Interest Rate Risk, Prepayment Risk and Banks' Securitization of Mortgages

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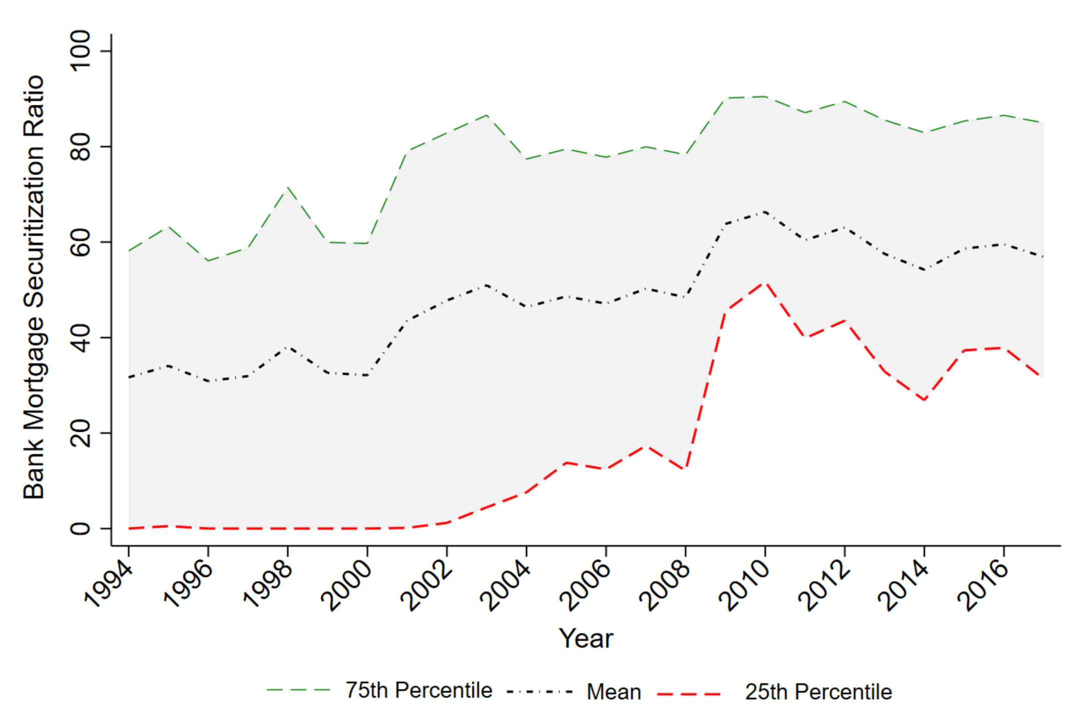
Motivation

- There exists a large dispersion in banks' mortgage securitization in any given year.
- The literature -

  Funding constraints, liquidity concerns, tax benefits and risk transfer (e.g., Loutskina and Strahan 2009, Loutskina 2011 Agarwal, Chang, and Yavas 2012, Fuster and Vickery 2015, Han, Park, and Pennacchi 2015).
- This paper - Interest rate risk and prepayment risk in mortgages.



Interest Rate Risk in Mortgages & Securitization

- A change in market interest rates leads to an opposite change in the value of a mortgage.
- Volatile market interest rates → Volatile mortgage value → volatile cash flow to banks holding many mortgages on balance sheets.
- Why imporant to study?
  - 30-year fixed-rate mortgages (FRMs) dominate the U.S. mortgage market - FRMs make up 91% of U.S. first-lien mortgages originated between 2009–2013, and 83% of the stock of loans as of December 2013 (Fuster and Vickery, 2015).
  - U.S. interest rates vary widely over time.
- Mortgage securitization: Agency v.s Non-agency Market (PLS)
  - Agency market: GSEs (Fannie Mae and Freddie Mac);
  - Non-agency market: Private institutions such as trusts and special purpose vehicles (SPVs);
- Mortgage Types: Conforming v.s Jumbo Mortgages)
  - The conforming loan limit (CLL), e.g., $ 510,400 in 2020.
  - Conforming mortgages - can be securitized through the agency market;
  - Jumbo mortgages - can not be securitized through the agency market;

Hypotheses

1. Hypothesis 1: Banks with longer-maturity liabilities are more capable of taking the interest rate risk in mortgages and thus securitize fewer mortgages.
2. Hypothesis 2: Banks with shorter-maturity liabilities originate fewer jumbo mortgages.

Key Findings

- In the conforming mortgage market, banks with longer-maturity liabilities securitize fewer mortgages.
- In the jumbo mortgage market, banks with shorter-maturity liabilities have a much lower approval rate.
- Banks deal with the prepayment risk induced by household refinancing in two ways:
  - *Ex ante*, more securitization;
  - *Ex post*, less likely to help households refinance their existing mortgages.

Data & Measures

- Data
  - Bank Call Reports
  - Summary of Deposits
  - HMDA
  - Fed Funds rates (FFR) from the website of the Federal Reserve Bank of St Louis, data on monetary shocks from [?], and distance data from NBER county-to-county database.
- Measuring the maturity of a bank's liability
  - The sensitivity of a bank's interest expenses to changes in Fed funds rate (Drechsler, Savov, and Schnabl, 2020)
  - The smaller the beta is, the longer maturity a bank's liability has.
- Measuring a bank's mortgage securitization:
  - Number of mortgages Sold by a bank in a county/Number of mortgages a bank originates in a county.

Results - Interest Rate Risk in Conforming Mortgages

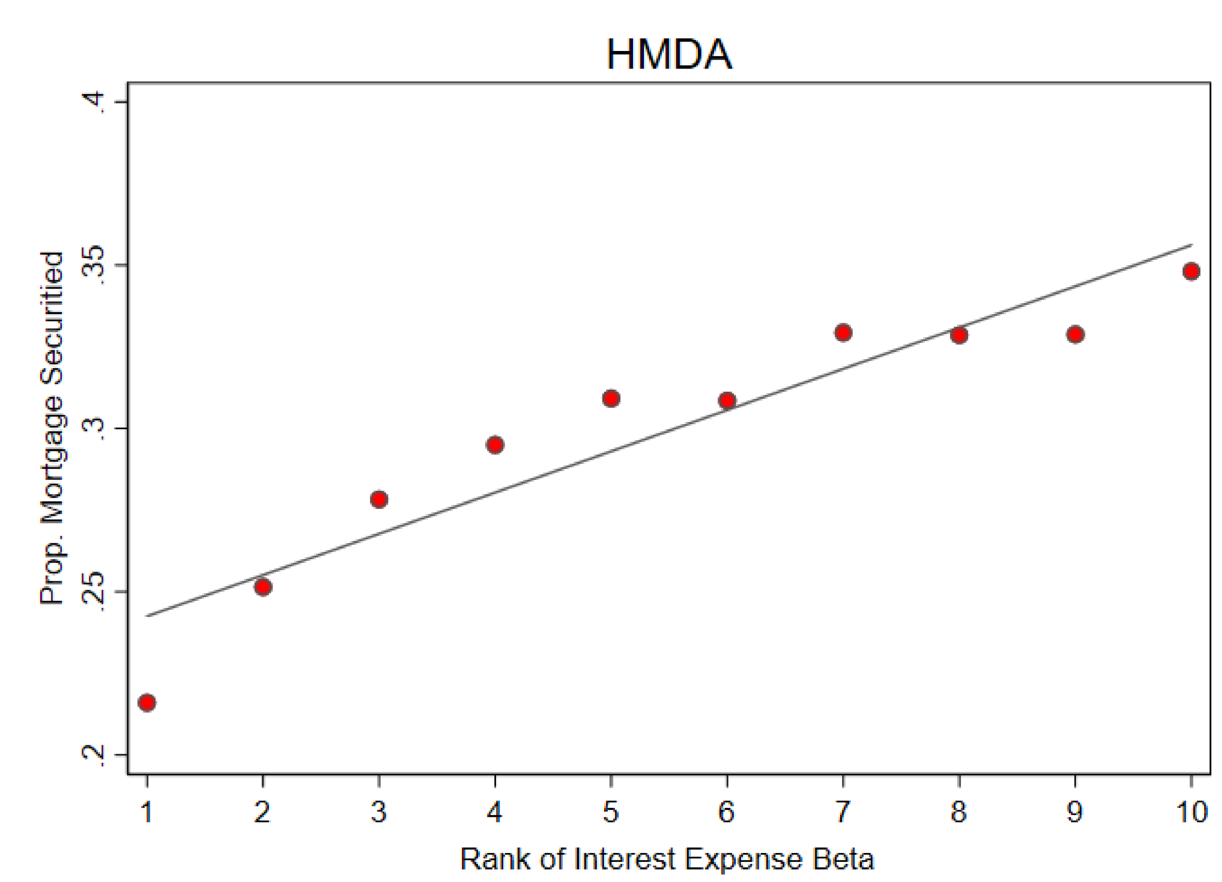
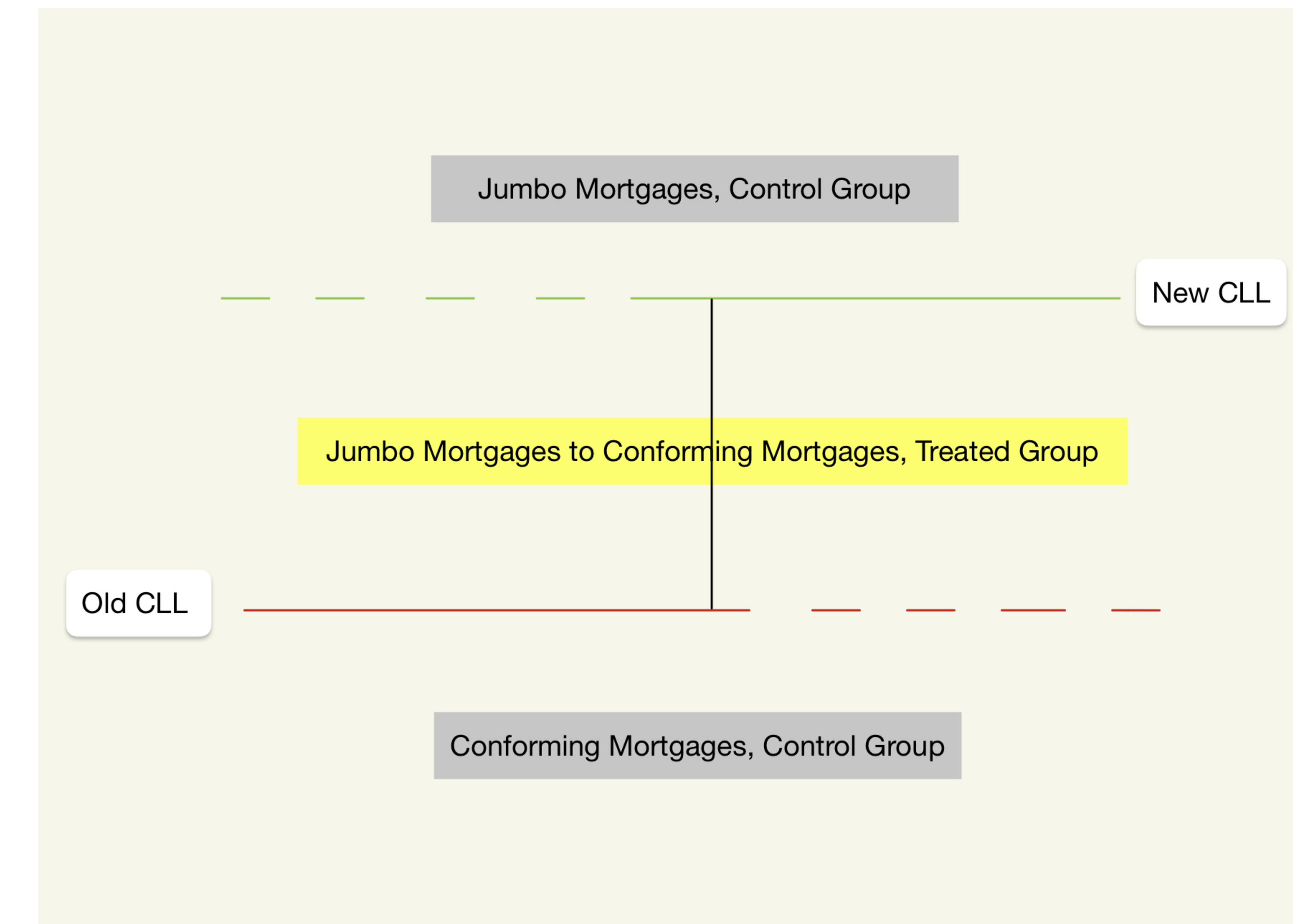


Figure 1. Cross-sectional Patterns

- Banks with longer-maturity liabilities securitize fewer mortgages.
- Banks with interest expense beta one standard deviation above the average securitize 10.18% more mortgages than those with interest beta one standard deviation below the average.

Results - Interest Rate Risk in Jumbo Mortgages



- Annual increases in the conforming loan limit (CLL) create exogenous shocks to a local mortgage market - reclassifying some jumbo mortgages into conforming mortgages.
- Banks with short-maturity liabilities approve more such mortgages.

Results - Prepayment risk, Mortgage Securitization & Refinancing

- Prepayment risk - the outstanding amount of a mortgage is prematurely paid back.
- Two main impacts on banks:
  - Losses in interest income;
  - Disruption in maturity matching;
- Matters more for banks with longer-maturity liabilities - more mortgages on balance sheets.
- Ex ante, anticipating the prepayment risk, banks with longer-maturity liabilities securitize more mortgages, resulting in a smaller securitization gap between banks with long- and short-maturity liabilities.
- Ex post, banks with longer-maturity liabilities are less likely to help households refinance their existing mortgages, i.e., fewer supplies of refinancing mortgages.