

Modeling Loss Given Default (LGD) in Commercial Real Estate

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What is LGD?

- Loss Given Default

: The portion of a defaulted loan that's not recovered

: **LGD = 1 – Recovery Rate**

: Important element of credit risk modelling since

$$\text{Expected Loss} = \text{PD} * \text{LGD} * \text{EAD}$$

- 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

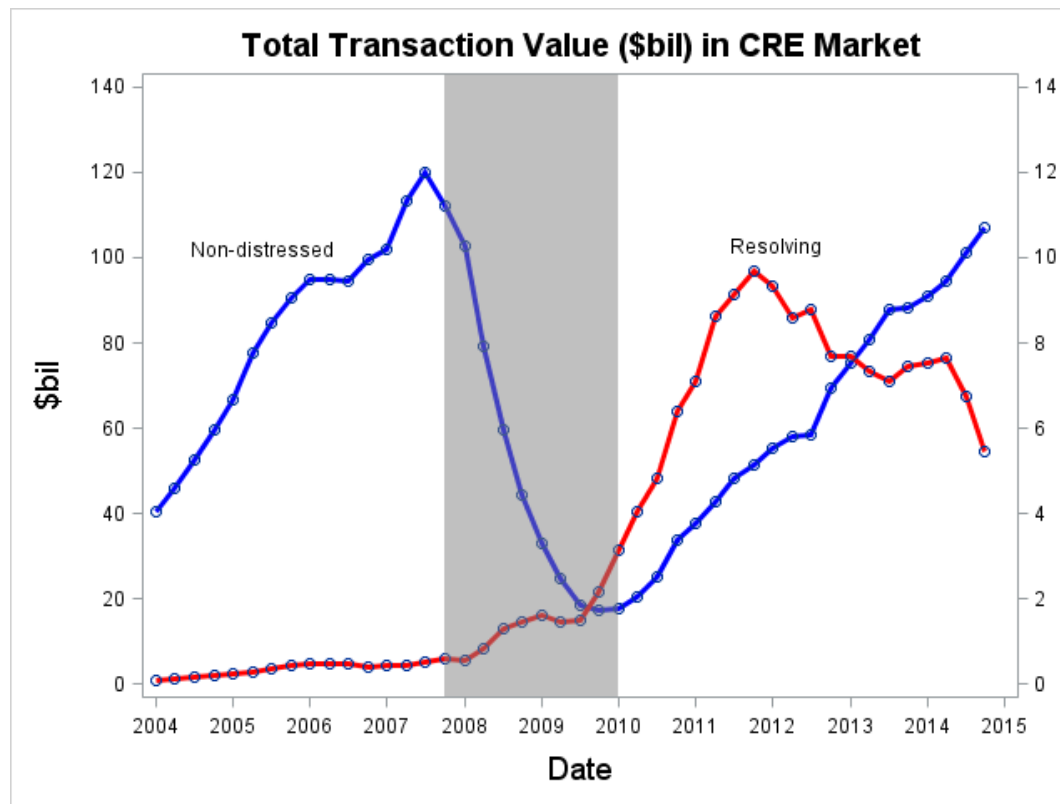
-> Geography, e.g. local economic conditions, natural disasters

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.



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 (↑)
- Loan Size (↑)
- Property Type
- Geography

Indebtedness

Liquidity

Fundamentals

Fundamentals & Liquidity

: Macro-Economic Conditions, e.g.

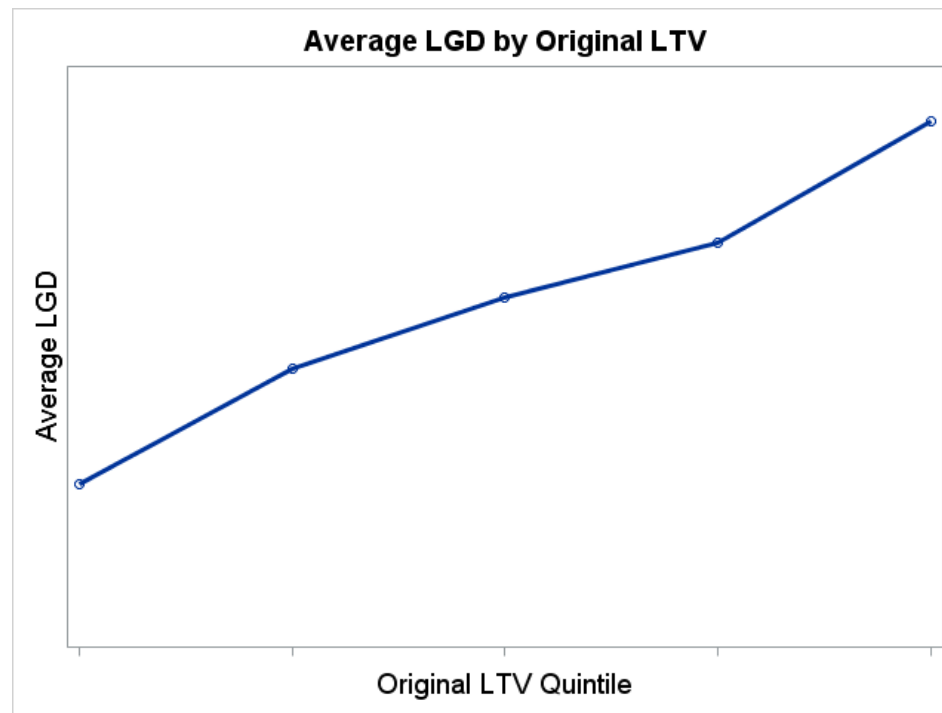
- Change in CRE Prices (↓)
- Vacancy Rates (↑)

Fundamentals & Liquidity

Fundamentals & Liquidity

Example 1: LGD and Origination LTV

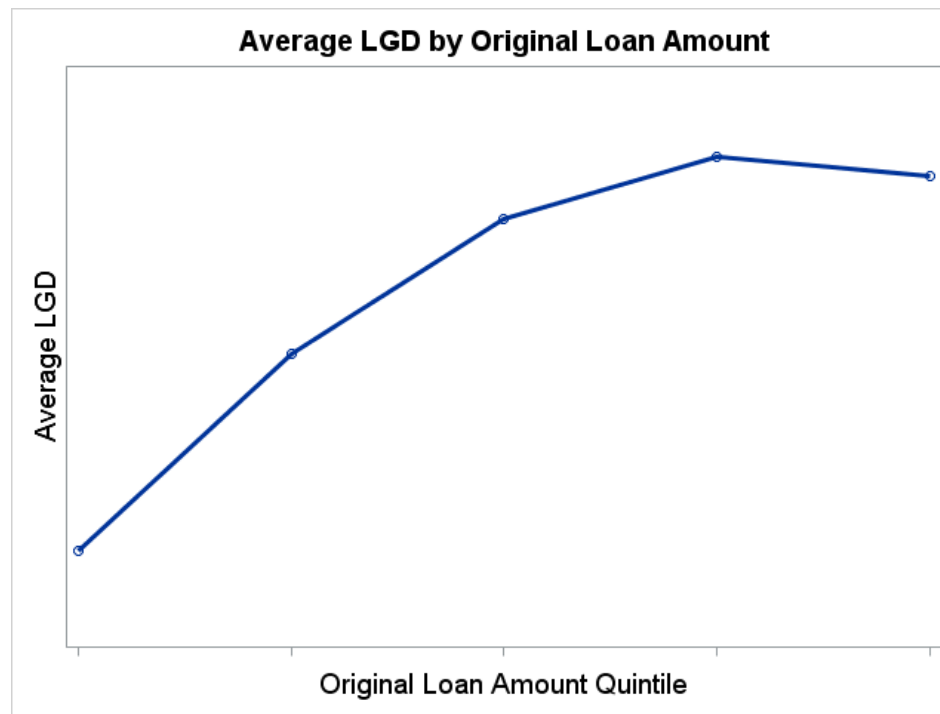
- High LTV loans are riskier and tend to incur higher LGDs.



Y-axis: not-to-scale

Example 2: LGD and Loan Size

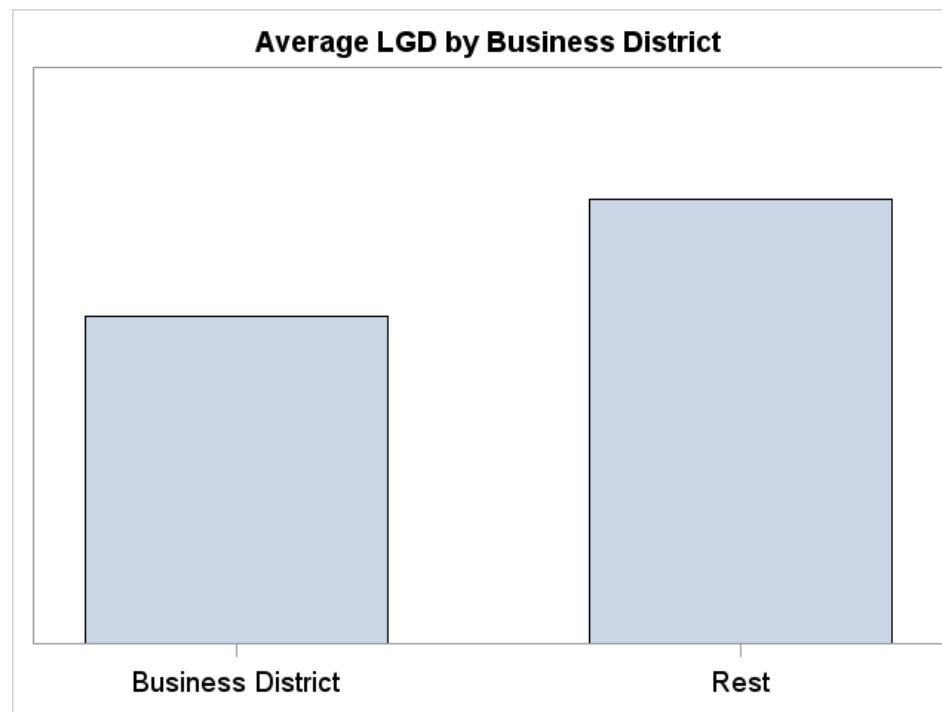
- Larger loans tend to incur higher LGDs.



Y-axis: not-to-scale

Example 3: LGD and Location

- Loans in business districts tend to incur lower LGDs.



Y-axis: not-to-scale