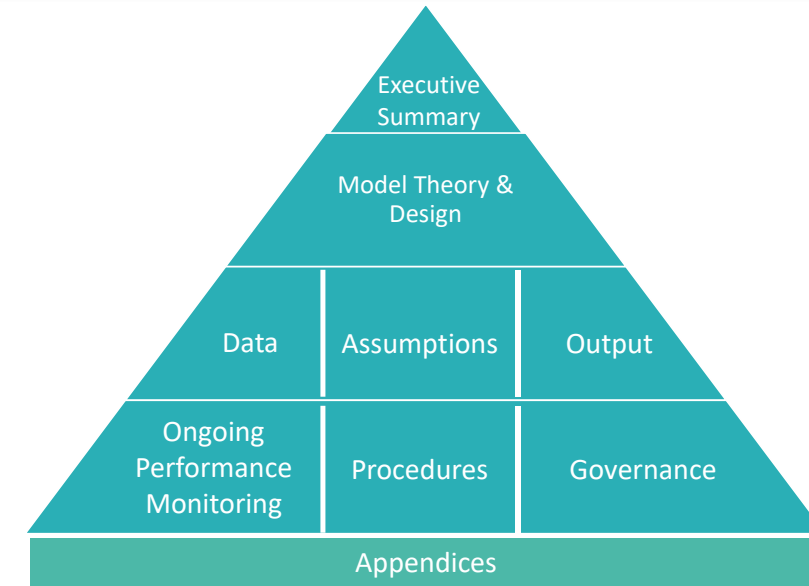
- Model validation
- Remediation
- Independent audit
- Stakeholder education





- ◆ Vendor documentation ≠ model documentation
- ◆ Quality of vendor technical documentation varies
- ◆ Cohesive documentation challenging when relying on vendor
- ◆ Better documentation at institutions with formalized MRM
- ◆ Don't wait until the end to develop
- ◆ Consider soliciting external resources

- ◆ Purpose and intended use
- ◆ All assumptions and limitations
- ◆ Management decisions using model
- ◆ Design, theory, and logic
- ◆ Mathematical specifications
- ◆ Comparisons with alternative theories
- ◆ Rigorous assessment of data quality and relevance
- ◆ Testing: demonstrate the model is accurate, robust and stable
- ◆ Interpretation of outputs with limitations delineated
- ◆ Back testing or out of sample analysis and sensitivity analysis



A credible MRM framework can provide standardized templates

- ◆ Starts with sound model development and testing practices
- ◆ Documenting the journey
  - Model selection
  - Methods chosen and rationale
  - Data selection/testing
  - Segmentation
  - Assumption development/support
  - Testing process
  - Validation and Effective Challenge

## Implementation Phase

- Governance, policies, etc.
- Data assessment
- Model or vendor selection
- Segmentation
- Methodology selection
- Forecast horizon
- Reversion period
- Assumption development
- Q-Factor framework
- Initiate documentation
- Education

## Testing Phase

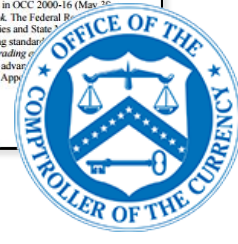
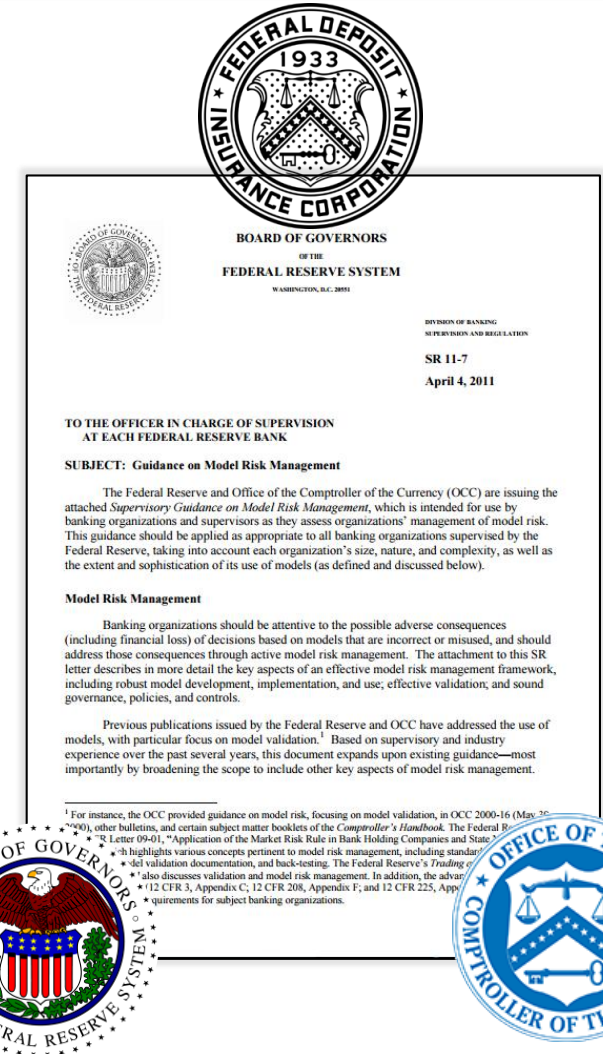
- ALLL/ACL parallel runs
- Performance testing
- Assumption tuning and sensitivity testing
- Refine qualitative factoring
- Define ongoing performance monitoring
- Establish ongoing production process
- Complete documentation

## Pre-Production Phase

- **Model validation**
- Remediation
- Independent audit
- Stakeholder education

- Institutions with well-established MRM programs have been better prepared for validation and ‘effective challenge’
- If you haven’t formalized your MRM program yet, do it – it will pay dividends
- Greatest challenges:
  - Lack of awareness of expectations
  - Over-reliance on vendors for all the ‘answers’
  - Time and resources
- Involve MRM/audit early in the process to observe and provide guidance
- Educate and establish expectations for stakeholders (model owners, vendors, etc.)
- Ideally include MRM “friendliness” assessment as part of vendor risk assessment and selection

Note: • OCC MRM Examiners Handbook was published in August 2021  
 • FDIC Updated Their Risk Management Manual to include MRM in March 2022



## Effective Challenge Defined:

“Critical analysis by objective, informed parties that can identify model limitations and produce appropriate changes. Effective challenge depends on a combination of incentives, competence, and influence.”

- Incentives to provide effective challenge to models are stronger when:
  - ✓ Greater separation of that challenge from the model development process
  - ✓ Well-designed compensation practices
  - ✓ Corporate culture
- Competence is a key to effectiveness since technical knowledge and modeling skills are necessary to conduct appropriate analysis and critique
- Challenge may fail to be effective without the influence to ensure that actions are taken to address model issues
  - ✓ Explicit authority
  - ✓ Stature within the organization
  - ✓ Commitment and support from higher levels of management

- ◆ Your CECL committee will be your first line of defense
- ◆ Establish the process and important questions upfront

### Some considerations:

- ✓ Do the baseline results make sense?
- ✓ Do the key drivers make sense?
- ✓ What are the most impactful drivers and assumptions? Do they make sense?
- ✓ Do the results from changing key variables or drivers make sense?
- ✓ Are assumptions reasonable and sufficiently supported?
- ✓ Are assumptions aligned with assumptions used for other models in the institution?
- ✓ Are qualitative factors and their impact reasonable? Supportable?
- ✓ What is the impact on earnings and capital if economic conditions deteriorate?

## **Conventional Aspects of Model Development & Management (SR 11-7)**

---

- ✓ Data and data selection
- ✓ Methodologies
- ✓ Segmentation
- ✓ Assumptions
- ✓ Output
- ✓ Governance
- ✓ Ongoing performance monitoring

## **Risk Rating and Validation Frequency**

---

- ✓ CECL model will be classified as a “High-Risk Model”
- ✓ Annual review to determine if full validation needed
- ✓ Plan for annual validation for the next few years
- ✓ You will not be able to rely on your vendor to validate
- ✓ Your vendor’s independent “certification” will not qualify as your validation



Model Governance

Data Inputs quality,  
appropriateness,  
sourcing, extraction,  
cleaning, transformation,  
and more)

Portfolio Segmentation

Model Design &  
Conceptual Soundness

Model Development &  
Methodology

Reasonable and  
Supportable Period &  
Mean Reversion

Qualitative Factors

Macroeconomic  
Scenarios

Model Performance &  
Testing

Model Documentation

Model Reporting &  
Performance Monitoring

Model Implementation

- Model is implemented and tested
- Performed and documented dry-run
- Established CECL governance framework
- Complete CECL model documentation

**Mark Haberland**

mhaberland@darlingconsulting.com

(mobile) 508.237.2473

*Thank You!*



**With over 25 years of experience in balance sheet and model risk management, and hands-on experience in audit and leading the operations of DCG's Financial Analytics Department, Mark has unique expertise for optimizing and "right-sizing" risk management in the community, mid-size, and large banking space.**

**In his current role, Mark facilitates educational programs and collaborative workshops and is a trusted resource for financial institutions, industry, and state trade associations, as well as regulatory agencies on a variety of balance sheet and model risk management/validation topics, including IRR, Liquidity, CECL, BSA/AML, and ALCO.**

**Mark is a frequent author and top-rated speaker on a vast array of risk management topics and is a member of the Financial Managers Society's Board of Directors. The son of an educator and member of the faculty of Pacific Coast Banking School, Mark's passion for teaching drives his desire to work with bankers to strive for excellence within their organizations.**

**Mark lives on the North Shore of Boston with his wife, two children, and two dogs. He is a graduate of St. Michael's College in Vermont with a degree in accounting.**

