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

Motivation

...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
  - Maug (1997), Bhide (1993), Coffee (1991), Aghion et al. (2004)
- 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

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 $\Rightarrow$ 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

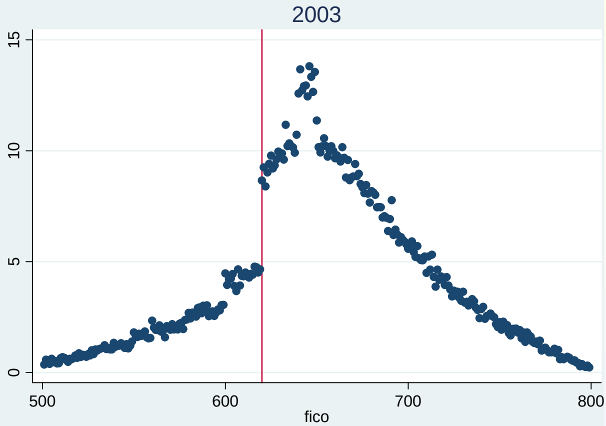
Panel A: Entire Sample

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

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

Adhoc Rule in Lending

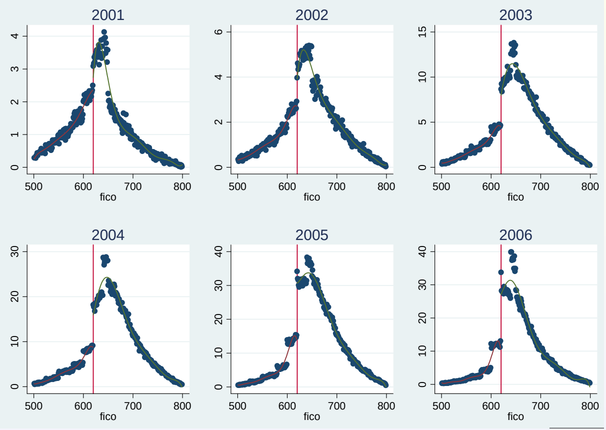
Number of Loans (in'00) at each FICO score: Low Documentation



- 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

$$Y_i = \left(\alpha + \beta T_i + \theta f(FICO(i)) + \delta T_i * f(FICO(i)) + \epsilon_i \right)$$

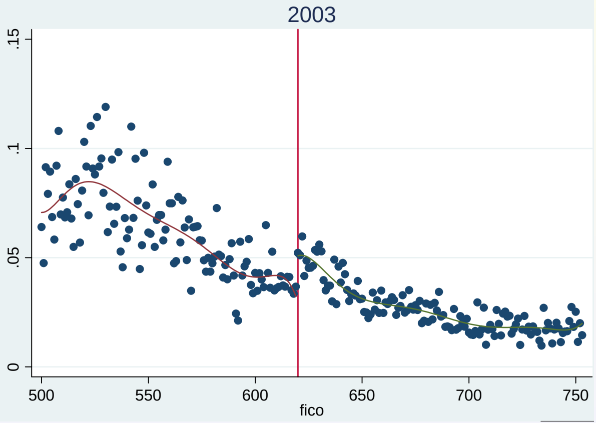
Low Documentation Loans

Year	β	t-stat	Observations	R^2	Mean
2001	36.83	(2.10)	299	0.96	117
2002	124.41	(6.31)	299	0.98	177
2003	354.75	(8.61)	299	0.98	413
2004	737.01	(7.30)	299	0.98	831
2005	1,721.64	(11.78)	299	0.99	1,148
2006	1,716.49	(6.69)	299	0.97	903

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

Delinquencies of Loans

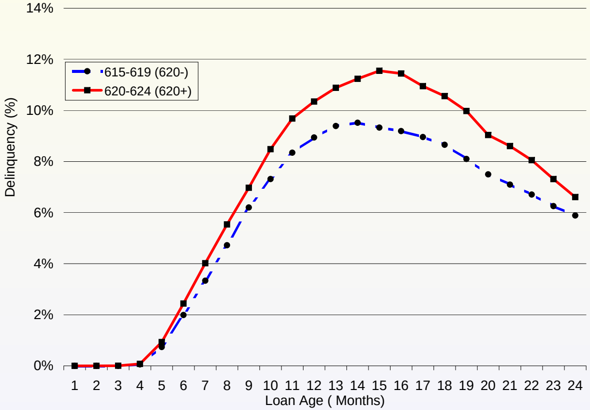
Delinquencies: Low Documentation



- 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

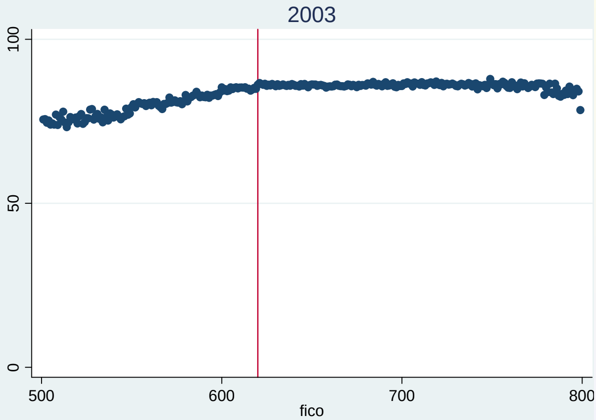
Alternative Explanation

What about...

- Selection on Observables
  - Borrowers
  - Investors/Issuer

Loan Characteristics Around Thresholds

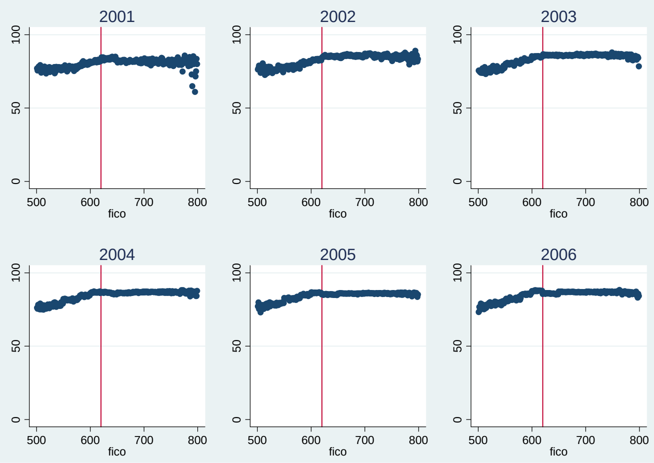
Loan To Value Ratio: Low Documentation



- No jump in loan to value at 620

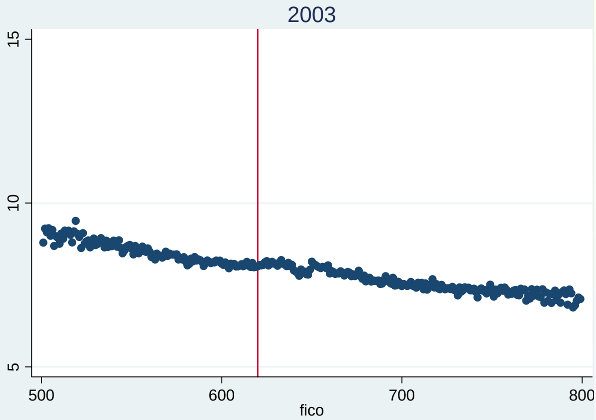
Loan Characteristics Around Thresholds

Loan To Value Ratio: Low Documentation



Loan Characteristics Around Thresholds

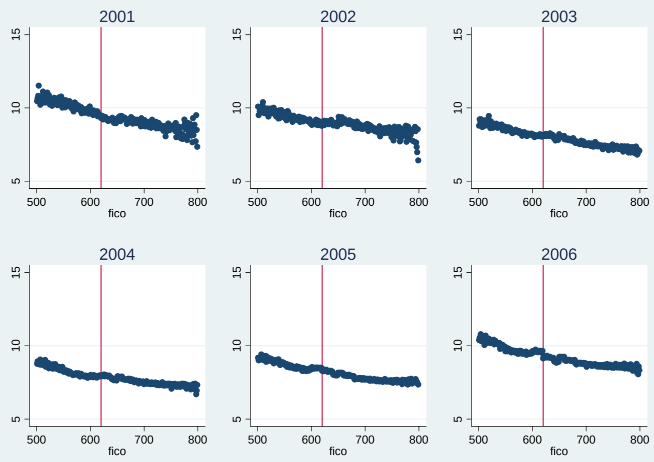
Interest Rates: Low Documentation



- No jump in interest rates at 620.

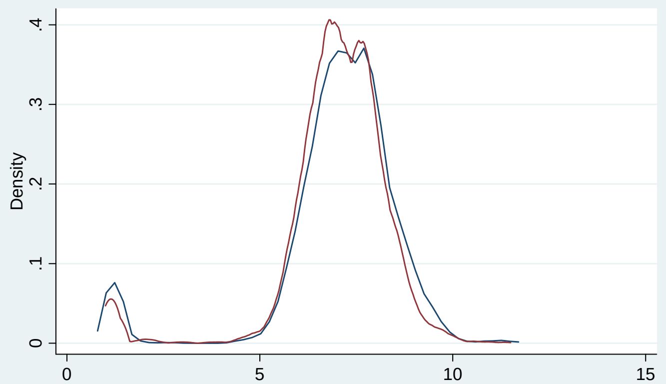
Loan Characteristics Around Thresholds

Interest Rates: Low Documentation



Distribution of Loan Contracts around 620

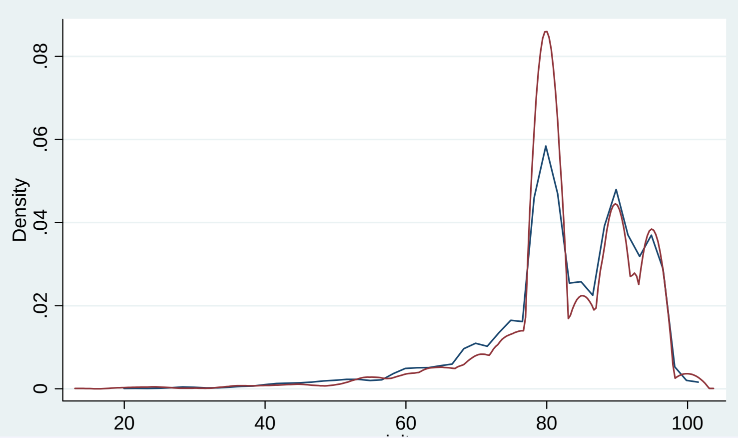
Interest Rates: Low Documentation



- 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



Borrower Demographics Around Thresholds

Household Income: Low Documentation

- No jump in borrower demographic variables at 620 across years

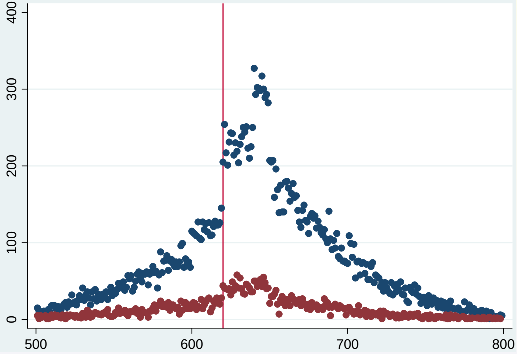
Other Tests

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)

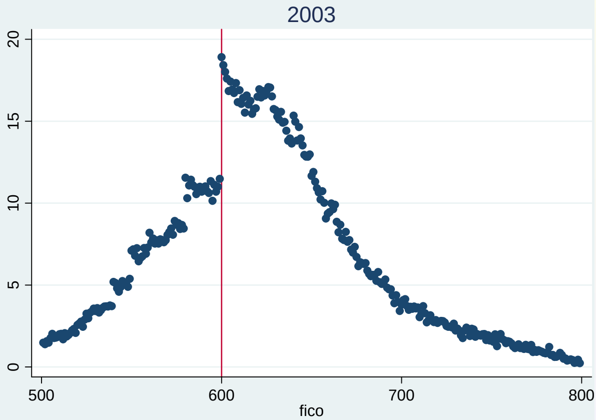
Another Adhoc Rule Of Lending

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

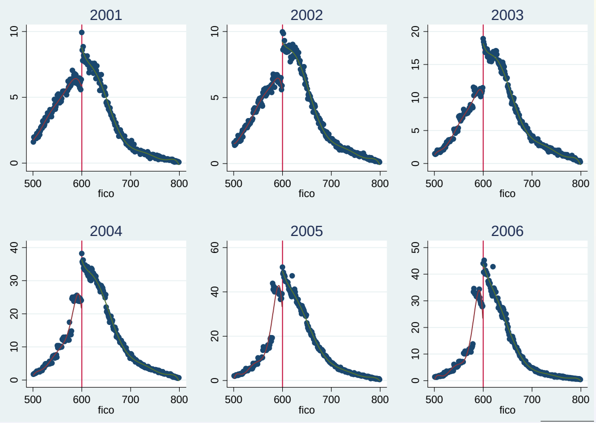
Number of Loans at each FICO score: Full Documentation



- Large jump in number of loans at 600

Adhoc Rule in Lending

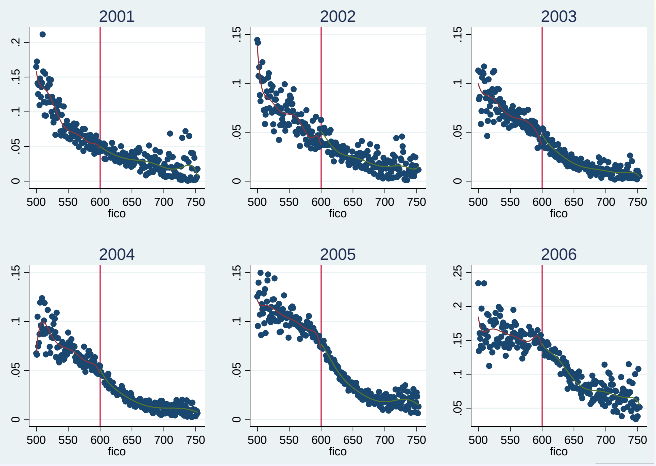
Number of Loans at each FICO score: Full Documentation



- Large jump in number of loans at 600

Delinquencies of Loans

Delinquencies: Full Documentation



Robustness Checks

Additional Tests

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

Conclusion

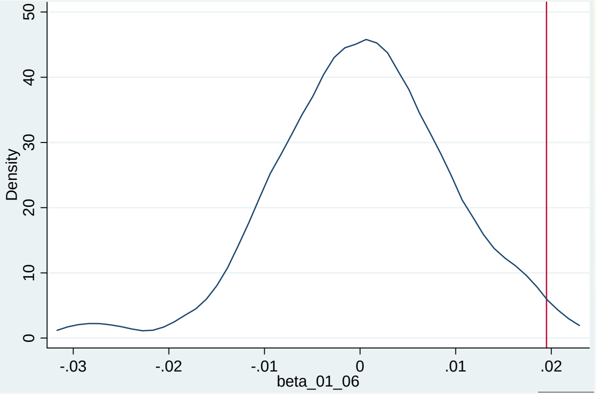
- Securitization destroys screening incentives of lenders
  - Extrapolation required to assess effects on the entire market

- 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

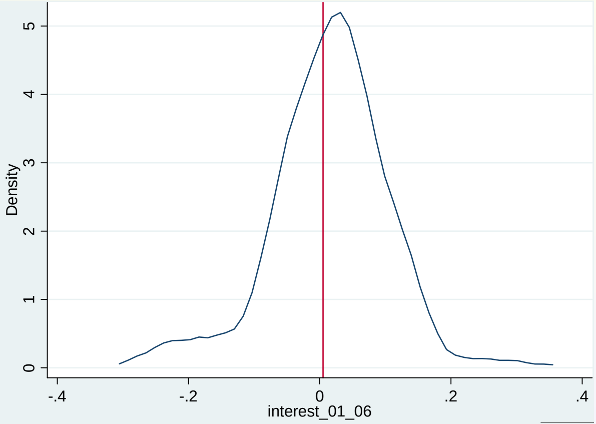
Delinquencies



- Same pattern for all years

Permutation Tests

Interest Rate



- Same pattern for all years