Debt Securities and Other Assets Considerations Under CECL

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Speakers

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Today’s Discussion Points

» Changes to debt securities accounting as a result of ASC 326
» PCD accounting
» Transition Guidance, Disclosures and Reporting
» Modeling considerations – securities and other insurance assets in scope
» Q&A
CECL Focus

Banks
- Retail loans
- C&I – CRE loans
- Securities
  - Munis
  - Bonds

Corporates
- Small business loans
- C&I loans
- Short dated exposures

Insurance
- Investments
  - securities
    - Bonds
    - Structured
    - munis
- C&I loans
- CRE

Different Exposure Profiles
Overall Changes to Security Accounting

» Treatment of AFS and HTM classified securities will be distinctly different
  » HTM will follow the CECL model
  » AFS securities have their own path
» In both instances, replaces the current other-than-temporary-impairment (“OTTI”) logic
HTM Debt Securities

Future GAAP vs Current GAAP

**OTTI Model**

- Impairment is measured and recorded only when FV is less than Amortized Cost (AM Cost)
- Perform assessment at the individual security level
- Use DCF method
- Best estimate of the PV ECF basis
- Write off AM Cost when OTTI is recognized
- Considers length of time in unrealized loss position

**CECL Model**

- Measure ECL upon initial recognition
- Perform assessment on a collective pool basis when similar characteristics exist
- Various measurement methods
- Risk of loss basis
- Write off AM Cost only when security is deemed uncollectible
- Length of time in unrealized loss position is irrelevant. Loss is recognized even if FV>AM Cost
AFS Credit Loss Model Decision Tree

1. Start
2. Is FV < Am Cost?
   - Yes: Write off the allowance and Am Cost to FV through NI
   - No: No allowance or write down
3. Do you intend to sell the security or will likely be required to sell?
   - Yes: Write off the allowance and Am Cost to FV through NI
   - No: If decline is due to credit losses – recognize ACL through provision, subject to FV floor. Non-credit related change – record through OCI.
AFS Securities will be treated differently
Future GAAP differences between HTM, HFI and AFS

New AFS Credit Loss Model
» ECL are measured and recorded through allowance only when FV is less than AM Cost
» Perform assessment at the individual security level
» Use DCF method
» Best estimate basis

CECL Model
» Measure ECL upon initial recognition (HFI loans and HTM securities)
» Perform assessment on a collective pool basis when similar characteristics exist
» Various measurement methods
» Risk of loss basis
What is PCD?

« PCD → Purchase Credit Deteriorated (PCD) assets
  » At acquisition experienced a more-than-insignificant deterioration in credit quality since origination
  » Replaces the former Purchase Credit Impaired (PCI) accounting which required evidence of deterioration

» Applies to all assets within the CECL scope as well as AFS debt securities

» Accounting for PCD assets:
  – Allowance is determined in a similar manner as an originated or purchased performing asset
  – No provision on Day 1. Instead, AM Cost = FV (price) + Allowance
  – When non-DCF method is used, estimate loss on the basis of UPB

<table>
<thead>
<tr>
<th>Day 1</th>
<th>Example</th>
<th>Day 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dr Asset 100</td>
<td>Par Amount: $100</td>
<td>Apply relevant credit loss models dependent on the asset classification</td>
</tr>
<tr>
<td>Cr Discount 20</td>
<td>Purchase Price: $70</td>
<td>Accrete the non-credit discount to income using the Effective Interest Rate (EIR)</td>
</tr>
<tr>
<td>Cr Allowance 10</td>
<td>Loss Rate: .1</td>
<td></td>
</tr>
<tr>
<td>Cr Cash 70</td>
<td>ECL: $10 (100 * .1)</td>
<td></td>
</tr>
<tr>
<td>Am Cost: $80</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Carrying Value: $70</td>
<td></td>
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</tr>
</tbody>
</table>
Transition Guidance for HTM and AFS

AFS and HTM
Debt Securities

OTTI previously recognized

Transition prospectively (no change to AmCost)

The EIR is retained and locked in

Amounts previously recognized in OCI – continue to accrete to income over the life using EIR

Recoveries of the previous charge offs after adoption – recognize in income when received
New Disclosure Requirements…Qualitative Disclosures

326-20-50-11 An entity shall disclose all of the following by portfolio segment and major security type:

a) A description of how expected loss estimates are developed

b) A description of the entity’s accounting policies and methodology to estimate the allowance for credit losses, as well as a discussion of the factors that influenced management’s current estimate of expected losses, including:

1) Past Events
2) CURRENT CONDITIONS
3) REASONABLE AND SUPPORTABLE FORECAST ABOUT THE FUTURE

…A discussion of the changes in the factors that influence management’s estimate (for example, changes in portfolio composition, current underwriting practices and significant events or conditions that were not relevant in previous periods…

…as CECL nears, look for new and changed disclosures from FASB, SEC, and Regulatory bodies…
New Disclosure Requirements…Roll Forwards!

### Allowance for Credit Losses

<table>
<thead>
<tr>
<th></th>
<th>Total Loans and Leases</th>
<th>Total HTM Securities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beginning Balance</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Charge offs</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Recoveries</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Initial Allowance for PCD</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Provision</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Passage of time (optional)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ending Balance</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Allowance for Credit Losses rollforward

<table>
<thead>
<tr>
<th></th>
<th>AFS Securities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beginning Balance</td>
<td></td>
</tr>
<tr>
<td>Charge offs</td>
<td></td>
</tr>
<tr>
<td>Recoveries</td>
<td></td>
</tr>
<tr>
<td>Additional ACL on AFS not reserved for previously</td>
<td></td>
</tr>
<tr>
<td>Initial Allowance for PCD acquired this period</td>
<td></td>
</tr>
<tr>
<td>Reduction for Sold AFS</td>
<td></td>
</tr>
<tr>
<td>Reduction for securities that are moved to other categories</td>
<td></td>
</tr>
<tr>
<td>Changes in ACL for AFS</td>
<td></td>
</tr>
<tr>
<td>Ending Balance</td>
<td></td>
</tr>
</tbody>
</table>
CECL Modelling Approaches…which one is right?

- **Qualitative Adjustments Required**
  - Scenario Enabled
  - Rating Implied
  - PD/LGD
  - Survival Competing Hazards
  - MC State Transition
- **Granularity**
  - Industry Benchmark Proxy Data
  - Historical CO Closed Pools Open Pools
  - Vintage Analysis
  - Roll Rates Migration
- **3rd dimension: Cashflow based vs. static**
  - Cashflow-based
  - Static

**Single Risk measure**
- DCF
- Non-DCF

**Dual Risk measure**
Methodologies
Example of Moody’s models and methodologies offered

- Historical Loss Analyzer
  - Historical Analysis
  - Snapshot
  - Vintage
  - Call Report Forecast
  - Loss rates
  - Loan Level
  - Customized

- Retail
  - Call Report Forecast
  - Loss rates
  - Loan Level
  - Customized

- Commercial - CRE
  - Call Report Forecast
  - Loss rates
  - Loan Level
  - Customized

- Commercial – C&I
  - Call Report Forecast
  - Loss rates
  - Loan Level
  - Rating/PD Converter
  - Customized

- Securities
  - Cashflows
  - Credit Models (Retail or Commercial)
  - Munis
  - Annual Default Study

- Receivables
  - Reinsurance receivables
  - Trade receivables
  - Other receivables

- Custom
  - SAS
  - R
  - Python
  - Excel

Adopt and Adapt
## Overview of ECL Calculation Engines

### Three Methodologies for ECL Calculations

<table>
<thead>
<tr>
<th>Loss Rate</th>
<th>PD/LGD</th>
<th>Cash Flow</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Annualized</td>
<td>• Annualized</td>
<td>• DCF - Expected Cash Flow</td>
</tr>
<tr>
<td>• Lifetime</td>
<td>• Lifetime</td>
<td>• DCF Loss Cash Flow</td>
</tr>
<tr>
<td>• Curve</td>
<td></td>
<td>• Loss Cash Flow</td>
</tr>
</tbody>
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<table>
<thead>
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</tr>
<tr>
<td>• Loss Cash Flow</td>
<td></td>
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</tr>
</tbody>
</table>
PD/LGD Method

**Probability of Default**
What is the probability of a borrower defaulting over the contractual life of the loan?

**Loss Given Default**
When the loan defaults, what percentage of the exposure at default is charged off?

**Exposure at Default**
What is the outstanding loan balance at default?

**Expected Loss**
The CECL allowance is the product of these three values!

\[
PD \times LGD \times EAD = EL
\]
CECL – Commercial Loan Models and Data

Source Data
- Secure cloud based data exchange
- CSV file upload
- Scenario Upload
- Automated data load through API

Model Development
- Model Development Data

Commercial

Origination
- C&I (CRE OO*)
- CRE

Loan Level
- C&I (CRE OO*)
- CRE
- (calibration available)

Segment Level
- C&I (CRE OO)
- CRE
- (calibration available)

Data and Benchmarks
- CRE
- Data Alliance (C&I, CRE, Proj Finance and Asset Finance)
- Risk Bench
- Loan viewer

* OO – CRE Owner Occupied
CMM is the leading analytical model and risk management tool for assessing credit risk in commercial real estate loans.

CMM offers:

- PD and LGD (PIT and TTC) metrics built on extensive, proprietary dataset and calibrated to recent financial crisis
- Robust scenario analysis/stress testing capabilities that support regulatory compliance (CECL, DFAST)
- Reflects local CRE market variables
- ECL projections – lifetime
- Analyze a variety of loan types:
  - Permanent and Construction
  - Fixed or Floating Rate loans
  - Cross-Collateralized properties
  - Senior or Subordinated loans
- Most property types (Hotel, Office, Retail, Multifamily, Industrial)
CECL – Securities Model Development and Data

Model Development

Structured Credit
- Cash
- Synthetic
- Market Value
- CMBS
- Non-Agency
- Agency
- Large-Loan
- Conduit
- CLO ABS CDO
- TRS
- ABS CDO
- CRE
- CBO
- CLO
- Non-Agency
- Agency
- Whole Loan Pools
- HELOC / HEL
- Whole Loan Pools
- CMOs, TBAs
- Multi Family / Multi Class
- Single Class / Mega MM
- Reverse Mortgages
- REREMIC
- Market Place Lending
- Lease
- Loan
- Cash flow model

Model Development Data

Consumer ABS
- Autos
- Student Loan
  - Private
  - FELP
- CMBS
- Non-Agency
- Agency
- Conduit
- Large-Loan
- Esoteric
- Bank
- Retail
- Credit Card
- Private
- FELP
- Non-Agency
- Agency
- Whole Loan Pools
- CMOs, TBAs
- Multi Family / Multi Class
- Single Class / Mega MM
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Credit Model
Quantitative Approach

» Complexity of underlying collateral and deal structure
» Model-driven collateral forecasting
» Analyst assumptions/overrides
Credit Modeling Overview

For each asset type, forecast default, prepayment, and severity for each loan or pool in the transaction.

FACTORS
- Economic Data
- Loan and/or Pool Data
  - Residential (RMBS) – FICO, LTV, Zip Code, Rate, Term/Age
  - Commercial (CMBS) – DSCR, LTV, Type, MSA
  - Consumer (ABS) – Pool Strats, WA FICO/LTV, Age
  - Corporate – Assets, Liabilities, Volatility

MODELS
- Default
- Severity
- Prepayment

OUTPUT
- Loan Level EL(L)
- Pool Level EL(L)

Σ
Stress Potential Muni Credit Losses

Muni Loss Forecasts: Scenario Conditioned PD and LR Forecasts

» Allows users to stress individual muni issuers, or entire portfolios for CECL and other stress testing applications

» Historical data spanning 5 decades and over 32,000 muni issuers

» 2 step forecasting process links PDs to macroeconomic variables (national and sub-national) using structural models

» Extensive off-the-shelf scenario coverage (S0-S9, Regulatory, etc.)
Muni Loss Forecast Models
Scenario-Conditioned and Issuer Specific

Source: Moody’s Analytics
Starting PD: TTC to PIT PD Converter

Using Moody’s internal models and data to produce a dynamic PD to rating map.

(1) Credit cycle estimation

Point-in-time PD term structure is adjusted to reflect the current credit cycle.

(2) Forward looking adjustments

Additionally, for the calculation of lifetime ECL the tool extrapolates point-in-time PD term structure through the loan’s maturity.
Scenario Conditioning: GCORR Macro Model

» **Industry Leading Model:** Moody’s correlation framework is the industry standard to estimate clustered defaults and ratings downgrades in poor macro-economic conditions.

» **Model ready to use “off the shelf”:** General segment, industry and country (including sector, region, industry, etc.) and asset correlation model that is calibrated on Moody’s proprietary data set.

  - Parameterize credit factors to match risk of each individual exposure
  - Easily backtest/validate impairment estimates based on available loan loss history of individual institution (if available)
  - Annual updates of macro factors, relationships and credit factors

» **Flexible Approach:** Model pre-calibrated to a full set of sector, industry, regional and asset class factors. For each run, user decides which variables will define the scenario and the tool creates a conditional model to reflect the scenarios impact on systemic credit risk.
Questions & Answers