

Securitization, Competition and Monitoring

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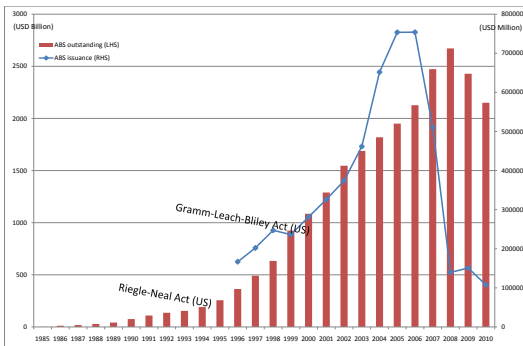
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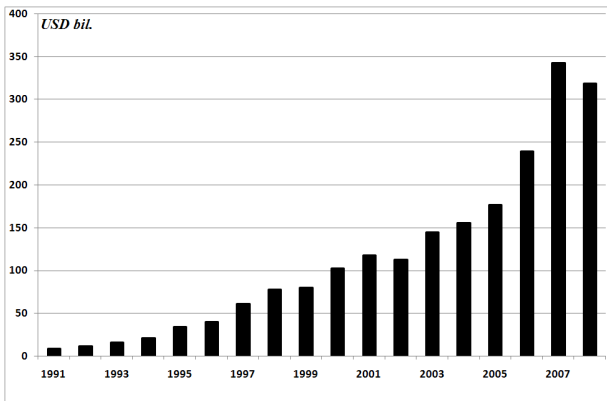
Securitization

- Gradual increase in securitization/loan sales in the last two decades
 - ABS market in the US (Data: Gorton and Metrick, 2011)



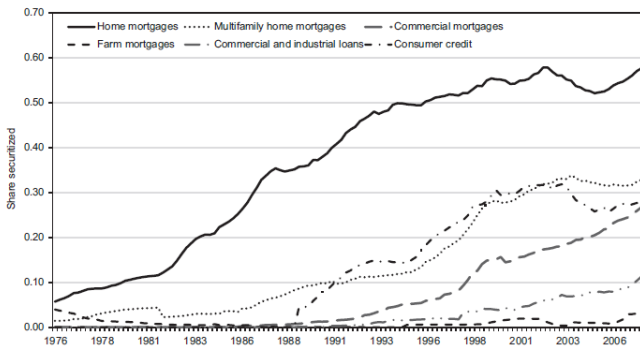
Securitization

- Gradual increase in securitization/loan sales in the last two decades
- Single name loan sales in the US (Data: Reuters LPC Traders Survey)



Securitization

- Development of secondary loan markets associated with an evolution in the business model of banks
 - Shift from “originate-to-hold” (OTH) to “originate-to-distribute” (OTD) model (Butler, 2007; Hellwig, 2008)
 - Increase in fraction of loans securitized (Loutskina, 2011).



Competition

- Over the last two decades, competition in the banking sector has increased, due to deregulation and liberalization
 - Vives (2001); Boot and Schmeits (2006).
- US
 - Riegle-Neal Act of 1994: abolition of geographical barrier to entry between states;
 - Gramm-Leach-Bliley Act of 1999: end of separation between commercial banking and investment banking business.
- European Union
 - Second Banking Directive of 1989: introduction of single banking license (effective in 1993).

Question: Is there a link between more competitive environment and development of securitization?

Monitoring

- Literature emphasizes the negative effects of securitization on screening/monitoring incentives (“dark side”)
 - theoretical contributions with opaque secondary market
 - Morrison 2005, Parlour and Plantin 2008, Hakenes and Schnabl, 2010
 - empirical evidence
 - subprime market
(Keys et al. 2010, Mian & Sufi 2009, Purnanandam 2011, Dell’Arricia et al 2008)
 - corporate loans
(Berndt & Gupta 2009, Gaul and Stebunov, 2009)
- Screening/monitoring is at the core of banks’ business
 - reduction in screening/ should reduce banks’ profit?

Question: Why did bank managers (and shareholders) followed the securitization trend?

- (standard explanation: banks exploit investors’ inability to understand/price securitized products).

The paper

- Interaction of securitization and competition in loan market
- Dynamic competition setup (2-periods)
 - switching costs allow for positive profits in equilibrium
 - competition affected by extent of private information
 - 1 *Ex post*
 - informational advantage \Rightarrow winner's curse on competitors (Sharpe 1990, von Thadden 2004)
 - 2 *Ex ante*
 - more competition for initial market share (Gehrig & Stenbacka 2007, Bouckaert & Degryse 2004)
- Impact of securitization?
 - (transfer of part of loan portfolio cash-flows to outside investors)

Main results

Securitization has two distinct effects

- reduces incentives to monitor (standard effect).
- softening competition effect (new)

Higher securitization (shift from OTH to OTD) can lead to

- higher (collective) profits for banks
- but negative effect on efficiency (from less monitoring)

Two broad implications/interpretations

- points to distributive consequences of securitization
 - rent extraction effect (on borrowers, not investors).
- suggests additional motivation for securitization
 - tool to mitigate the impact of higher competition
 - link between increase in loan market competition and in securitization (empirical)

Outline of the talk

- 1 Introduction
- 2 Framework
- 3 Analysis
 - Exogenous securitization
- 4 Extension
 - Endogenous securitization
- 5 Conclusion

Structure of competition

- Imperfect competition between banks in loan market (duopoly: A,B)

- Price competition (loan rate) in 2 subsequent periods
 - 1 1st period: competition for new borrowers
(pure Bertrand price competition)
 - 2 2nd period
 - Different loan offering policy (own vs. rival's clientele)
depends on the information (private vs. public)
 - Borrower's switching cost $s \in [0, \bar{s}]$ (uniformly distributed)
heterogeneous / known only to borrowers at the end of period 1

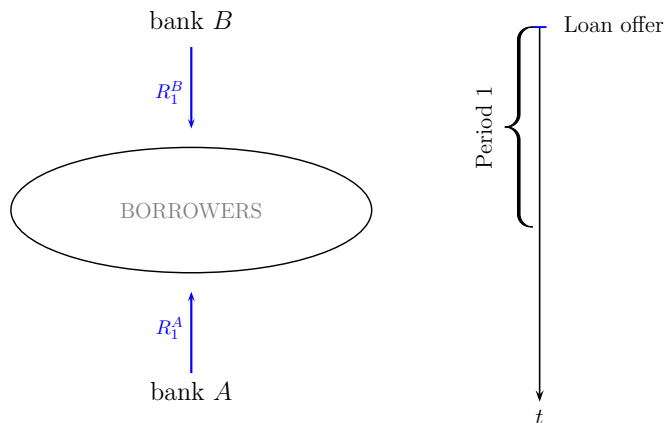
Borrowers and banks

- Two types of borrowers (private information)
 - Type H (proportion λ).
 - One positive NPV project in each period: $I \rightarrow Y$ w.p. p_H
 - Type L (proportion $1 - \lambda$).
 - First period: choice between two negative NPV projects.
 - Bad project $I \rightarrow Y$ w.p. p_L
 - Very bad project that fails surely, but yield private benefits B
 - Second period: Only very bad project.

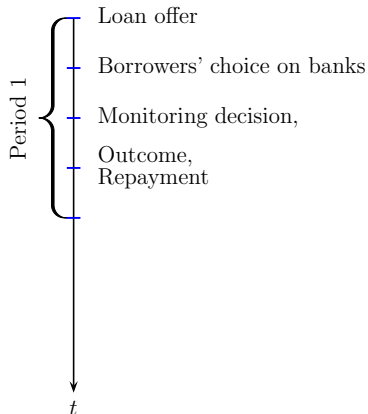
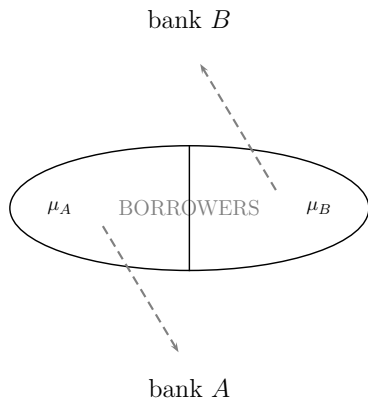
- Banks : can monitor borrowers (HT, 1997)
 - monitoring intensity $\sigma^i \in [0, 1]$, cost $\sigma^i \cdot c$
 - w.p. σ^i : prevent very bad project + learn type
 - full monitoring efficient

- Information structure
 - First period project NPV > 0 in expectation
 - Period 1 default record: observable (credit register)
 - Second period project: NPV < 0 cond. on default / NPV > 0 cond. on success

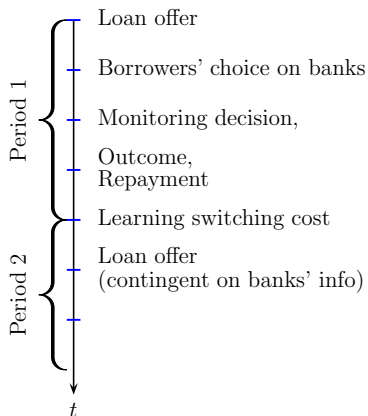
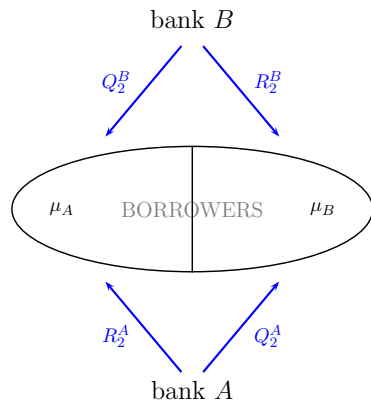
Timing



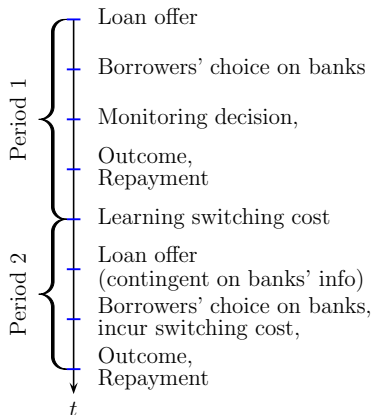
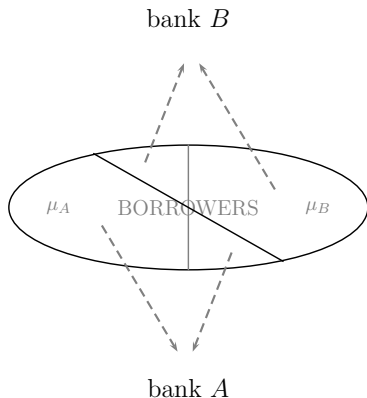
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Timing



Securitization

- In period 1, each bank sells a fraction $\tau \in [0, 1]$ of all loans to external investors
 - τ perfectly observed by investors and competitor
 - many rational, risk neutral investors (0 discount rate)
 - loan portfolio sold at fair price

$$P^* = \tau \cdot \bar{p}^e \cdot R_1^i$$

where $\bar{p}^e = \lambda p_H + \sigma^e (1 - \lambda) p_L$: prob. of repayment expected by investors

- Securitization occurs before monitoring
- Look at effect of τ on equilibrium monitoring and profits
 - Extension with endogenous securitization.

Second period competition

- Competition given initial market shares and private/public information on borrowers.
- Borrowers face tradeoff between interest rate and switching costs.
 - Borrower receiving two offers switch whenever $s < p(R_2^i - Q_2^j)$
- (If switching costs are large enough) The period-2 competition game over bank i 's clients has a unique equilibrium in pure strategies
 - (Per borrower) profits of bank i and rival j on i 's (initial) clients are

$$\tilde{\pi}^{i/i}(\sigma_i) \equiv \sigma_i \lambda (1 - p_H) (p_H Y - I) + \lambda p_H \frac{4}{9} \bar{s},$$

$$\tilde{\pi}^{j/i}(\sigma_i^e) \equiv \lambda p_H \frac{1}{9} \bar{s} - \sigma_i^e (1 - \lambda) p_L I.$$

- Condition on switching costs: $\lambda p_H \frac{1}{9} \bar{s} > (1 - \lambda) p_L I$
- Positive profits *on both clienteles*
 - Switching cost + winner's curse effect.

First period

- Bank i 's overall expected profits

$$\Pi^i = \mu^i \left[-I + (\lambda p_H + \sigma_i^e \tau (1 - \lambda) p_L) R_1^i \right. \\ \left. + \sigma_i (-c + \bar{\pi}^{i/i} + (1 - \tau) (1 - \lambda) p_L R_1^i) + (1 - \sigma_i) \pi^{i/i} \right] \\ + \mu^j \tilde{\pi}^{i/j} (\sigma_j^e)$$

- $\bar{\pi}^{i/i}$ = profit on own clients in period 2 if monitored,
- where $\pi^{i/i}$ = profit on own clients in period 2 if not monitored,
- $\tilde{\pi}^{i/j}$ = profit on rival's clients in period 2.

- Monitoring strategy depends on condition

$$c \stackrel{\leq}{>} (1 - \tau) (1 - \lambda) p_L R_1^i + \left(\bar{\pi}^{i/i} - \pi^{i/i} \right)$$

- In equilibrium $R_1^A = R_1^B$ determined by undercutting argument
 - Competition for market share stops when on own clients = profits on rivals' clients

Equilibrium

- There exists a unique equilibrium in which both banks are active in the first period.
- This equilibrium is symmetric and characterized by the monitoring intensity

$$\sigma^* = \begin{cases} 0 & \text{if } c_\tau < c, \\ \sigma(c, \tau) & \text{if } \bar{c}_\tau \leq c \leq c_\tau, \\ 1 & \text{if } c < \bar{c}_\tau. \end{cases}$$

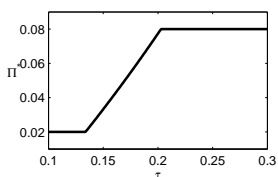
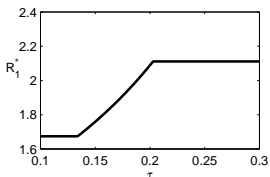
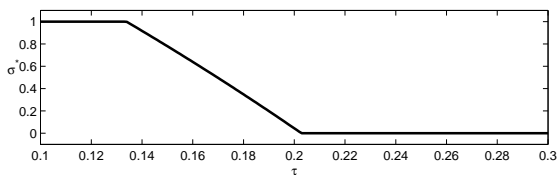
with $\sigma(c, \tau)$ continuous and decreasing in both arguments.

- Equilibrium profits and first period interest rate are given by

$$\Pi^* = \frac{1}{9} \lambda p_H \bar{s} - \sigma^* (1 - \lambda) p_L I > 0,$$

$$R_1^* = \frac{I - \lambda p_H \frac{1}{3} \bar{s} - \sigma^* (\lambda (1 - p_H) (p_H Y - I) + (1 - \lambda) p_L I - c)}{\lambda p_H + \sigma^* (1 - \lambda) p_L}.$$

Effect of an increase in τ



- Decrease in lending standards and increase in profits!
- (Irrespective of effect on welfare).

The softening competition effect

- Results point to a softening competition effect of securitization
- Securitization affect profits through reduction in monitoring intensity
 - (Fair pricing in secondary market + same discount factors)
- Decrease in monitoring has two different effect
 - Reduction of repayment probability of its own clients;
 - Reduction of the adverse selection problem (winner's curse) for rival (→ higher profits from poaching).
- Only the latter effect matters for equilibrium profits
 - In contrast to future rents on one's clients, future profits on the competitor's clients cannot be passed on to borrowers through lower rates in the first period.
 - Profits from poaching thus act as a form of "opportunity return" on funds.
 - Competition for initial market share less intense.

Strategic use of securitization?

- The softening competition effect can be used to mitigate the consequence of an (exogenous) increase in competition.
- Extension: Incumbent (A) facing entry on its market by entrant (E).
- In absence of entry, full monitoring and no use of securitization.
- Focus on A's strategic securitization decision
 - E has no monitoring ability; switching from E to A entails no switching costs.
 - Securitization by E is irrelevant.
 - (A=relationship lenders / E=new entrant with limited expertise).

- Incumbent and entrant profits write

$$\Pi^A = \mu^A \left[-I + (\lambda p_H + \hat{\sigma}_A \tau (1 - \lambda) p_L) R_1^A + \sigma_A (-c + \bar{\pi}^{i/i} + (1 - \tau) (1 - \lambda) p_L R_1^i) + (1 - \sigma_i) \pi^{i/i} \right]$$

$$\Pi^E = \mu^E [\lambda p_H R_1^E - I] + \mu^A \tilde{\pi}^{i/j} (\hat{\sigma}_A).$$

- Equilibrium easily characterized
 - E drives down its initial rate until its first period profit on a borrower equals the profit it can make by poaching in the second period.
 - A engages in “limit pricing”.
- Interest rate

$$R_1 = \frac{1}{\lambda p_H} \left(I + \tilde{\pi}^{i/j} (\hat{\sigma}_A) \right) = \frac{1}{\lambda p_H} \left(I + \frac{1}{9} \lambda p_H \bar{s} - \hat{\sigma}_A (1 - \lambda) p_L I \right).$$

- Monitoring intensity depends on condition

$$c \begin{cases} \leq \\ \geq \end{cases} \bar{\pi}^{i/i} - \pi^{i/i} + (1 - \tau) (1 - \lambda) p_L R_1$$

Strategic use of securitization

Proposition

- In the monopoly case, securitization is either irrelevant, or leads to a decrease in monitoring and profits. Hence, securitization is never used.*
 - When faced with entry, there are cases where the incumbent bank can strictly increase its equilibrium profits by engaging in securitization.*
- Securitization as a strategic response to entry.
 - Incumbent uses securitization to signal to entrant a decrease in its monitoring. This increases the entrant's future profit from poaching, and reduces competitive pressure in the first period.
 - (Securitization activity easily observed by other banks)
 - Provides a link between increase in competition and development of securitization.

Conclusion

- Summary of results
 - Effect of OTD on strategic competition in loan market.
 - OTD can lead to decrease in intensity of competition (standard).
 - Softening competition effect (rent extraction).
- Empirical implications
 - Securitization as a response to exogenous increase in competition?
 - Empirical studies on the determinants of securitization should take into account the degree of competition.
- Policy implications
 - usual prescription: increase transparency vis-a-vis secondary market investors.
 - another dimension to consider: competition conditions in primary market
 - impact depends on switching costs, borrowers' ability to understand/observe securitization
 - desirability of securitization may be different in different market segments.