Did Securitization Lead to Lax Screening? Evidence from Subprime Loans

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Motivation

Framework

- Banks serve as delegated monitors
  - Remove duplication in monitoring: Diamond [1984]
- However, must be given incentives to do so
  - Who monitors the monitors?: Holmstrom and Tirole [1997]
    - Illiquidity of loans provides incentives: Diamond and Rajan [2003]

Securitization: Some Facts

- Explosive growth in the last decade or so
  - Involves converting illiquid assets to liquid securities
- Changes the business model of financial intermediaries
  - “risk warehousing” to “originating and distributing”
    - “buy and hold” to “buy and sell”
Motivation

Several Benefits...

- Improved risk sharing in the economy
  - Lower cost of capital
- Banks better at withstanding negative shocks
  - Kashyap and Stein [2000]; Loutskiana [2006]; Loutskiana and Strahan [2007]
  - “...makes banks more flexible and resilient”: Greenspan at ABAC in 2004
...but What About Costs?

- Banks at arm’s length no longer screen and monitor risks they originate
  - Parlour and Plantin [2007]
- Classic liquidity vs. incentives tradeoff
- View has gained prominence since the outburst of subprime crisis
  - “...securitization contributed to bad lending: in the old days, banks that originated bad loans bore the consequences; in the new world of securitization, the originators could pass the loans onto others”: Stiglitz [2007]
- Reputation or guarantees from lenders may prevent moral hazard: Gorton and Pennacchi [1995]
- Ultimately an empirical question
  - Related to literature on bank sales: Gorton and Pennacchi [1995]; Drucker and Puri [2007]
Motivation

- Does securitization lead to lax screening by lenders?

- Loans more likely to be securitized default 20% more than similar risk profile loans with lower likelihood of securitization
Motivation

Empirical Design

Data and Main Empirical Results

Strategy

Identification Strategy

Main Complications

- Endogeneity of securitization makes causal claims difficult
  - Use adhoc threshold in lending market to generate exogenous variation in securitization likelihood of a loan as compared to another loan with similar risk characteristics
- Conditional on securitization, wide variation possible in loan contracts
  - Use detailed data on subprime loans contracts to control for various loan characteristics
Adhoc Rule Of Lending

Background On Credit Scores (FICO)

- FICO score (350-800) reflects the credit quality of the borrowers
  - A scaled probability score with a higher FICO ⇒ borrower with better credit quality
  - Fair Isaac: “FICO gives ranking of potential borrowers by the probability of having some negative credit event in the next two years”
  - Generated via software licensed by Fair Isaac to three independent repositories (TransUnion, Experian, and Equifax)
- Most reliable measure used by the lender, rating agencies and investors: Gramlich [2007]
  - High predictability even for low income borrowers
  - Median score used by lenders
Adhoc Rule Of Lending

Threshold of 620 FICO

- Threshold in mid 1990s by Fannie Mae and Freddie Mac in their guidelines on what loans would be purchased by them
  - Fair Isaac: “... those agencies [Fannie Mae and Freddie Mac], have indicated to lenders that any consumer with a FICO score above 620 is good...”
  - Guidelines by Freddie Mac: “... a score below 620 is a strong indication that the borrower’s credit reputation is not acceptable...”
- Confirmed in several papers/ rating agency guidelines/ articles/ origination matrices of lenders/ anecdotes
Identification Strategy

Using adhoc cutoff as a measure of ease of securitization

- Analogous to Fuzzy RD design
  - Make causal inferences on lender’s behavior by comparing performance of loans to borrowers with scores of 619 (620-) vs. 621 (620+)
Large Dataset on Subprime Mortgages

▶ Loan Performance database: All securities issues in secondary non-agency market
  - Loans in more than 8000 non prime loan pools
  - Borrower characteristics: Credit score (FICO), debt to income ratio, documentation (full, limited, no)
  - Loan characteristics: LTV, loan amount, term and interest rate type (ARM vs. FRM), type of property (owner occupied, vacation, investor)

▶ Restrict sample for reasonable comparison
  - New purchases of owner-occupied, single family residences
  - Not FHA or VA insured or Alt-A
  - Sample period 2001-2006
Overall Market Trends

Summary Statistics

Panel A: Entire Sample

<table>
<thead>
<tr>
<th>Year</th>
<th>Number of Loans</th>
<th>% Low Documentation</th>
<th>Mean Loan-To-Value</th>
<th>Mean FICO</th>
</tr>
</thead>
<tbody>
<tr>
<td>2001</td>
<td>136,483</td>
<td>26.0%</td>
<td>84.6</td>
<td>611</td>
</tr>
<tr>
<td>2002</td>
<td>162,501</td>
<td>32.8%</td>
<td>85.6</td>
<td>624</td>
</tr>
<tr>
<td>2003</td>
<td>318,866</td>
<td>38.9%</td>
<td>87.0</td>
<td>637</td>
</tr>
<tr>
<td>2004</td>
<td>610,753</td>
<td>40.8%</td>
<td>86.6</td>
<td>639</td>
</tr>
<tr>
<td>2005</td>
<td>793,725</td>
<td>43.4%</td>
<td>86.3</td>
<td>639</td>
</tr>
<tr>
<td>2006</td>
<td>614,820</td>
<td>44.0%</td>
<td>87.0</td>
<td>636</td>
</tr>
</tbody>
</table>

- Steady growth in number of loans securitized
- ↑ in % low documentation, LTV ratio
- Loans with higher credit score securitized
Adhoc Rule in Lending

Number of Loans (in’00) at each FICO score: Low Documentation

- Large jump in number of loans at 620
Adhoc Rule in Lending
Number of Loans (in ’00) at each FICO score: Low Documentation

- Similar trend across years
Adhoc Rule in Lending

Estimating Discontinuity in Low Documentation Loans

\[ Y_i = \left( \alpha + \beta T_i + \theta f(FICO(i)) + \delta T_i \ast f(FICO(i)) + \epsilon_i \right) \]

<table>
<thead>
<tr>
<th>Year</th>
<th>( \beta )</th>
<th>t-stat</th>
<th>Observations</th>
<th>( R^2 )</th>
<th>Mean</th>
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</thead>
<tbody>
<tr>
<td>2001</td>
<td>36.83</td>
<td>(2.10)</td>
<td>299</td>
<td>0.96</td>
<td>117</td>
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<tr>
<td>2002</td>
<td>124.41</td>
<td>(6.31)</td>
<td>299</td>
<td>0.98</td>
<td>177</td>
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<td>2003</td>
<td>354.75</td>
<td>(8.61)</td>
<td>299</td>
<td>0.98</td>
<td>413</td>
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<tr>
<td>2004</td>
<td>737.01</td>
<td>(7.30)</td>
<td>299</td>
<td>0.98</td>
<td>831</td>
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<tr>
<td>2005</td>
<td>1,721.64</td>
<td>(11.78)</td>
<td>299</td>
<td>0.99</td>
<td>1,148</td>
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<tr>
<td>2006</td>
<td>1,716.49</td>
<td>(6.69)</td>
<td>299</td>
<td>0.97</td>
<td>903</td>
</tr>
</tbody>
</table>

- Large jump at 620+ relative to 620- in number of low documentation loans post 2001
Delinquencies of Loans

Delinquencies: Low Documentation

- Default rates jump around the 620 threshold
Performance of Loans Around Thresholds

60+ Delinquency: Low Documentation

- Loans at $620^+$ default more relative to loans at $620^-$
- Large magnitudes relative to mean default rates – around 20% more
Alternative Explanation

What about...

- Selection on Observables
  - Borrowers
  - Investors/Issuer
Loan Characteristics Around Thresholds

Loan To Value Ratio: Low Documentation

▶ No jump in loan to value at 620
Loan Characteristics Around Thresholds

Loan To Value Ratio: Low Documentation

Securitization and Screening
Loan Characteristics Around Thresholds

Interest Rates: Low Documentation

- No jump in interest rates at 620.
Loan Characteristics Around Thresholds

Interest Rates: Low Documentation

![Graphs showing loan characteristics around thresholds for different years (2001-2006).](image-url)
Distribution of Loan Contracts around 620

Interest Rates: Low Documentation

- No difference in the distributions of interest rates offered at $620^+$ and $620^-$
- KS test rejects that the two distributions are not equal at 1%
Distribution of Loan Contracts around 620
Loan to Value: Low Documentation

![Distribution Graph](image-url)
Borrower Demographics Around Thresholds

Household Income: Low Documentation

- No jump in borrower demographic variables at 620 across years
Other Tests

What about...

- **Manipulation of FICO Scores**
  - Why manipulate?

- **Soft Information**
  - Do effects attenuate with more hard information?
A Natural Experiment

Number of Loans: Low Documentation

Predatory laws passed in Georgia and New Jersey in Oct 2002
Subsequently reversed Georgia (April 2003) and New Jersey (May 2004)
Another Adhoc Rule Of Lending

**Threshold of 600 FICO**

- Threshold appears in advice by Fair Isaac
  - Fair Isaac: “...anything below 600 is considered someone who probably has credit problems that need to be addressed...”
  - Einav, Jenkins and Levin [2007]: “...a FICO score above 600, a typical cut-off for obtaining a standard bank loan”
- Value of soft information is lower for loans that provide full documentation
Another Adhoc Rule

Number of Loans at each FICO score: Full Documentation

- Large jump in number of loans at 600
Adhoc Rule in Lending

Number of Loans at each FICO score: Full Documentation

- Large jump in number of loans at 600
Delinquencies of Loans

Delinquencies: Full Documentation

- 2001
- 2002
- 2003
- 2004
- 2005
- 2006
Robustness Checks

Additional Tests

- Variation within:
  - Pool
  - Lenders
  - States
- Other counterfactual checks
- Other cutoff rules
- Other performance measures (delinquency definitions)
Conclusion

- Securitization destroys screening incentives of lenders
  - Extrapolation required to assess effects on the entire market

- Cautious on welfare implications of securitization
  - Benefits need to be evaluated with these costs

- Implications in general for defaults models and regulation through models (BASEL II)
  - Default models not invariant to strategic behavior of participants: Lucas [1976]
Permutation Tests

Delinquencies

- Same pattern for all years
Permutation Tests

Interest Rate

- Same pattern for all years