A Quantitative Model of Bank Merger Dynamics

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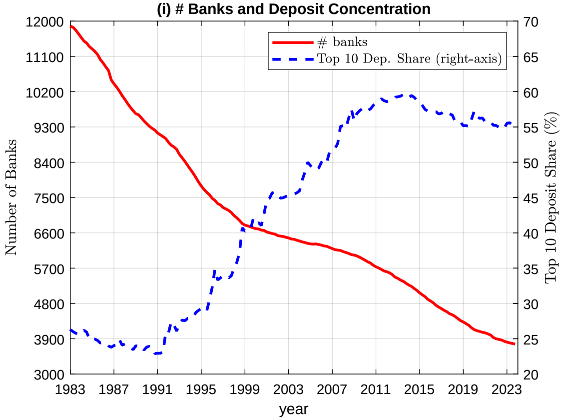
Question



- What are the effects of banking industry consolidation due to Riegle-Neal on lending, markups, financial stability, and allocative efficiency?

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3. Estimate parameters in two steady states and validate untargeted moments versus data.
4. Conduct policy counterfactuals:
   - What would have happened absent Riegle-Neal?
   - How have mergers affected the transmission of monetary policy?
   - What is optimal dynamic merger regulation?

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5. Granular regressions for the banking industry (Gabaix (2011)) demonstrate that deposit shocks to the largest banks have a substantial effect on aggregate bank lending. ▸ Bank Granularity

Mapping a Simple Model to the Data

- Rising market share of large banks & declining number of banks $\rightarrow$ Merger stage where the dominant bank acquires a measure of fringe banks following the framework of Gowrisankaran and Holmes (2004).

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- Financial (in)stability → entry/exit creating an endogenous size distribution of banks.

Model Essentials

- 2 types of bank $i \in \{d, f\}$
- Each period begins with:
  - A measure γ of ex-ante identical fringe banks, each with D_f deposits
  - A dominant bank, with deposits D_d
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- Second, loan market competition, a la Cournot, occurs.
  - Banks chose between loans and securities, with securities offering a risk free rate $r_A > r_D$.
  - Borrowers decide whether to fund their project, and then make a discrete choice between bank B and nonbank N loans.

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- Following the loan stage:
  - Banks with positive profits pay dividends. Banks with negative profits choose to exit or inject costly equity.
  - New fringe banks can enter at cost K_f.
  - The next period begins with $(\gamma = \Gamma - \gamma_x + \gamma_e, D_d', \theta')$

Merger Stage

- Starting in state $s = (\gamma, D_d, \theta)$:
- The dominant bank makes a TOLI offer to a measure $\gamma - \Gamma$ of fringe banks.
- Let $p(s, \Gamma)$ be the price of a unit of deposits. Then, the dominant bank solves the following problem:

$$v_d(s) = \max_{\Gamma \in [0,\gamma]} -p(\Gamma, s)(\gamma - \Gamma)D_f - H(\Gamma, s) + w_d(\Gamma, D'_d, \theta) \tag{1}$$

subject to

$$p(\Gamma, s)D_f \geq w_f(S) \tag{2}$$

- where $H(\Gamma, s)$ are regulatory costs, w_d is the value of the dominant bank at the loan stage, and $S = (\Gamma, D'_d, \theta)$
- If the dominant bank chooses to not acquire any fringe banks, then $\Gamma^*(s) = \gamma$

Bank Profit

- Following the loan stage, loan defaults (θ') and chargeoffs (λ) are realized. The profit of bank $i \in \{d, f\}$ is given by:

$$\pi_i(L_i; S, \theta', \lambda_i') = [\theta' r_B^L - (1-\theta')\lambda_i']L_i + r^A(D_i - L_i) - r^D(D_i) - C_i(L_i). \quad (3)$$

where $C_i(L_i)$ is the cost of loan monitoring. We assume $C_i(L_i)$ takes the following form:

$$C_i(L_i) = \kappa_i + C_{1i}L_i + C_{2i}L_i^2 \quad (4)$$

Further, we denote dividends by:

$$\mathscr{D}_i(L_i; S, \theta', \lambda_i') = \pi_i(L_i; S, \theta', \lambda_i') - \mathbf{1}_{\{\pi_i(\cdot)<0\}}\psi_i(|\pi_i(L_i; S, \theta', \lambda_i')|). \quad (5)$$

where ψ_i captures the costs of equity issuance.

Dominant Bank Loan Problem

The dynamic programming problem of the dominant bank can then be written as:

$$w_d(S, r_N^L) = \max_{L_d \leq D'_d} \mathbb{E}_{\theta'|\theta}\Big[\max_{x'_d \in \{0,1\}} (1 - x'_d)\big(\mathscr{D}_d(L_d; S, \theta', \lambda'_d) + \beta v_d(s')\big)\Big], \tag{6}$$

subject to

$$L_d + \Gamma L_f^*(L_d, S, r_N^L) = L_B(r_B^L, r_N^L), \tag{7}$$

$$\gamma' = F(L_d, S, \theta'). \tag{8}$$

where $s' = (\gamma', D'_d, \theta')$ and the function $F(L_d, S, \theta')$ captures the transition of the measure of fringe banks.

- Equation (7) illustrates both loan market clearing and that the dominant bank takes into account both how their loan decision affects the fringe loan decision, L_f, and the bank interest rate, r_B^L.
- Equation (8) ensures that the dominant bank internalizes its impact on market structure in the future.

Fringe Bank Loan Problem

- Given the stackelberg game in the loan market, taking the interest rates r_B^L and r_N^L as given, the problem of the fringe bank solves:

$$w_f(L_d, S, r_N^L) = \max_{\ell_f \leq D_f} \mathbb{E}_{\theta', \lambda'_f | \theta} \Big[\max_{\chi'_f \in \{0,1\}} (1 - \chi'_f) \big(\mathscr{D}_f(\ell_f; L_d, S, \theta', \lambda'_f) + \beta v_f(s') \big) \Big]$$

- The entry decision satisfies:

$$v_i^e(L_d, S, r_{\mathcal{N}}^L, \theta'; \gamma^e(x'_d, e'_d)) = \max_{e'_i \in \{0,1\}} (1 - e'_i) \{-K_i + v_i(s')\}, \tag{9}$$

- The evolution of the mass of fringe banks then is given by:

$$\gamma' = F(L_d, S, \theta') = \Gamma - \gamma^x(L_d, S, \theta') + \gamma^e(L_d, S, \theta'). \tag{10}$$

Markov Perfect Equilibrium

- Taking r^A and r^D as given, a **Markov Perfect Merger Equilibrium** is a set of bank value functions $\{v_i, w_i\}$ and policy functions $\{\Gamma, L_i, \ell_f, x'_i, \chi'_f, e'_i\}$ for $i \in \{d, f\}$, ℓ_N, prices $\{p, r^L_B, r^L_N\}$, and transition functions for $\{\gamma', D'_d\}$ such that:
  1. The pre-merger value function v_d solves (1). The merger quantity Γ maximizes (1).
  2. The merger pricing function p satisfies (2).
  3. The post-merger value functions w_d and w_f solve (6) and (9). The loan supply policy functions (L_d, ℓ_f) and exit decision rules (x'_d,χ'_f) maximize (6) and (9).
  4. Consistency requires $\ell_f = L_f$ and $\chi'_f = x'_f$.
  5. r^L_B clears the loan market (7). Demand For Loans
  6. r^L_N satisfies the nonbank first order condition (21). Nonbank Loan Problem
  7. The mass of entrants γ^e solves the entry problem (9)
  8. Transition functions are consistent with mergers, entry, and exit (10)

Calibration

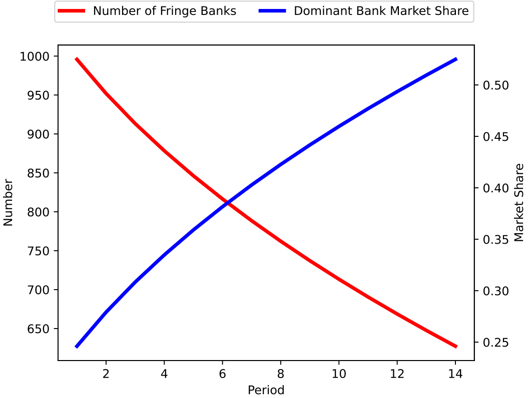
- We estimate most model parameters using Simulated Method of Moments to match the banking industry data pre-Riegle-Neal (1984-1993).
Parameters and Targets

- Broadly we targets moments related to:
  - Loan outcomes: Loan default frequency and charge-off rates
  - Bank costs: Net marginal expenses and fixed costs
  - Bank profitability: Dividend issuance, equity issuance

- The calibrated parameters: Calibration

- We recalibrate bank fixed costs and the nonbank marginal cost change to match banking industry data post-Dodd-Frank. Recalibrated Parameters

Validation: Untargeted Transition Path



- We present the evolution of the endogenous state variables in the 14 years post-Riegle-Neal.
- We capture the decline in the number of banks and the growth of dominant bank quite accurately as in Figure 1.

Price and Market Share Changes: Transition Path

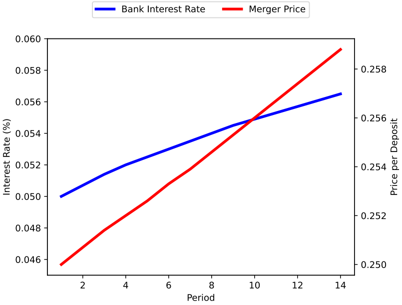


Figure: Evolution of Market Prices

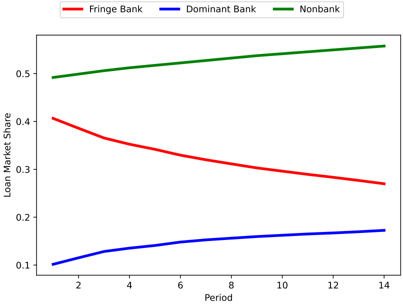


Figure: Evolution of Loan Market

- Bank mergers increase the price of loans and the value of fringe banks.
- The growth of the nonbanking sector is partially due to bank mergers.

Counterfactual: No Riegle-Neal

Name	Calc	Pre	Post	Post - No Mergers
Deposit Market Share Top 10	$\frac{D_d}{D_d+\gamma D_f}$	24.60%	55.26%	27.00%
Loan Market Share Top 10	$\frac{L_d}{L_d+\gamma L_f}$	21.51%	40.68%	22.19%
Bank Loans to Total Loans Ratio	$\frac{L_d+\gamma L_f}{L_n+L_d+\gamma L_f}$	51.51%	39.70%	44.92%
Interest Rate	r_B^L	4.93%	5.49%	4.96%
Bank Failure Rate Fringe	$\frac{\gamma_x}{\Gamma}$	0.03%	0.44%	1.24%
Loan Markup Top 10	$\frac{\theta r^L}{r_D+c'(L_d)}$	218.16%	258.73%	180.46%
Loan Markup Fringe	$\frac{\theta r^L}{r_D+c'(L_f)}$	204.25%	135.03%	128.60%
Tobin's Q (Dominant)	$\frac{V_d}{D_d}$	27.08%	34.04%	30.85%
Tobin's Q (Fringe)	$\frac{V_f}{D_f}$	23.40%	6.42%	2.15%

- Absent mergers, the dominant bank has a much lower market share.
- Increased competition leads to a lower interest rate and lower markups.
- However, bank value declines and there are more bank failures.

Allocative Efficiency

- We use the following decomposition of weighted average bank-level cost, as proposed by Olley and Pakes (1996).

$$\hat{c} \equiv \sum_{i \in \{D,F\}} C_i(L_i)\omega(L_i) = \bar{c} + Cov(C_i(L_i), \omega(L_i)) \quad (11)$$

Moment	Pre Riegle-Neal	Post Dodd-Frank	No Merger Regulation $h = 0$
Avg. (loan-weighted) cost $\hat{c}$	0.0293	0.0403	0.0352
Avg. cost $\bar{c}$	0.0300	0.0479	0.0479
$Cov(c, \omega)$	-0.0006	-0.0076	-0.0128
Total Bank Loans $L_d + \Gamma L_f$	1.2000	0.9174	0.7594

- Allocative efficiency, as measured by $Cov(c, w)$, increases as dominant banks can exploit increasing returns to scale.
- Absent merger regulation, allocative efficiency is even higher, as more mergers allow banks to further exploit increasing returns to scale.

Conclusion

- We document evidence on banking mergers, granularity, and the marginal propensity to lend.
- We develop a model based on the dominant-fringe framework of Gowrisankaran and Holmes (2004), to study the effects of bank mergers.
- We use the model to conduct counterfactuals
- Maintaining pre-Riegle-Neal merger restrictions would create more competition, leading to lower interest rates, but a less valuable bank sector with more frequent bank failures
- Allowing more mergers improves allocative efficiency, but decreases total bank lending.

References I

Greg Buchak, Gregor Matvos, Tomas Piskorski, and Amit Seru. Fintech, regulatory arbitrage, and the rise of shadow banks. *Journal of Financial Economics*, 130:453–483, 2018.

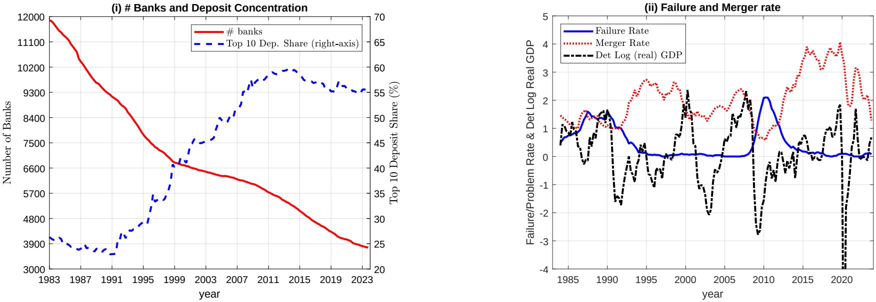
Xavier Gabaix. The granular origins of aggregate fluctuations. *Econometrica*, 79 (3):733–772, 2011.

Gautam Gowrisankaran and Thomas J Holmes. Mergers and the evolution of industry concentration: results from the dominant-firm model. *RAND Journal of Economics*, pages 561–582, 2004.

G. Steven Olley and Ariel Pakes. The dynamics of productivity in the telecommunications equipment industry. *Econometrica*, 64(6):1263–1297, 1996.

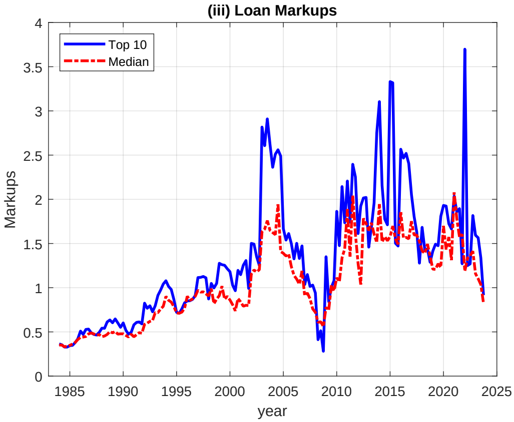
Appendix

Deposit Market Concentration



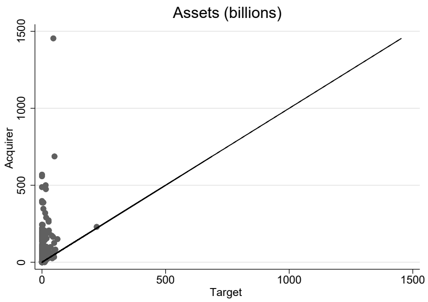
- Rise in top 10 bank share and decline in the number of fringe banks is driven by merger activity. Back

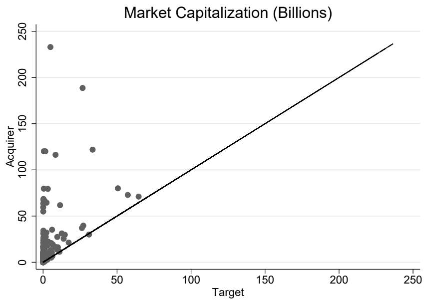
Bank Loan Markups



- Rise in top 10 bank share and declining number of fringe banks coincides with a rise in markups. Back

Acquirers vs. Targets





- Acquirers are larger than targets, whether measured by assets or market capitalization.
- The median acquirer is seven times larger than median target. Back

Bank Marginal Propensity to Lend

- We are interested in estimating the following relationship:

$$\Delta L_{it} = \beta_{k(i)} \Delta D_{it} + \zeta_{it} \tag{12}$$

- Following the MPC literature, the deposit shock process is given by:

$$\begin{aligned} \log(D_{it}) &= \xi_k X_{it} + z_{it} + \varepsilon_{it} \quad \text{where} \quad z_{it} = z_{it-1} + \eta_{it} \\ \Rightarrow \Delta D_{it} &= \xi_k \Delta X_{it} + \underbrace{\eta_{it} + \Delta \varepsilon_{it}}_{=\nu_{it}} \end{aligned} \tag{13}$$

Then the deposit process in (13) implies that equation (12) can then be written as

$$\Delta L_{it} = \beta_k \xi_k \Delta X_{it} + \beta_k \nu_{it} + \zeta_{it}. \tag{14}$$

so that the idiosyncratic shocks ν_{it} help identify the MPL.

Bank MPL Regression

	Dependent Variable $\Delta \log(L_{it})$					
ν_{it}	0.515***	0.514***	0.520***	0.519***	0.456***	0.455***
	(0.00103)	(0.00103)	(0.00170)	(0.00170)	(0.00256)	(0.00256)
$\nu_{it} \times I_{t10}$		0.358***		0.345***		0.305***
		(0.0221)		(0.0453)		(0.0633)
Bank FE	✓	✓	✓	✓	✓	✓
Time FE	✓	✓	✓	✓	✓	✓
Bank Controls	✓	✓	✓	✓	✓	✓
Period	1984-2019		1984-1993		2011-2019	
N	946299	946299	353150	353150	169536	169536
R-sq	0.362	0.362	0.398	0.398	0.287	0.287
adj. R-sq	0.348	0.349	0.371	0.371	0.260	0.260

- Results suggest the average MPL out of deposits is 0.51, with the largest banks having a higher MPL of 0.86. Back

Bank Granularity Regressions

- We implement Gabaix (2011) granularity results in the banking industry.
- Let the granular residual be:

$$\Gamma_t^d = \sum_{i=1}^{K} \omega_{it} \nu_{it} \tag{15}$$

- K denotes the number of “granular” banks, $\omega_{it} = \frac{L_{i,t-1}}{L_{t-1}}$ is the loan market share of bank i, $L_{t-1} = \sum_{i=1}^{N} L_{i,t-1}$ is aggregate lending.
- We then estimate the model:

$$\Delta L_t = \beta_\Gamma \Gamma_t^d + \epsilon_t^\Gamma \tag{16}$$

- We compute the R^2 from the estimated equation (16) given by

$$R^2 = \frac{\beta_\Gamma^2 Var(\Gamma_t^d)}{Var(\Delta L_t)}. \tag{17}$$

Bank Granularity Regressions and MPL

- Equation (16) can be rewritten as:

$$\Delta L_t \approx \sum_{i=1}^{N} \omega_{it} \Delta L_{it} = \beta_d \underbrace{\sum_{i=1}^{K} \omega_{it} \nu_{it}}_{\Gamma_t^d} + \underbrace{\beta_f \sum_{i=K+1}^{N} \omega_{it} \nu_{it} + \sum_{i=1}^{N} \omega_{it} (\beta_k \xi_k X_{it} + \zeta_{it})}_{=\epsilon_t^{\Gamma}}$$

- Under this approximation, $\beta_\Gamma = \beta_d$.
- Our estimate of β_d is biased downward if there is business stealing/mergers.

Bank Granularity Regression Results

	Dep. Var. $\Delta \log(L_t)$					
	Top 10 Banks		Top 35 Banks		Top 100 Banks	
(intercept)	0.00774***	0.00772***	0.00788***	0.00794***	0.00775***	0.00779***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Γ_t^x	0.220***	0.219***	0.328***	0.326***	0.381***	0.376***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Γ_{t-1}^x	-0.0221	-0.0225	-0.0363	-0.0365	-0.0335	-0.0314
	(0.567)	(0.562)	(0.420)	(0.419)	(0.466)	(0.495)
Γ_{t-2}^x		0.0118		0.0391		0.0464
		(0.761)		(0.388)		(0.315)
N	191	190	191	190	191	190
R^2	0.149	0.149	0.224	0.227	0.273	0.277
Adjusted R^2	0.140	0.136	0.215	0.214	0.265	0.265

- R^2 of 0.149 suggests that shocks to largest 10 banks have a substantial impact on aggregate lending.
- Implied MPL is much lower (0.220), likely due to business stealing/mergers.

Back

Demand for Loans

- Demand for loans comes from ex-ante identical borrowers who demand one-period loans to fund a risky project.
- Every period, given r_B^L, r_N^L, and shock ω, borrowers decide whether to invest ($\iota = 1$) or not ($\iota = 0$).

$$\max_{\{\iota\}}(1-\iota)\cdot\omega + \iota\cdot E_{\boldsymbol{\delta}}[\Pi_E(\theta, r_B^L, r_N^L, \boldsymbol{\delta})] \tag{18}$$

- Conditional on choosing $\iota = 1$, entrepreneurs observe $\boldsymbol{\delta} = \{\delta_B, \delta_N\}$ and then choose which type of lender $k \in \{B, N\}$ to borrow from to solve:

$$\Pi_E(\theta, r_B^L, r_N^L, \delta) = \max_{k\in\{B,N\}} \alpha E_{\theta'|\theta}[\pi(r_k^L, \theta)] + \delta_k \tag{19}$$

where

$$\pi_E(r_k^L, \theta') = \begin{cases} \max\{0, R - r_k^L\} & \text{with prob } \theta' \\ \max\{0, -(\lambda' + r_k^L)\} & \text{with prob } 1-\theta' \end{cases}.$$

Back

Nonbank Loan Problem

- The profit of the representative nonbank is given by:

$$\pi_N(\ell_N, S, \theta', \lambda') = [\theta' r_N^L - (1-\theta')\lambda' - c_N]\ell_N \tag{20}$$

- The first order condition of the non-bank with respect to ℓ_N is given by

$$r^D = E_{\theta'|\theta}\left[\theta' r_N^L - (1-\theta')\lambda'\right] - c_N. \tag{21}$$

Back

Parameters and Targets

Parameter		Value	Target
Deposit Interest Rate (%)	$\bar{r} = r^D$	0.0014	Avg Interest Expense Deposits
Bank Discount Factor	β	0.998	$(1 + r^D)^{-1}$
Return on Securities	r_A^+	0.0180	Return on Net Securities
Default Frequency (Good Times)	θ_G	0.969	Mean Default Frequency (Non-Crisis)
Default Frequence (Bad Times)	θ_B	0.80	Mean Default Frequency (Financial Crisis)
Loan Loss Rate	$\bar{\lambda}$	0.31	Average Charge-off rate
Standard Dev Loan Loss rate f	σ_λ	0.15	Std dev charge off rates f
Standard Dev Loan Loss rate d	σ_λ	0.15	Std dev charge off rates d
Number of Borrowers	N	8.5	Deposit to Output
Return on investing	R	0.20	Net Interest Margin
Price coefficient	α	42.0	Elasticity of Loan Demand
Lower bound demand shock	$\underline{\omega}$	0.693	Normalization
Upper bound demand shock	$\bar{\omega}$	1.193	Dividend Issuance d and f
Mean size of Fringe Bank f	D_f	0.001	Relative Size Fringe to Top 10
Linear Cost Loans d	C_d^1	0.010	Net Marginal Expenses Top 10
Quadratic Cost Loans d	C_d^2	0.001	Elasticity Net Marginal Expenses Top 10
Fixed cost d	κ_d	0.0028	Fixed cost over loans Top 10
Mean Dist Cost Loans f	C_f^1	0.010	Net Marginal Expenses Fringe
Quadratic Cost Loans f	C_f^2	0.001	Elasticity Net Marginal Expenses Fringe
Fixed cost f	κ_f	$0.012 \times D_f$	Fixed cost over loans Fringe
External finance param. d	ψ_d^1	0.05	Avg. equity issuance to loan ratio Fringe
External finance param. f	ψ_f^1	0.50	Avg. equity issuance to loan ratio Fringe
Entry Cost f	K_f	$0.55 \times D_f$	Entry Rate
Regulatory Merger Cost	h	0.001	Post-Dodd-Frank Bank Market Share Top 10
Marginal Cost Nonbank	c_N	0.375	Bank Loan to Total Loans

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Parameters That Change

Parameter		Pre-Riegle-Neal	Post-Dodd-Frank
Fixed cost d	κ_d	0.0028	0.0035
Fixed cost f	κ_f	$0.012 \times D_f$	$0.028 \times D_f$
Marginal Cost nonbank	c_N	0.375	0.315

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Calibration

Name	Calc	Data Pre	Data Post	Model Pre	Model Post
Average Charge-off rate	$E'_\theta[(1-\theta')\lambda']$	0.96%	0.94%	0.96 %	0.96 %
Elasticity of Loan Demand	$-\alpha r_B^L(1-s_B)$	-1.1	-1.1	-1.00	-1.39
Deposit Share Top 10 to Fringe	$\frac{D_d}{D_d+\gamma D_f}$	24.77%	57.79%	24.60%	55.26%
Loan Share Top 10 to Fringe	$\frac{L_d}{L_d+\gamma L_f}$	28.55%	52.86%	21.51%	40.68%
Bank Loans to Total Loans Ratio	$\frac{L_d+\gamma L_f}{L_n+L_d+\gamma L_f}$	44.54%	33.28%	51.51%	39.70%
Net Interest Margin	$E_\theta[\theta' r_B^L - r_D]$	4.94%	4.35%	4.63%	5.18%
Net Marginal Expenses Top 10	$\frac{c(L_D)}{L_D}$	1.15%	1.35%	1.03%	1.04%
Net Marginal Expenses Fringe	$\frac{c(L_F)}{L_F}$	2.00%	1.69%	1.00%	1.00%
Elasticity Net Mg Expenses Top 10	$\frac{dC_D(L_d)}{dL_d}$	0.95%	1.03%	1.05%	1.08%
Elasticity Net Mg Expenses Fringe	$\frac{dC_f(L_f)}{dL_f}$	0.78%	0.84%	1.00%	1.00%
Fixed cost over loans Top 10	$\frac{\kappa_D}{L_D}$	0.89%	0.78%	1.02%	0.88%
Fixed cost over loans Fringe	$\frac{\kappa_F}{L_F}$	0.99%	5.83%	1.20%	2.80%
Bank Failure Rate Top 10	x_d	0.00%	0.00%	0.00%	0.00%
Bank Failure Rate Fringe	$\frac{\gamma_x}{\Gamma}$	0.76%	0.44%	0.03%	0.44%
Relative Size Dominant to Fringe	$\frac{D_f}{D_d}$	324.79	688.47	325.00	717.36
Dividends/Assets Top 10	$\mathcal{D}_d/D_d$	0.36%	0.74%	1.65%	1.99%
Dividend/Assets Fringe	$\mathcal{D}_f/D_f$	0.39%	0.66%	1.50%	0.43%
Loan Markup Top 10	$\frac{\theta r^L}{r_D+c'(L_d)}$	56.29%	205.37%	218.16%	258.73%
Loan Markup Fringe	$\frac{\theta r^L}{r_D+c'(L_f)}$	46.64%	149.73%	204.25%	135.03%
Interest Rate	r_B^L	6.69%	3.18%	4.93%	5.49%
Ratio of Loans to Deposits Top 10	$\frac{L_d}{D_d}$	83.3%	64.1%	84.18%	55.51%
Ratio of Loans to Deposits Fringe	$\frac{L_f}{D_d}$	73.3%	79.7%	99.99%	99.99%

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