“A Quantitative Model of Banking Industry Dynamics”
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This paper

- This is a very interesting paper.
- Analyzes the link between market structure (in banking industry) and risk taking (e.g. prob. of crisis).
- Studies data to guide modeling choices (e.g. high concentration) and test the theory.
- Builds a dynamic model of the banking industry with Cournot competition.
- Performs policy experiments
  - lower competition (no regional banks)
  - subsidy to national banks (too big to fail)
(Simplified) Model

- Households provide deposits at the rate $r = r^D$.
- Given $r^L$, borrowers choose:
  - Borrow and produce, or take outside value, $\omega$.
  - Risk and return of the project.
Borrower’s problem and the demand of loans

- Borrower’s Project Type
- Borrower’s Expected Profits
- Loans Demand

Graphs showing the relationship between Loan Rate, \( r_L \), and the corresponding project types, expected profits, and loans demand.
Fringe banks

- Fringe banks take \( r^L \) as given and decide to lend \( \bar{d} \) or not.
- They can exit after the realization of the shock (limited liability).
- This implies that they will enter if they will make profits in at least one state.

\[
\phi^f = p(R(r^L), z_g, s_1)(1 + r_L) \\
+ (1 - p(R(r^L), z_g, s_1))(1 - \lambda) - (1 + r^D)
\]

- All the fringe bank with cost \( \phi^f \leq \phi^{f*} \) will lend \( \bar{d} \).
- The measure of potential fringe bank is \( M \).
Fringe bank’s problem
Dominant bank’s problem

- The dominant bank chooses $l^d$ to maximize expected profits, $\pi^d(r^L(l^d))l^d$, where $r^L(l^d)$ can be obtained as follows.
  - dominants bank picks $l^d$
  - solve for $r^L$ such that

$$L^D(r^L) = L^S,f(r^L) + l^d$$

(notice this step is like competitive equilibrium)
Dominant (regional) bank’s problem
“Lower competition” is similar to the simplified model

<table>
<thead>
<tr>
<th>Moment</th>
<th>Benchmark</th>
<th>Lower Competition</th>
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</thead>
<tbody>
<tr>
<td>Default Frequency (%)</td>
<td>1.95</td>
<td>2.28</td>
</tr>
<tr>
<td>Exit Rate (%)</td>
<td>1.29</td>
<td>1.22</td>
</tr>
<tr>
<td>Borrower Return (%)</td>
<td>13.25</td>
<td>13.22</td>
</tr>
<tr>
<td>GDP</td>
<td>0.72</td>
<td>0.6</td>
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<td>Loan Supply</td>
<td>0.63</td>
<td>0.53</td>
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<tr>
<td>Taxes/GDP (%)</td>
<td>0.04</td>
<td>0.03</td>
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<tr>
<td>Loan Interest Rate (%)</td>
<td>6.84</td>
<td>8.04</td>
</tr>
<tr>
<td>Borrower Project (%)</td>
<td>13.57</td>
<td>13.59</td>
</tr>
<tr>
<td>Avg. Number Fringe Banks</td>
<td>7472</td>
<td>7497</td>
</tr>
<tr>
<td>Avg. Number Dominant Banks</td>
<td>2.90</td>
<td>1.00</td>
</tr>
</tbody>
</table>
Why are big banks big?

- They present evidence of concentration in the banking industry.
- Then, they construct a model with “dominant banks” (at most two in each region).
- Is concentration enough evidence for this choice?
- What types of loans do they have in mind?
- It may be hard to argue that the mortgage market is not competitive.
Why are big banks big?

- Model: only one bank can enter both regional markets and diversify regional shocks.
- Although regional banks could diversify (securitization), there is some evidence that regional banks suffer from regional shocks.
  - Bank failure rates were higher in states with the largest declines in personal income and the largest increases in unemployment (Wheelock, 2009).
  - Correlation between house prices in Missouri and Charge-offs (real state loans):
    - Bank of America: 0.33
    - Missouri Banks: 0.45
- But there is also evidence of economies of scale.
  - “Do Large Banks have Lower Costs? New Estimates of Returns to Scale for U.S. Banks” (Wheelock and Wilson, 2009).
Changes in the market structure in the US

- Before 1920, branching restrictions limit the geographical scope of banks operations.
- In the early 1920s many states relaxed branching restrictions and created a consolidation movement heading into the Great Depression.
- Legislation following the Great Depression stopped it for about 50 years.
- 1920s consolidation movement would be repeated and extended in the 1980s and 1990s.
- Banks operating national branching networks rose from 10% of the banking system’s loans or deposits in 1980 to more than 70% of the system by the mid-1990s.
The market structure and the Great Depression

- Friedman and Schwartz (1963) contend that branching restrictions left the U.S. banking system especially vulnerable to banking panics.
- Grossman (1994) finds that panics were less likely to occur during the Depression in countries that had nationwide branch banking.
- Wheelock (1995) and Mitchener (2002) find that during the Depression bank failure rates were lower in states that permitted some branching.
- Carlson and Mitchener (2009) show that branching deregulation in California in the 1920s and 1930s increased the probability of survival during the Great Depression.