Bank Director

Breakout 2: Embracing the Volatility Brought on by CECL

#BDAudit23

Patrick Vernon
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Embracing the Volatility Brought on by CECL

June 13, 2023

Patrick Vernon, Senior Manager

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- Patrick Vernon is a Senior Manager in the Advisory Services business unit within Crowe LLP, focusing on transaction and valuation services for financial institutions and investor groups regarding select asset acquisitions and whole bank and financial service firm acquisitions. Patrick also has extensive experience with CECL implementation projects and solutions including risk assessment, data visualization, model documentation and theory, and technology solution evaluation. Patrick has a background in external audit engagements with a primary focus on Allowance for Loan Losses and Mortgage Banking Derivatives.

- Patrick engages in the valuation and accounting of acquired loans, debt instruments, and other financial instruments as well as the valuation of intangibles acquired through financial services business combinations. Patrick also engages in CECL consulting services, assisting financial institutions in the preparation, validation, and refinement of the CECL reserve models and methodologies. Patrick previously worked in Crowe's external audit group with a focus on financial institutions and private equity engagements and the assessment of mortgage banking derivative accounting and valuation.

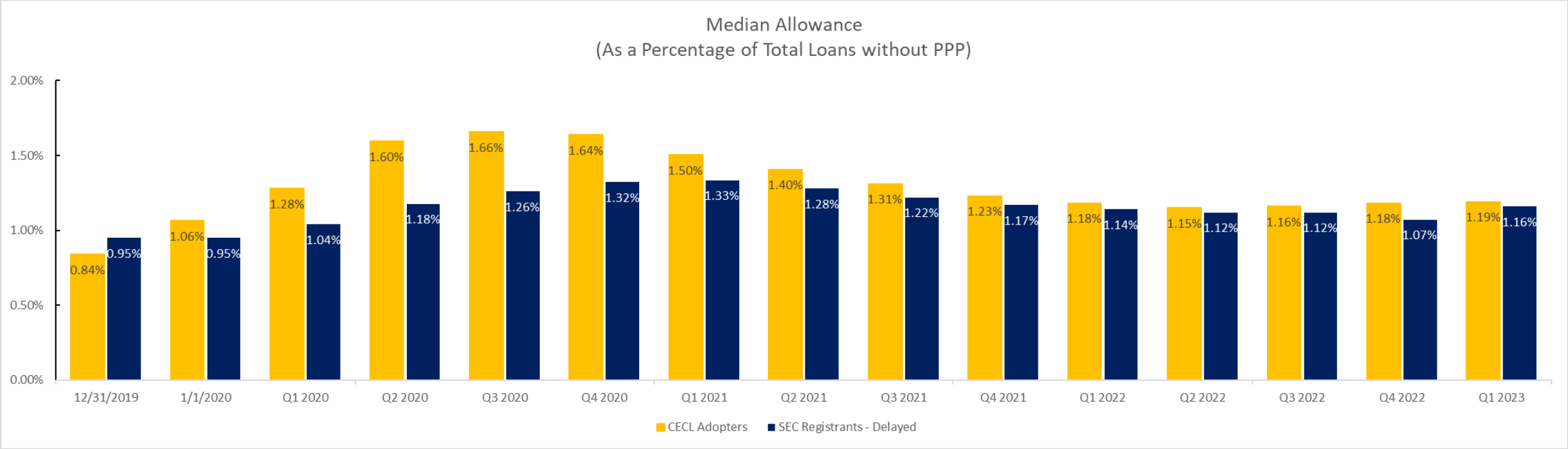
- Patrick holds a Bachelor of Science in Accounting from Miami University in Oxford, OH

Agenda

1. Observations from CECL Adoption
2. Model Risk Management / Model Validation Best Practices

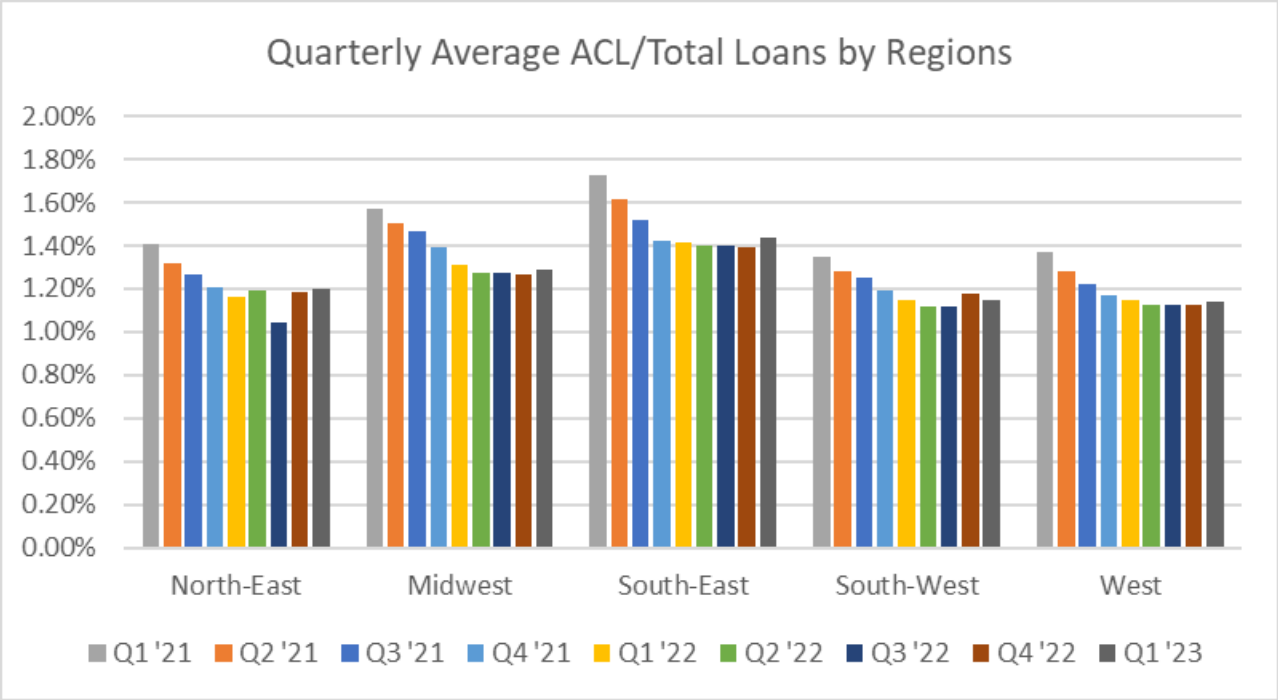
Observations from CECL Adoption

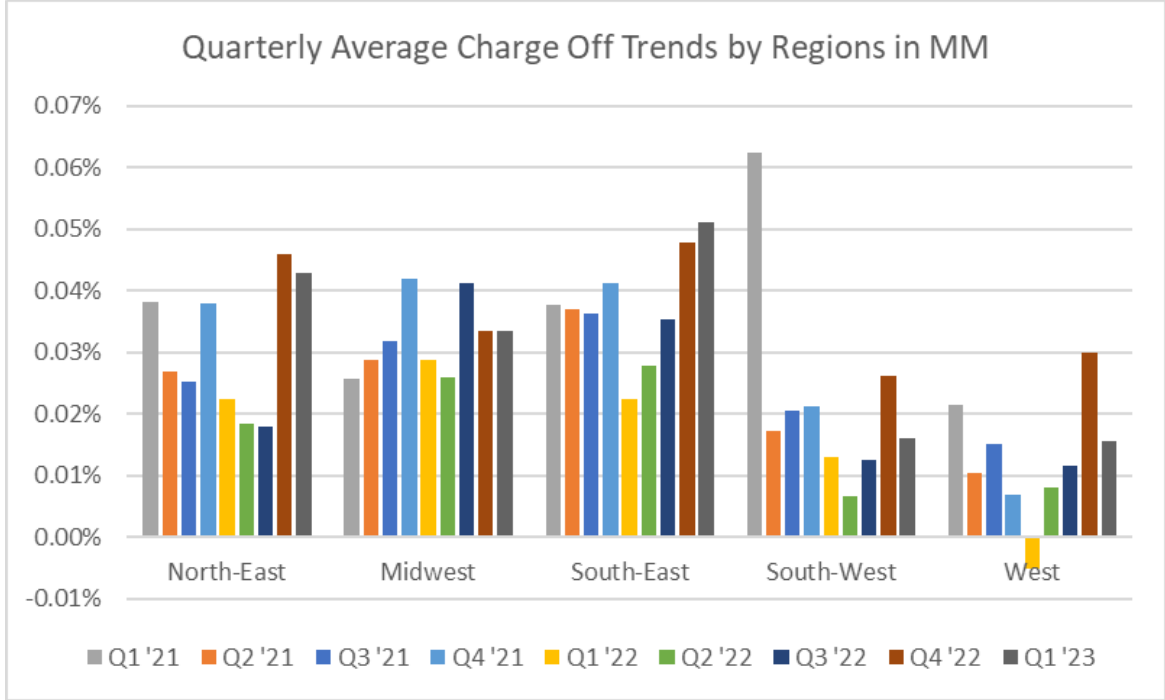
CECL Adoption Impact*



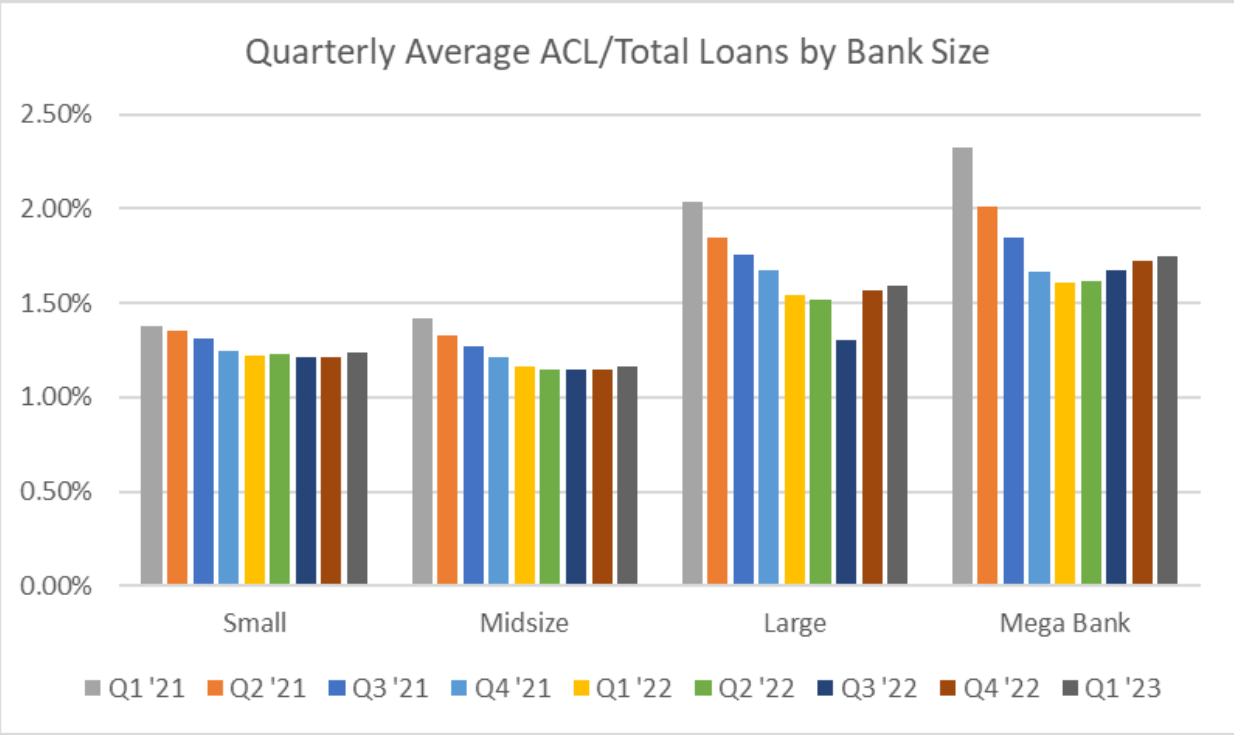
*This chart has been accumulated from publicly available information via SEC filings. The process inherently introduces risk of error. Crowe LLP does not warrant this information is error-free. As such, reliance cannot be placed on this information. Users should be aware errors might exist in this chart and other chart drill down displays. This chart is for informational purposes and is not a substitute for legal or accounting advice.

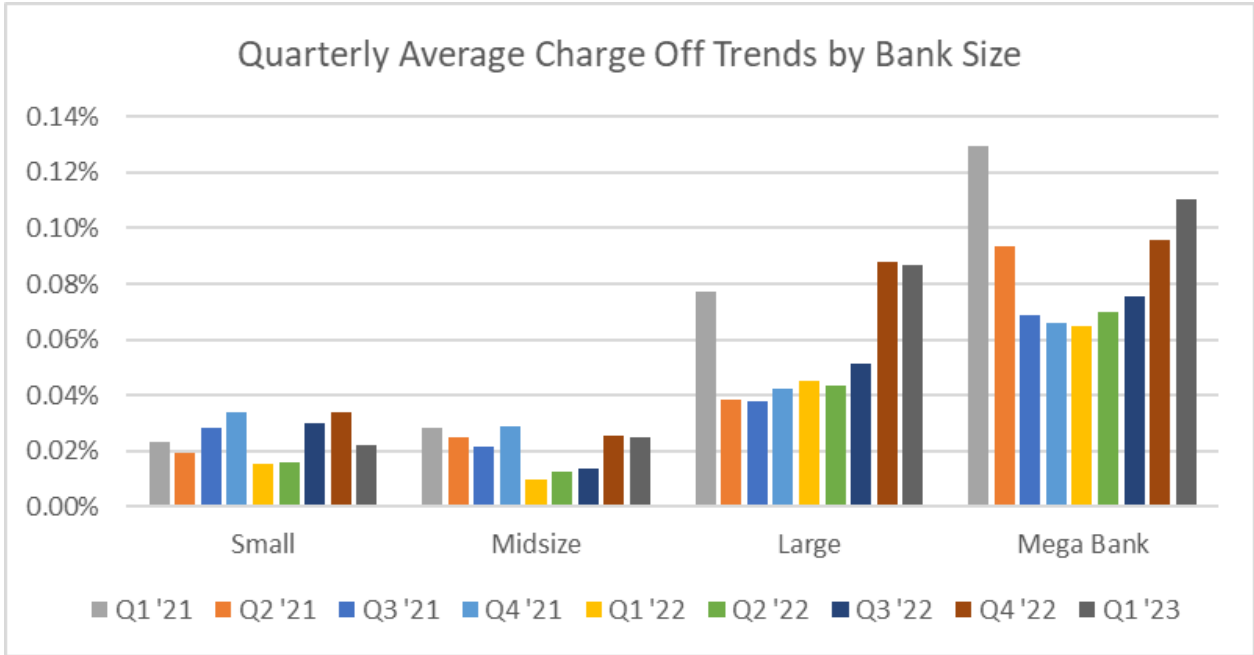
CECL Trends - Regional





CECL Trends – Asset Size





Bank size classifications were derived from the OCC's Midsize Bank Supervision which generally includes banks with assets between $8B and $60B.

Small - Less than $8B
Midsize - > $8B but < $60B
Large - > $60B but < $1T
Mega Bank - > $1T

Polling Question

- For your institution, what was the reported change in ACL as of 1/1/2023.

A

We had a decline in our reserve for the period

B

Increase of 1-15 bps

C

Increase of 16 – 30 bps

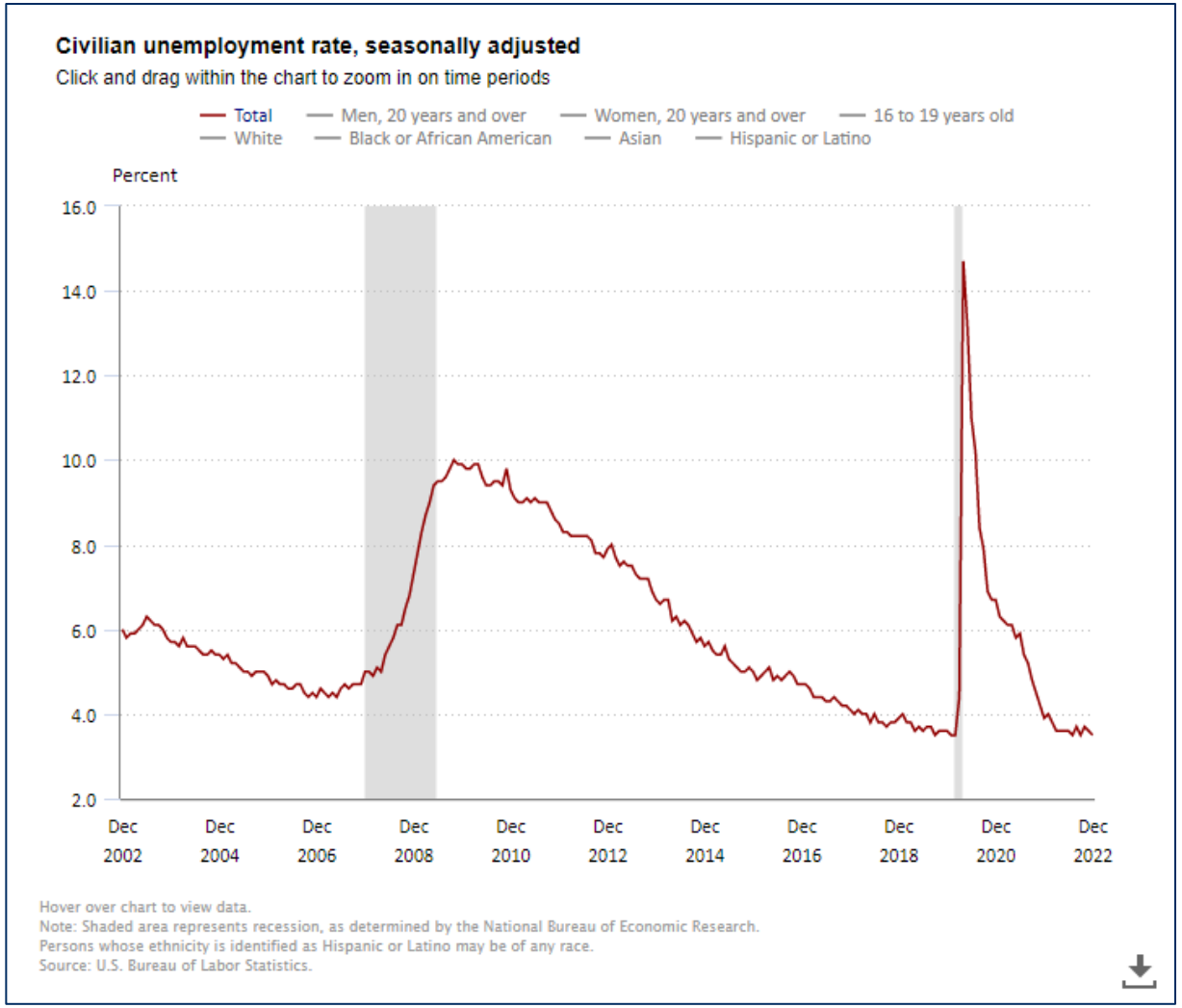
D

Increase of 31 – 50 bps

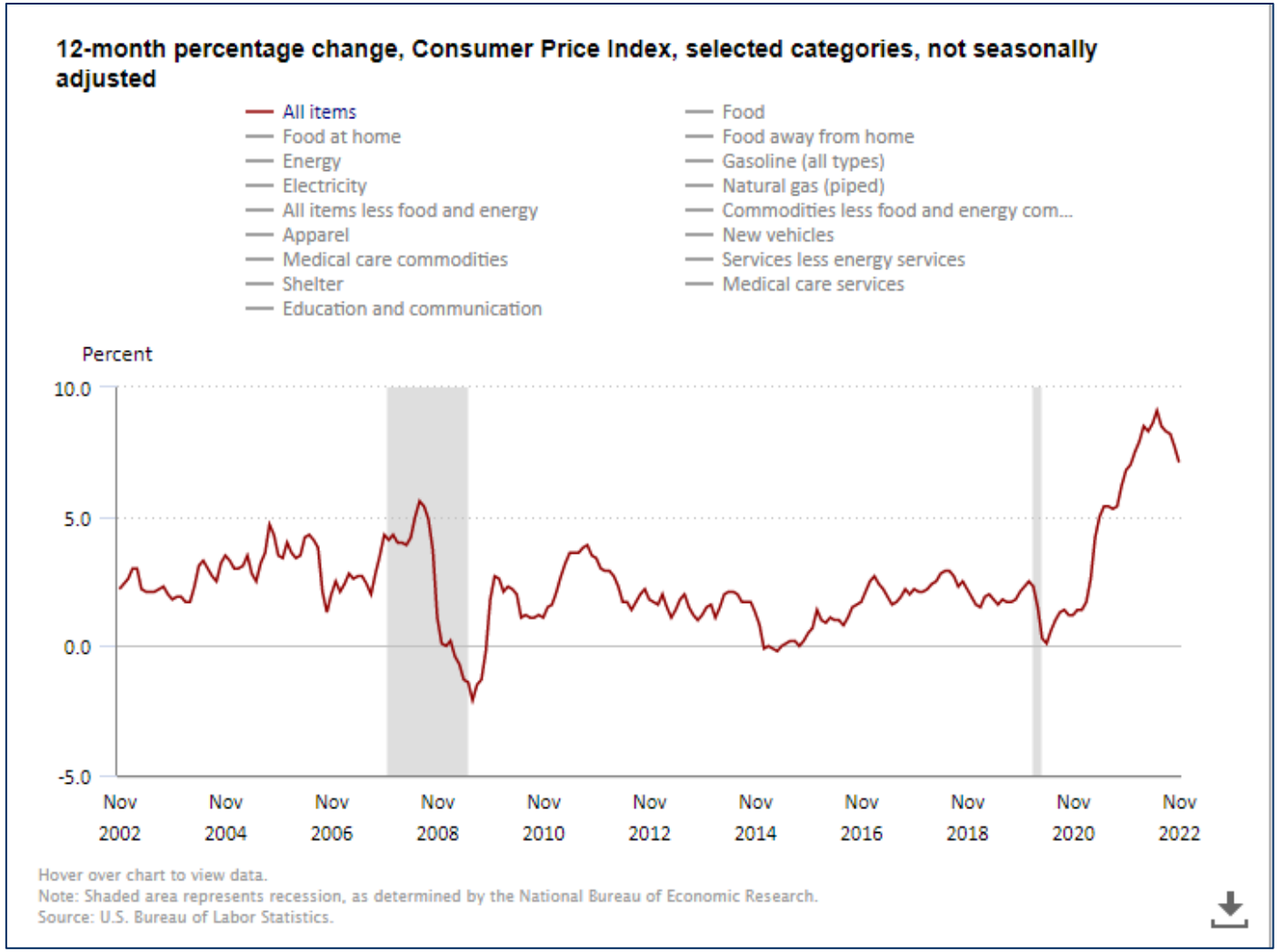
E

Increase greater than 30 bps

Macroeconomic Impacts - Unemployment

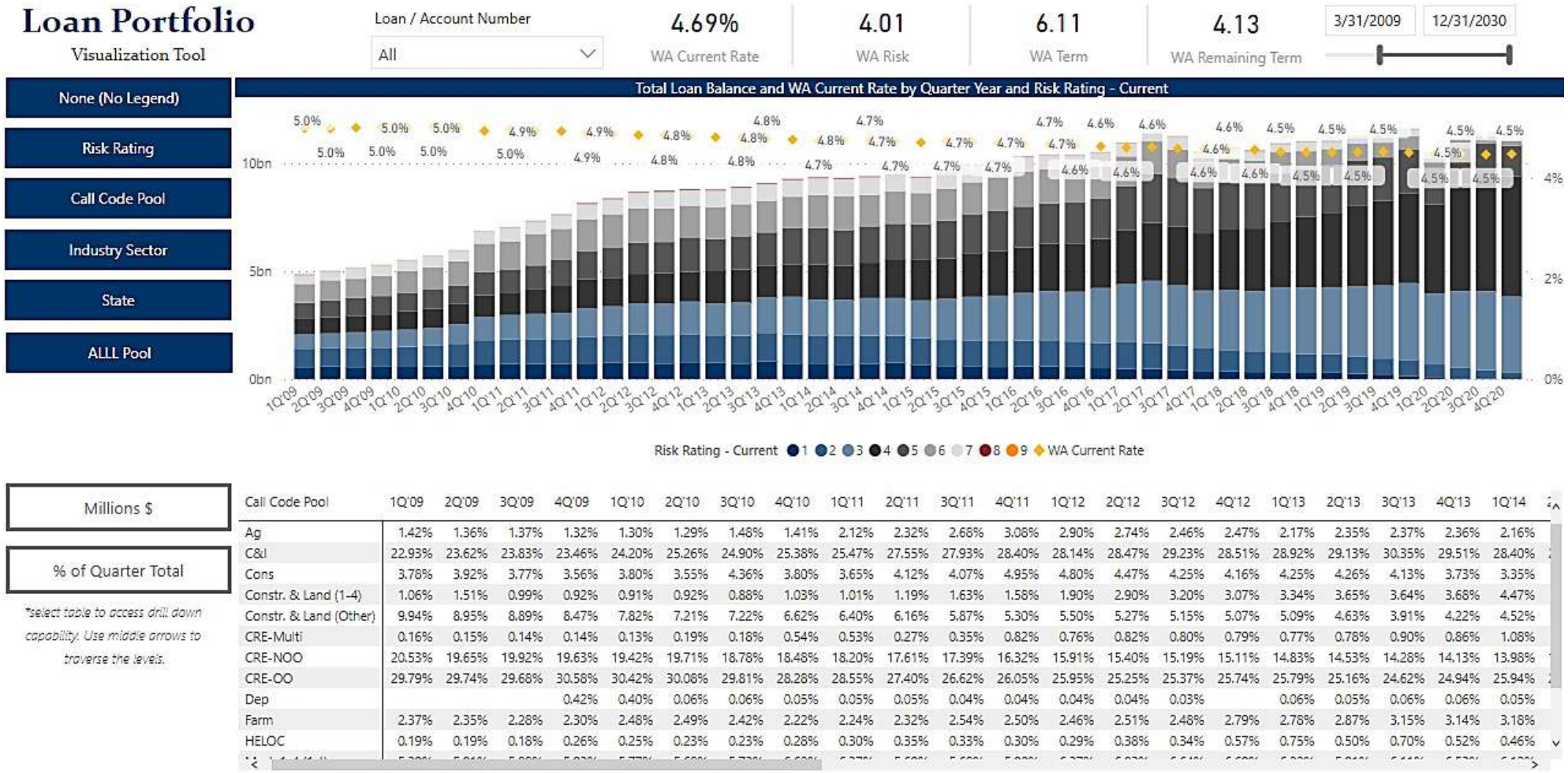


Macroeconomic Impacts



Portfolio Trends Over Time

- Monitor Changes over time
- How are Risk Ratings moving?
- Drill into specific portfolios and characteristics for further analysis



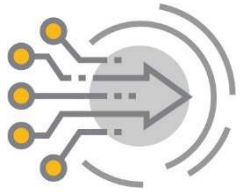
Call Code Pool	1Q'09	2Q'09	3Q'09	4Q'09	1Q'10	2Q'10	3Q'10	4Q'10	1Q'11	2Q'11	3Q'11	4Q'11	1Q'12	2Q'12	3Q'12	4Q'12	1Q'13	2Q'13	3Q'13	4Q'13	1Q'14
Ag	1.42%	1.36%	1.37%	1.32%	1.30%	1.29%	1.48%	1.41%	2.12%	2.32%	2.68%	3.08%	2.90%	2.74%	2.46%	2.47%	2.17%	2.35%	2.37%	2.36%	2.16%
C&I	22.93%	23.62%	23.83%	23.46%	24.20%	25.26%	24.90%	25.38%	25.47%	27.55%	27.93%	28.40%	28.14%	28.47%	29.23%	28.51%	28.92%	29.13%	30.35%	29.51%	28.40%
Cons	3.78%	3.92%	3.77%	3.56%	3.80%	3.55%	4.36%	3.80%	3.65%	4.12%	4.07%	4.95%	4.80%	4.47%	4.25%	4.16%	4.25%	4.26%	4.13%	3.73%	3.35%
Constr. & Land (1-4)	1.06%	1.51%	0.99%	0.92%	0.91%	0.92%	0.88%	1.03%	1.01%	1.19%	1.63%	1.58%	1.90%	2.90%	3.20%	3.07%	3.34%	3.65%	3.64%	3.68%	4.47%
Constr. & Land (Other)	9.94%	8.95%	8.89%	8.47%	7.82%	7.21%	7.22%	6.62%	6.40%	6.16%	5.87%	5.30%	5.50%	5.27%	5.15%	5.07%	5.09%	4.63%	3.91%	4.22%	4.52%
CRE-Multi	0.16%	0.15%	0.14%	0.14%	0.13%	0.19%	0.18%	0.54%	0.53%	0.27%	0.35%	0.82%	0.76%	0.82%	0.80%	0.79%	0.77%	0.78%	0.90%	0.86%	1.08%
CRE-NOO	20.53%	19.65%	19.92%	19.63%	19.42%	19.71%	18.78%	18.48%	18.20%	17.61%	17.39%	16.32%	15.91%	15.40%	15.19%	15.11%	14.83%	14.53%	14.28%	14.13%	13.98%
CRE-OO	29.79%	29.74%	29.68%	30.58%	30.42%	30.08%	29.81%	28.28%	28.55%	27.40%	26.62%	26.05%	25.95%	25.25%	25.37%	25.74%	25.79%	25.16%	24.62%	24.94%	25.94%
Dep				0.42%	0.40%	0.06%	0.06%	0.05%	0.05%	0.05%	0.04%	0.04%	0.04%	0.04%	0.03%		0.06%	0.05%	0.06%	0.06%	0.05%
Farm	2.37%	2.35%	2.28%	2.30%	2.48%	2.49%	2.42%	2.22%	2.24%	2.32%	2.54%	2.50%	2.46%	2.51%	2.48%	2.79%	2.78%	2.87%	3.15%	3.14%	3.18%
HELOC	0.19%	0.19%	0.18%	0.26%	0.25%	0.23%	0.23%	0.28%	0.30%	0.35%	0.33%	0.30%	0.29%	0.38%	0.34%	0.57%	0.75%	0.50%	0.70%	0.52%	0.46%

CECL Adoption Challenges Observed

Effectiveness of models

Extreme economic circumstances challenged the effectiveness of many models built for CECL that were primarily driven by declines in home price index or changes in unemployment.

Key Considerations from CECL Adoption



Agility to support robust, on-demand analysis and sensitivity testing is invaluable.

Don’t ignore unique pockets of the portfolio that might warrant additional segmentation or qualitative factors.

Use stressed scenarios to determine calculation limits and develop contingency plans in advance.

Q-factors are still important. Identify what is missing/different from the base calc and avoid double counting.

The more parallel runs, the better.

Data quality (and warehousing) takes time and must be taken seriously.

Key Monitoring Considerations

- Do the selected models still adequately reflect underlying portfolio risk?
- Refresh appropriateness of underlying model drivers
  - Developmental Dataset (history)
    - Completeness and Accuracy
  - Segmentation
  - Forecast/Reversion length
  - Weighting applications
  - Prepayment

- **Are models still appropriate?**
- Applicability of macro-economic variables and forecasting components
- Calibration of Qualitative Factors
- Model sensitivity and back testing
- Unfunded commitment modeling
- Model validation

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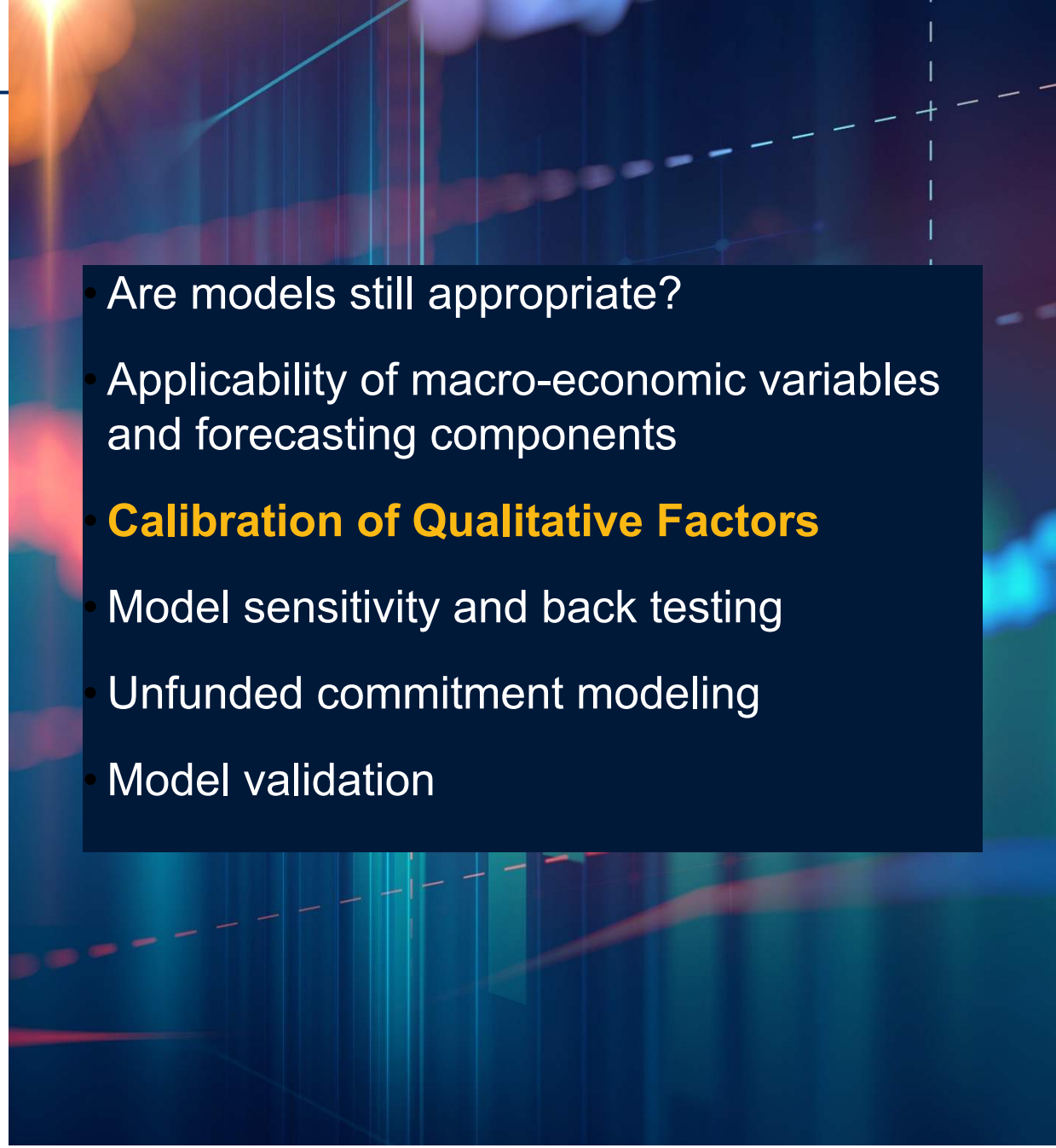
Key Monitoring Considerations

- How are forecasts and macro-economic factors incorporated? Top Down vs. Bottom Up
- Directional consistency and relationship between factors and underlying credits
- Organizational consistency
- Common factors seen

Unemployment (National, regional)	Mortgage Rate Projections
Housing Price Index	CRE Price Index
Personal Consumption Expenditures	Vacancy Rates
Gross Domestic Product	Treasury Yield Curves (i.e., 10 Year)
BBB Spreads	Volatility Index
Consumer Confidence	Rental Vacancy Rates
National Retail Sales	Prime, LIBOR, SOFR, etc. Projections

Key Monitoring Considerations

- Start with a baseline quantitative estimate
- Evaluate factors listed in the standard and FFIEC guidance
  - Lending policy procedures
  - Economic and business conditions
  - Nature and volume of loans
  - Lending staff
  - Problem loan trends
  - Loan review quality
  - Collateral value
  - Credit concentrations
  - Competition, legal and regulatory environment
- Focus on through the cycle and anchoring
- Avoid double-counting specific risk



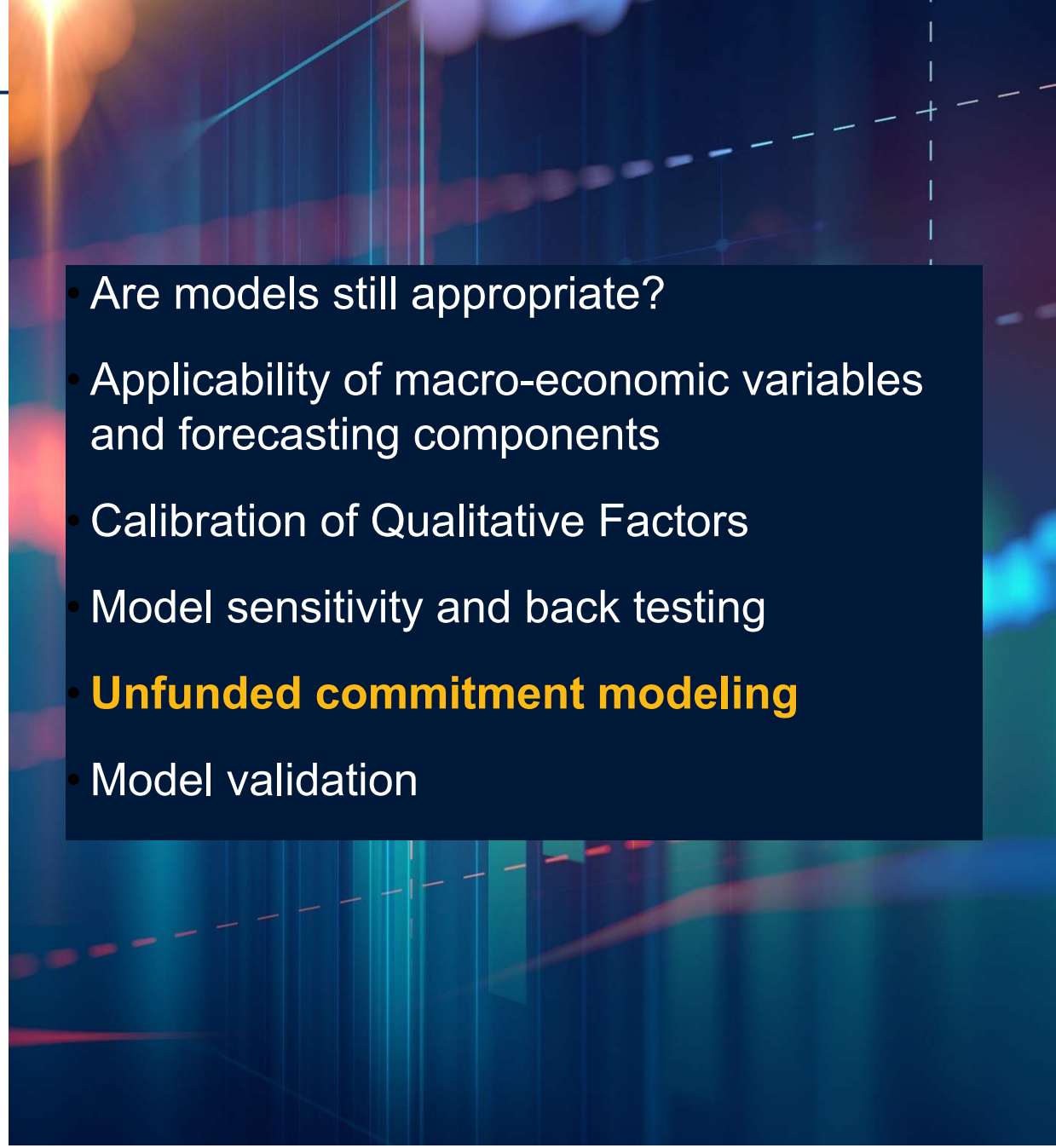
- Are models still appropriate?
- Applicability of macro-economic variables and forecasting components
- Calibration of Qualitative Factors
- **Model sensitivity and back testing**
- Unfunded commitment modeling
- Model validation

Key Monitoring Considerations

- Parallel testing
- Multi-scenario modeling
- Alternative assumptions
- Historical performance monitoring

Key Monitoring Considerations

- Evaluate unconditional cancellability
- Understand historical funding expectations
- Consider pool specific loan performance attributes
  - Construction Loans
- Determine appropriate loss rate application



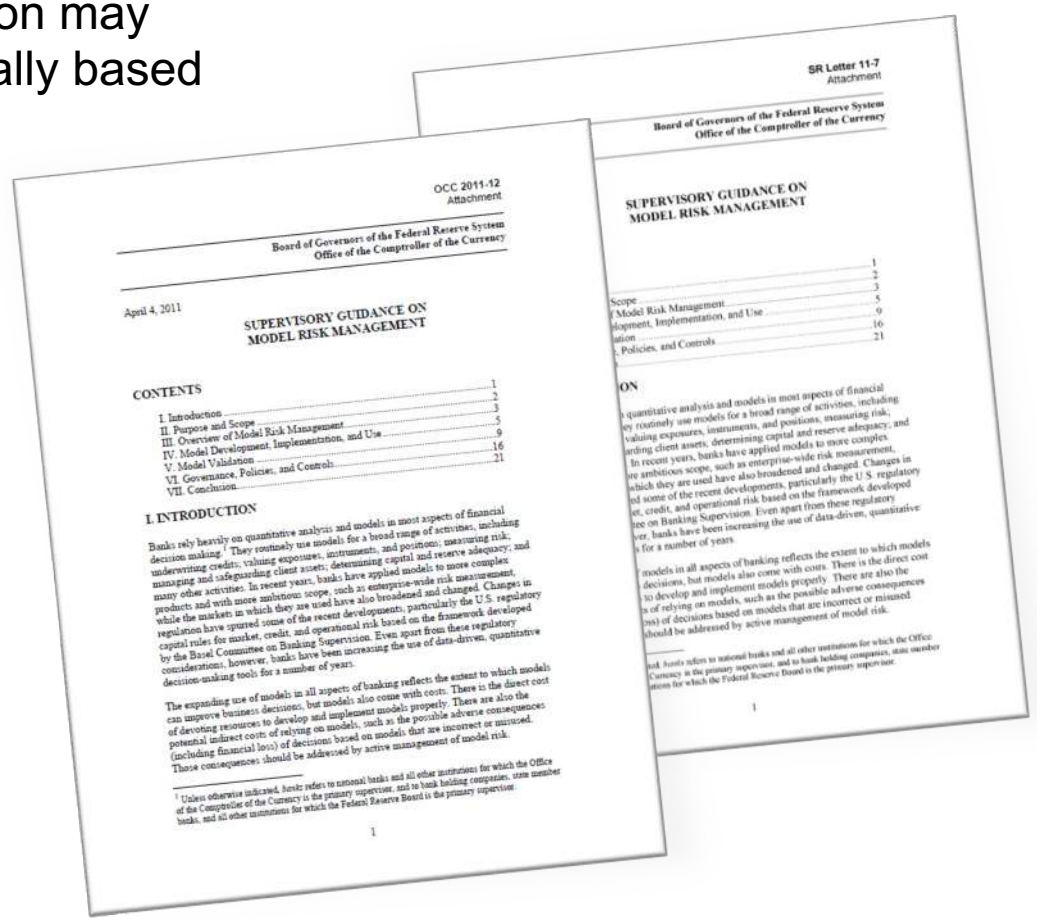
Model Risk Management / Model Validation Best Practices

Regulatory Guidance on Model Risk Management

- Model Risk can be defined as the potential loss an institution may incur, as a consequence of decisions that could be principally based on the output of models, due to errors in the development, implementation, or use of such models

Three Primary Areas of Focus:

- Model Development Implementation, and Use
- Model Validation
- Governance, Policies, and Controls



Regulatory Guidance on Model Risk Management

- Per the Interagency Policy Statement on the Allowance for Loan and Lease Losses

  - The institution periodically validates the ALLL methodology. This validation process should include procedures for a review, by a party who is independent of the institution's credit approval and ALLL estimation processes, of the ALLL methodology and its application in order to confirm its effectiveness. A party who is independent of these processes could be the internal audit staff, a risk management unit of the institution, an external auditor (subject to applicable auditor independence standards), or another contracted third party from outside the institution. One party need not perform the entire analysis as the validation can be divided among various independent parties.

https://www.federalreserve.gov/boarddocs/srletters/2006/sr0617a1.pdf

Governance and Oversight: Model Validation

- **Understanding risk management practices surrounding the development, execution, and maintenance of the CECL model**
  - Established roles and responsibilities of the board and senior management
  - Policies and procedures
- Model risk management principles and practices are in play

<u>Model Validation Considerations</u>

- How does effective challenge of the model and results take place?
- Is reporting on the model clear and comprehensive, including model performance?
- What are the plans to provide ongoing monitoring over the model?

Understanding Validation Expectations

Independent

Appropriate level of expertise

Identifies model weaknesses and limitations

Vendor models are subject to validation

Management oversight

Validation activities in line with the risk of the model

Model Risk Assessment

The model risk assessment determines the depth and breadth of model risk management governance including model validation.

- Financial Statement Impact
- Complexity
  - Quantitative
  - Programming
- Reputational Risk
  - Investors
  - Market
- Regulatory Scrutiny
  - Examiners
  - Auditors
- Maturity
  - New or significantly revised model
  - Minimal challenge or vetting to this point

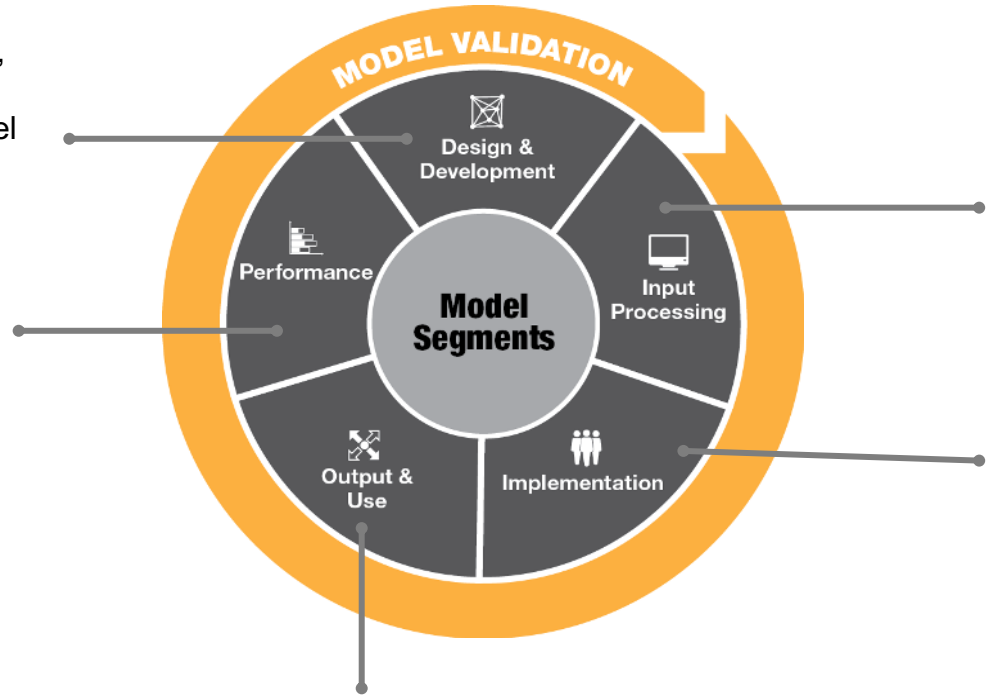
Model	CECL Model
Financial Statement Impact	High
Complexity	High
Reputational Risk	High
Regulatory Scrutiny	High
Maturity	High
Model Rating	**High**

Model Validation Approach – Five Segments

Model Validation testing is focused on five key segments. Each model segment has unique model risks. These model risks, along with the Company's control environment, require testing and effective challenge to form a reasonable belief that the model is operating as designed and intended.

Validates the intended purpose of the model, the model logic and functionality, alignment of the model to the purpose, assumptions and limitations of the model and methodology used to design and develop the model.

Validates the established plan to assess the performance of the model on an ongoing basis. Also reviews the comprehensiveness and clarity of model output reporting.



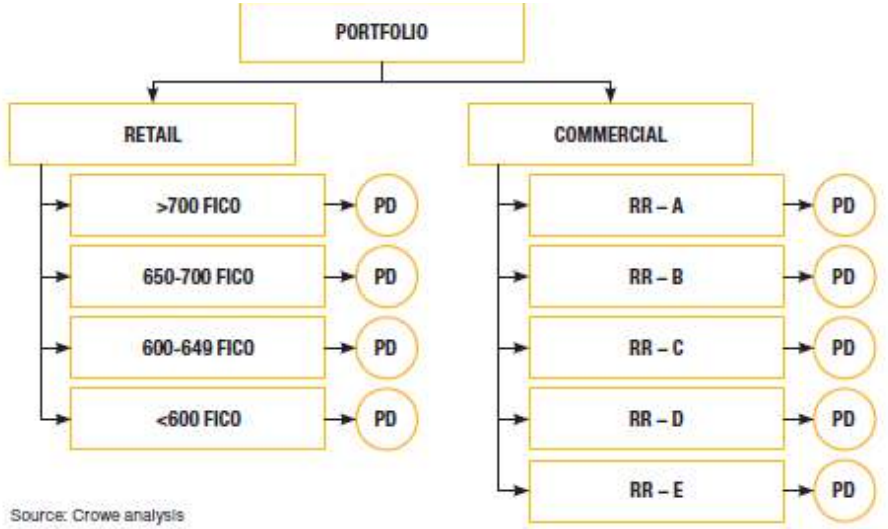
Validates the inputs relied upon by the model, including the accuracy and completeness of the model data as well as the ongoing maintenance of inputs.

Validates the processes to implement the model and related functionality, the model inputs, as well as the related model configurations and settings. This also encompasses assessing the integration of the design and functionality of the model into the organizations' business setting.

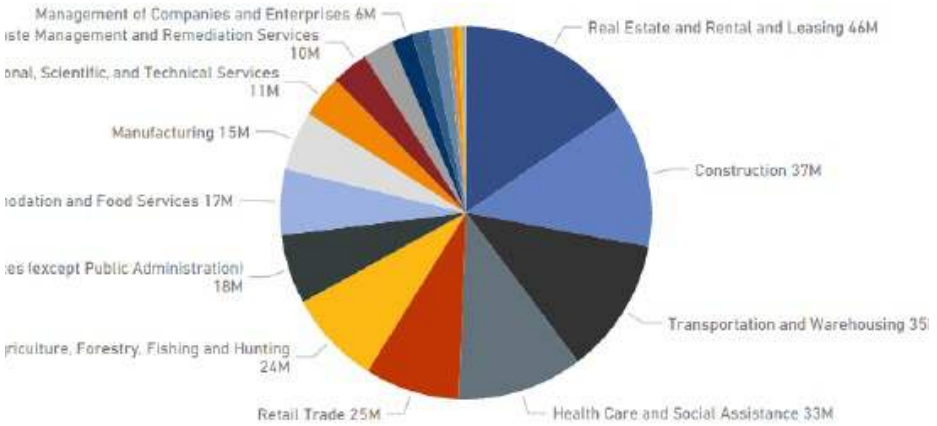
Conduct outcome analysis. including back testing, sensitivity testing, and benchmarking, to assess the performance of the model.

Design & Development

- **Portfolio Segmentation**
  - Segments capture similar risk characteristics and key risk drivers
- **Model Methodology**
  - Alignment of the selected methodology to business/regulatory/accounting requirements and industry practice
  - Assess if the methodology (cumulative loss, transition matrix, vintage, PD/LGD, etc..) is suitable for the portfolio characteristics
  - Qualitative framework
  - Reasonable and supportable forecasts
  - Reversion technique
  - Comparison to alternative models/methodologies
- **Assumptions and Limitations**
  - Assumptions and limitations are identified and properly mitigated
- **Model Documentation**
  - Documentation is clear and comprehensive



Source: Crowe analysis

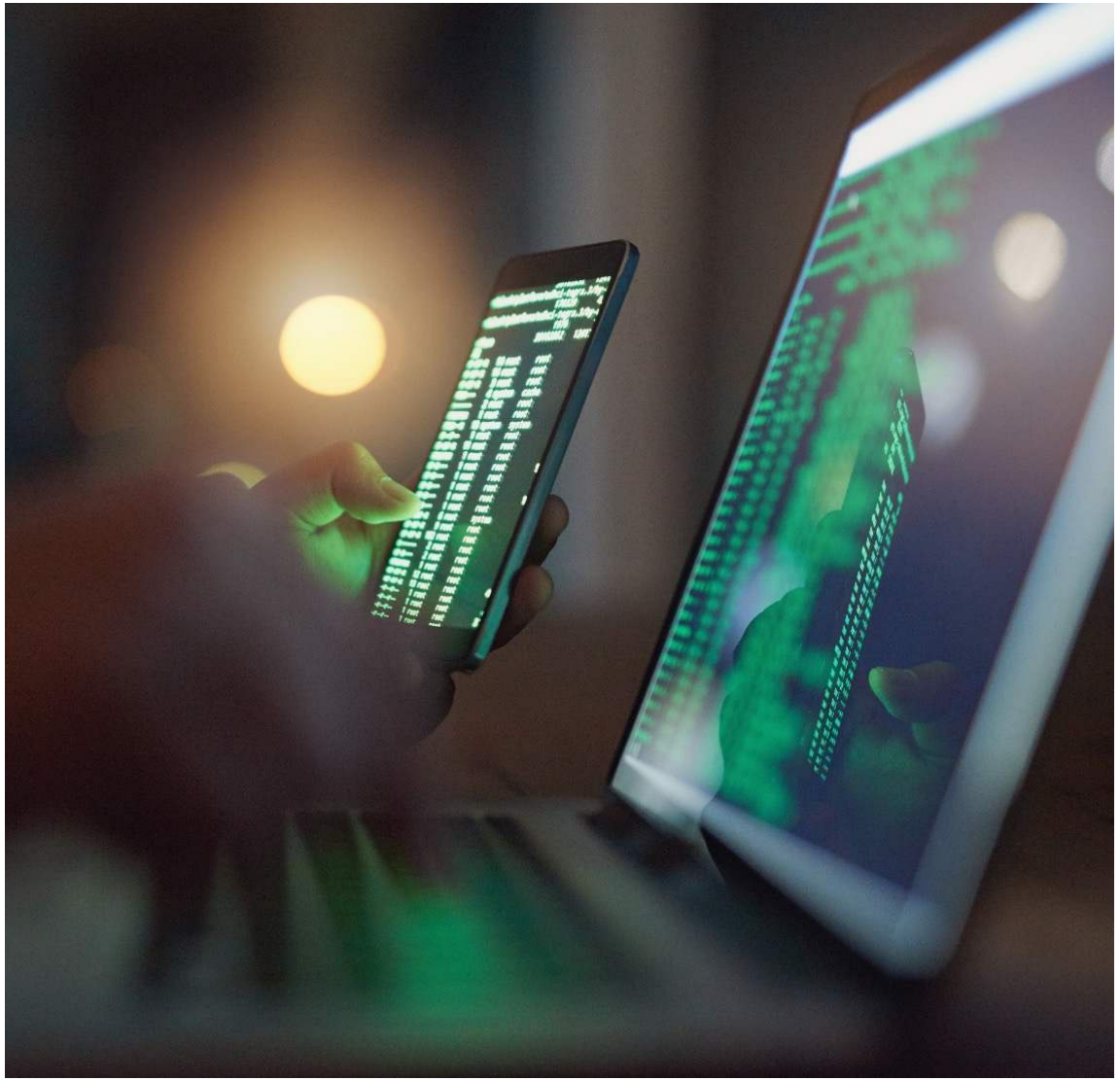


Input Processing

- **Inventory source data feeds**
  - Assess if data sources are reliable and subject to data governance requirements
  - Data completeness (e.g. origination date, renewal dates, risk rating)
- **Assess appropriateness of data**
  - Historical time period
  - Use of data proxies (missing values)
  - Third party data (e.g. industry/peer loss data, macroeconomic data, prepayment rates)
- **Data Transfer**
  - Data preparation, data transformations, and data integrity checks
  - Reconciliation of model inputs from source to model
  - Process to remediate data issue

Implementation

- **Model Calculation Accuracy**
  - Assess development test results
  - Review of model code
  - Replication of model calculations
  - Documentation should be transparent to allow for replication
- **Model Procedures**
  - Procedures should be detailed to reduce operation error and key personnel risk
- **Change Control Procedures**
  - Procedures are in place to document, test, review, and approve model changes
  - Version Control
- **Model Controls**
  - Access rights and restriction
  - Code and data back-up



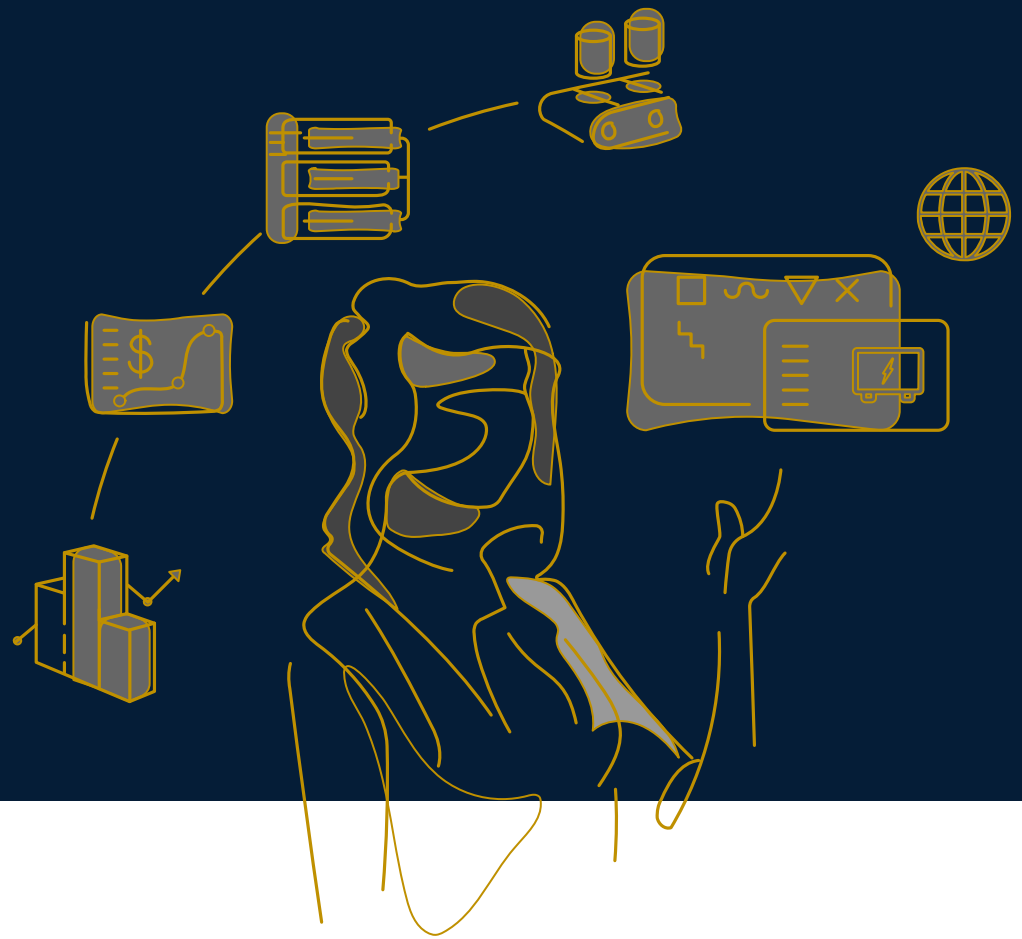
Output & Use

- **Sensitivity Testing**
  - Measure how changing parameters impact the CECL estimate.
  - What-If Scenarios
- **Benchmark Analysis**
  - Peer organizations
  - Alternative methodologies
  - Forecasts
- **Back-testing**
  - Accuracy of loss estimates
  - Accuracy of macroeconomic forecasts
  - Discriminatory power and calibration for probability of default
- **Directional Consistency**

Performance

- **Model Reporting**
  - Management reporting
  - Disclosures
- **Ongoing Monitoring**
  - Activities
  - Frequency
  - Thresholds and action taken when breached
  - Oversight
- **Compliance with Model Risk Management Governance**
  - Approval
  - Model risk assessment
  - Inventory
  - Finding tracking and resolution

Questions?



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