

# Introduction to CECL Quantification

# Today's Speakers



- » **Emil Lopez** is a Director in the Enterprise Risk Solutions Group, based in New York, focusing on the development of software and analytic solutions for impairment accounting (CECL/IFRS 9).
- » Prior to joining the product strategy group, Mr. Lopez led risk rating and stress testing modeling projects for Basel and DFAST institutions.
- » Mr. Lopez received his MBA from New York University and received his BS in finance and business administration from the University of Vermont.



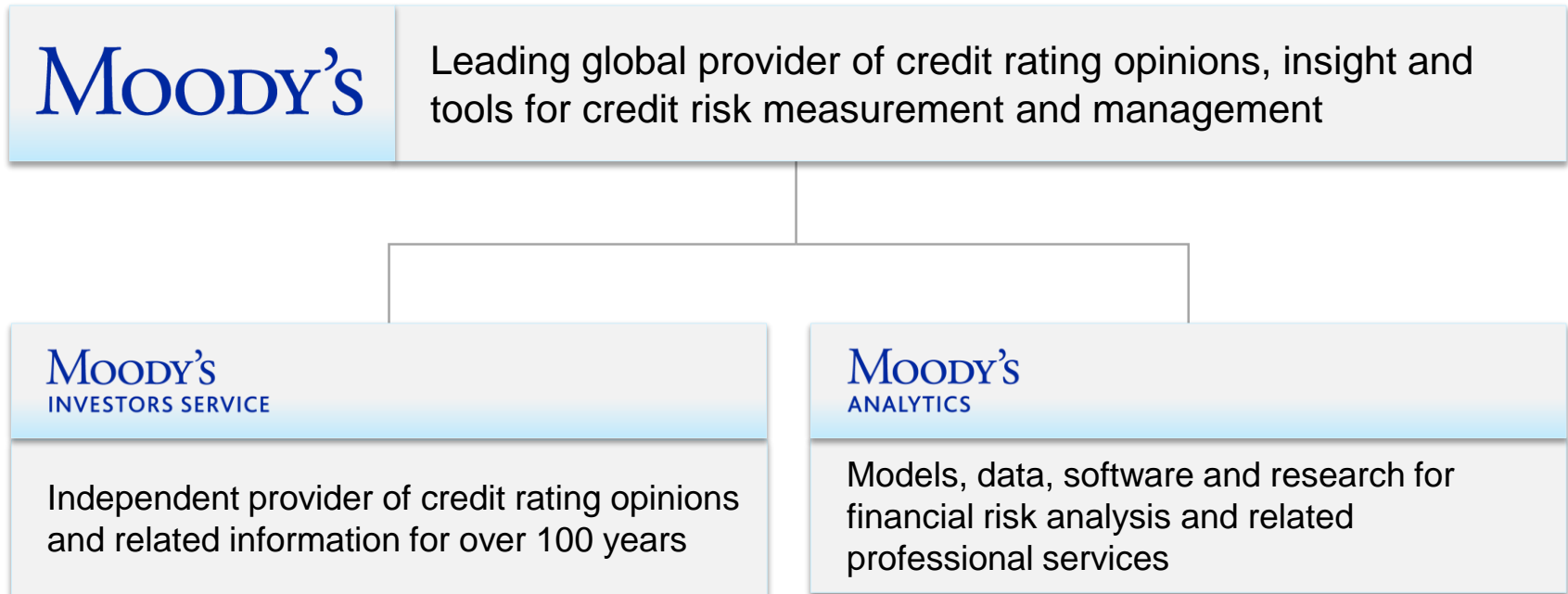
- » **Dr. Jing Zhang** is Managing Director and the Global Head of Moody's Analytics Research and Modeling Group. His group is responsible for the quantitative modeling behind the EDF and LGD models for both public and private firms, commercial real estate, portfolio and balance sheet, and insurance analytics.
- » PhD from the Wharton School of the University of Pennsylvania
- » Editor of Risk Books "*CCAR and Beyond*," and "*From Incurred Loss to Expected Loss*" (forthcoming)

## Moderator



- » **Ed Young** is a Senior Director at Moody's Analytics. He advises clients across the Americas on risk management and regulatory expectations issues around capital planning, liquidity, and credit stress testing, as well as allowance for credit loss processes.
- » Prior to joining Moody's Analytics, Ed spent ten years working for the Federal Reserve. During his tenure, he participated on a multitude of Federal Reserve System initiatives related to capital planning, liquidity planning, stress testing, credit risk management, interest rate risk management, and model risk management.

# About Moody's Analytics



Welcome!

## Moody's Analytics CECL Webinar Series: Expected Credit Loss Quantification



### Introduction to CECL Quantification *Today*

#### CRE CECL Methodologies

Tuesday, February 28, 2017 | 1:00PM EST

#### C&I CECL Methodologies

Tuesday, March 14, 2017 | 1:00PM EST

#### Retail CECL Methodologies

Tuesday, March 28, 2017 | 1:00PM EST


#### Structured Assets CECL Methodologies

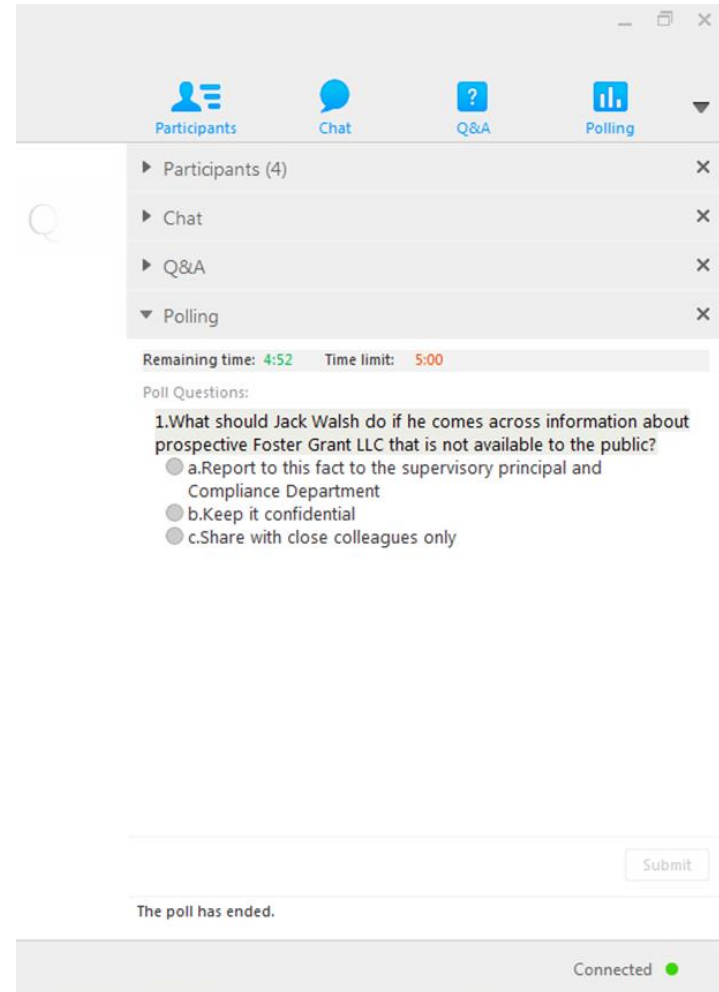
Thursday, April 20, 2017 | 1:00PM EST

To find out more about Moody's Analytics perspectives on CECL and register for our webinar series visit:

[www.moodyanalytics.com/cecl](http://www.moodyanalytics.com/cecl)

# Polling Instructions

1. Click on the  icon located in the right hand corner of the WebEx platform, so that the icon is blue (as shown).
2. Select your answers in the **Polling** section that appears in the right hand panel of the platform.
3. Results will display after the poll has ended.



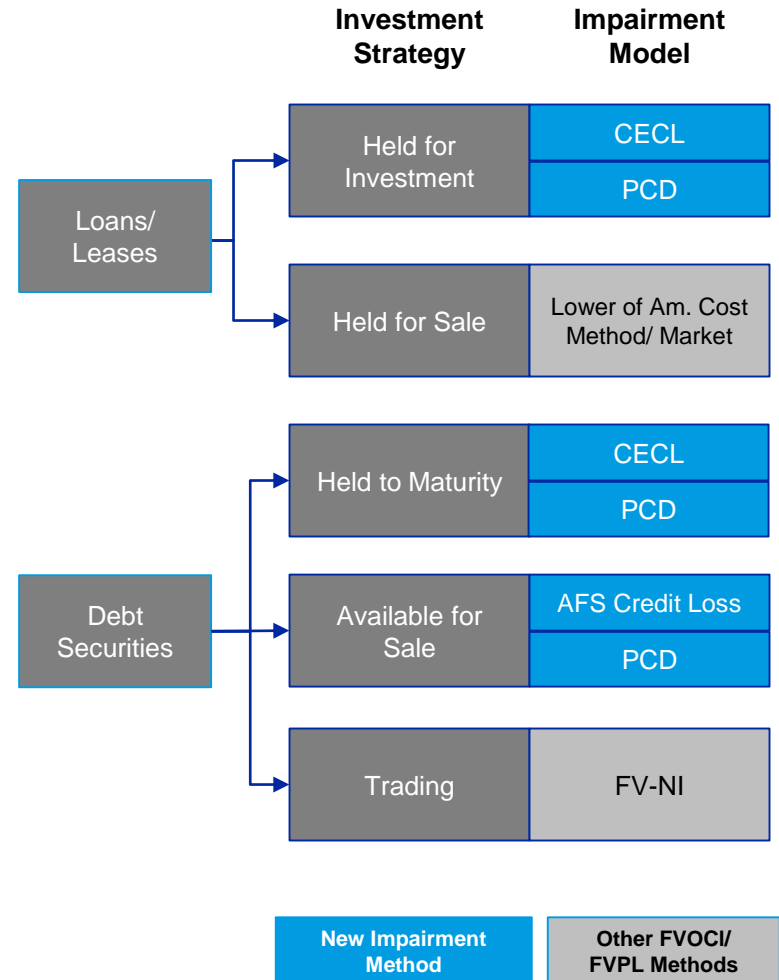
# Topic 326: Measurement of Credit Losses on Financial Instruments; commonly known as “CECL”

## Who/What does it apply to?

- » All banks, savings associations, credit unions, and financial institution holding companies, regardless of asset size
- » Entities holding financial assets and net investment in leases that are not accounted for at fair value through net income
- » Includes: Loans, debt securities, trade receivables, net investments in leases, off-balance-sheet credit exposures, reinsurance receivables, etc.
- » The standard requires organizations to immediately record the full amount of credit losses that are expected over the lifetime of the financial asset

## When does it go into effect?

- » FY 2019 (after 12/15/19) for public business entities that are SEC filers
- » FY 2020 (after 12/15/20) for all other public business entities
- » FY 2021 (after 12/15/21) for all other entities,
- » Early adoption permitted December 15, 2018



# In essence, the new standard is about improving the measurement of and reporting on credit losses

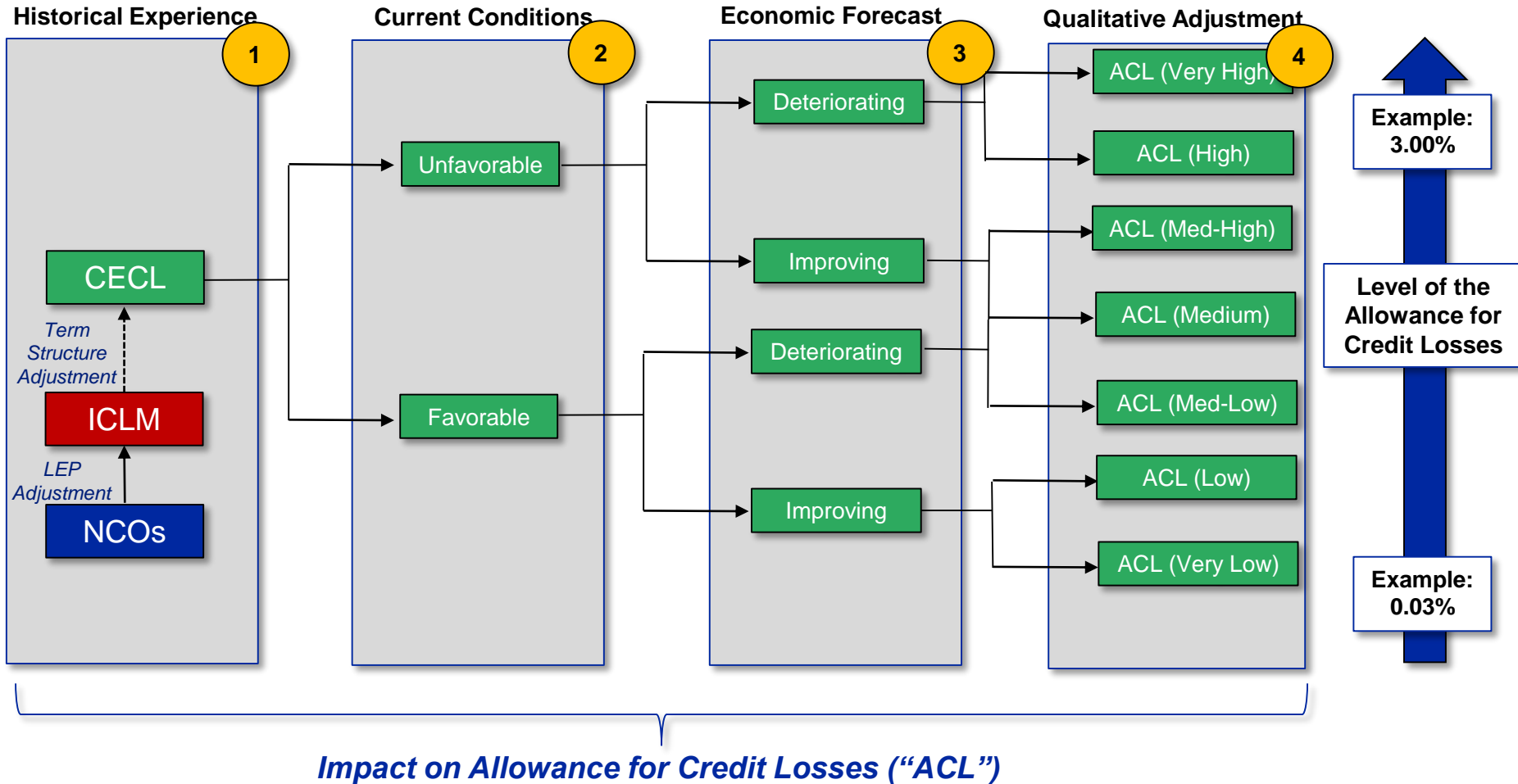
Institutions will need to measure and record immediately all expected credit losses (ECL) over the life of their financial assets based on:

- 1) Past events, including historical experience
- 2) Current conditions
- 3) Reasonable and supportable forecasts

***If it effects the collectability of the reported amount, it should be considered!***

- » Although “reasonable and supportable forecasts” are required, an entity will not need to create an economic forecast over the entire contractual life of long-dated financial assets
- » Institutions will have significant discretion over how they measure expected credit losses
- » ECL recorded at origination and updated at subsequent reporting dates

# Hypothetical illustration of the expected credit loss quantification process



ICLM = Incurred Credit Loss Model (current GAAP) | CECL = Current Expected Credit Loss model (effective 2019-2021)



# The ASU requires entities to apply one of two approaches to evaluate expected credit losses

## Collective (“Pool”) Evaluation

- » Required for financial assets when similar risk characteristic(s) exists

## Individual Evaluation

- » Required when a financial asset does not share risk characteristics with its other financial assets

## Examples of Shared Risk Characteristics

- » Internal or external credit score
- » Risk ratings or classification
- » Financial asset type
- » Collateral type
- » Size
- » Effective interest rate
- » Term
- » Geographical location
- » Industry of the borrower
- » Vintage

# Key Modeling Challenges for CECL

## » Model **methodology**

- Loan-level versus cohort-level?
- Can we leverage existing stress testing, Basel or other models? How?

## » Incorporating **macroeconomic drivers** in accounting:

- Which economic scenario? How many?
- Demonstrating relationship to credit losses
- Sensitivity analysis and scenario spreads

## » **Lifetime length determination**: particularly for revolving products

- ECL for off balance sheet exposures to be reported separately

## » **Benchmarking** to industry performance and previous crisis

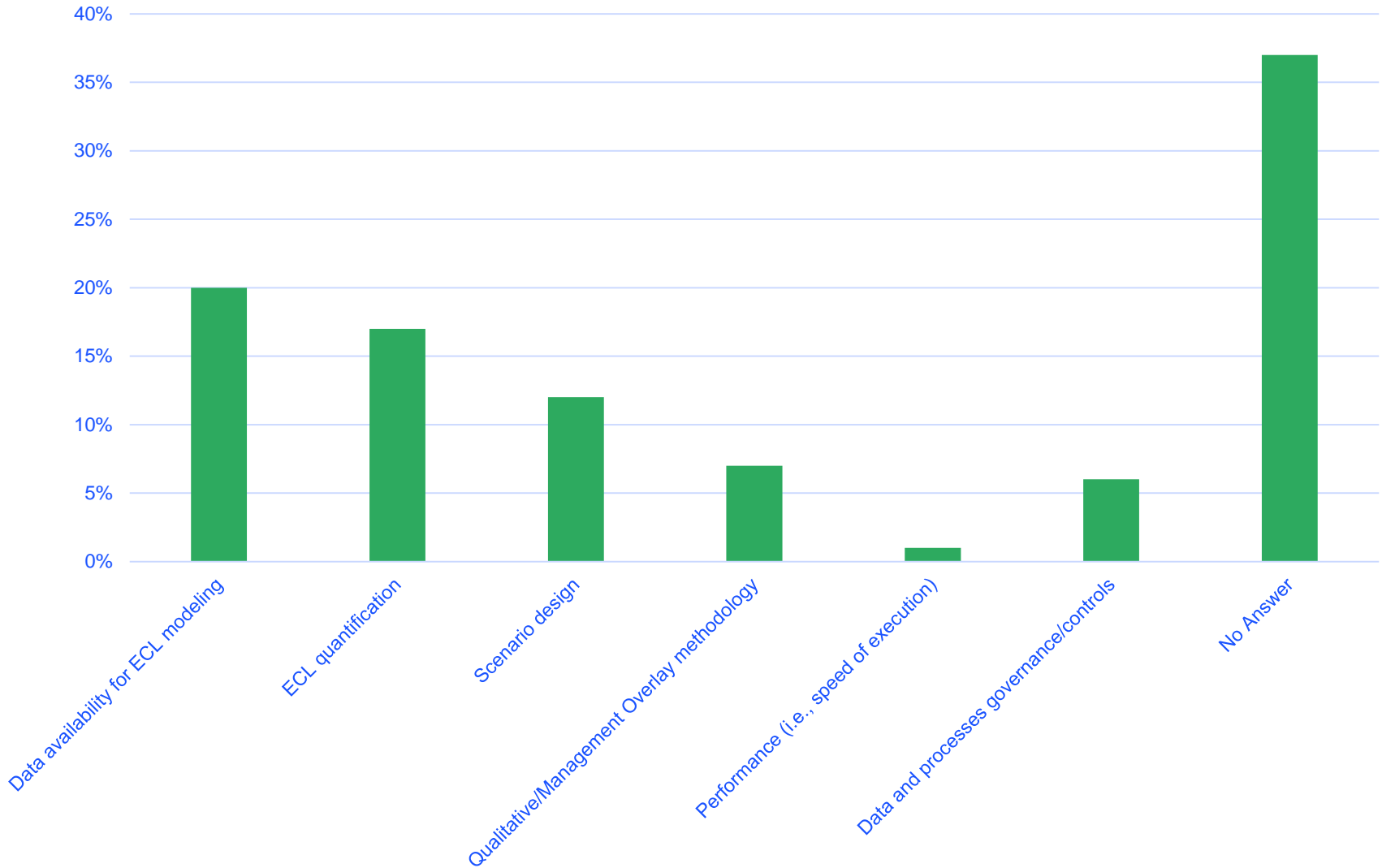
- Support forecasts for audit

## » **Disclosures**: models, production processes and reporting platforms need to support required reporting

# 1. What is the most significant challenge you anticipate in CECL implementation?

- A. Data availability for ECL modeling
- B. ECL quantification
- C. Scenario design
- D. Qualitative/Management Overlay methodology
- E. Performance (i.e., speed of execution)
- F. Data and processes governance/controls

## What is the most significant challenge you anticipate in CECL implementation?



# CECL Calculation: Strategic and Tactical Considerations

## Criteria

- » Incorporate historical experience
- » Incorporate current conditions
- » Incorporate forward-looking information
- » Forecast life of loan ECL
- » Segment and granularity appropriate

## Technical Considerations

- » Portfolio materiality
- » Data availability: historical and reporting-date data
- » Development costs: short-term vs. long-term investments
- » Timing

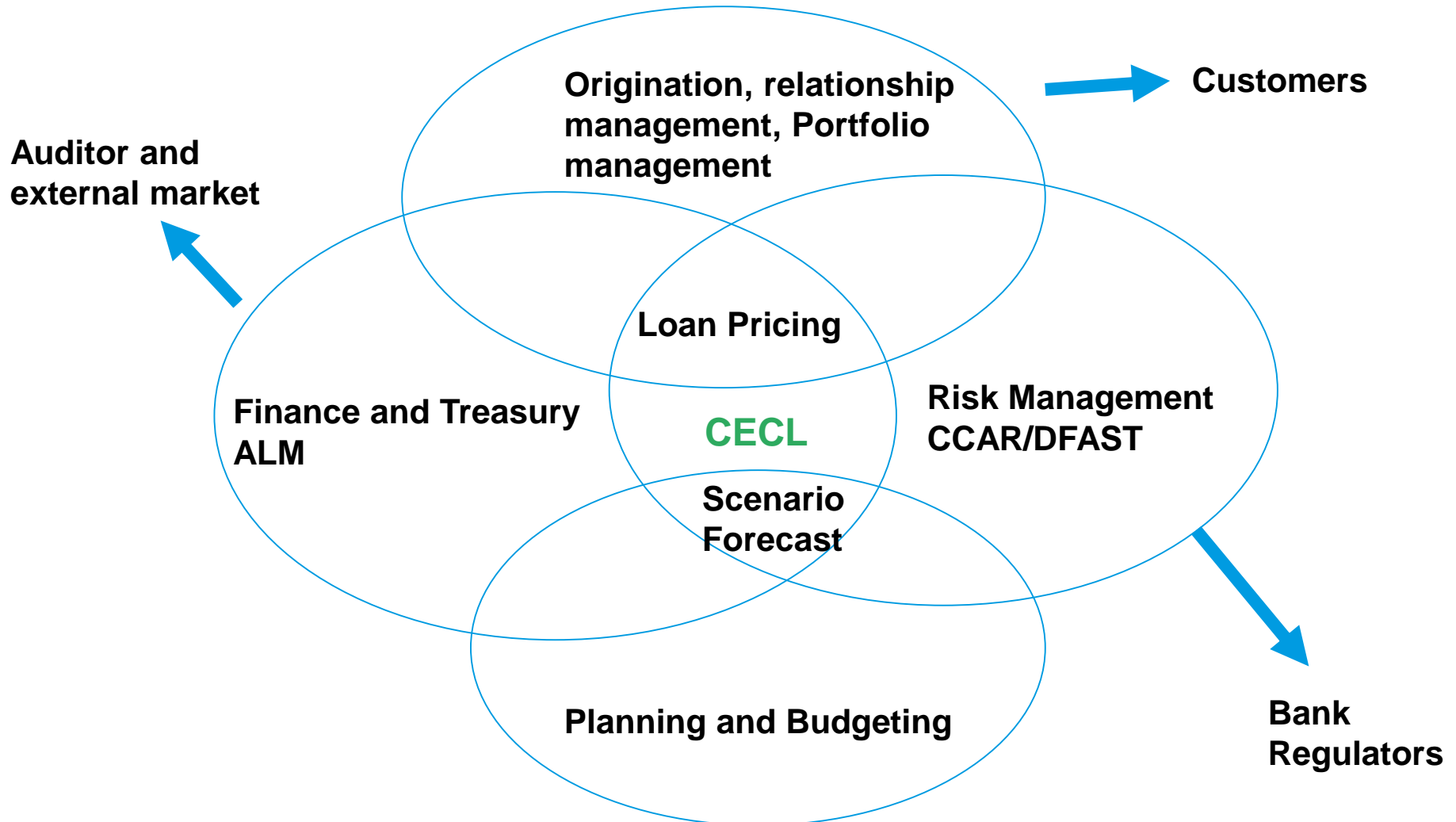
## Strategic Considerations

- » Invest in data, measurement and system capabilities for both CECL and other applications
- » Consider the impact of less granular quantification on competitiveness
- » Consider the impacts on lending and other business decisions
- » Coordination and alignment with other processes
- » Interactions with various internal and external stakeholders

***One Size Does Not Fit All!***

# Coordination and Alignment With Other Processes

---And Considering the interactions with various stakeholders



# Possible Methodologies

- » Loss rate methods
  - Average charge-off method
  - Static pool analysis
  - Vintage analysis
- » PD/LGD rating method
  - Basel models
  - Internal rating models
  - Granular stress testing models
- » Roll-rate method (migration analysis)
- » Discounted cash flow analysis



*For most banks, the typical approach is to leverage or build on top of existing approaches*

**Both statistical and qualitative analysis can be applied to any method to**

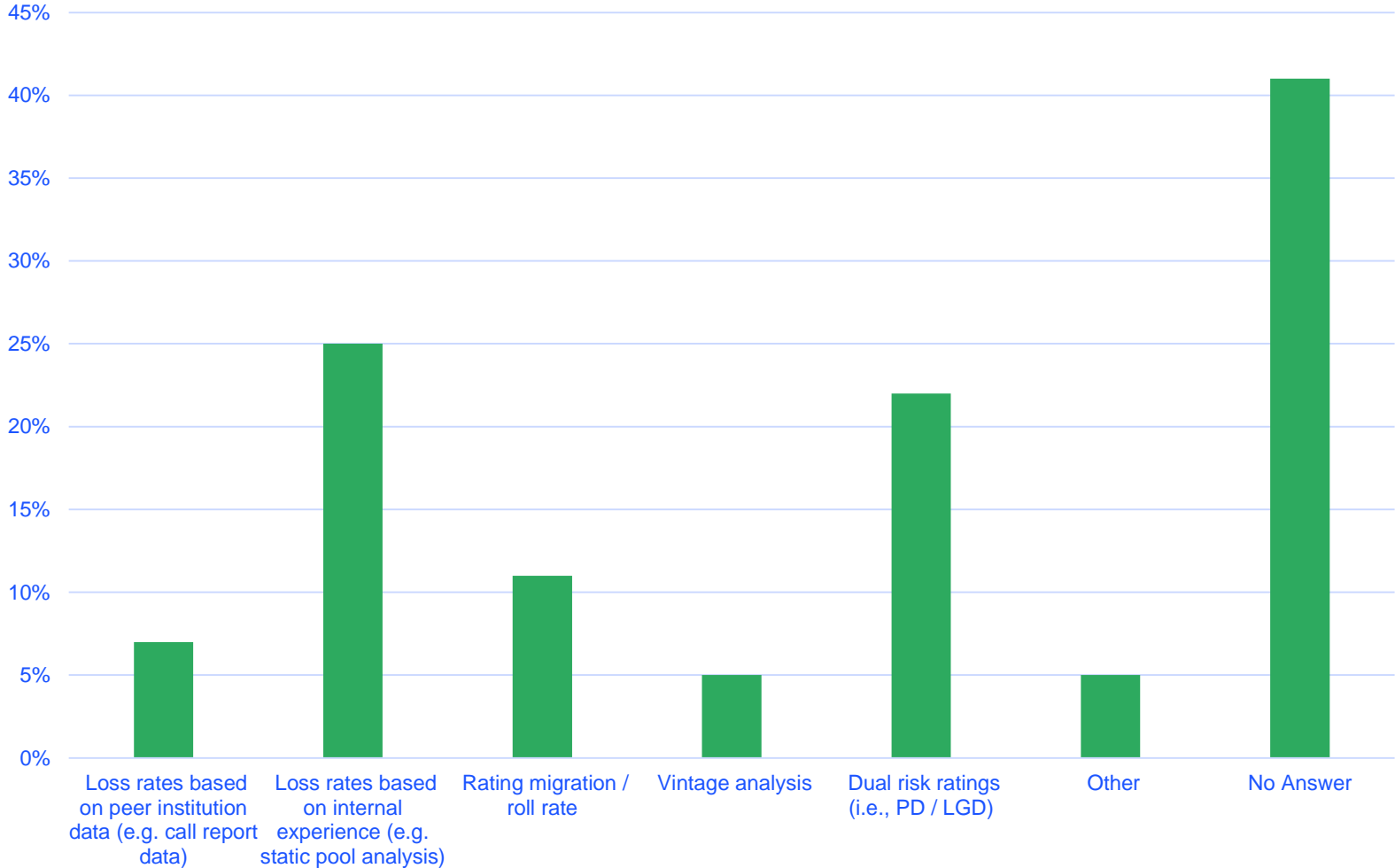
- » Incorporate forward-looking assessment (e.g. linking loss rate to forecast)
- » Account for life-time loss

## 2. What is/are the approach(es) you use in ALLL estimation today for your commercial portfolios?

- A. Loss rates based on peer institution data (e.g. call report data)
- B. Loss rates based on internal experience (e.g. static pool analysis)
- C. Rating migration / roll rate
- D. Vintage analysis
- E. Dual risk ratings (i.e., PD / LGD)
- F. Other



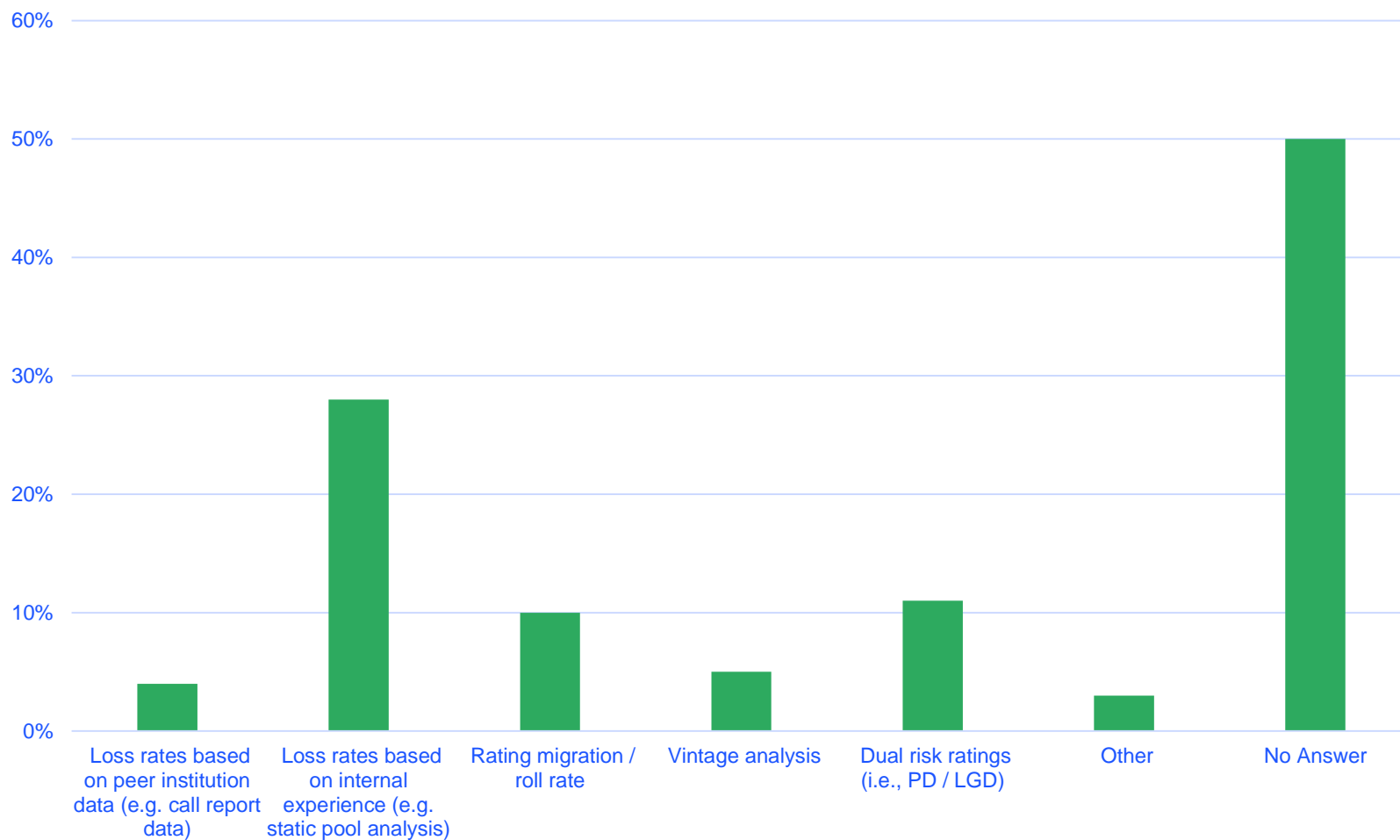
# What is the approach you use in ALLL estimation today for your commercial portfolios?



### 3. What is/are the approach(es) you use in ALLL estimation today for your retail portfolios?

- A. Loss rates based on peer institution data (e.g. call report data)
- B. Loss rates based on internal experience (e.g. static pool analysis)
- C. Rating migration / roll rate
- D. Vintage analysis
- E. Dual risk ratings (i.e., PD / LGD)
- F. Other

## What is the approach you use in ALLL estimation today for your retail portfolios?



# Building Upon the Loss Rate Approach

## Starting Point

- » Apply a historic loss rate percentage, either collective or individual evaluation
- » Average charge-off method
- » Static pool analysis
- » Vintage analysis



## Enhancement

- † Incorporate forward-looking assessment
- † Link loss rate directly or indirectly to macro forecast
- † Extend annual loss to life-time loss
- † Leverage external data if appropriate



## Considerations

- ✓ Easy to implement
- ✓ Close to the current practice
- ✓ “Q” factor can be used to incorporate forward-looking assessment
- ✓ Proper segmentation and granularity is important
- ✓ Considering the linkage with business decisions such as loan underwriting

# Leveraging the Roll Rate Approach

## Starting Point

- » Compute percentages of assets that will “roll” or “migrate” to a more severe risk rating or delinquency status.
- » Roll-rate percentages are applied to the balance in each category to estimate the amount that will migrate to the next category.
- » Aggregate total migration for each category to determine the allowance.



## Enhancement

- † Incorporate forward-looking assessment
- † Linking the “roll” or “migration” to macroeconomic forecast
- † Incorporate life-time loss



## Considerations

- ✓ Linking credit migration to macroeconomic forecast: statistically or qualitatively?
- ✓ Consider the linkage with business decisions such as setting loan terms

# Leveraging the Dual Rating Framework

## Starting Point

- » The PD/LGD/EAD framework for Basel IRB PD
- » The dual rating framework currently used in business decision such as loan pricing, limit setting, risk monitoring and setting reserve



## Enhancement

- † Adjust “regulatory” definition to “accounting” definition
- † TTC to PIT conversion to incorporate forward looking assessment
- † Extend term structure of PD and LGD



## Considerations

- ✓ Easier to implement for Basel IRB banks (this is the most popular approach for IFRS 9 implementation)
- ✓ There is a wealth of data and expertise in place as a result of IRB compliance
- ✓ Easier to assess impact on business decisions such as setting loan term pricing and terms

# PD, LGD, EAD Modeling Under Basel and CECL

	BASEL	CECL
<b>PD</b>	<ol style="list-style-type: none"> <li>1-year TTC (through-the-cycle) PD based on historical long run average default rate;</li> <li>Subject to prescribed regulatory floors (e.g. 3.b.p for some portfolio)</li> <li>Estimated based on minimum five years of historical data</li> </ol>	<ol style="list-style-type: none"> <li>Term structure of PDs</li> <li>Point-in-time (PIT) PD measures;</li> <li>Include historical, current and forward looking elements at reporting date for all possible outcomes;</li> <li>No prescribed regulatory floors</li> </ol>
<b>LGD</b>	<ol style="list-style-type: none"> <li>“Downturn” LGD to reflect adverse economic scenarios.</li> <li>Consider both direct and indirect costs associated with collection of the exposure;</li> <li>Regulatory prescribed floors;</li> <li>Discount rate based on weighted average cost of capital or risk-free rate;</li> <li>Min. 5 year data for retail and 7 year for sovereign, corporate and bank exposures</li> </ol>	<ol style="list-style-type: none"> <li>“Current ” or “forward looking” to reflect impact of economic scenarios;</li> <li>Only costs directly attributable to the collection of recoveries (remove the collective cost in BASEL LGD);</li> <li>Discount rate based effective interest rate;</li> <li>Timely evaluations of collateral value and consideration of future value changes</li> </ol>
<b>EAD</b>	<ol style="list-style-type: none"> <li>“Downturn” EAD to reflect what would be expected during a period of economic downturn conditions;</li> <li>Estimates take into consideration of on/off balance sheet exposures adjusted for estimated future draw downs over the lifetime.</li> </ol>	<ol style="list-style-type: none"> <li>Consider all contractual terms (e.g. prepayment, usage, call and similar options) over the lifetime;</li> <li>Adjust for firm’s estimates for the undrawn commitments</li> </ol>

# Leveraging the CCAR/DFAST Stress Testing Framework

## Starting Point

- » CCAR/DFAST or other stress testing models
- » These models have gone through extensive and rigorous validation and benchmark
- » Resource and expertise built for CCAR/DFAST



## Enhancement

- † Calibrate the models to both “adverse/stress” and “normal” scenarios
- † Extend term structure of PD and LGD
- † Enhance segmentation and granularity



## Considerations

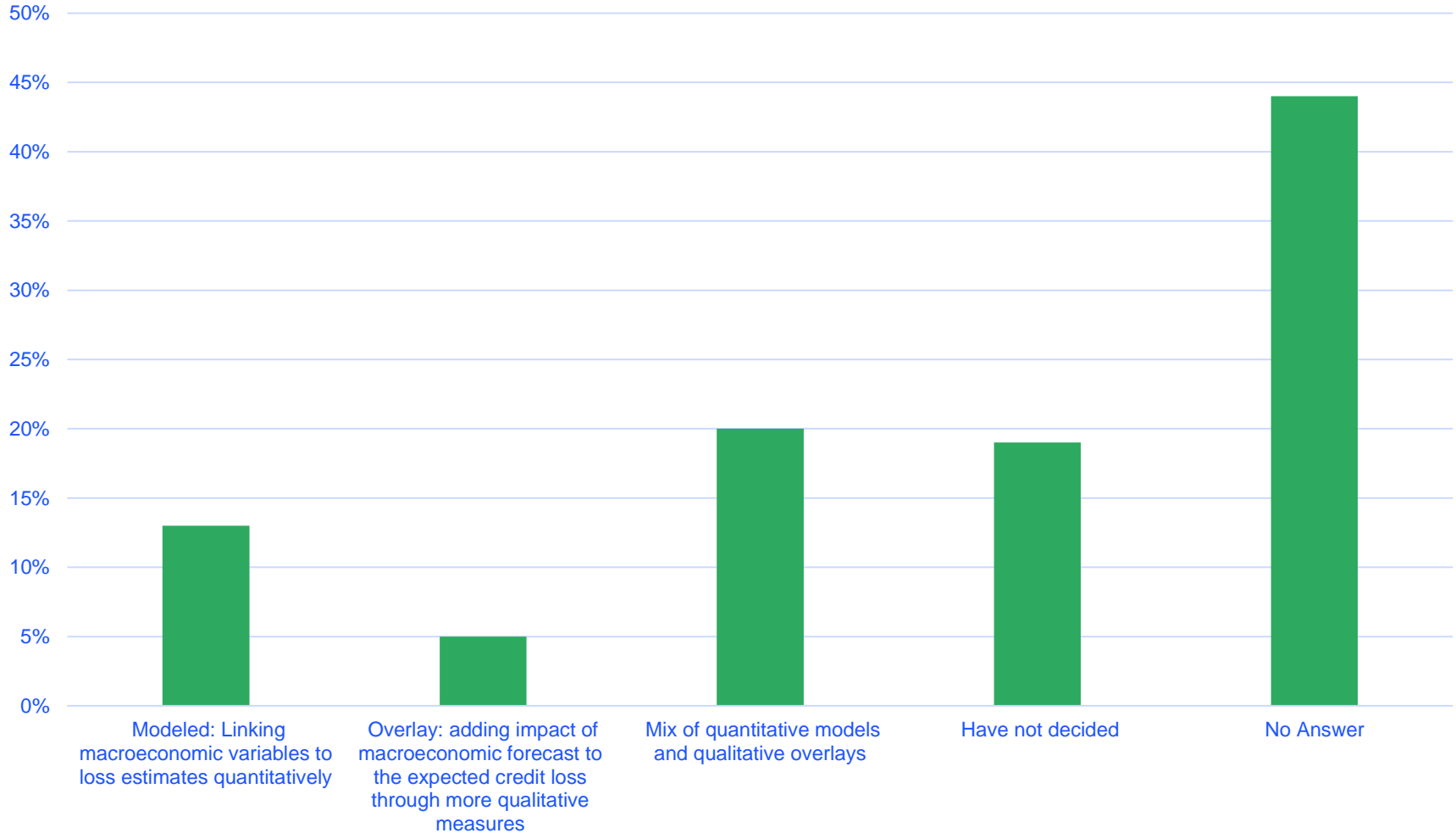
- ✓ More seamless integration with CCAR/DFAST process
- ✓ There is a wealth of data and expertise already in place as a result of CCAR implementation
- ✓ Consider the linkage with other business applications such as underwriting, pricing of loans etc.



## 4. How do you plan to incorporate forward-looking information to expected credit loss estimates?

- A. Modeled: Linking macroeconomic variables to loss estimates quantitatively
- B. Overlay: adding impact of macroeconomic forecast to the expected credit loss through more qualitative measures
- C. Mix of quantitative models and qualitative overlays
- D. Have not decided

## How do you plan to incorporate forward-looking information to expected credit loss estimates?



# Business Impacts of CECL can be Significant and Profound

## IFRS 9 packs bigger punch than Basel changes, say bankers

Capital hit from new loan loss accounting rules to rival incoming Basel regulations



Loss allowance under CECL and FAS 5&114 can differ materially due to differences

- » between PIT and TTC PDs
- » lifetime expected loss and the assumed loss emergence period

CECL may affect

- » Fluctuation / volatility in provision and earnings,
- » Available capital

These impacts on earnings and capital may be significant with consequences for

- » Loan origination---loan product term and pricing
- » Customer relationship
- » Hedging and other credit portfolio decisions

*Will my approaches to estimating CECL help track and monitor these impacts? Will they help design metrics to reduce potential volatility—e.g. by diversifying loans within portfolios to reduce concentrations of credit risk or adjusting maturities of loans?*

# Key Takeaways

- » Modeling expected credit losses represents one of the key challenges of the CECL accounting standard
- » Existing risk measurement tools used for regulatory capital, internal ratings, and stress testing can serve as good starting points. However, necessary enhancements may include:
  - Segmentation granularity
  - Adjustment for current conditions
  - Linkage to forward-looking scenarios
  - Extension to life of loan
  - Adjustment for built-in bias (i.e. conservatism)
- » The appropriate approach ultimately depends on portfolio- and organization-specific considerations, including data availability and interconnectedness of banking functions
- » The rest of the webinar series will focus on modeling considerations for specific asset classes

Welcome!

## Moody's Analytics CECL Webinar Series: Expected Credit Loss Quantification



### Introduction to CECL Quantification

*Today*

#### **CRE CECL Methodologies**

Tuesday, February 28, 2017 | 1:00PM EST

#### C&I CECL Methodologies

Tuesday, March 14, 2017 | 1:00PM EST

#### Retail CECL Methodologies

Tuesday, March 28, 2017 | 1:00PM EST

#### Structured Assets CECL Methodologies

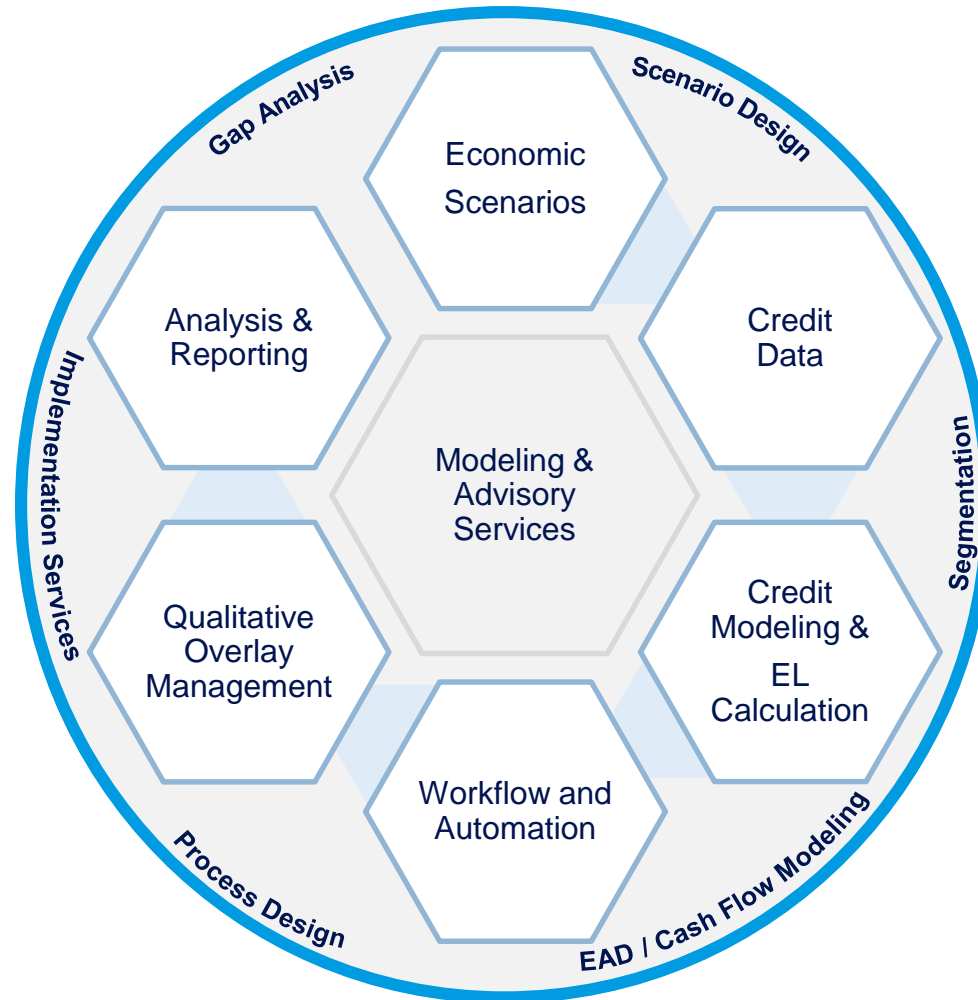
Thursday, April 20, 2017 | 1:00PM EST

**To find out more about Moody's  
Analytics perspectives on CECL  
and register for our webinar series  
visit:**

[www.moodyanalytics.com/cecl](http://www.moodyanalytics.com/cecl)

# Moody's Credit Loss and Impairment Analysis Suite

## Solutions to Support CECL Impairment Calculation



© 2017 Moody's Corporation, Moody's Investors Service, Inc., Moody's Analytics, Inc. and/or their licensors and affiliates (collectively, "MOODY'S"). All rights reserved.

CREDIT RATINGS ISSUED BY MOODY'S INVESTORS SERVICE, INC. AND ITS RATINGS AFFILIATES ("MIS") ARE MOODY'S CURRENT OPINIONS OF THE RELATIVE FUTURE CREDIT RISK OF ENTITIES, CREDIT COMMITMENTS, OR DEBT OR DEBT-LIKE SECURITIES, AND CREDIT RATINGS AND RESEARCH PUBLICATIONS PUBLISHED BY MOODY'S ("MOODY'S PUBLICATIONS") MAY INCLUDE MOODY'S CURRENT OPINIONS OF THE RELATIVE FUTURE CREDIT RISK OF ENTITIES, CREDIT COMMITMENTS, OR DEBT OR DEBT-LIKE SECURITIES. MOODY'S DEFINES CREDIT RISK AS THE RISK THAT AN ENTITY MAY NOT MEET ITS CONTRACTUAL, FINANCIAL OBLIGATIONS AS THEY COME DUE AND ANY ESTIMATED FINANCIAL LOSS IN THE EVENT OF DEFAULT. CREDIT RATINGS DO NOT ADDRESS ANY OTHER RISK, INCLUDING BUT NOT LIMITED TO: LIQUIDITY RISK, MARKET VALUE RISK, OR PRICE VOLATILITY. CREDIT RATINGS AND MOODY'S OPINIONS INCLUDED IN MOODY'S PUBLICATIONS ARE NOT STATEMENTS OF CURRENT OR HISTORICAL FACT. MOODY'S PUBLICATIONS MAY ALSO INCLUDE QUANTITATIVE MODEL-BASED ESTIMATES OF CREDIT RISK AND RELATED OPINIONS OR COMMENTARY PUBLISHED BY MOODY'S ANALYTICS, INC. CREDIT RATINGS AND MOODY'S PUBLICATIONS DO NOT CONSTITUTE OR PROVIDE INVESTMENT OR FINANCIAL ADVICE, AND CREDIT RATINGS AND MOODY'S PUBLICATIONS ARE NOT AND DO NOT PROVIDE RECOMMENDATIONS TO PURCHASE, SELL, OR HOLD PARTICULAR SECURITIES. NEITHER CREDIT RATINGS NOR MOODY'S PUBLICATIONS COMMENT ON THE SUITABILITY OF AN INVESTMENT FOR ANY PARTICULAR INVESTOR. MOODY'S ISSUES ITS CREDIT RATINGS AND PUBLISHES MOODY'S PUBLICATIONS WITH THE EXPECTATION AND UNDERSTANDING THAT EACH INVESTOR WILL, WITH DUE CARE, MAKE ITS OWN STUDY AND EVALUATION OF EACH SECURITY THAT IS UNDER CONSIDERATION FOR PURCHASE, HOLDING, OR SALE. MOODY'S CREDIT RATINGS AND MOODY'S PUBLICATIONS ARE NOT INTENDED FOR USE BY RETAIL INVESTORS AND IT WOULD BE RECKLESS AND INAPPROPRIATE FOR RETAIL INVESTORS TO USE MOODY'S CREDIT RATINGS OR MOODY'S PUBLICATIONS WHEN MAKING AN INVESTMENT DECISION. IF IN DOUBT YOU SHOULD CONTACT YOUR FINANCIAL OR OTHER PROFESSIONAL ADVISER.

ALL INFORMATION CONTAINED HEREIN IS PROTECTED BY LAW, INCLUDING BUT NOT LIMITED TO, COPYRIGHT LAW, AND NONE OF SUCH INFORMATION MAY BE COPIED OR OTHERWISE REPRODUCED, REPACKAGED, FURTHER TRANSMITTED, TRANSFERRED, DISSEMINATED, REDISTRIBUTED OR RESOLD, OR STORED FOR SUBSEQUENT USE FOR ANY SUCH PURPOSE, IN WHOLE OR IN PART, IN ANY FORM OR MANNER OR BY ANY MEANS WHATSOEVER, BY ANY PERSON WITHOUT MOODY'S PRIOR WRITTEN CONSENT.

All information contained herein is obtained by MOODY'S from sources believed by it to be accurate and reliable. Because of the possibility of human or mechanical error as well as other factors, however, all information contained herein is provided "AS IS" without warranty of any kind. MOODY'S adopts all necessary measures so that the information it uses in assigning a credit rating is of sufficient quality and from sources MOODY'S considers to be reliable including, when appropriate, independent third-party sources. However, MOODY'S is not an auditor and cannot in every instance independently verify or validate information received in the rating process or in preparing the Moody's Publications.

To the extent permitted by law, MOODY'S and its directors, officers, employees, agents, representatives, licensors and suppliers disclaim liability to any person or entity for any indirect, special, consequential, or incidental losses or damages whatsoever arising from or in connection with the information contained herein or the use of or inability to use any such information, even if MOODY'S or any of its directors, officers, employees, agents, representatives, licensors or suppliers is advised in advance of the possibility of such losses or damages, including but not limited to: (a) any loss of present or prospective profits or (b) any loss or damage arising where the relevant financial instrument is not the subject of a particular credit rating assigned by MOODY'S.

To the extent permitted by law, MOODY'S and its directors, officers, employees, agents, representatives, licensors and suppliers disclaim liability for any direct or compensatory losses or damages caused to any

person or entity, including but not limited to by any negligence (but excluding fraud, willful misconduct or any other type of liability that, for the avoidance of doubt, by law cannot be excluded) on the part of, or any contingency within or beyond the control of, MOODY'S or any of its directors, officers, employees, agents, representatives, licensors or suppliers, arising from or in connection with the information contained herein or the use of or inability to use any such information.

NO WARRANTY, EXPRESS OR IMPLIED, AS TO THE ACCURACY, TIMELINESS, COMPLETENESS, MERCHANTABILITY OR FITNESS FOR ANY PARTICULAR PURPOSE OF ANY SUCH RATING OR OTHER OPINION OR INFORMATION IS GIVEN OR MADE BY MOODY'S IN ANY FORM OR MANNER WHATSOEVER.

Moody's Investors Service, Inc., a wholly-owned credit rating agency subsidiary of Moody's Corporation ("MCO"), hereby discloses that most issuers of debt securities (including corporate and municipal bonds, debentures, notes and commercial paper) and preferred stock rated by Moody's Investors Service, Inc. have, prior to assignment of any rating, agreed to pay to Moody's Investors Service, Inc. for appraisal and rating services rendered by it fees ranging from \$1,500 to approximately \$2,500,000. MCO and MIS also maintain policies and procedures to address the independence of MIS's ratings and rating processes. Information regarding certain affiliations that may exist between directors of MCO and rated entities, and between entities who hold ratings from MIS and have also publicly reported to the SEC an ownership interest in MCO of more than 5%, is posted annually at [www.moody's.com](http://www.moody's.com) under the heading "Investor Relations — Corporate Governance — Director and Shareholder Affiliation Policy."

Additional terms for Australia only: Any publication into Australia of this document is pursuant to the Australian Financial Services License of MOODY'S affiliate, Moody's Investors Service Pty Limited ABN 61 003 399 657AFSL 336969 and/or Moody's Analytics Australia Pty Ltd ABN 94 105 136 972 AFSL 383569 (as applicable). This document is intended to be provided only to "wholesale clients" within the meaning of section 761G of the Corporations Act 2001. By continuing to access this document from within Australia, you represent to MOODY'S that you are, or are accessing the document as a representative of, a "wholesale client" and that neither you nor the entity you represent will directly or indirectly disseminate this document or its contents to "retail clients" within the meaning of section 761G of the Corporations Act 2001.

MOODY'S credit rating is an opinion as to the creditworthiness of a debt obligation of the issuer, not on the equity securities of the issuer or any form of security that is available to retail investors. It would be reckless and inappropriate for retail investors to use MOODY'S credit ratings or publications when making an investment decision. If in doubt you should contact your financial or other professional adviser.

Additional terms for Japan only: Moody's Japan K.K. ("MJKK") is a wholly-owned credit rating agency subsidiary of Moody's Group Japan G.K., which is wholly-owned by Moody's Overseas Holdings Inc., a wholly-owned subsidiary of MCO. Moody's SF Japan K.K. ("MSFJ") is a wholly-owned credit rating agency subsidiary of MJKK. MSFJ is not a Nationally Recognized Statistical Rating Organization ("NRSRO"). Therefore, credit ratings assigned by MSFJ are Non-NRSRO Credit Ratings. Non-NRSRO Credit Ratings are assigned by an entity that is not a NRSRO and, consequently, the rated obligation will not qualify for certain types of treatment under U.S. laws. MJKK and MSFJ are credit rating agencies registered with the Japan Financial Services Agency and their registration numbers are FSA Commissioner (Ratings) No. 2 and 3 respectively.

MJKK or MSFJ (as applicable) hereby disclose that most issuers of debt securities (including corporate and municipal bonds, debentures, notes and commercial paper) and preferred stock rated by MJKK or MSFJ (as applicable) have, prior to assignment of any rating, agreed to pay to MJKK or MSFJ (as applicable) for appraisal and rating services rendered by it fees ranging from JPY200,000 to approximately JPY350,000,000. MJKK and MSFJ also maintain policies and procedures to address Japanese regulatory requirements.