CECL Webinar Series:
Empowering Users, Satisfying Auditors

Olivier Brucker, Senior Director
Emil Lopez, Director

October 5, 2017
Moody’s Analytics CECL Webinar Series:
The Roadmap to Success

TODAY
Empowering Users, Satisfying Auditors

ENTIRE SOLUTION WEBINAR SERIES IS AVAILABLE ON DEMAND AT WWW.MOODYSANALYTICS.COM/CECL

Aug 1   Meeting the Analytic Challenges of CECL
Aug 24  Leveraging Industry Data for CECL Compliance
Sep 6    Lifetime Expected Credit Loss Modeling
Sep 19  Economic Scenarios for CECL: What’s Reasonable and Supportable?
Moody’s Analytics CECL Solution Suite

Today’s Focus is on Process Automation

- **Models**
  - Top-down and granular CECL compliant credit risk models
  - Off-the-shelf or customizable models to reflect bank’s own experience

- **Data**
  - Comprehensive credit risk data across asset classes to support benchmarking, validation and modeling
  - Bank peer benchmarking data

- **Advisory**
  - Quantitative Impact analysis
  - Model gap assessment
  - CECL framework design and implementation
  - Custom credit risk modeling

- **Economic Scenarios**
  - Standard and custom economic forecasts and supporting narratives
  - Scenario probabilities to support multi-scenario analysis

**PROCESS AUTOMATION**

- Data ingestion and storage
- Integrated ECL modeling and qualitative overlays
- Management analysis and reporting
Today’s Speakers

Olivier Brucker
Senior Director, Banking RegTech
Olivier Brucker is a Senior Director and Sales Manager at Moody’s Analytics working with its suite of Enterprise Risk Management Solutions. In his current role, Olivier consults with clients to maximize their return on investment from Moody’s Analytics solutions. His focus is on implementation of regulatory compliance solutions such as ALLL/CECL, CCAR/DFAST as well as Basel capital and liquidity for domestic and international financial institutions.

Emil Lopez
Director, Risk and Finance Analytics
Emil 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.

Moderator

Dan Parker
Managing Director, Head of Enterprise Risk Services Sales, Americas
Dan is a Managing Director who manages the client facing teams in the Americas responsible for software and analytics solutions. The team works largely with banks and insurance companies on regulatory and accounting solutions, as well as products and services for portfolio management, capital management and credit origination.
CECL Implementation Concerns

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

February 2017
- Data availability: 2%
- ECL quantification: 11%
- Scenario design: 18%
- Qualitative overlay methodology: 27%
- Performance (i.e. speed of execution): 32%

August 2017
- Data availability: 35%
- Scenario selection, design, and support: 18%
- Expected credit loss methodology: 37%
- Process governance and controls: 10%

Are infrastructure challenges (and opportunities) being overlooked?

Source: Moody’s Analytics CECL Surveys
Typical CECL Process and Key Challenges

- Exposures
- Counterparties
- Risk Mitigants

**Data**

**Estimation Approach**
- Scenarios
- Loss Rates
- PD/LGD/EAD
- DCF/Non-DCF

**Calculation**
- Lifetime ECL
- Allowance
- Provision

**Analysis**
- Attribution
- Trends
- Drill-down
- Benchmarking

**Management Overlay**
- Qualitative factors
- Supporting documentation

**Reporting**
- Approvals
- Disclosures
- Management Reporting

**Quantification**
- Portfolio segmentation
- Modeling methodology
- CECL compliant credit risk estimation
- Economic forecasts
- Sensitivity analysis
- Cash flow modeling
- Qualitative adjustment framework
- External support data

**Automation & Reporting**
- Centralized input data
- Multiple loss estimation approaches
- Results analysis and drill-down
- Qualitative and management overlays
- Governance and controls
- Comprehensive audit trail
- Disclosures and management reporting
- GL posting
Maximizing Value from your CECL Processes

Integrate Banking Processes

Foster Collaboration

Strengthen Governance and Auditability

Improve Decision-making

Grow with You

Extract Value of New Computing Technology
Integrate Banking Processes

- ALLL / CECL
- Regulatory Capital
- Origination & Portfolio Mgt
- Stress Testing
Integrate Banking Processes

Regulatory Capital and CECL

Available Capital = Current Capital + Change in Future Required Capital - Capital Consumed Due to Credit Risk

Credit Quality Impacts Both
Integrate Banking Processes

Stress Testing and CECL
Foster Collaboration

- Structure
- Workflow
- Reports
- Approvals
- Timeline
- Multiple user interaction
## Dec 31, 2018 Allowance Calculation

### Approvals - Coverage - Loans and Leases

<table>
<thead>
<tr>
<th>CONFIGURE TABLE</th>
<th>Dec 31, 2018</th>
<th></th>
<th></th>
<th>Reserve for Unfunded SM</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Amortized Cost ($M)</td>
<td>Allowance ($M)</td>
<td>Unfunded Commitment ($M)</td>
<td>Reserve for Unfunded ($M)</td>
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<tr>
<td>Total Loans and Leases</td>
<td>20,000</td>
<td>200</td>
<td>2,500</td>
<td>25</td>
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<tr>
<td>Commercial and Industrial</td>
<td>12,200</td>
<td>122</td>
<td>500</td>
<td>5</td>
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<tr>
<td>Energy</td>
<td>2,100</td>
<td>21</td>
<td>200</td>
<td>2</td>
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<tr>
<td>Healthcare</td>
<td>900</td>
<td>9</td>
<td>200</td>
<td>2</td>
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<tr>
<td>Other</td>
<td>9,200</td>
<td>92</td>
<td>100</td>
<td>1</td>
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<tr>
<td>Commercial Real Estate</td>
<td>5,100</td>
<td>51</td>
<td>500</td>
<td>5</td>
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<tr>
<td>Consumer Loans</td>
<td>2,700</td>
<td>27</td>
<td>1,500</td>
<td>15</td>
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</table>

### Approvals - 3 items

<table>
<thead>
<tr>
<th>Approver</th>
<th>Status / Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Approver</td>
<td>Approved Sep 2, 2018</td>
</tr>
<tr>
<td>Branch Manager</td>
<td>APPROVE</td>
</tr>
<tr>
<td>CFO</td>
<td>APPROVE</td>
</tr>
</tbody>
</table>
Strengthen Governance and Auditability

How auditors will audit the CECL estimate:

» Obtain an understanding of management’s process to establish CECL estimate

» Assess the reasonableness of the estimate by one or more approaches

» Internal Control over Financial Reporting (ICFR) framework is also tested to ensure that controls are designed and operating effectively
Dec 31, 2018 Allowance Calculation

Created By
Anna L

Creation Date
08/22/2017 22:36:42

Last Modified By
Anna L

Modified Date
08/22/2017 22:36:42

Step
1 - Portfolios

Description

0 / 10,000
### Dec 31, 2018 Allowance Calculation

<table>
<thead>
<tr>
<th>Portfolio</th>
<th>Parameters</th>
<th>Results</th>
<th>Approvals</th>
</tr>
</thead>
<tbody>
<tr>
<td>14.1M</td>
<td>$14.1B</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>Total Records</td>
<td>Total Balance</td>
<td>Total Allowance</td>
<td>Allowance (all data)</td>
</tr>
<tr>
<td>03/31/2017</td>
<td>03/31/2017</td>
<td>03/31/2017</td>
<td>03/31/2017</td>
</tr>
<tr>
<td>ServiceBureau_LargeCnl</td>
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<td>Approved</td>
<td></td>
</tr>
<tr>
<td>ServiceBureau_CRE</td>
<td>573</td>
<td>Approved</td>
<td></td>
</tr>
<tr>
<td>ServiceBureau_Retail</td>
<td>138</td>
<td>Approved</td>
<td></td>
</tr>
<tr>
<td>ServiceBureau_SME</td>
<td>92</td>
<td>Approved</td>
<td></td>
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<tr>
<td>ServiceBureau_SME</td>
<td>88</td>
<td>Approved</td>
<td></td>
</tr>
<tr>
<td>ServiceBureau_CRE</td>
<td>542</td>
<td>Approved</td>
<td></td>
</tr>
<tr>
<td>ServiceBureau_LargeCnl</td>
<td>190</td>
<td>Approved</td>
<td></td>
</tr>
<tr>
<td>ServiceBureau_Retail</td>
<td>134</td>
<td>Approved</td>
<td></td>
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<tr>
<td>ServiceBureau_CRE</td>
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<td></td>
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<tr>
<td>ServiceBureau_SME</td>
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</tr>
<tr>
<td>ServiceBureau_LargeCnl</td>
<td>199</td>
<td>Approved</td>
<td></td>
</tr>
<tr>
<td>ServiceBureau_Retail</td>
<td>154</td>
<td>Approved</td>
<td></td>
</tr>
</tbody>
</table>
Empowering Users, Satisfying Auditors, October 5, 2017

**Filtering Options**
To view data, select at least one value from each filter. Up to twelve filter combinations can be displayed.

- **As of Date**: 08/31/2017
- **Scenario**: 3 items
- **Macroeconomic Variables**: Gross Domestic Product (USA)

**View**
Click and drag to zoom.

**Economic Data and Forecast**

- 08/31/2017 Consensus Scenario Gross Domestic Product (USA)
- 08/31/2017 Moderate Recession Scenario Gross Domestic Product (USA)
- 08/31/2017 Protracted Slump Scenario Gross Domestic Product (USA)
## Model Inventory

### Models

<table>
<thead>
<tr>
<th>Source</th>
<th>Name</th>
<th>Output</th>
<th>Validation Status</th>
<th>Type</th>
<th>Owner</th>
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<tr>
<td>MA</td>
<td>GCorr 2016</td>
<td>PD</td>
<td>Validated</td>
<td>Imported</td>
<td>Anna D.</td>
</tr>
<tr>
<td>MA</td>
<td>RiskCalc U.S. Corporate v4.0</td>
<td>PD</td>
<td>Validated</td>
<td>Imported</td>
<td>Mike S.</td>
</tr>
<tr>
<td>MA</td>
<td>CMM 3.0</td>
<td>PD</td>
<td>In progress</td>
<td>Imported</td>
<td>John S.</td>
</tr>
<tr>
<td>MA</td>
<td>Mortgage Portfolio Analyzer</td>
<td>LGD</td>
<td>In progress</td>
<td>Imported</td>
<td>Sarah T.</td>
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<tr>
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<td>PD</td>
<td>Validated</td>
<td>Imported</td>
<td>Mark K.</td>
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<tr>
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<td>CreditEdge</td>
<td>PD</td>
<td>Validated</td>
<td>Imported</td>
<td>Mike S.</td>
</tr>
<tr>
<td>MA</td>
<td>CreditCycle PD</td>
<td>PD</td>
<td>Pending</td>
<td>Imported</td>
<td>Anna D.</td>
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<tr>
<td>MA</td>
<td>CreditCycle LGD</td>
<td>LGD</td>
<td>Validated</td>
<td>Imported</td>
<td>Kevin D.</td>
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<tr>
<td>Internal</td>
<td>Expected Consumer Credit Losses</td>
<td>Loss Rate</td>
<td>Validated</td>
<td>Imported</td>
<td>John S.</td>
</tr>
</tbody>
</table>
Dec 31, 2018 Allowance Calculation

- Total Records: 14.1M
- Total Allowance: $129M
- Total Balance: $14.1B

Allowance this period: not calculated
Allowance 7/2020 $222M
Difference: not calculated

Maximum: $305M
Most records in group: $1-2M

Results
CRE Property Type Results

Configuration View

- USA Chicago, IL: Unpaid Principal 294,273,000.00, Loss Allowance 7,804,726.99, Loss Rate 0.0%
- Office: Unpaid Principal 48,612,000.00, Loss Allowance 1,892,551.09, Loss Rate 0.0%
- Multifamily: Unpaid Principal 55,450,000.00, Loss Allowance 1,523,920.84, Loss Rate 0.0%
- Retail: Unpaid Principal 87,885,000.00, Loss Allowance 1,875,397.77, Loss Rate 0.0%
- Industrial: Unpaid Principal 50,492,000.00, Loss Allowance 1,030,548.20, Loss Rate 0.0%
- Hotel: Unpaid Principal 51,834,000.00, Loss Allowance 1,482,309.09, Loss Rate 0.0%
- USA Cincinnati, OH: Unpaid Principal 123,000.00, Loss Allowance 6,886.78, Loss Rate 0.0%
- USA Cleveland, OH: Unpaid Principal 26,128,000.00, Loss Allowance 105,369.10, Loss Rate 0.0%
- Hotel: Unpaid Principal 945,000.00, Loss Allowance 11,522.56, Loss Rate 0.0%

Adjustments
79 contracts in selection

- Original loss allowance: $1,030,548
- Adjusted loss allowance: $1,491,836

Lending Procedures Underwriting $461,287.563
Improve Decision-making

Investment in process infrastructure can improve management decision-making:

» Diagnose trends and drivers of the allowance
» Inform portfolio management
» Enable ad-hoc inquiries
### Dec 31, 2018 Allowance Calculation

**Totals (all data)**
- **Total Records**: 14.1M
- **Total Balance**: $14.1B
- **Total Allowance**: $129M

**Allowance (all data)**
- **Allowance this period**: not calculated
- **Allowance 7/2020**: $222M
- **Difference**: not calculated

**Distribution of Records (Loans and Leases)**
- **Maximum**: $305M
- **Most records in group**: $1-2M

**Configure View**

<table>
<thead>
<tr>
<th>Service Bureau</th>
<th>Unpaid Principal</th>
<th>Loss Allowance</th>
<th>Loss Rate</th>
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</thead>
<tbody>
<tr>
<td>Service Bureau_CRE</td>
<td>602,024,000.00</td>
<td>21,930,820.41</td>
<td>0.03</td>
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<td>Service Bureau_LargeCnl</td>
<td>169,885,000.00</td>
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<tr>
<td>Service Bureau_Retail</td>
<td>3,443,684,000.00</td>
<td>28,033,935.07</td>
<td>0.01</td>
</tr>
<tr>
<td>Service Bureau_SME</td>
<td>2,482,000.00</td>
<td>39,931.08</td>
<td>0.01</td>
</tr>
</tbody>
</table>
### Dec 31, 2018 Allowance Calculation

**Totals (all data)**
- Total Records: 14.1M
- Total Balance: $14.1B
- Total Allowance: $129M

**Allowance (all data)**
- Allowance this period: not calculated
- Allowance 7/2020: $222M
- Difference: not calculated

**Distribution of Records (Loans and Leases)**
- Maximum: $305M
- Most records in group: $1-2M

---

**Results**

**CRE Property Type Results**

<table>
<thead>
<tr>
<th>Portfolio Identifier</th>
<th>Reporting Date</th>
<th>Adjustment Identifier</th>
<th>2017-06-30</th>
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</thead>
<tbody>
<tr>
<td>ServiceBureau_CRE</td>
<td>2017-06-30</td>
<td>1 item(s)</td>
<td></td>
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</tbody>
</table>

**CONFIGURE VIEW**

- **USA Chicago, IL**
  - Unpaid Principal: 294,273,000.00
  - Loss Allowance: 7,804,726.99
  - Loss Rate: 0.03

- **Office**
  - Unpaid Principal: 48,612,000.00
  - Loss Allowance: 1,892,551.09
  - Loss Rate: 0.04

- **Multifamily**
  - Unpaid Principal: 55,450,000.00
  - Loss Allowance: 1,523,920.84
  - Loss Rate: 0.03

- **Retail**
  - Unpaid Principal: 87,885,000.00
  - Loss Allowance: 1,875,397.77
  - Loss Rate: 0.02

- **Industrial**
  - Unpaid Principal: 50,492,000.00
  - Loss Allowance: 1,030,548.20
  - Loss Rate: 0.02

- **Hotel**
  - Unpaid Principal: 51,834,000.00
  - Loss Allowance: 1,482,309.09
  - Loss Rate: 0.03

- **USA Cincinnati, OH**
  - Unpaid Principal: 123,000.00
  - Loss Allowance: 6,886.78
  - Loss Rate: 0.06

- **Hotel**
  - Unpaid Principal: 123,000.00
  - Loss Allowance: 6,886.78
  - Loss Rate: 0.06

- **USA Cleveland, OH**
  - Unpaid Principal: 26,128,000.00
  - Loss Allowance: 105,369.10
  - Loss Rate: 0.00

- **Hotel**
  - Unpaid Principal: 945,000.00
  - Loss Allowance: 11,522.56
  - Loss Rate: 0.01
## Contract Browser

### Filters

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Operator</th>
<th>Value</th>
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<tbody>
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<td>portfolioIdentifier = ServiceBureau_CRE</td>
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<tr>
<td>reportingDate = 2017-06-30</td>
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<td></td>
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<tr>
<td>metropolitanStatisticalArea = USA Chicago, IL</td>
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<td></td>
</tr>
<tr>
<td>propertyType = Industrial</td>
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### Contracts - 10 Items

<table>
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<tr>
<th>As of Date</th>
<th>Instrument Identifier</th>
<th>Portfolio Identifier</th>
<th>Asset Class</th>
<th>Unpaid Principal Balance</th>
<th>Loss Rate Adjusted</th>
<th>Loss Allowance Adjusted</th>
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</thead>
<tbody>
<tr>
<td>06/30/2017</td>
<td>CRE_1003</td>
<td>ServiceBureau_CRE</td>
<td>Loan-Commercial real estate</td>
<td>62000</td>
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<tr>
<td>06/30/2017</td>
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<td>ServiceBureau_CRE</td>
<td>Loan-Commercial real estate</td>
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<td>3569.175005467</td>
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<td>06/30/2017</td>
<td>CRE_1006</td>
<td>ServiceBureau_CRE</td>
<td>Loan-Commercial real estate</td>
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<td>29395.647900996</td>
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<tr>
<td>06/30/2017</td>
<td>CRE_1006</td>
<td>ServiceBureau_CRE</td>
<td>Loan-Commercial real estate</td>
<td>2458000</td>
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<td>06/30/2017</td>
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<td>ServiceBureau_CRE</td>
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<td>06/30/2017</td>
<td>CRE_1008</td>
<td>ServiceBureau_CRE</td>
<td>Loan-Commercial real estate</td>
<td>138000</td>
<td>0.032949179</td>
<td>5807.447104323</td>
</tr>
</tbody>
</table>
“With great power comes great responsibility” - Spiderman’s Uncle

As financial institutions grow, so do:

- Regulatory and auditor expectations
- M&A integration “pains”
- Datasets and transaction volumes

How can CECL software help?
### Methodology Decision Paths

<table>
<thead>
<tr>
<th>Segment Level Choices</th>
<th>Decision Paths</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Measurement Objective</strong></td>
<td>Incurred Loss or Lifetime ECL?</td>
</tr>
<tr>
<td><strong>Estimation Approach</strong></td>
<td>Historical Loss Rate, PD/LGD, Migration/Roll Rates?</td>
</tr>
<tr>
<td><strong>Relevant Risk Parameters</strong></td>
<td>Loss Rate, PD/LGD, Discount Rate, Line of Credit Usage</td>
</tr>
<tr>
<td><strong>Risk Parameter Horizon</strong></td>
<td>Discounted Cash Flow (DCF) or non-DCF?</td>
</tr>
<tr>
<td><strong>Information Profile at Starting Point</strong></td>
<td>Are existing risk measures already CECL compliant?</td>
</tr>
<tr>
<td><strong>Risk Parameter Enhancements</strong></td>
<td>Incorporate current/forward-looking information quantitatively or qualitatively?</td>
</tr>
</tbody>
</table>
### Expected Credit Loss

<table>
<thead>
<tr>
<th>Order</th>
<th>Scope</th>
<th>Method</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>Asset Class = CRE</td>
<td>Annualized Loss Rate</td>
</tr>
<tr>
<td>2</td>
<td>Asset Class = C&amp;I, Country = USA</td>
<td>Lifetime Loss Rate</td>
</tr>
<tr>
<td>3</td>
<td>Asset Class = Retail</td>
<td>DCF: Expected Cash Flow</td>
</tr>
<tr>
<td>4</td>
<td>ALL OTHER DATA</td>
<td>Loss Rate Curve</td>
</tr>
</tbody>
</table>
### Dec 31, 2018 Allowance Calculation

#### Parameters

**Scenario Settings**

**Model Mapping & Parameters**

#### Probability of Default

<table>
<thead>
<tr>
<th>Order</th>
<th>Scope</th>
<th>Methodology</th>
<th>Model</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>Asset Class = CRE</td>
<td>PD Model</td>
<td>CMM™ 3.0</td>
</tr>
<tr>
<td>2</td>
<td>Asset Class = C&amp;I, Country = USA</td>
<td>PD Model</td>
<td>RiskCalc™ U.S. Corporate v4.0</td>
</tr>
<tr>
<td>3</td>
<td>Asset Class = Retail</td>
<td>PD Model</td>
<td>CreditCycle™</td>
</tr>
<tr>
<td>4</td>
<td>ALL OTHER DATA</td>
<td>Implied PD</td>
<td>Moody's Ratings</td>
</tr>
</tbody>
</table>
### Scenario Settings

<table>
<thead>
<tr>
<th>Scenario Name</th>
<th>Description</th>
<th>As of Date</th>
<th>Weight</th>
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<tbody>
<tr>
<td>S7</td>
<td>Consensus Scenario</td>
<td>12/19/2018</td>
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<tr>
<td>S3</td>
<td>Moderate Recession</td>
<td>12/19/2018</td>
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</tbody>
</table>

**TOTAL WEIGHT**

100%
## Analysis

<table>
<thead>
<tr>
<th>Name</th>
<th>Step</th>
<th>Reporting Date</th>
<th>Modified Date</th>
<th>Subproject</th>
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</thead>
<tbody>
<tr>
<td>Consensus scenario as of Dec 19</td>
<td>1 - Portfolio - Step 1</td>
<td>12/31/2018</td>
<td>12/20/2018 16:37:15</td>
<td>...</td>
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<tr>
<td>Consensus scenario as of Dec 17</td>
<td>1 - Portfolio - Step 1</td>
<td>12/31/2018</td>
<td>12/18/2018 16:37:15</td>
<td>Midwest Bank 1</td>
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<td>Midwest Bank 1 / MB Branch A / Allowance Team</td>
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Extract Value from Computing Technology

- User-centered vs. IT-centered Applications
- Light IT Footprint
- Computing Power On-demand
- Support Evolving AI Tech
- Multiple Access Points
Extracting Value from Computing Technology

Total Cost of Ownership: On-Premise vs. Cloud

9% Software Licenses
68% Subscription Fee

On-Premise
- Customization & Implementation
- Hardware
- IT Personnel
- Maintenance
- Training

Cloud
- Implementation, Configuration & Training

Ongoing Costs

On-Premise
- Applying Upgrades
- Performance Tuning
- Rewriting Customizations & Integrations
- Downtime
- Database
- Hardware
- IT Burden
- Security

Cloud
- Subscription Fee
- Training
- New Configurations
Summary

» CECL estimates will incorporate more information and judgment subject to examination from regulators, auditors, and other stakeholders.

» Centralizing and streamlining the allowance estimation process is a significant investment, but one with the opportunity to:
  - Improve integration of risk management processes
  - Foster collaboration across functional groups
  - Strengthen process governance
  - Aid in portfolio management and decision making
  - Future-proof a growing organization
Polling Instructions

1. The icon will appear in the right hand corner of the WebEx platform when it comes time for polling.
2. Please select it, so that the icon is blue (as shown).
3. Select your answers in the Polling section that appears in the right hand panel of the platform.
4. Click “Submit.”
5. Results will display after the poll has ended.
Polling Questions

1. How does your institution plan to manage the allowance estimation process under CECL?
   a. Excel-based process
   b. Enhance existing system
   c. Deploy or build new solution

2. When do you plan to start implementing it?
   a. Already in progress
   b. Before the end of the year
   c. First half of 2018
   d. Second half of 2018
   e. After 2018
   f. Yet to be determined

3. What is the most important benefit you see in automating your CECL process?
   a. Improving governance and auditability
   b. Improving performance and efficiency
   c. Improving accuracy and decision-making
Risk & Finance Practitioner Conference 2017

Theme: The Rise of Risktech

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