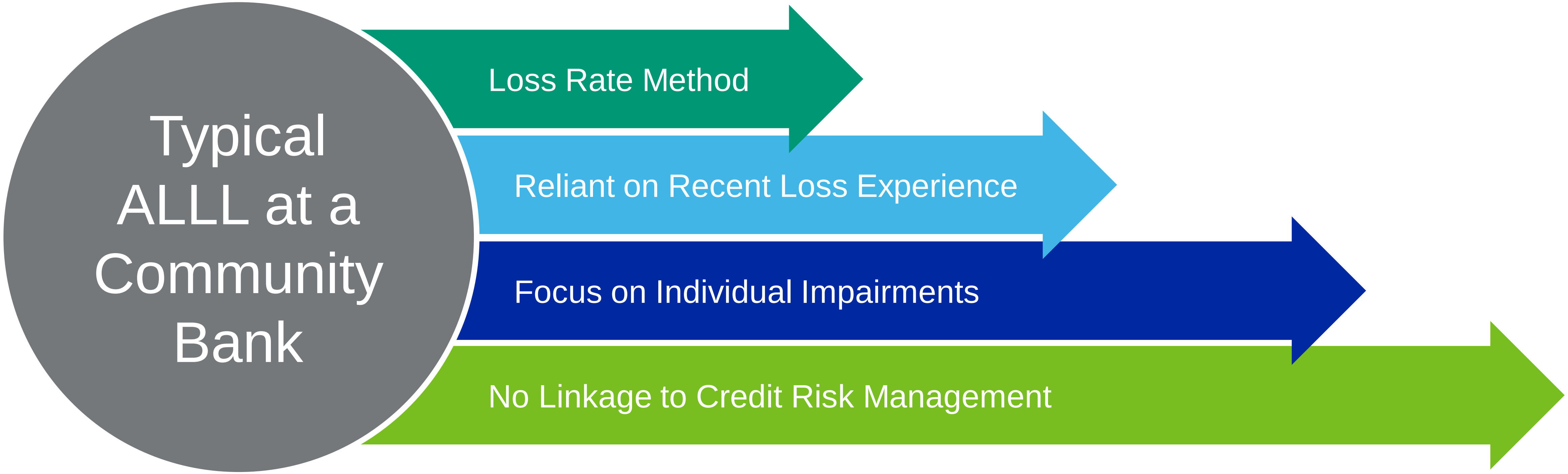
Moody's Analytics

Simple But Not Simpler: Day 1 Modeling Approaches

A review of simple approaches available to community banks on the road to their CECL journey.

A Word on Incurred Loss Approach Today



Complexity Scaled to Sophistication….

“ Simplicity is always great until it gives you the wrong answer or someone asks a simple question you can’t answer! When the “answer” drives decisions towards bonuses, dividends, and raising capital, the stakes can be high! ”

American Bankers Association

What is Loss Rate under CECL?

Portfolio Risk

CECL measures credit risk facing the portfolio, not losses in the portfolio

Age of Loan Matters

Multiplying annual charge off rates by the expected life will result in unreasonable CECL estimate

Maintain Life-of-Loan Ratios

Life-of-loan loss rate is based on the lifetime charge-off and amortized cost at origination of a specific loan

Underwriting Matters

Vintage disclosures are in the heart of CECL standard. Vintage loss rates are significantly different from annual loss rates

Credit Metrics That “Move” with ECL

Un-learn the meaning of the credit risk metrics under Incurred Loss

Allowance Attribution Factors

- New Loans
- Exits
- Charge-offs
- Aging Effects (Loss Curve Patterns)
- Forecasts

Simplest Way to Explain Levels of Credit Risk is by

“ analyzing the likelihood that a loan will go bad and then estimating the severity of the loss if it does go bad. In other words, probability of a default and loss given the default ”

American Bankers Association

Our destination…

Emphasizing Simplicity

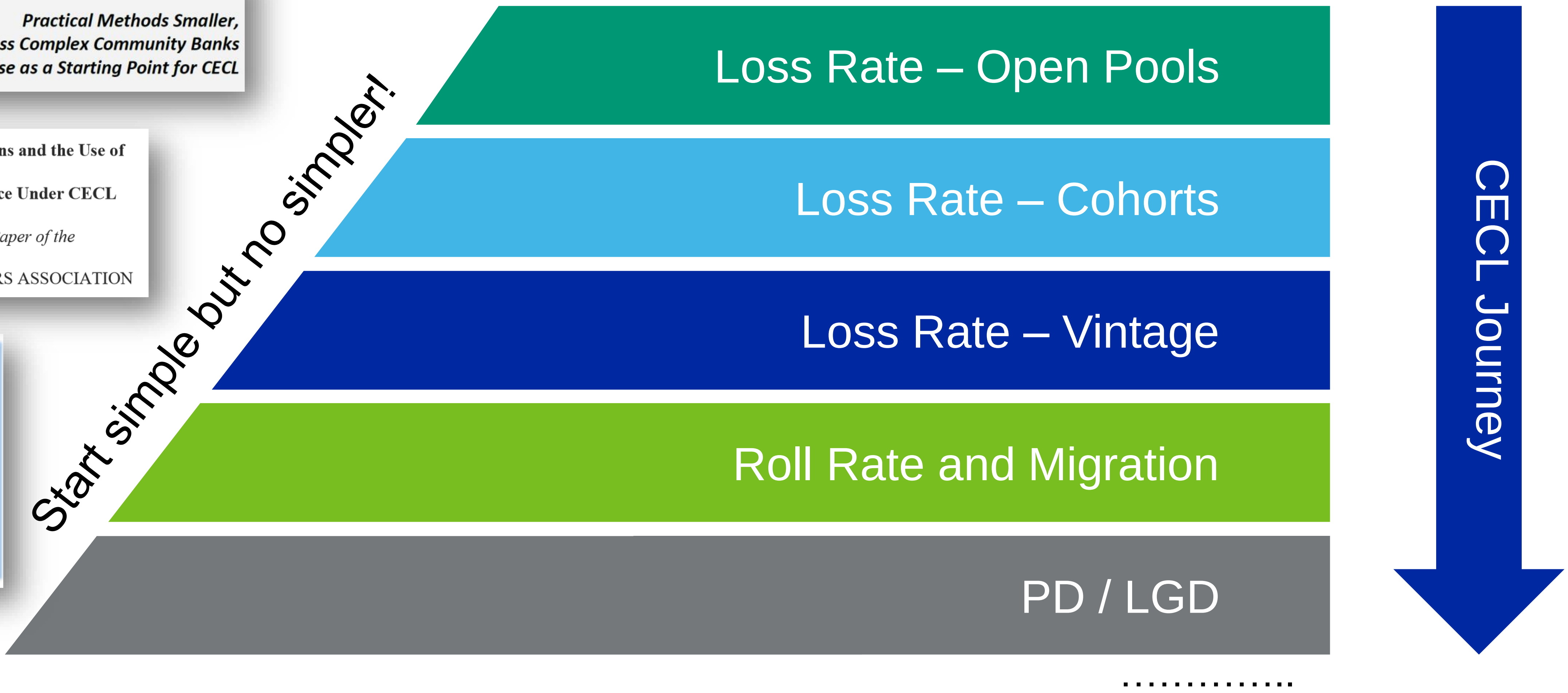
Regulators

Practical Methods Smaller, Less Complex Community Banks Can Use as a Starting Point for CECL

Loss Rate Calculations and the Use of Historical Experience Under CECL

A Discussion Paper of the

AMERICAN BANKERS ASSOCIATION



CECL Day 1 Methodologies

Loss rate – Open Pools Methods

The Process: Identify all net charge-offs (both charge-offs and recoveries) recorded during a lifetime period (segmented loans) and divide by the average amortized cost balance during that lifetime period.

Loss Rate Open Pools

Simplest

Closest form of approach to what is being done today for incurred loss approach. Requires less data than other methods.

Segmentation

Likely to require new segmentation based on risk characteristics.

Volatility and Q factor

Loss rate combines both probability of default and collateral elements, additional analysis required to understand why loss rates are volatile. Time consuming process at Month end…

Downside

Loss rate open pools mixes loans of different origination period, different prepayment characteristics and different maturation status if not controlled for results will be mixed and hard to explain.

CECL Day 1 Methodologies

Loss rate – Cohort Method (Closed Pools)

The Process: All loans are identified as of a specified date and subsequent net charge-offs (both charge-offs and recoveries) in future periods relating to those specific loans are identified and accumulated until final resolution of each of the related loans. Accumulated net charge-offs are then divided by the beginning amortized cost to arrive at a loss rate for the pool.

Loss Rate Cohorts

Simpler

Approach requires more data but still preserves it simplicity of understanding losses based on cohort origination

Segmentation

Likely to require new segmentation based on risk characteristics. Requires enough data for each segment to have a smooth loss profile. Otherwise industry data may have to be procured

Volatility and Q factor

Loss rate combines both probability of default and collateral elements. Closed pools assume similar origination dates and underwriting standards, thereby facilitating explanation of volatility over previous method

Downside

Data retained is significantly more than that of the open pool method. Tracking of loans through their lifetime may required data management effort (DW)

The Process: Identify all loans originated during each period and then identify all future charge-offs that relate to those loans. Vintage loss rates are also often analyzed within distinctive matrices, such as the matrix shown in paragraph 326-20-55-30 of the CECL standard's guidance.

CECL Day 1 Methodologies

Loss rate – Vintage Method (Closed Pools)

Loss Rate Vintage

Simpler

Approach requires more data but still preserves it simplicity of understanding losses based on cohort origination. Data gathered is akin to that required for PD/LGD approaches

Segmentation

Likely to require new segmentation based on risk characteristics. Requires enough data for each segment to have a smooth loss profile. Otherwise industry data may have to be procured

Volatility and Q factor

Loss rate combines both probability of default and collateral elements. Vintage analysis provides tracking of vintage and maturation implicitly easier to relate macro changes intuitively.

Downside

Data retained is significantly more than that of the open pool method. Tracking of loans through their lifetime may required data management effort (DW)

The Process: Calculate the migration rates of loans from different segments (by risk rating, by delinquency status, etc.), and determine the percentage of borrowers that "roll" into the probable loss and/or default categories.

CECL Day 1 Methodologies

Loss rate – Roll rate and Migration Methods

Loss Rate
Roll rate
and
Migration

Simple

Type of analysis being done today for short timeframe (12-18 months) provide intuitive information on credit quality migration.

Segmentation

Likely to require new segmentation based on risk characteristics. Requires enough data for each segment to have a smooth loss profile. Otherwise industry data may have to be procured

Volatility and Q factor

Ability to separate impact of default migration making explanation of changes in ECL more transparent - migration from quarter to quarter when compared to origination would provide clues for adjustment required.

Downside

Life time roll rate and migration are highly unstable given the nature of the quarter over quarter multiplicative effect making it problematic to use for lifetime loss rates estimation.

CECL Day 1 Methodologies

PD / LGD – Wholly grail?

The Process: PD requires a history of default count through time which can be used to defined the probability of an obligor to default over time based on a definition of default (usually 90 days). LGD can derived from average loss intensity experience through time. These PD/LGD methods can range from simple to very complex. Industry data can be used to supplement internal data.

PD / LGD

Simple

PD / LGD approach is a natural evolution of the simpler approach (vintage) seen previously. Allows for understanding separation between inability to pay, timing and size of loss

Segmentation

Likely to require new segmentation based on risk characteristics. Requires enough data for each segment to have a smooth loss profile. Otherwise industry data may have to be procured.

Volatility and Q factor

Understanding timing of loss and the value of collateral recoveries based on risk segmentation provides a much clearer path to understanding volatility and allows more intuitive adjustments

Downside

Requires some statistical knowledge although count based PD and historical LGD values can be done in a simple way. Correlation to macro-economic factor may require more work but again less side analysis to justify changes from period to period

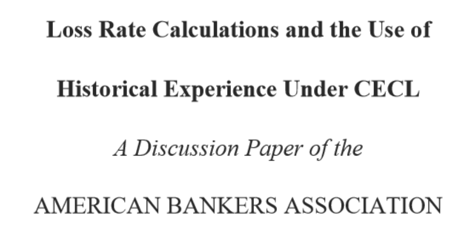
Emphasizing Simplicity

Regulators

FASB

CSBS

Practical Methods Smaller, Less Complex Community Banks Can Use as a Starting Point for CECL



Loss Rate Calculations and the Use of Historical Experience Under CECL

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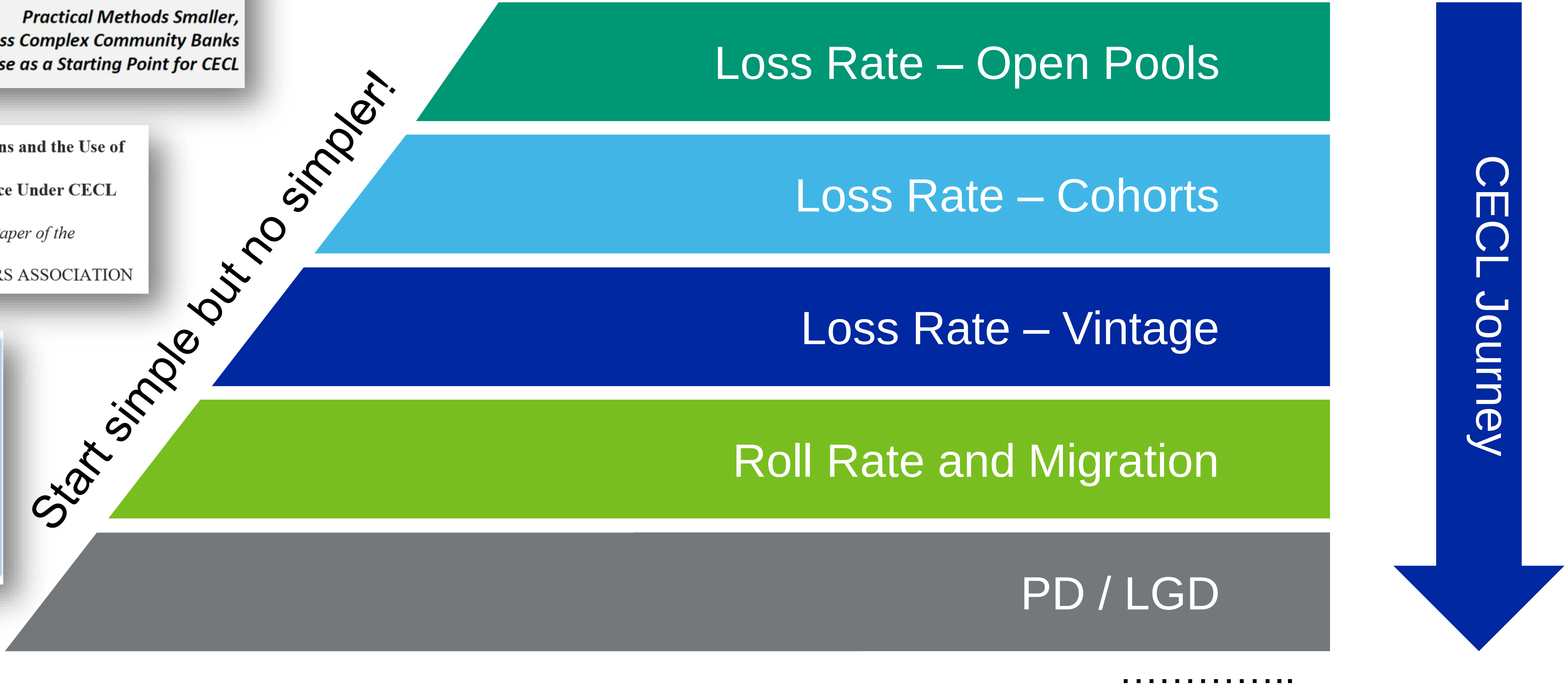
FINANCIAL ACCOUNTING SERIES

FASB Accounting Standards Update

Financial Instruments—Credit Losses (Topic 326)

Measurement of Credit Losses on Financial Instruments

Financial Accounting Standards Board

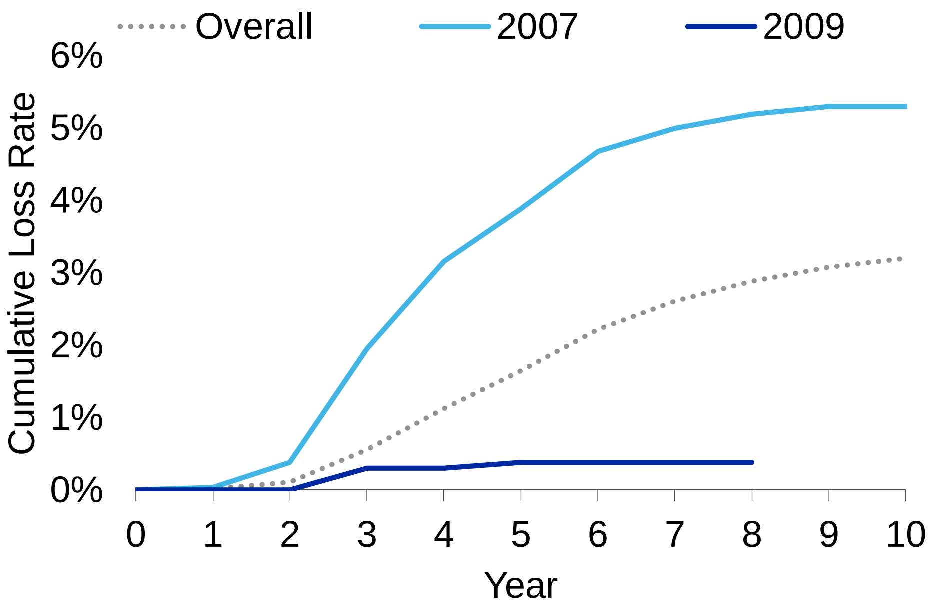


Asset- specific Discussion

CRE Loss Rate Model Research

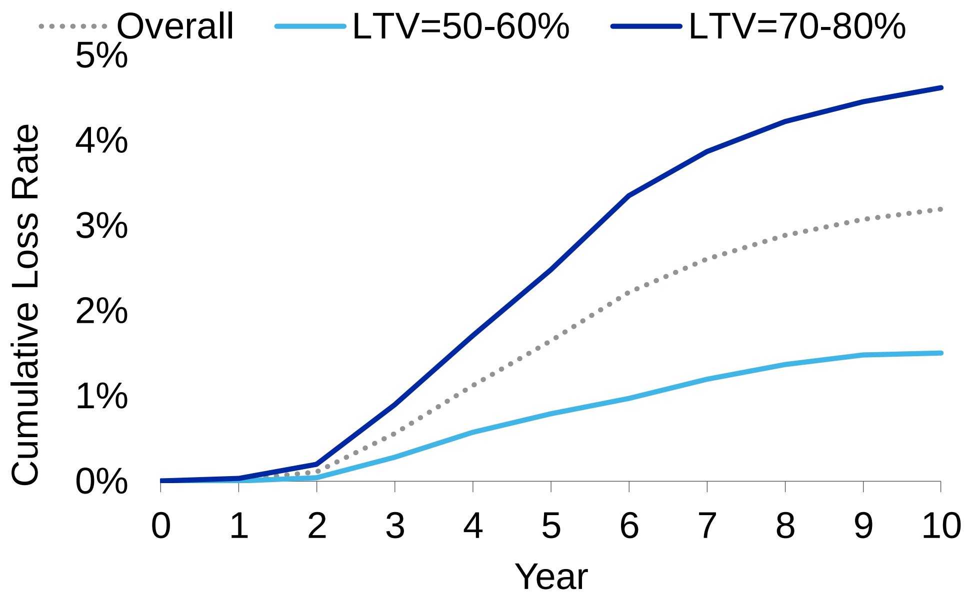
Historical CRE Loss Experience Is Correlated with Loan Characteristics

» CRE loan performance depends critically on origination vintage



Based on CMM development dataset

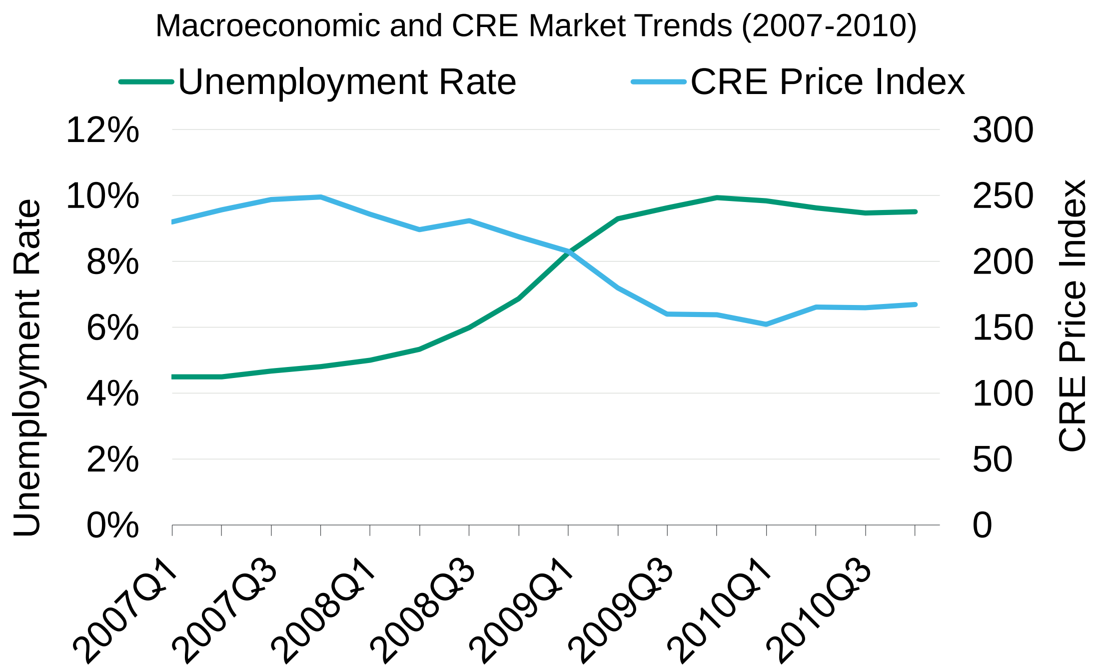
» Origination LTV is a major risk driver for CRE loans

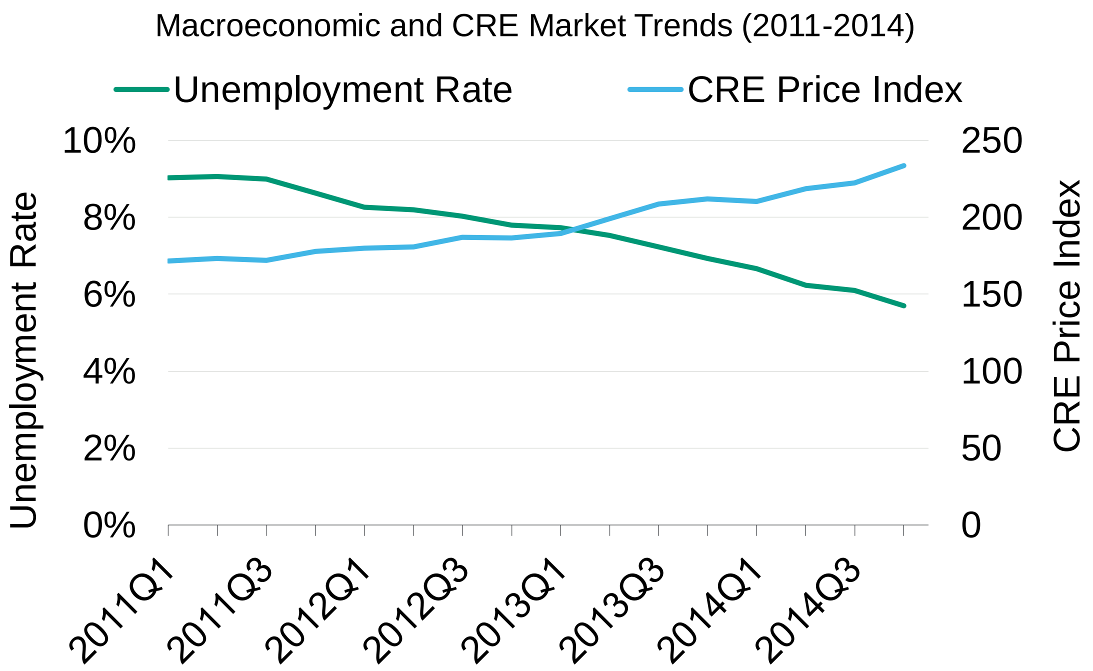


Based on CMM development dataset

CRE Loss Is Also Driven By Macroeconomic and Market Conditions

- Historical CRE loss is closely tied to historical macroeconomic and CRE market trends
- A reliable CRE loss estimate depends on reasonable and supportable forecasts of future economic and CRE market conditions





CRE Loss Rate Model Combines Industry Data with Bank Experience

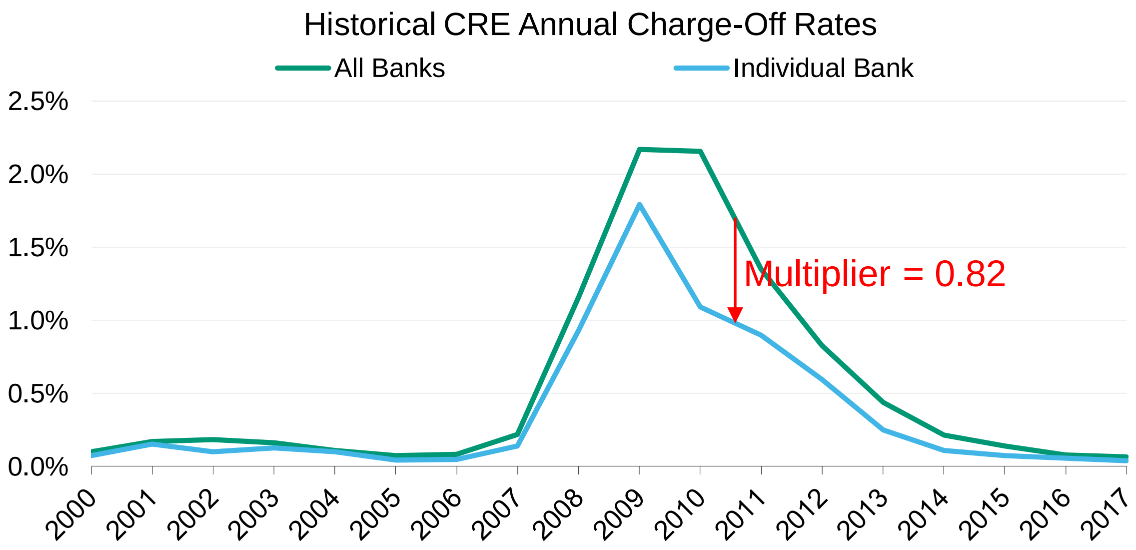
» Model specification: $EL = f(Loan\ Factors, Macro\ Factors, Market\ Factors)$

- LTV
- Vintage
- Property Type
- Property Status

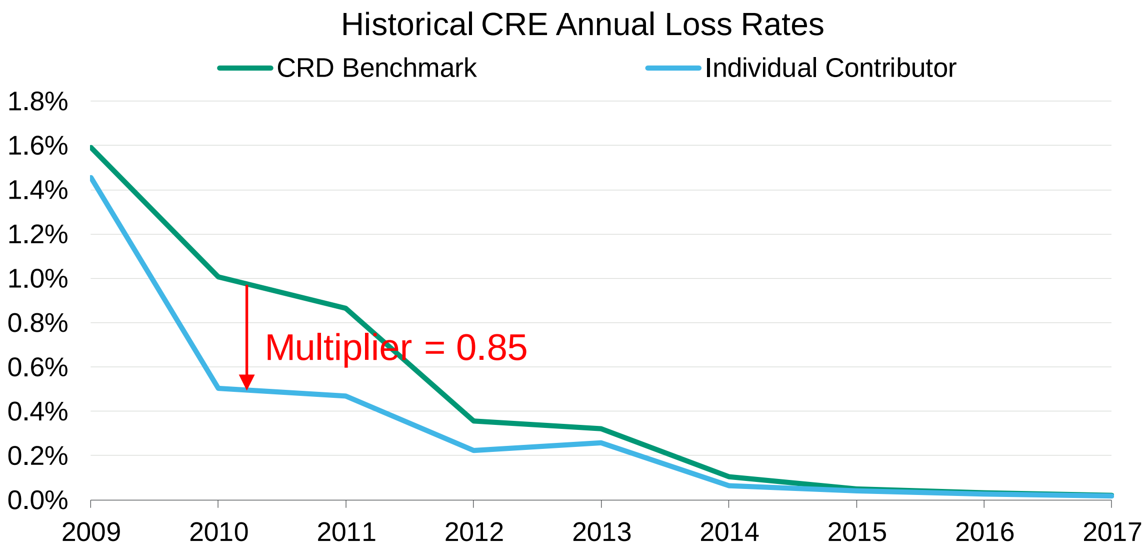
- GDP
- Unemployment
- Interest Rate

- CRE Price Index
- Market Vacancy
- Market Rent

» Final loss estimate can be calibrated to individual bank experience based on call reports

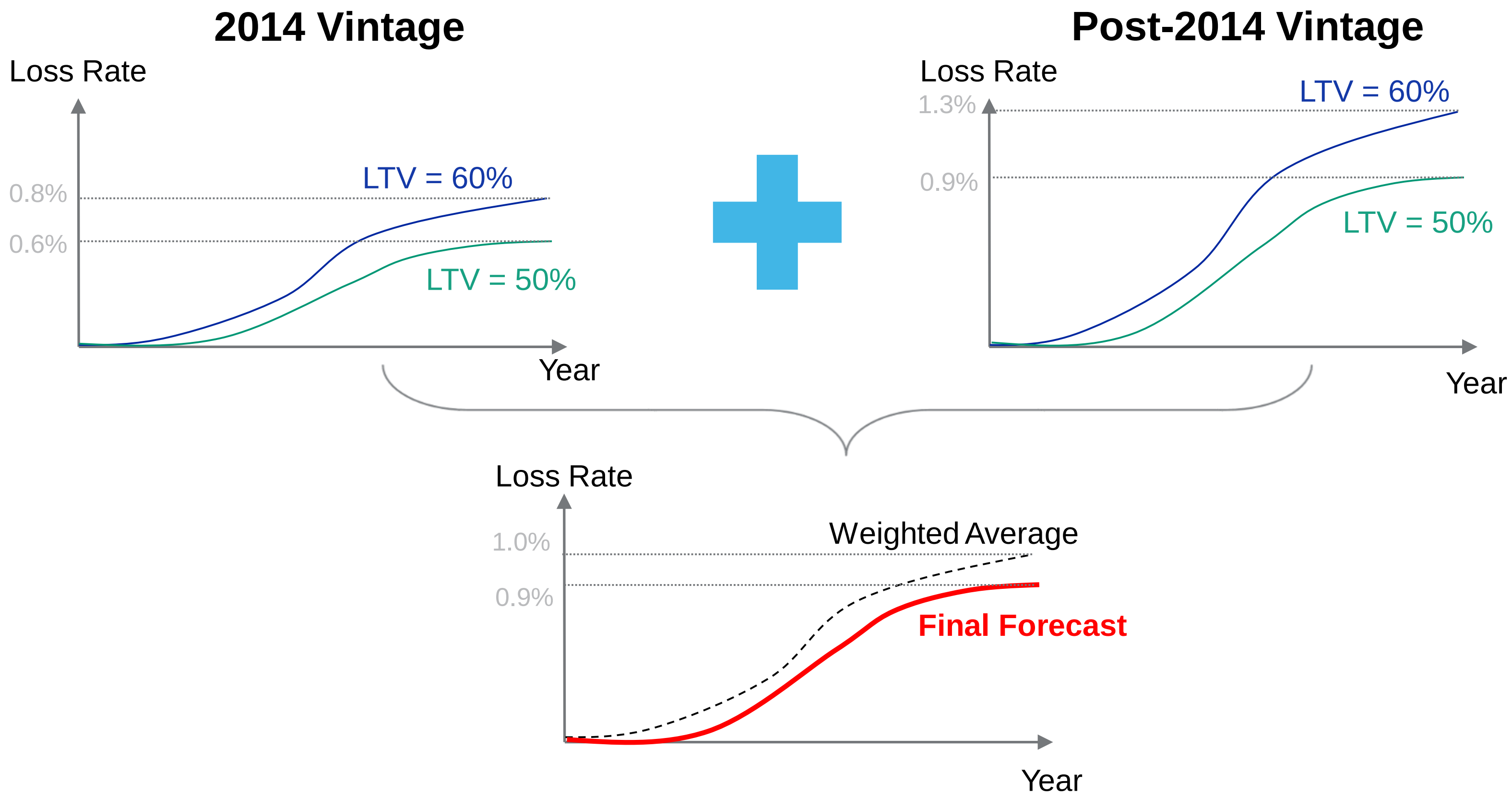


» Alternatively, it can be calibrated to historical loss rate for banks with sufficient historical loss data



CRE Loss Rate Forecast: An Example

- Suppose that a bank always originates CRE loans at 50% or 60% LTV
- Currently, 20% of its CRE loans were originated in 2014 and the rest were originated after 2014
- Historically, its CRE charge-off rate is 10% lower than that of its peers on average



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