

# Expected Loss Quantification: *Factors That Move the Needle*

September 2017

# Agenda

1. Foundational Elements
2. Economic Scenarios and Loss Forecasting
3. Conclusion

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Foundational Elements

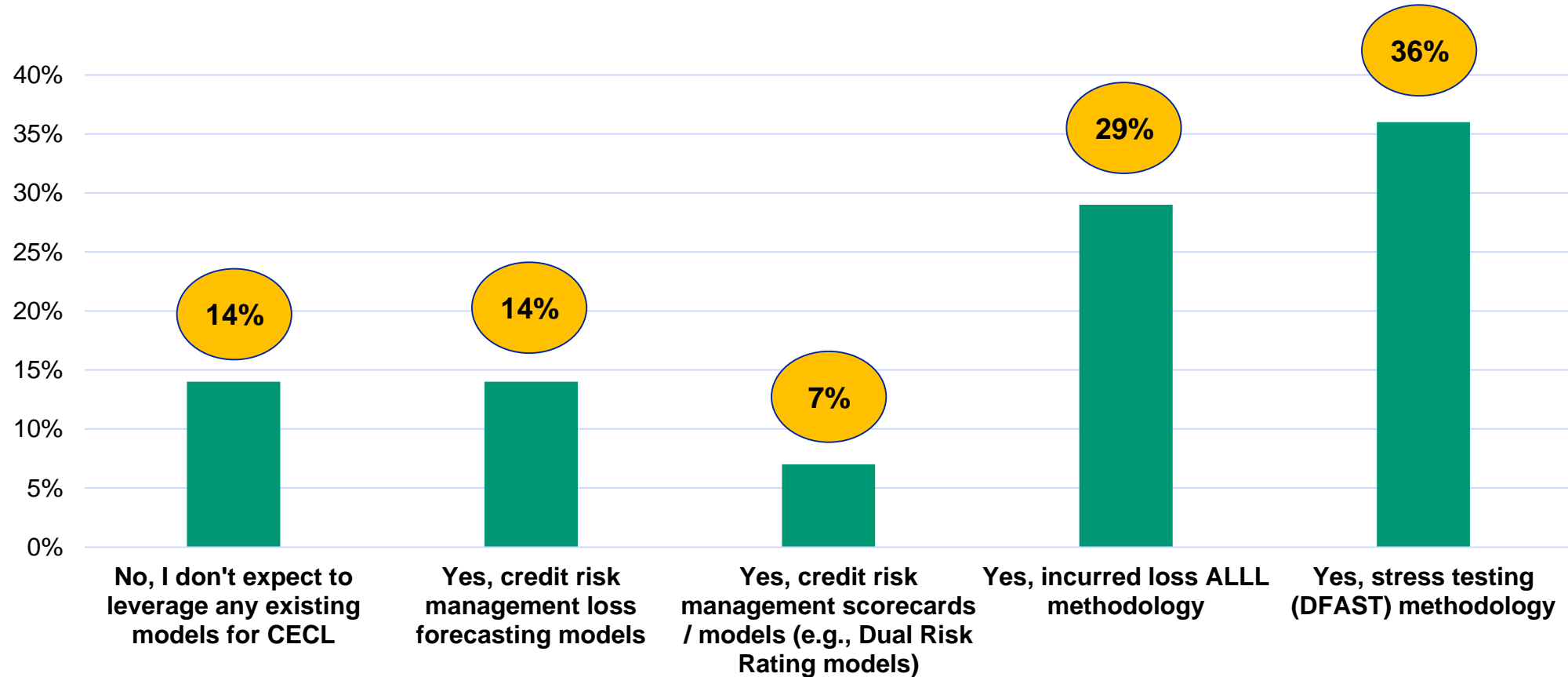
# From the Interagency Guidance...

“ ...better alignment of allowance estimation practices with existing credit risk assessment and risk management practices is likely, as the new accounting standard allows a financial institution to leverage its current internal credit risk systems as a framework for estimating expected credit losses. ”

*Interagency Frequently Asked Questions on the New Accounting Standard on Financial Instruments – Credit Losses*

# Starting Points for CECL Implementation

Do you anticipate leveraging existing models in your CECL process?

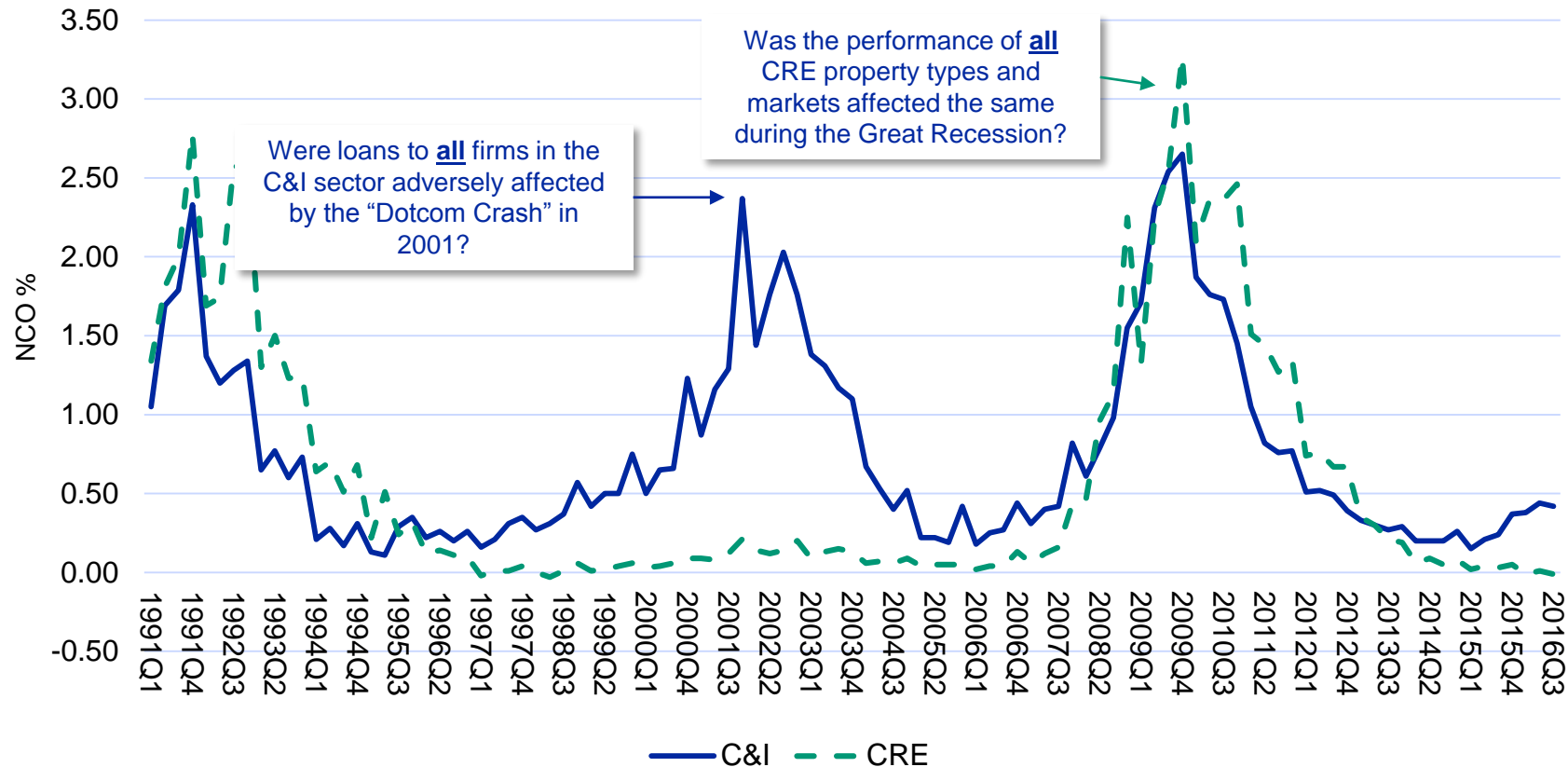


Moody's Analytics, February 2017

# Common Pitfalls: Segmentation Matters

## Example: Call Report Level NCOs

Net Charge Off Rate for C&I and CRE Loans 1991 - 2016



What about today's credit conditions?

...or the near-term future?

... or your individual portfolio concentrations?

# CECL Requirement: “Pool” Evaluation of ECL When Similar Risk Characteristics Exist

## Collective (“Pool”) Evaluation

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

## Individual Evaluation

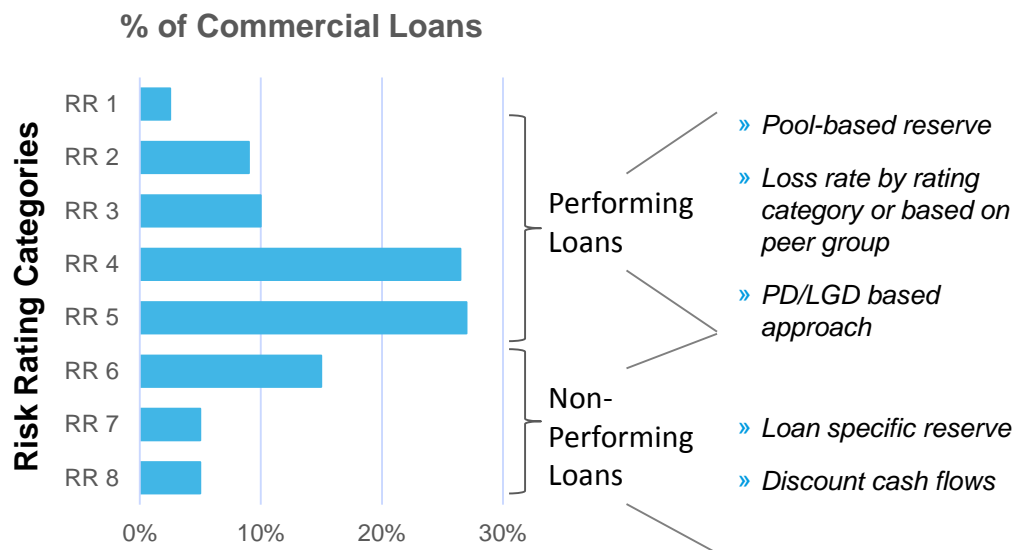
- » Required when a financial asset does not share risk characteristics with its other financial assets

## 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

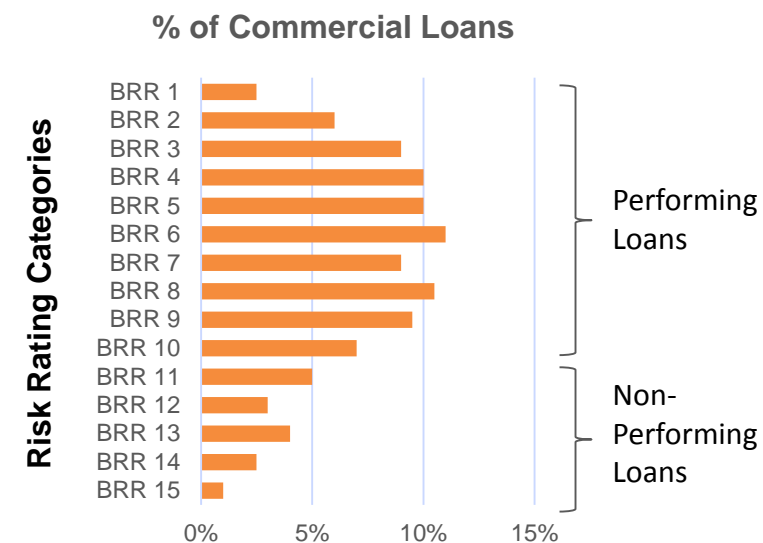
# A Word on Risk Ratings Processes

## COMMON STORY



- » Expert judgment driven assessment of risk
- » Risk rating represents rank ordering of expected loss
- » No separation between borrower risk and facility risk

## BETTER WAY

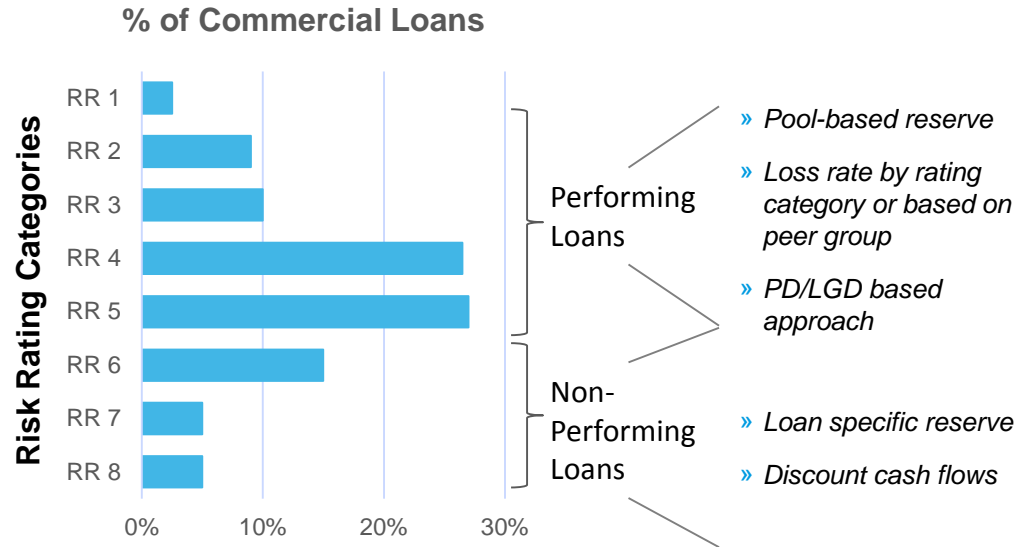


- » Dual risk ratings: borrower (BRR) distinct from facility
- » Often associated with Advanced Basel II/III approaches for capital calculation
- » Risk drivers include qualitative and quantitative components



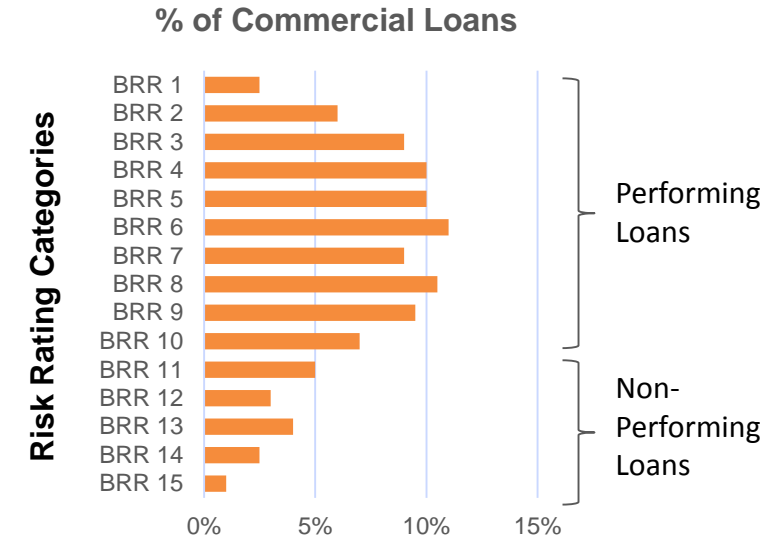
# Why Are Accurate Risk Ratings are Critical?

## COMMON STORY



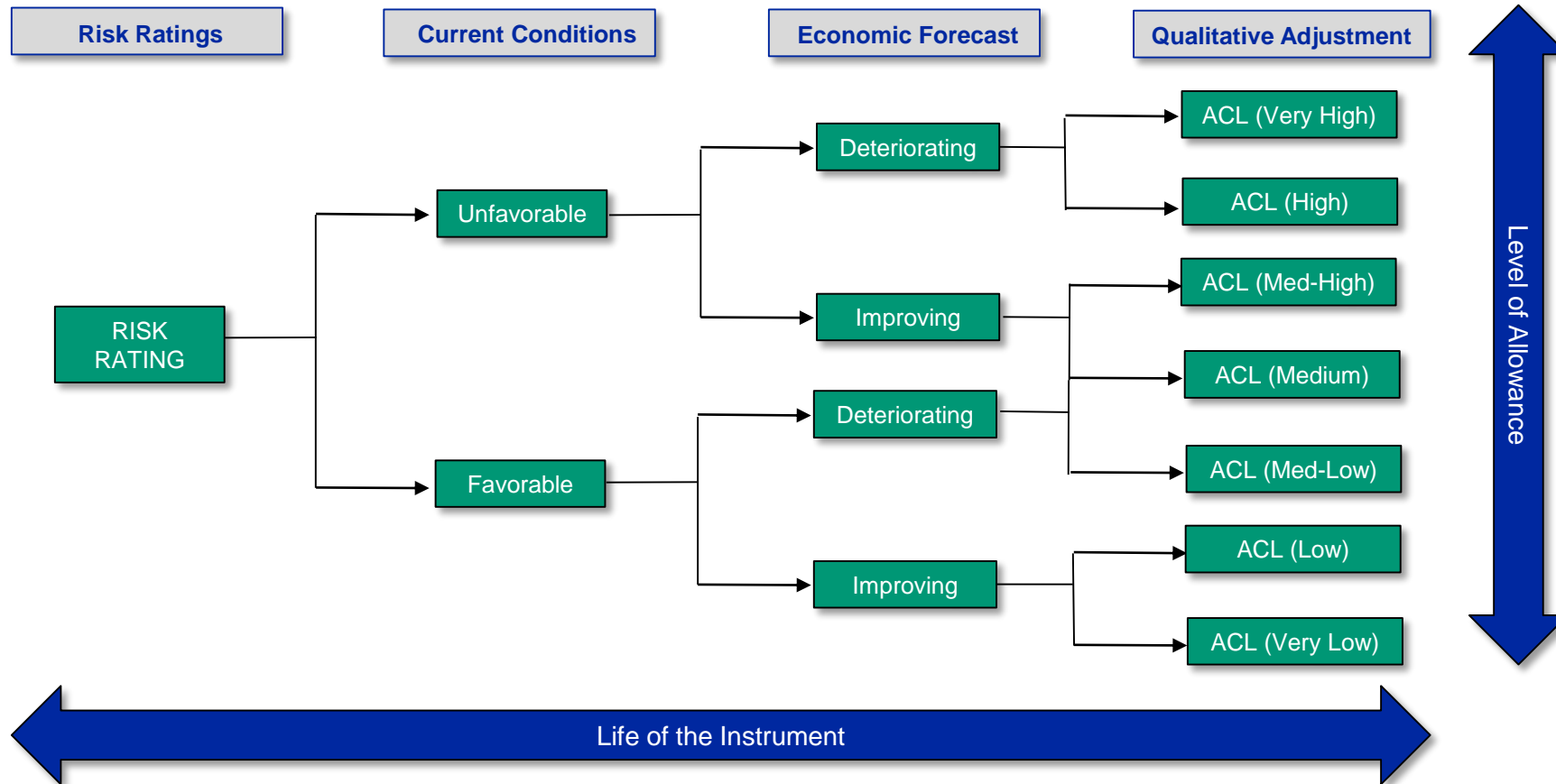
- » Could lead to clustering of credits in certain pass risk grades.
- » Questions:
  - Meaning of ratings?
  - Master rating scale concentrations?
  - Portfolio segmentation?

## BETTER WAY



- » Benefits of a more refined risk rating process:
  - Can isolate drivers of credit risk more effectively
  - Reduces the subjectivity within the risk-rating process
  - Enables a bank to develop more repeatable, reasonable, and supportable forecasts

# From Risk Rating to CECL



**Increase in loss allowance under CECL to be driven by:**

- » Level of PDs and LGDs
- » State of the business cycle
- » Reasonable and supportable forecasts
- » Maturity of exposures

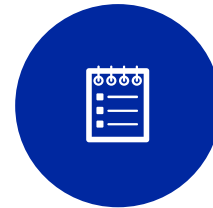
# What if CECL Was In Effect in 2007?

## Question: Does granularity matter?



### Case Study

- » Sample of 200 C&I loans (non-financial institutions)
- » 2007 Q1 originations, >3-year maturities
- » Internally rated 1-5 (pass grades as of Q4 2007)
- » Analysis periods from 2007 Q4 to 2009 Q4
- » Moody's economic forecast scenarios as of 2007Q4, 2008 Q4 and 2009 Q4



### Assumptions

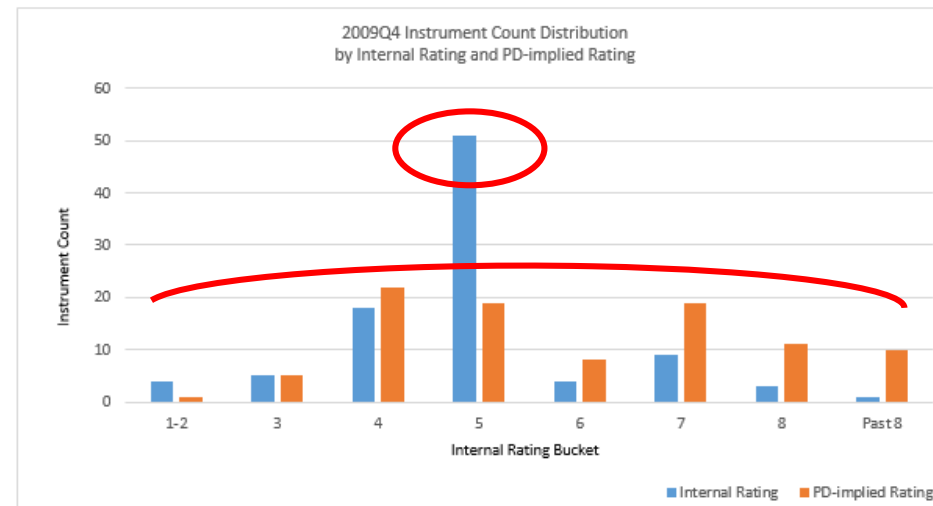
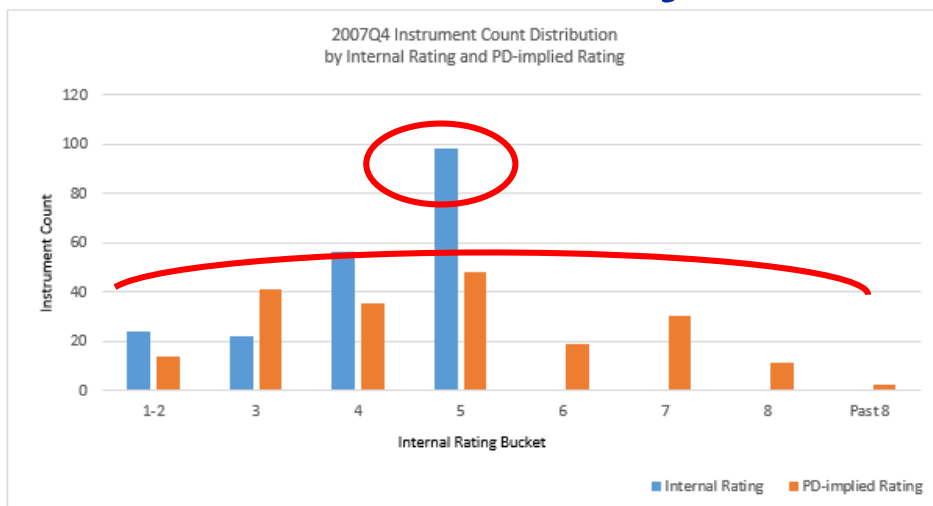
#### For the Rating-based Analysis:

- » PD measures were derived from internal ratings (1-5) that were mapped to the Moody's rating-based PD map

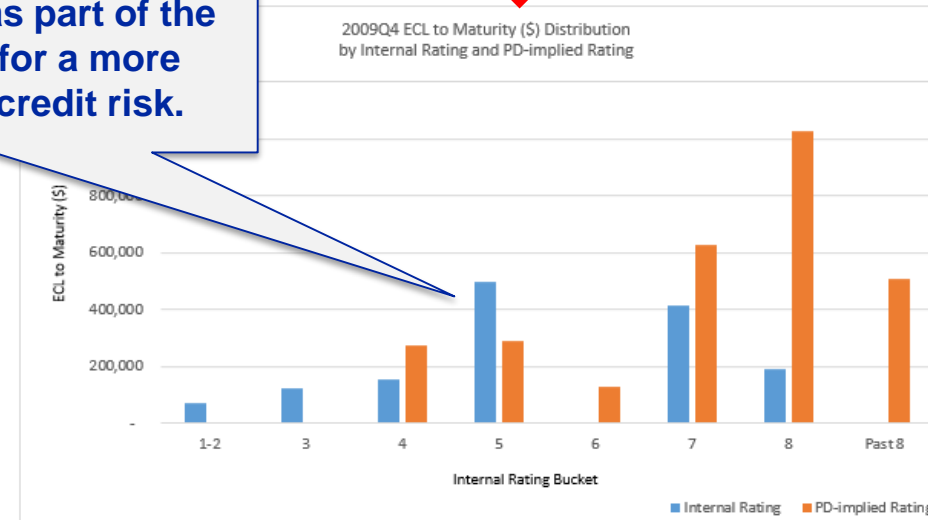
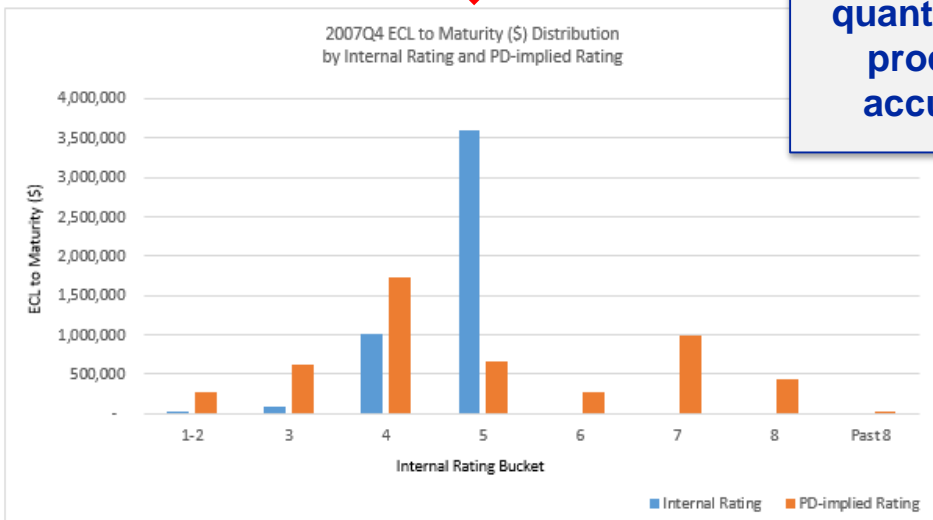
#### For the PD-based Analysis:

- » PD measures were calculated based on the obligor's financial statement and economic cycle adjustments, independently of the internal ratings

# Does Granularity Matter? Yes!

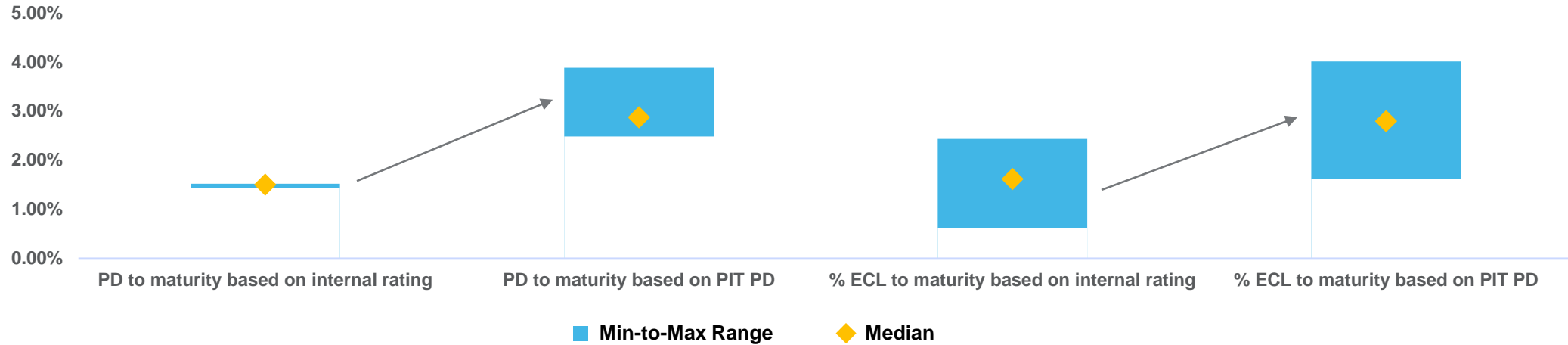


**Granular analysis using objective quantitative tools as part of the process provide for a more accurate view of credit risk.**



# Differences Are More Pronounced At Instrument Level

Instruments that are internally rated 5 with the TTC (long term) rating-implied PD of 1.51%:



	Individual Instruments						
	1	2	3	4	5	6	7
PD to maturity based on internal rating	1.52%	1.52%	1.51%	1.50%	1.49%	1.48%	1.43%
PD to maturity based on PIT PD	2.54%	3.14%	2.87%	2.54%	3.88%	2.48%	3.13%
% ECL to maturity based on internal rating	2.43%	2.22%	1.68%	1.61%	1.15%	1.13%	0.61%
% ECL to maturity based on PIT PD	4.01%	2.36%	2.14%	2.79%	1.61%	3.70%	3.37%

# CECL as Pricing and Capital Advantage

“ [Bankers] will likely be expected to integrate the assumptions used in their CECL loss estimates (mainly those pertaining to forecasts of the future) with those used in asset/liability management, capital management, and overall budgeting. CECL’s requirement to record a life of loan loss estimate at origination (in other words, recognize the cost up front), for practical purposes, will force a bank to weigh the potential risks much more closely before expanding its business. This can change bank behavior. ”

*FASB’s Current Expected Credit Loss Model for Credit Loss Accounting (CECL):  
Background and FAQ’s for Bankers*  
American Bankers Association, June 2016

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## Economic Scenarios and Loss Forecasting

# The Trouble With Our Predictions

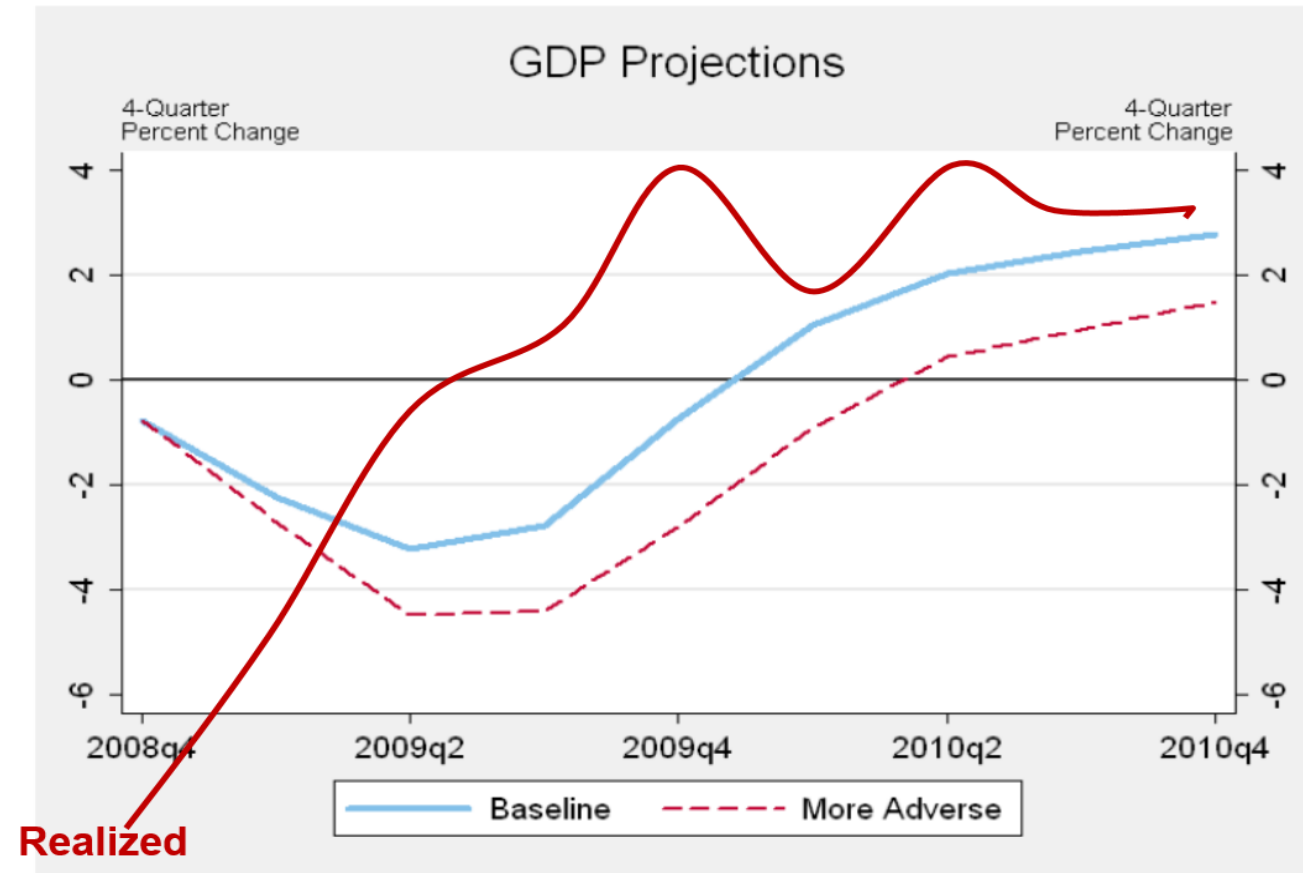
“ It’s hard enough to know where the economy is going. But it’s much, much harder if you don’t know where it is to begin with. ”

Nate Silver  
*“The Signal and The Noise”*

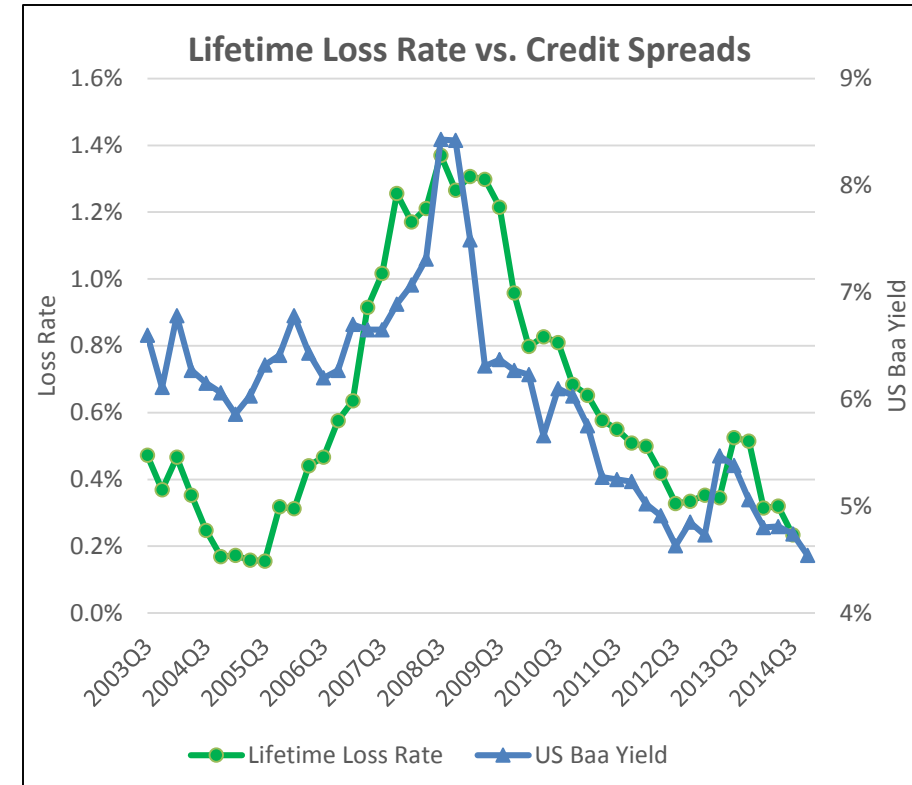
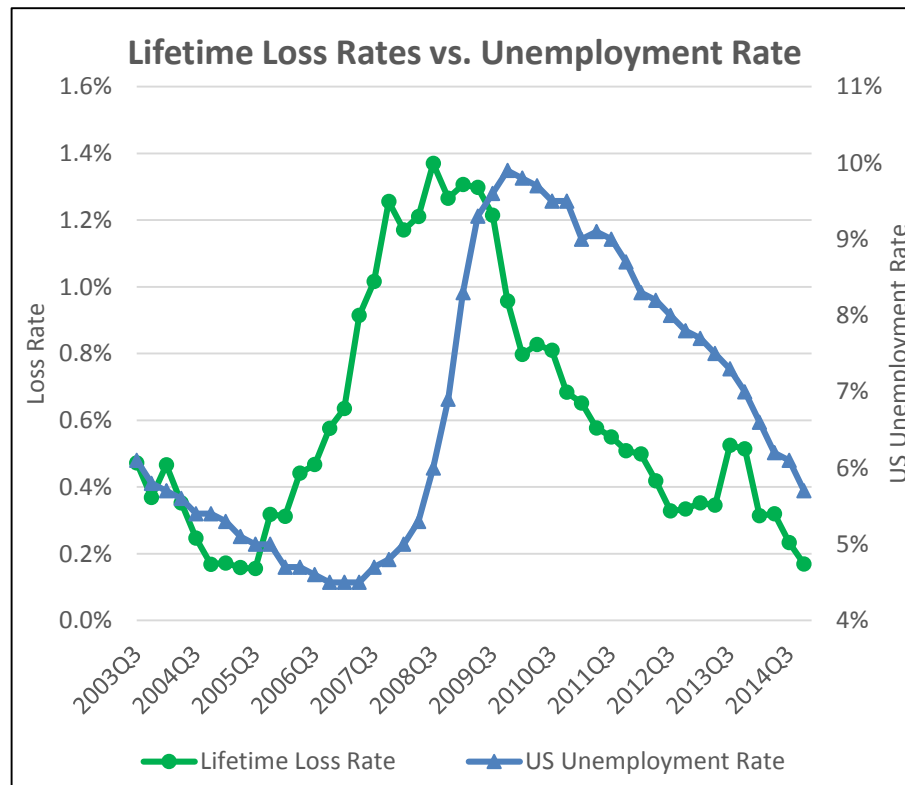


# Realized Recession Was Worse but Recovered Fast

The Fed's SCAP forecast from Early 2009



# Finding Right Economic Variables for Risk Attributes is Critical



# What is Reasonable and Supportable?

## Two Considerations to Determine Forecast Horizon:



### CECL Model

- » Is the length of observed historical performance sufficient to project losses?
- » Is observed history of performance relevant for the future time horizon?
- » Is the methodology used reasonable and supportable over the time horizon?



### Forecast

- » Are forecasts for forward-looking drivers econometrically determined?
- » Is data with limited history being extrapolated?
- » Are economic cycles being forecasted in a reasonable fashion?

# Range of Moody's Analytics Macroeconomic Scenarios

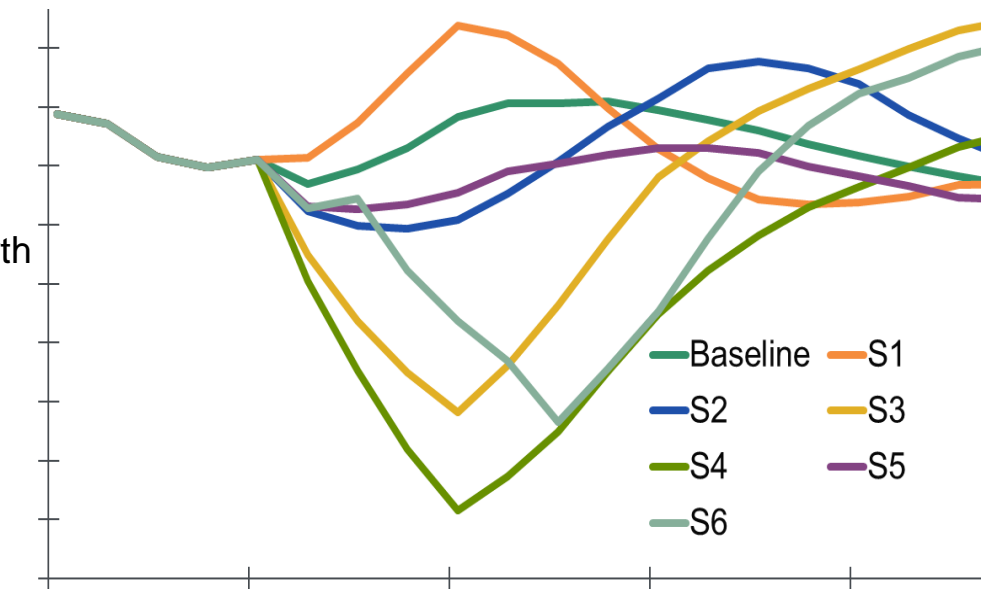
## Economic scenarios (2007)

- BL Baseline Scenario
- S2 Housing Market Recovery, Mild Recession
- S4 Housing Market Crash, Severe Recession

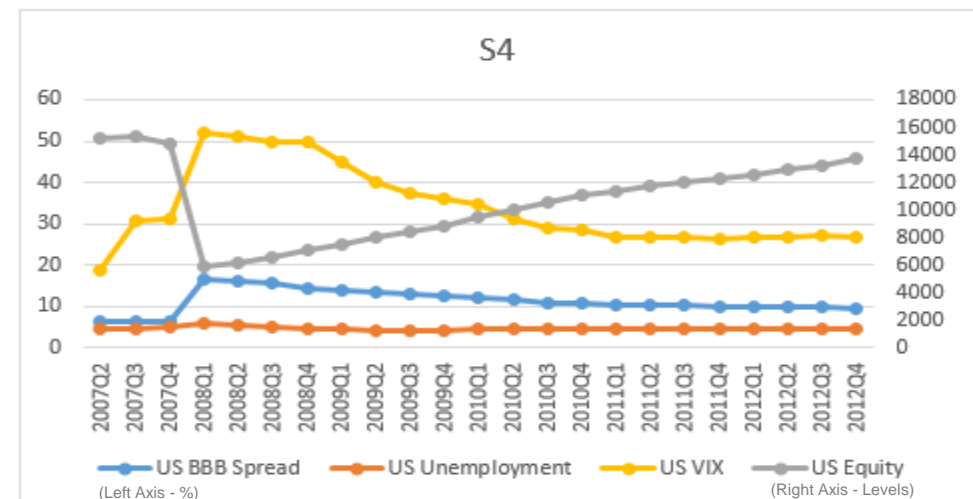
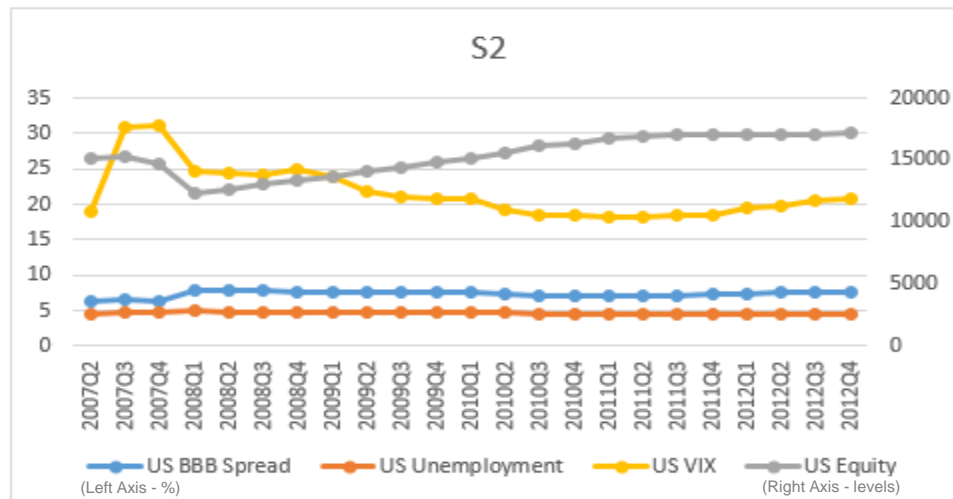
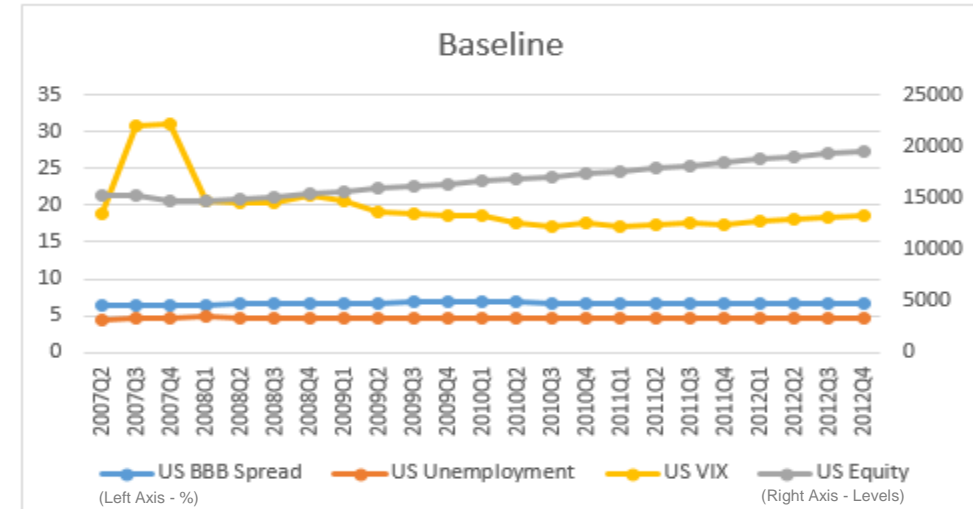
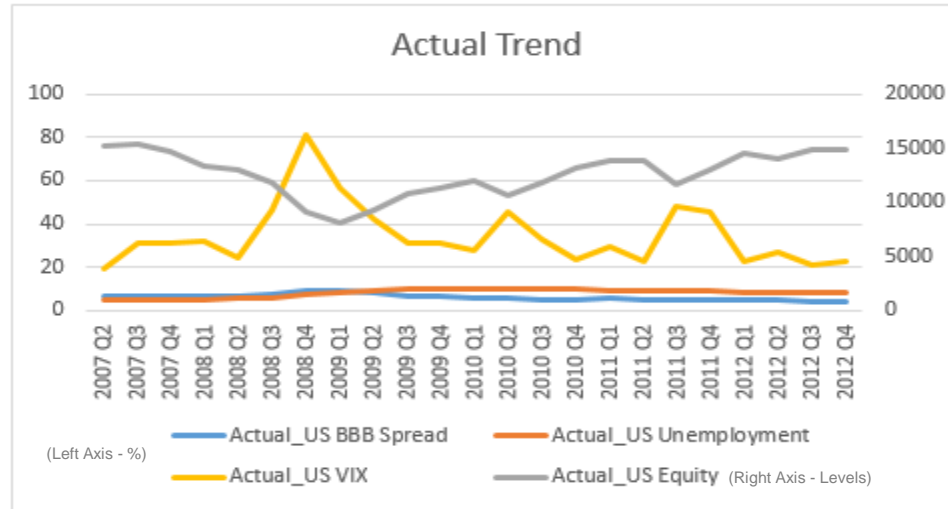
## Economic scenarios (2017)

- S1 Stronger Near-Term Growth
- S2 Slower Near-Term Growth
- S3 Moderate Recession
- S4 Protracted Slump
- S5 Below-Trend Long-Term Growth
- S6 Stagflation
- S7 Next-Cycle Recession
- S8 Low Oil Price
- CF Consensus Scenario
- BL Baseline Scenario

Real GDP growth rate, % Yr/Yr



# Range of Scenarios in 2007 Compared to Actual



# What if CECL Was In Effect in 2007? *(Continued)*



## Questions to Test

- » What can we learn about impact of reasonable & supportable period length?
  - Revert to Moody's long term PDs
  - Compare 1 year, 2 year and no mean reversion
- » Is there benefit to using more than one scenarios?
  - Compare outcomes based on different scenarios
  - Compare probability-weighted outcome of 3 scenarios to a single scenario



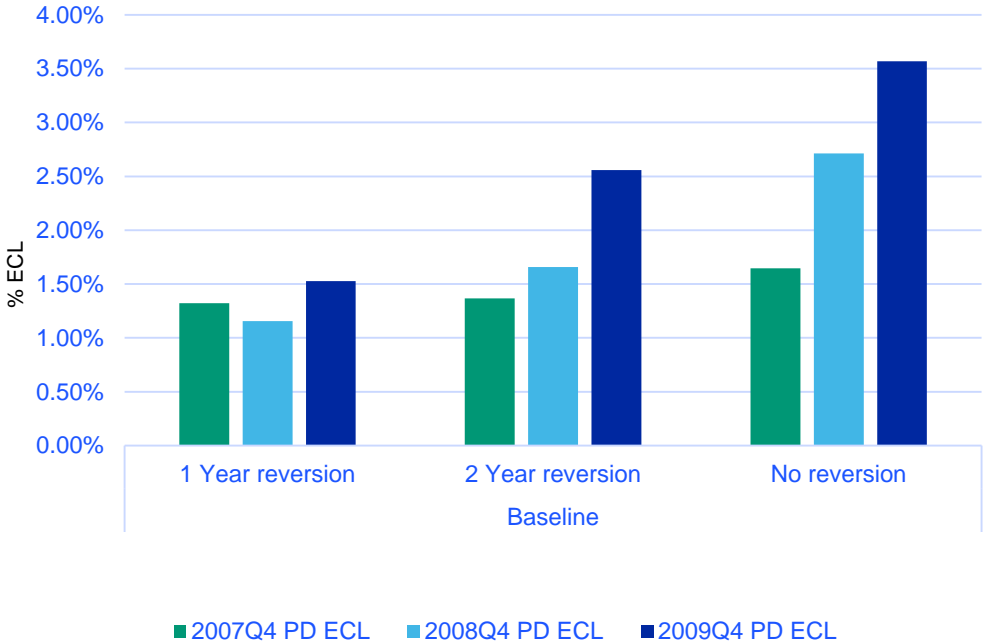
## Assumptions

### Economic variables for C&I portfolio

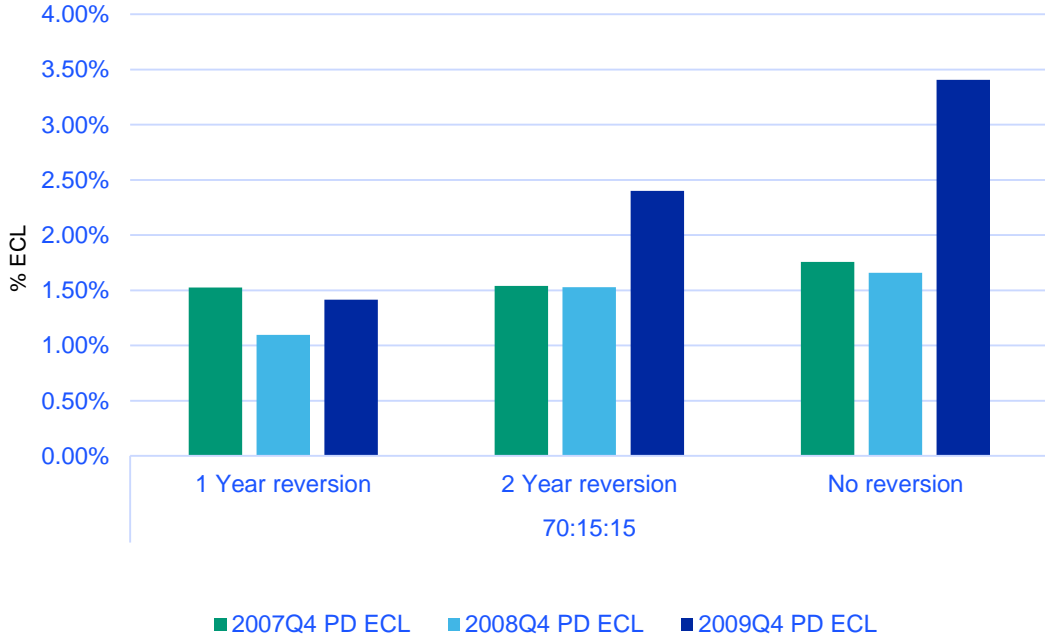
- » US Unemployment Rate
- » S&P Equity Index
- » CBOE Volatility Index (VIX)
- » Intermediate Term BBB Bond Spread

# Testing Impact of Scenario Selection

Baseline Scenario



Scenario Combination (70% BL: 15% S2: 15% S4)



Reversion to historical information beyond reasonable horizon addresses forecast uncertainty.... As does forecasting under multiple scenarios.

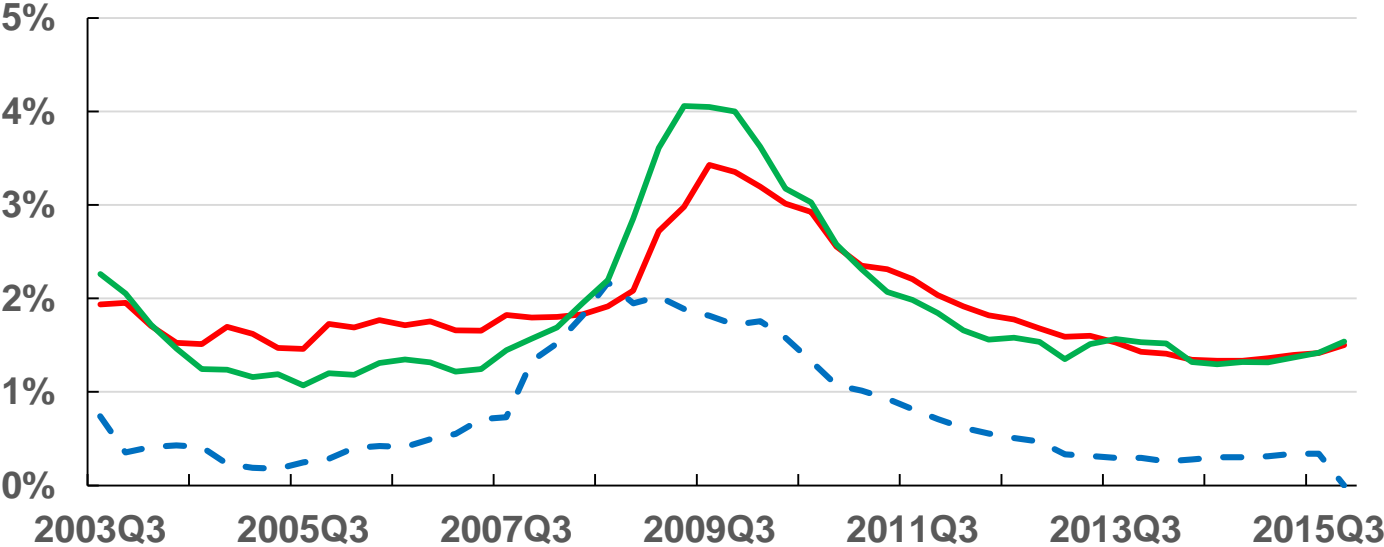
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Conclusion



# What If CECL Was in Place During Financial Crisis...

## Bank Level View

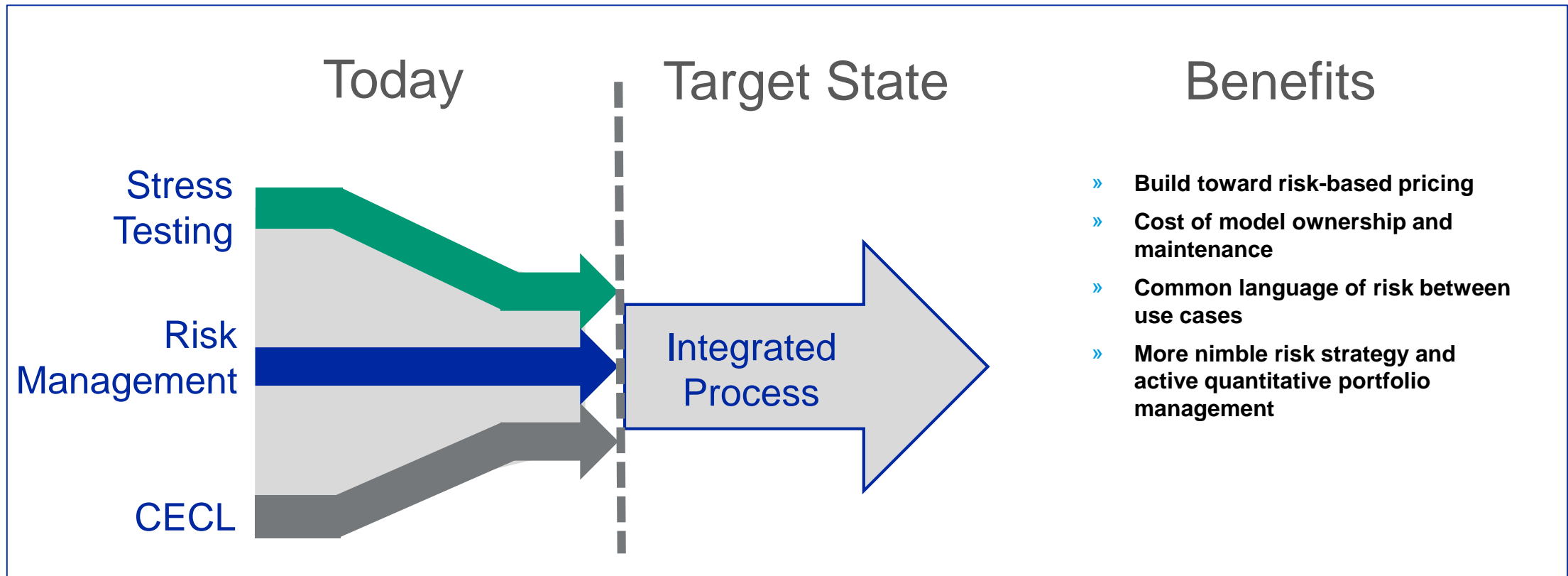


- Modeled C&I Allowance Rate, Incurred Loss
- - - Next 4-Quarter NCO Rate (FR Y-9C)
- Modeled C&I Allowance Rate, CECL

Standard Deviation	Incurred Loss	CECL
2003Q3 – 2015Q4	0.55%	0.83%
Crisis Period (2007Q1 – 2010Q4)	0.66%	1.04%

# Looking ahead...

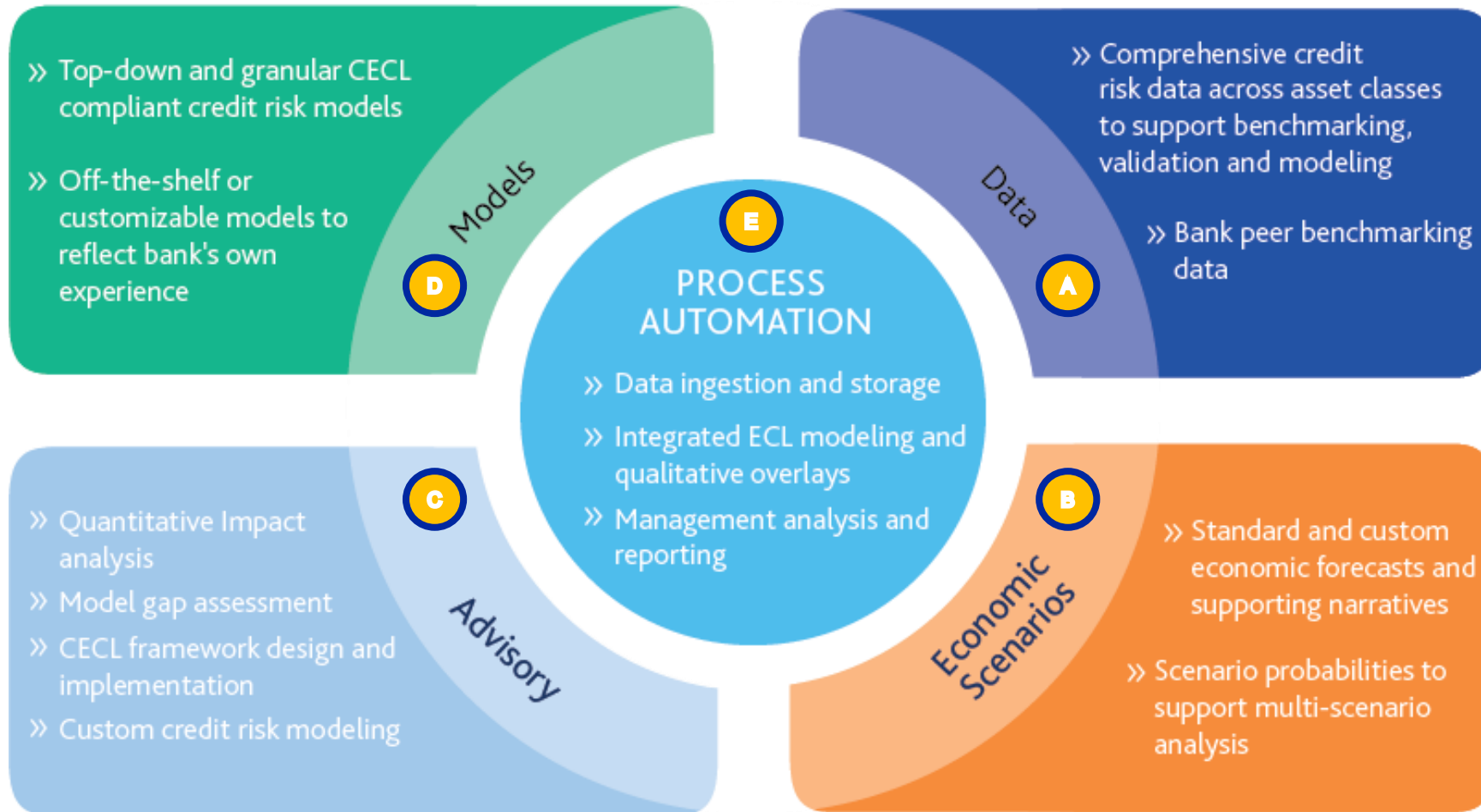
The opportunity to align risk management processes and forecasts



A

About Moody's Analytics

# Moody's Analytics Core Capabilities



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*With thanks to Jin Oh, Ed Young*

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