Securitization, Competition and Monitoring

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Disclaimer

The views expressed here are my own and should not be interpreted as reflecting those the Banque de France or the Eurosystem.
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 (Buiter, 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
- US
  - Riegle-Neal Act of 1994: abolition of geographicals barrier to entry between states;
- European Union

**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
  - 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 ⇒ 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 $\lambda$).
    - 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. $\sigma^i$: 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

bank $B$

$R_1^B$

BORROWERS

bank $A$

$R_1^A$

Loan offer

Period 1

$t$
Timing

- Bank $B$
- Bank $A$
- Borrowers $\mu_A$ $\mu_B$

Period 1
- Loan offer
- Borrowers’ choice on banks
- Monitoring decision,
- Outcome,
- Repayment

$t$
Timing

Period 1
- Loan offer
- Borrowers’ choice on banks
- Monitoring decision,
  Outcome,
  Repayment

Period 2
- Learning switching cost
- Loan offer
  (contingent on banks’ info)
Timing

Period 1
- Loan offer
- Borrowers’ choice on banks
- Monitoring decision
- Outcome
- Repayment

Period 2
- Learning switching cost
- Loan offer (contingent on banks’ info)
- Borrowers’ choice on banks, incur switching cost
- Outcome
- Repayment
Securitization

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

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

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 $\tau$ 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 \( s < p \left( R_i^2 - Q_j^2 \right) \)
- (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
    \[
    \tilde{\pi}^{i/i} (\sigma_i) \equiv \sigma_i \lambda (1 - p_H) (p_H Y - I) + \lambda p_H \frac{4}{9} \bar{s},
    \]
    \[
    \tilde{\pi}^{j/i} (\sigma_{i}^e) \equiv \sigma_{i}^e \lambda p_H \frac{1}{9} \bar{s} - \sigma_{i}^e (1 - \lambda) p_L I.
    \]
- 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

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

where

- $\bar{\pi}^{i/i} = $ profit on own clients in period 2 if monitored,
- $\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

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

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

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

$$R_1^* = I - \lambda p_H \frac{1}{3} \bar{s} - \sigma^* (\lambda (1 - p_H)(p_H Y - I) + (1 - \lambda) p_L I - c)$$
Effect of an increase in $\tau$

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

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

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

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

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

$$c \geq \bar{\pi}^{i/j} - \pi^{i/j} + (1 - \tau) (1 - \lambda) p_L R_1$$
Strategic use of securitization

Proposition

1. In the monopoly case, securitization is either irrelevant, or leads to a decrease in monitoring and profits. Hence, securitization is never used.

2. 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.