Commercial Real Estate (CRE)
Credit Risk Solutions & Best Practices

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Agenda

1. Credit Risk Management Challenges
2. Best Practices
3. Stress Testing Model and Approach
4. CRE Risk Tools
5. Questions
Speakers

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**Chris Henkel** is a Director in the Enterprise Risk Solutions group with Moody’s Analytics where he leads the risk measurement delivery team throughout the Americas. He has vast experience offering advisory services and custom quantitative risk solutions to clients. Chris has served as a credit risk instructor and is a frequent lecturer in industry conferences and organizations. He received his master’s and undergraduate degree from the University of Texas and graduated Valedictorian form the Southwestern Graduate School of Banking at Southern Methodist University.
CRE Credit Risk Management Challenges
Challenges in CRE Risk Management

Updated Property Information
- Valued - $95M in 2007
- Now?

Foresight into Market Fundamentals
- Sound forecast that differentiates between property types and submarkets is important is not available

Default history and modeling expertise
- Default history over multiple credit cycles and from multiple sources is important for sound modeling and CRE data history is not captured

Intuition vs quantitative validation
- Several qualitative factors can impact the analysis and risk measures and integrating quantitative models with intuition can be a challenge

Assessing the impact of macro economy
- Different cities and neighborhoods react differently to an economic recession or expansion
CRE Best Practices
Understanding why CRE credit events occur

**Insufficient income (NOI) to make the mortgage payment**
- Rising vacancy and loss of rental income during recessions
- Deterioration of certain neighborhoods or properties even during boom years

**Perceived inability to sell the property for the loan amount**
- LTV comes into play when the borrower is having cash-flow problem or during the time to refinance

**Lack of reserves and additional outside resources available to cover cash flow shortfalls**
- Both ability and willingness to pay shortfalls decrease during recessions
- Size of shortfall likely to matter: $1 million >> $1000
Employing a modeling framework that reflects business practices

Starting with collateral
- Forecasting cash flow under various scenarios
- Property value influences default decision mostly during cash flow stress
- Macro and local market condition matters

Modeling default behavior
- Option A: Continue payment out of pocket, expecting market recovery
- Option B: Default on loan

Empirical Evidence
- Inability to reach consensus triggers credit events
- Borrowers are more likely to default in a recession than in an economic expansion
A granular market forecast can improve model accuracy

A forecast should:

• Differentiate between different cities and neighborhoods to identify high risk concentration

• Provide visibility into how market behavior might change under various economic conditions

Using a multi-pass forecasting to identify the volatility in individual property value and income can help improve confidence in the model.
Default history should span across the industry and economic cycles

- Different segments/origination groups have experienced each economic cycle uniquely

- Insurance segment saw high losses in the early 90’s and have since been able to maintain high quality portfolios

- Commercial banks experienced moderate losses in the recent financial crises

- CMBS portfolios experienced highest losses in the recent crisis

Data Source: Mortgage Bankers’ Association
CRE Stress Testing Model and Approach
Our focus for today is on the loss forecasting components of stress testing

Items Commonly Stressed

» Income (revenues)
» Expenses
» Rates on interest earning assets
» Rates on interest bearing liabilities
» Provisions for loan losses
» Balances and volumes
» Non-performing loans
» Charge-offs
» RWAs
» Capital levels (regulatory and economic)
» Capital ratios

NCOs/Loans (1992-2013)
All FDIC Insured Institutions

Source: FDIC
Stress testing loan losses is not a new concept - but it has our attention now more than ever

**Common Approach to Stress Testing (pre-DFAST)**

» Historically based on stressed loss-rate analysis based on call report categories

» “Top-down” approach with a focus on material credit concentrations

» Loss rates applied to specific segments

» Included scenario and sensitivity analysis:
  - “What if” questions
  - Impact on earnings and capital
  - Integrated with overall risk management, ALCO, and capital planning

» Still relevant for smaller institutions

» Loose link between macroeconomic conditions to stressed losses

**Enhanced Approach and Requirements**
If unemployment rate rises above 10%, what would be the impact to the credit quality in my CRE portfolio?

Source: Federal Reserve
It is important to first translate the forecast of macrovariables into a forecast of RE variables.

Macroeconomic Scenario

National and Local Real-Estate Market Factors

CRE loans

Translation Engine

Forward-looking Volatility

Stressed Losses
Changes in unemployment certainly influence changes in real estate factors, but differently through time.

Comparison of Changes in Vacancy Rate and Unemployment Rate (1988 – 2013)

<table>
<thead>
<tr>
<th>Recession</th>
<th>Trough to Peak Unemployment Rate Change</th>
<th>Trough to Peak Vacancy Rate Change</th>
<th>$\Delta \text{Vacancy} \over \Delta \text{Unemployment} $</th>
</tr>
</thead>
<tbody>
<tr>
<td>2001-2002</td>
<td>2.2%</td>
<td>5.6%</td>
<td>2.5</td>
</tr>
<tr>
<td>2008-2010</td>
<td>5.4%</td>
<td>4.5%</td>
<td>0.8</td>
</tr>
</tbody>
</table>
With a stressed RE forecast, we can estimate factors such as DSCR and LTV – and, in turn, PDs and LGDs.

Future values of NOI relative to debt service... 

…calibrated to the historical experience.

<table>
<thead>
<tr>
<th>Realized NOI Point</th>
<th>DSCR</th>
<th>Empirical Default Rate</th>
<th>Empirical Loss Given Default</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>1.20</td>
<td>0.50%</td>
<td>5.0%</td>
</tr>
<tr>
<td>B</td>
<td>0.95</td>
<td>5.00%</td>
<td>25.0%</td>
</tr>
<tr>
<td>C</td>
<td>0.30</td>
<td>15.00%</td>
<td>40.0%</td>
</tr>
</tbody>
</table>

Note: Values do not necessarily reflect actual model coefficients; they are presented to illustrate the concept.
In the end, the impact of a given scenario can be translated into a loan-level estimate of expected loss.
What is CMM® (Commercial Mortgage Metrics)

» CMM is the leading analytical model and risk management tool for assessing credit risk in commercial real estate loans

» CMM offers:

» State-of-the-art model

» Built on extensive, proprietary dataset and calibrated to recent financial crisis

» Flexible framework that allows clients to customize the models

» Robust scenario analysis/stress testing capabilities that support regulatory compliance

» Enterprise-class software
# CMM Inputs, Outputs & Uses

## CMM Inputs

- **Loan Details**
  - Loan Amount, Term/Amort *
  - Rate: Fixed, Floating, Other *
  - Structure *

- **Property details**
  - Property type, Location, Property Value, NOI *
  - Rent, Vacancy, Cap Rate, Lease rolls, Expenses

- **Asset Volatility**
  - Systematic and Idiosyncratic volatility

* Required input

## CMM Outputs

- Estimated Property Value
- Estimated NOI
- Expected Default Frequency (EDF)
- Loss Given Default (LGD)
- Expected Loss (EL)
- **Yield Degradation (YD)**
- Stressed Risk Measures
  - Stressed PD, LGD
  - Unexpected Loss
- **Implied Moody’s Rating**
- Customer Rating (Based on customer rating scale)

## CMM Uses

- Stress Testing
- Identify sources and causes of risk
- Price new loans
- Monitor loan expected performance as markets change
- Early Warning System
- Identify loans for potential sale
- Identify periods of maximum risk
- Respond to management and regulators
- Efficiently size capital allocations vis-à-vis competing asset classes
CMM capabilities at a glance

» Report risk measures at **portfolio and loan level**; also integrated with our spreading, loan origination and stress testing solutions

» Supports **back-testing** by allowing historical analysis on a portfolio

» Supports **regulatory stress testing**, by enabling you to generate risk measures under ECCA, supervisory scenarios and user-defined (organization specific) macroeconomic scenarios into CRE specific forecast and determine related losses on your portfolio

» Provides flexible framework that is **adjustable** to your default experience

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**Save your CRE portfolio on the Cloud and access from anywhere**

**Combine your CRE portfolio and macro forecast and instantly see the impact on risk measures**
Spread, Score, Store, Workflow & Reporting Solutions

Data Collection
- Consistent
- Single Source – RiskAnalyst & RiskOrigins

Financial Analysis
- CRE Data Templates
  - Income Producing
  - Land Development
  - Home Builder

Scenario Analyzer
- Dashboard
- Portfolio Reports
- Stress Testing

Scoring
- CMM EDF & LGD

Scorecards
- Quantitative EDF/LGD score combined with qualitative factors
Questions
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