Modeling Loss Given Default (LGD) in Commercial Real Estate

Jung-Eun Kim
Federal Reserve Bank of Richmond

2018 Stress Testing Model Symposium
Oct 10th, 2018

The views expressed in this presentation are those of the author and do not necessarily reflect those of the Federal Reserve Bank of Richmond or the Federal Reserve System.
What is LGD?

- **Loss Given Default**: The portion of a defaulted loan that’s not recovered
  \[ \text{LGD} = 1 - \text{Recovery Rate} \]
  Important element of credit risk modelling since
  \[ \text{Expected Loss} = \text{PD} \times \text{LGD} \times \text{EAD} \]

- **What determines LGD?**
  In general, the credit worthiness of the borrower, the riskiness of the loan, the type of collateral, and the state of the economy

- **Today’s topic**
  Modeling LGD in CRE – outline of R&D work
What Determines CRE LGD?

• The proceeds from sales of the collateral (the CRE property) is the main source of recovery.

-> The key determinant: **value of the collateral property**
   “How easily can we sell the collateral at a good price?”

A. **The Fundamental Value of Collateral**
   -> Net value of collateral, e.g. LTV
   -> Property characteristics, e.g. type of property
   -> Geography, e.g. local economic conditions, natural disasters

B. **Macro Economic Conditions and Market Liquidity**
   -> Market liquidity, e.g. fire-sale discount
CRE Market Activity

- Activity is highly pro-cyclical.
- **Non-distressed transactions** (left axis) plunge during Great Recession.
- **Resolving transactions** (right axis) occur with a lag, in part reflecting the slow pickup in market liquidity.

*Source: Real Capital Analytics*
Challenges of Modeling LGD

• **Limited Data**
  : Actual economic loss data for defaulted CRE loans are scarce.

• **Measurement of Realized Loss**
  : The recovery may occur over an extended period, and not be well captured by charge-offs or reserves.
  : Various costs are associated with recovery.

• **Distribution of LGD is Bimodal**
  : Model must account for many zero LGD outcomes.
LGD Models

• **Current LGD Model for CRE Loans**
  : Measures LGD using loss reserves and charge-offs
  : Risk drivers are loan characteristics and macroeconomic variables

• **A New LGD Model in R&D**
  : Uses realized losses from actual transactions.
  : Simpler treatment of zero LGD outcomes.
  : Implicitly incorporates the effect of market liquidity.
  : Shows stronger macro-economic sensitivity.
Some R&D Model Results

**LGD Risk Drivers**

: Loan Characteristics, e.g.
  - LTV (↑) Indebtedness
  - Loan Size (↑) Liquidity
  - Property Type Fundamentals
  - Geography Fundamentals & Liquidity

: Macro-Economic Conditions, e.g.
  - Change in CRE Prices (↓) Fundamentals & Liquidity
  - Vacancy Rates (↑) Fundamentals & Liquidity
Example 1: LGD and Origination LTV

- **High LTV loans are riskier** and tend to incur higher LGDs.

> Y-axis: not-to-scale
Example 2: LGD and Loan Size

- **Larger loans** tend to incur higher LGDs.

Y-axis: not-to-scale
Example 3: LGD and Location

- **Loans in business districts** tend to incur lower LGDs.

Y-axis: not-to-scale