

Competition and Bank Fragility

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Entry and Competition

- How does competition affect bank fragility?
- Empirical evidence from local (CBO and RBO) banks in the U.S. between 1990 and 2005
- State regulation: almost all of U.S. banking in the 1980s was local
- Followed by a period of large bank (LBO) entry (primarily through M&A activity) into markets where smaller local banks operate
- Examine the effects of LBO entry and competition on local bank portfolios

Findings and their Implications

- Increased LBO competition in the local bank's market leads to:
 - Higher local bank CRE concentrations
 - Effect holds for both CLD and non-CLD components of CRE
 - Robust to a variety of LBO competition measures
 - Lower closed-end RRE and non-credit card consumer lending shares
 - Essentially different retail lending forms
 - No effect on C&I lending
- Local bank implications:

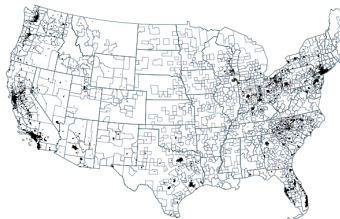
Reduced diversification opportunities and sector-specific shock exposure

- Interagency CRE guidance issued in December 2006
- 31% of all commercial banks in 2006 exceeded at least one of the concentration levels specified in the supervisory criteria
- "Banks exceeding just the construction loan criteria accounted for an estimated 80% of the losses to the [FDIC] insurance fund from 2007 to 2011." (Friend et al 2013)

Theory Predicts Results

- Related literature too numerous to do justice
- Theory of bank competition and fragility ([Keeley 1990](#); [Boyd and DeNicolo 2005](#); [Vives 2011](#))
- “Small banks are better able to collect and act on soft information than large banks. In particular, large banks are less willing to lend to informationally ‘difficult’ credits...” ([Berger et al, 2005](#))
- Competition between informed (small) and uninformed (large) lenders ([Boot and Thakor 2000](#); [Dell Arricia and Marquez 2004](#); [Sengupta 2007](#))
 - Entrants tend to focus on pooling borrowers in segments where borrowers are less opaque. Incumbents find it difficult to compete in low-risk, transactions-based retail segment, but leverage their local knowledge to focus on relatively riskier segments.
- Impact on economic outcomes ([Kroszner and Strahan 2014](#)) and bank attributes ([Levine et al 2017](#))
- The impact of deregulation on local banks ([Berger, Demsetz, and Strahan 1999](#))

LBO Bank Branch Locations

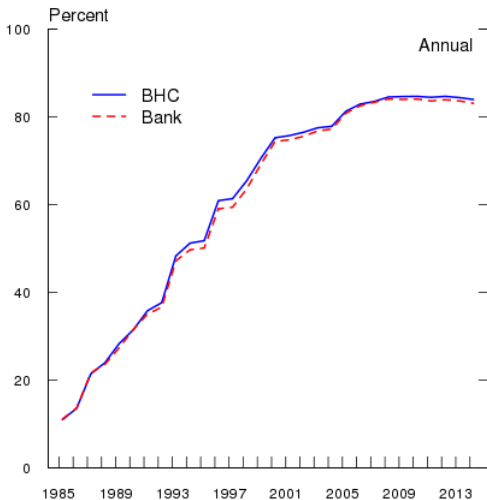


June 1990



June 2005

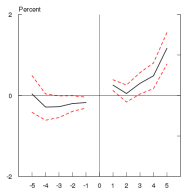
Share of Local (CBOs & RBOs) Banks Facing LBO Competition



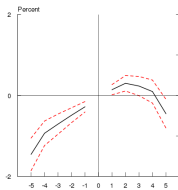
Local Bank Loan Shares Before and After LBO Entry

$$\text{Loan Share}_{i,t} = \alpha_i + \tau_t + \sum_{q=-5}^5 \beta_{t+1} D_{i,t+1} + \varepsilon_{i,t}$$

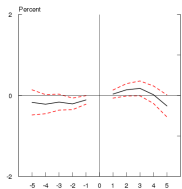
CRE



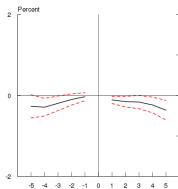
RRE



C&I



Consumer



Local Bank Loan Shares and LBO Competition

$$\text{Loan Share}_{i,t} = \alpha_i + \tau_t + \beta_1 \text{LBO Competition}_{i,t-1} + \gamma X_{i,t-1} + \varepsilon_{i,t}$$

- LBO: BHC with \$50 billion or more in real banking assets (2009 dollars)
- Five measures of LBO competition
 - Branch and Deposit Marketshare
 - Branch and Deposit HHI (log)
 - Deposit Level (log)
- Bank Variables: prior loan growth, NIM, delinquency and charge-off rates, Tier 1 leverage ratio
- County variables: population, per capita income, and building permits
- Bank-level market exposure controls: county-level variables weighted by local bank's branch share in each county

Modeling “Threat of Entry”

- LBO competition as a function of effective proximity to LBO
- Minimum distance between a local bank’s main office and any U.S. branch of an LBO headquartered in states that are allowed to enter the local bank’s home state. ([Jiang et al., 2016](#); [Jiang, Levine and Lin, 2017a,b](#))
- Two Steps:
 1. Exploit state-time variation in list of states whose BHCs were allowed entry into the home state of the local bank ([Amel, 1993](#))
 2. Compute distance to all LBO branches for open state, take minimum
- Relationship banking literature argues that local banks are unwilling to relinquish their customer base on the basis of competitive threats such as proximity to an LBO ([Sharpe, 1990](#); [Petersen and Rajan, 1995](#)).
- LBOs were successful in attracting these customers away from local banks

LBO Competition Measures as Determinants of Loan Shares

Panel A: Core Loan Categories

| | CRE (1) | RRE (2) | C&I (3) | Consumer (4) |
|---------------------|---------------------|---------------------|-------------------|-----------------------|
| <i>Branch MS</i> | 0.0523*** (5.26) | -0.00922 (-0.97) | 0.00361 (0.50) | -0.0189*** (-2.83) |
| <i>Deposit MS</i> | 0.0482*** (5.26) | -0.00848 (-0.97) | 0.00332 (0.50) | -0.0174*** (-2.82) |
| <i>Branches HHI</i> | 0.187*** (5.24) | -0.0330 (-0.97) | 0.0129 (0.50) | -0.0678*** (-2.83) |
| <i>Deposit HHI</i> | 0.186*** (5.24) | -0.0328 (-0.97) | 0.0128 (0.50) | -0.0674*** (-2.83) |
| <i>Deposit Vol.</i> | 0.0925*** (5.26) | -0.0163 (-0.97) | 0.00638 (0.50) | -0.0335*** (-2.83) |

Panel B: Core Loan Subcomponent Categories

| | CLD (1) | Non-CLD (2) | 1-4 Family CE (3) | HELOC (4) | Credit Card (5) | Non-Credit Card (6) |
|---------------------|---------------------|---------------------|----------------------|---------------------|--------------------|------------------------|
| <i>Branch MS</i> | 0.0194*** (3.77) | 0.0242*** (2.96) | -0.0227** (-2.48) | 0.00798** (2.26) | 0.000982 (0.15) | -0.0175*** (-2.78) |
| <i>Deposit MS</i> | 0.0182*** (3.77) | 0.0223*** (2.96) | -0.0209** (-2.48) | 0.00721** (2.26) | 0.000875 (0.15) | -0.0161*** (-2.78) |
| <i>Branch HHI</i> | 0.0689*** (3.75) | 0.0869*** (2.95) | -0.0814** (-2.47) | 0.0270** (2.26) | 0.00333 (0.15) | -0.0627*** (-2.78) |
| <i>Deposits HHI</i> | 0.0690*** (3.75) | 0.0864*** (2.95) | -0.0808** (-2.47) | 0.0264** (2.26) | 0.00326 (0.15) | -0.0623*** (-2.78) |
| <i>Deposit Vol.</i> | 0.0340*** (3.76) | 0.0430*** (2.96) | -0.0403** (-2.47) | 0.0130** (2.27) | 0.00161 (0.15) | -0.0310*** (-2.78) |

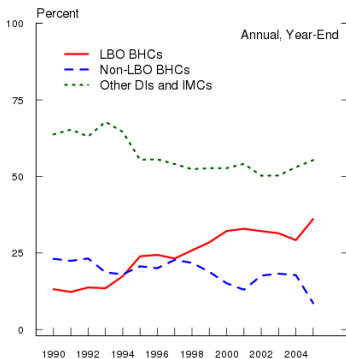
All regressions include year and bank fixed effects. Standard errors clustered at the bank level.

t statistic in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Exploring RRE Loan Shares Using HMDA

- County level originations by LBOs, non-LBOs, and non-banks.
- Use interstate banking restrictions as proxy for LBO competition
- Avoids the spatial correlations typically associated with distance measures

$$\Delta(\text{loans})_{c,g,t} = \gamma \text{Group}_g + \delta \text{Group}_g \times \text{RS}_{c,t-1} + \beta X_{c,t} + \alpha_c + \eta_t + \varepsilon_{c,g,t}$$



County-Level RRE Growth Rate Differences

| | Origination Amount | | | Origination Count | | |
|---|------------------------|------------------------|-----------------------|------------------------|-----------------------|-----------------------|
| | (1) | (2) | (3) | (4) | (5) | (6) |
| <i>Dependent</i> _{c,g,t-1} | -0.0752*** (-20.52) | -0.0500*** (-12.90) | -0.0230*** (-4.07) | -0.0559*** (-16.22) | -0.0285*** (-7.89) | -0.00759 (-1.39) |
| <i>Rice Strahan</i> _{c,g,t-1} | 0.00291 (0.01) | 0.435 (1.55) | 0.381 (1.23) | 0.132 (0.52) | 0.306 (1.18) | 0.413 (1.49) |
| Lender Type | | | | | | |
| <i>Non-LBO</i> _{c,g} | -2.703*** (-5.84) | -3.257*** (-6.79) | -7.627*** (-12.93) | -2.868*** (-6.42) | -3.323*** (-7.05) | -8.004*** (-13.54) |
| <i>Non-Bank</i> _{c,g} | -8.975*** (-25.97) | -7.880*** (-22.86) | -9.858*** (-22.74) | -8.403*** (-26.02) | -7.339*** (-22.75) | -8.736*** (-20.07) |
| Deregulatory Effect | | | | | | |
| <i>Non-LBO</i> _{c,g} × <i>RS Index</i> _{c,g,t-1} | -2.628*** (-14.15) | -2.568*** (-13.66) | -1.590*** (-6.59) | -2.090*** (-11.30) | -2.063*** (-11.07) | -1.092*** (-4.51) |
| <i>Non-Bank</i> _{c,g} × <i>RS Index</i> _{c,g,t-1} | 1.008*** (7.26) | 0.786*** (5.76) | 1.095*** (6.29) | 0.926*** (6.98) | 0.734*** (5.64) | 0.947*** (5.65) |
| $\Delta \ln(\text{RRE Permits})$ | X | | | X | | |
| $\Delta \ln(\text{FHFA HPI})$ | | X | | | X | |
| $\Delta \ln(\text{Moody's HPI})$ | | | X | | | X |
| Observations | 78,252 | 66,153 | 30,975 | 77,429 | 65,631 | 30,782 |
| Counties | 2,983 | 2,670 | 1,018 | 2,983 | 2,670 | 1,018 |
| Adjusted R ² | 0.39 | 0.46 | 0.52 | 0.35 | 0.41 | 0.47 |

Standard errors clustered by county. *t* statistic in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Conclusion

Greater LBO activity leads to:

- Larger shares of CRE loans at CBOs and RBOs
- Smaller shares of RRE and consumer loans

Evidence that competition increases bank fragility

- Smaller banks are less diversified
- Exposed to sector-specific shocks
- Highlights role of policy in encouraging asset diversification

Agnostic about the competitive mechanisms

- Funding and technology advantages
- Regulatory arbitrage such as independent mortgage companies