Competition and Bank Opacity

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Outline

1. Introduction
2. Data
3. Empirical methodology
4. Empirical results
5. Conclusion

Research Question

The impact of competition on bank opacity

- X: Interstate bank deregulation and interstate branch deregulation as exogenous sources of variation in competition
- Y: Discretionary loan loss provisioning as a measure of bank opacity

Motivation

- Ahmed, Takeda, and Thomas (1999) and Beatty et al. (2002) show that banks manage their financial statements to smooth earnings, circumvent capital requirements, and reduce taxes.
- Jayaratne and Strahan (1996) imply that any factor—including the management of financial statements—that interferes with the governance and regulation of banks can distort capital allocation and slow growth.
- Nonetheless, little is known about the impact of bank regulations and competition on bank opacity.
- Given the importance of banks for the efficiency of resource allocation, the scarcity of research on the market and regulatory determinants of bank opacity is surprising and potentially consequential.

Literature review

Three interrelated strands of research explain how competition can **reduce** opacity.

1. Competition can mitigate earnings management by reducing agency problems.

- Corporate insiders might manage earnings to conceal their extraction of rents, which is facilitated by agency problems between insiders and residual claimants on the firm (Jensen and Meckling 1976; Leuz, Nanda, and Wysocki 2003; Dechow, Ge, and Schrand 2010).
- As discussed by Shleifer and Vishny (1997), an intensification of product market competition can spur improvements in corporate governance that reduce these agency problems.

Literature review

2. Competition can boost the quality of financial statements by facilitating peer-firm comparisons.

- If competition encourages more bank entry and more similarity among banks, banks become more accurate benchmarks for one another (Holmstrom 1982; Nalebuff and Stiglitz 1983).
- Based on a field survey of 169 CFOs, peer-firm comparisons are one of the most important tools for detecting earnings management (Dichev et al., 2013).

3. Competition spurs banks to implement strategies for lowering their costs of funds.

- Earnings management or poor accounting credibility tends to increase the cost to a firm of raising equity or debt (e.g., Francis et al. 2005; Bharath, Sunder, and Sunder 2008; Graham, Li, and Qiu 2008; Lo 2015).

Literature review

In contrast, other research emphasizes that competition will **increase** opacity.

- Competition can induce firms to limit or manipulate the flow of information to hinder the entry of potential rivals and gain a strategic advantage over existing competitors (Verrecchia, 1983; Gertner, Gibbons, and Scharfstein, 1988).
- Greater competition spurs executives to engage in unethical behavior, including more aggressive accounting practices (Shleifer, 2004).
  - Corporate managers increase earnings management to protect themselves from being acquired even if this manipulation raises the cost of capital (Armstrong, Balakrishnan, and Cohen 2012).

Identification strategy

Two sources of variation in the competitive environment

1. **Interstate bank deregulation**
   - Interstate bank deregulation eased regulatory restrictions on bank holding companies (BHCs) headquartered in one state establishing subsidiaries in other states.
   - Individual states begin interstate deregulation in different years.
   - The reforms progressed in a state-specific process of unilateral and multilateral agreements over two decades.
2. **Interstate branch deregulation**
   - While the **Interstate Banking and Branching Efficiency Act of 1994 (IBBEA)** eliminated restrictions on interstate banking, **states had leeway in the timing of interstate branch deregulation**, which is when BHCs in one state can establish branches in other states.

Identification strategy

A key limitation to these state-time measures:

- Perhaps, deregulation triggered, or was associated with, other changes in a state that influenced the quality of information disclosed by banks, and it is these other changes—not increased competition—that influenced bank opacity.
- For example, a state's bank examiners might intensify their scrutiny of the financial statements of banks after deregulation.

→ Time-varying, bank-specific measures of competition

- based on the "gravity model" view

Preview of the results

Deregulation-induced competition materially enhances disclosure quality.

- Deregulation does not explain actual loan charge-offs, which is consistent with the view that competition reduces opacity.

Data on BHCs, subsidiaries, and states

BHC sample of 27,137 BHC-quarter observations (from the third quarter of 1986 to 2006)

- Delaware and South Dakota are excluded because they changed their laws to encourage the entry and formation of credit card banks.
- from Federal Reserve

Financial restatements

- A manually constructed dataset on financial restatements from 10-K, 10-Q, and 8-K files from EDGAR

State characteristics

- from Bureau of Economic Analysis

Bank deregulation

Interstate bank deregulation (1978-1995)

- *INTER* equals one for BHCs headquartered in a state in the years after that state first allows interstate banking and zero otherwise.
- $Ln(\#\ of\ States)_{jt}$:
  ln(1+number of states whose banks enter state j in year t)
- $Ln(\#\ of\ states - distance\ weighted)_{jt}$:
  states are weighted by the inverse of their distance from the state *j*.
- $Ln(\#\ of\ BHCs\ from\ other\ states)_{jt}$:
  ln(1+number of BHCs in states that can enter state j in year t)

Bank deregulation

Interstate bank branching (1994-1997)

- While the Riegle-Neal Act of 1994 effectively removed restrictions on interstate banking, it allowed states some discretion on the timing of the lowering of barriers to the establishment of branch networks by BHCs in other states.
- *INTER-BRANCH* equals one if a BHC is headquartered in a state that allows the BHCs from other states to establish branch networks and zero otherwise.

Bank subsidiary and BHC measures of competition

Perhaps, when a state deregulated interstate banking restrictions, this induced other policy reforms or was accompanied by changes in other factors that enhanced disclosure quality among banks within the state.

→ "Gravity model" predicts that the costs to a business of opening a new site are positively associated with the distance between the business's headquarters and the site.

$$Subsidiary\ Competition\ (DistanceWeighted)_{sjt} = Ln \sum_{i} \left[I_{jit} \Big/ DIS_{si} \right], \quad (4)$$

- I_{jit}=1(BHCs from state i are allowed to establish subsidiaries in state j in period t).
- DIS_{si} equals the distance between subsidiary s and state i

Bank subsidiary and BHC measures of competition

The subsidiary measures of competition are aggregated to the BHC level to calculate the interstate bank competitive pressures facing BHC, *b*, located in state *k* in period *t*.

$$BHC\ Competition\ (Distance\ Weighted)_{bkt} = \sum_{s \in b} \left[Subsidiary\ Competition(Distance\ Weighted)_{sjt} \right] * P_{sbt}, \quad (5)$$

- P_{sbt} is the proportion of assets of each subsidiary, s, within BHC, b, in period t.
- It measures the changing competitive environment facing a BHC as the BHC's subsidiaries in other states face different competitive pressures.

Estimating disclosure quality

"Abnormal" accrual of LLPs

1. Separation of the systemic component of LLPs, that is, the component of LLPs accounted for by bank and state determinants, from that part of LLPs unaccounted for by these fundamentals.

$$
\begin{aligned}
LLP_{bjt} = & \alpha_1 dNPA_{b,j,t+1} + \alpha_2 dNPA_{bjt} + \alpha_3 dNPA_{b,j,t-1} + \alpha_4 SIZE_{b,j,t-1} \\
& + \alpha_5 dLOAN_{bjt} + \alpha_6 CSRET_{jt} + \alpha_7 dGSP_{jt} + \alpha_8 dUNEMP_{jt} \\
& + \alpha_9 D_{jt} + \alpha_{10} D_{jt} * dNPA_{b,j,t+1} + \alpha_{11} D_{jt} * dNPA_{bjt} + \alpha_{12} D_{jt} \\
& * dNPA_{b,j,t-1} + \alpha_{13} D_{jt} * SIZE_{b,j,t-1} + \alpha_{14} D_{jt} * dLOAN_{bjt} \\
& + \alpha_{15} D_{jt} * CSRET_{jt} + \alpha_{16} D_{jt} * dGSP_{jt} + \alpha_{17} D_{jt} * dUNEMP_{jt} + \delta_j \\
& + \varepsilon_{bjt}. \qquad (1)
\end{aligned}
$$

(D_{jt}: one of the five deregulation measures.)

2. Discretionary LLPs$=ln(|\epsilon_{bjt}|)$

Table 1
Continued

B. Summary statistics

Variable	N	Mean	SD	P25	Median	P75
INTER	27137	0.98	0.14	1	1	1
INTER-BRANCH	27,137	0.56	0.50	0	1	1
Ln(# of states)	27,137	3.45	1.80	3.58	3.91	3.91
Ln(# of states – distance weighted)	27,137	0.82	1.55	0.90	1.25	1.26
Ln(# of BHCs from other states)	27,137	6.78	2.16	6.99	7.33	7.36
BHC competition (distance weighted)	25,803	0.72	1.76	0.88	1.25	1.26
BHC competition (distance and # of BHCs weighted)	25,803	4.10	2.19	4.29	4.74	4.81
BHC competition (distance and GSP weighted)	25,803	2.01	1.92	2.04	2.57	2.66
SIZE	27,137	11,014	64,318	477	1,067	3,569
logSIZE	27,137	7.34	1.59	6.17	6.97	8.18
LLP_lag (%)	27,137	0.14	0.27	0.04	0.08	0.15
LOSS	27,137	0.04	0.21	0	0	0
CAP	27,137	0.09	0.04	0.07	0.08	0.1
LLP (%)	27,137	0.14	0.27	0.04	0.08	0.15
NPA	27,137	0.01	0.02	0	0.01	0.02
dNPA (%)	27,137	−0.01	1.18	−0.15	−0.02	0.11
LOAN	27,137	5,880	28,660	300	680	2,180
dLOAN	27,137	0.03	0.09	0	0.02	0.05
LOAN_ASSETS	27,137	0.64	0.12	0.58	0.65	0.72
CSRET	27,137	0.01	0.01	0.01	0.02	0.02
dUNEMP	27,137	−0.02	0.03	−0.2	−0.1	0.1
dGSP	27,137	1.72	2.00	0.57	1.63	2.78
EBTP	27,137	31.89	171.54	1.18	3.02	9.89
RESTATEMENT	5,520	0.14	0.34	0.00	0.00	0.00
NONERROR RESTATEMENT	5,520	0.13	0.34	0.00	0.00	0.00

This panel presents summary statistics on the main variables used in the paper. The sample consists of BHC-quarter observations from the third quarter of 1986 to 2006. See Table 1, panel A for variable definitions.

The difference-in-differences specification

(Using state-time measures)

$$Disclosure\ Quality_{bjt} = \beta' \cdot D_{jt} + \gamma' \cdot X_{bjt} + \delta_b + \delta_t + \varepsilon_{ijt}, \qquad (2)$$

(Using BHC measures, and **state-time** and BHC fixed effects)

$$Disclosure\ Quality_{bjt} = \beta' \cdot BHC\ Competition\ (Distance\ Weighted)_{bjt} + \gamma' \cdot X_{bjt} + \delta_{jt} + \delta_b + \varepsilon_{bjt}, \qquad (8)$$

- X_{bjt} includes the logarithm of bank assets (*logSIZE*), one quarter lag of loan loss provisions (LLP_{lag}), negative net income indicator variable (*LOSS*), bank capital ratio (*CAP*), earnings before tax and provisions (*EBTP*) and features of each BHC's loan portfolio.

Validity of the approach

- This approach requires that the change in discretionary LLPs in deregulated and regulated states would have been the same in the absence of deregulation.

$$Disclosure\ Quality_{bjt} = \beta_1 D_{jt}^{-10} + \beta_2 D_{jt}^{-9} + \ldots + \beta_{20} D_{jt}^{+10} + \delta_b + \delta_t + \varepsilon_{bjt}, \qquad (3)$$

- Year zero equals to the year in which a state started interstate bank deregulation.

Validity of the approach

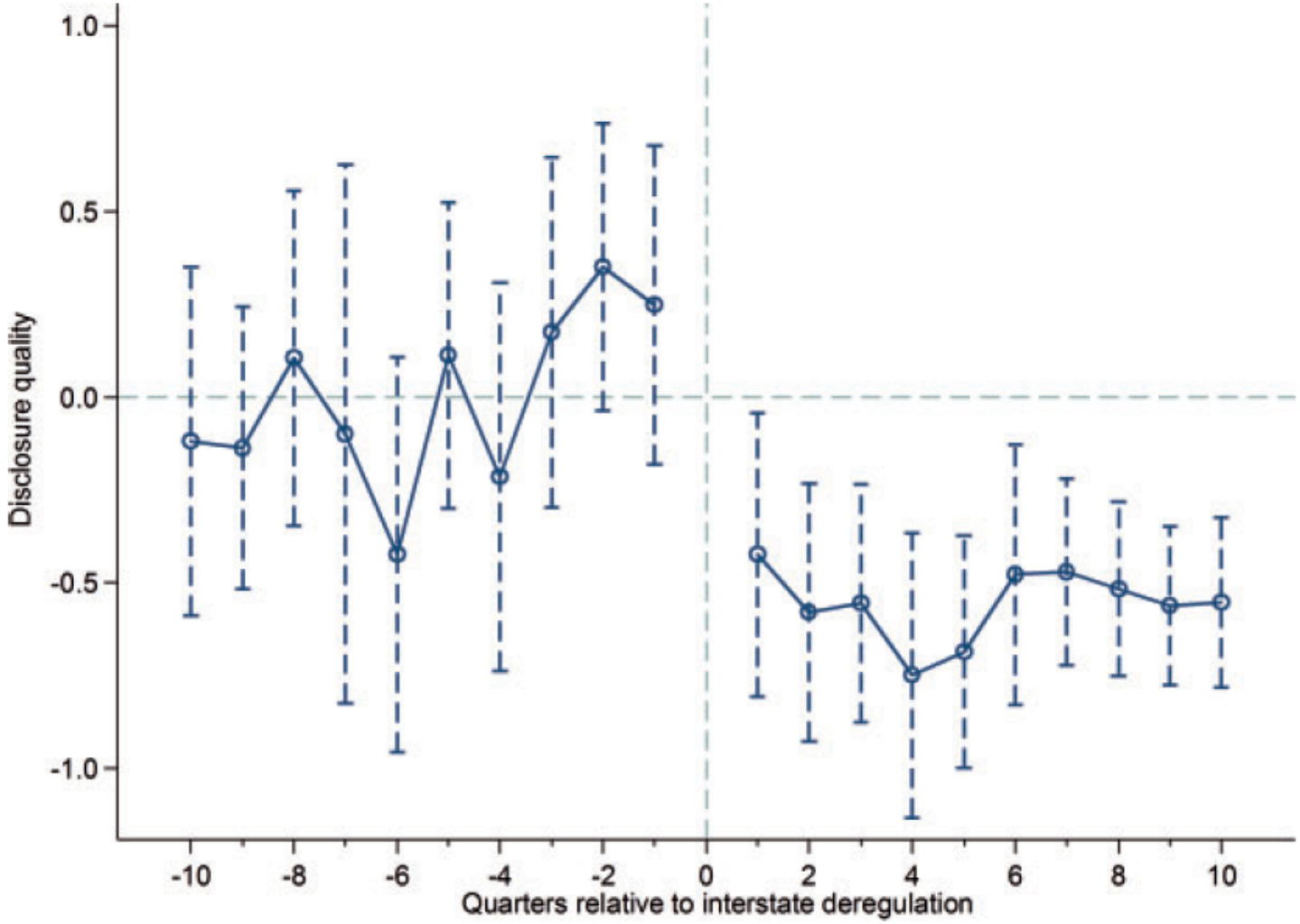

Figure 1
Evolution of disclosure quality around interstate bank deregulation

Do LLPs in a state predict the timing of bank regulatory reforms?

- For each state and year, they aggregate discretionary LLPs by BHCs operating in that state (weight: proportion of assets).

Table 2
Banking deregulations and lagged disclosure quality

A. Interstate deregulation

	(1)	(2)	(3)	(4)	(5)
Dep var	*INTER*		*Ln(# of States)*	*Ln(# of States – Distance Weighted)*	*Ln(# of BHCs from Other States)*
State-weighted residuals one year before interstate deregulation	0.0094 (0.0081)	0.0105 (0.0104)	0.0831 (0.0578)	0.0745 (0.0506)	0.0970 (0.0674)
State-weighted residuals two years before interstate deregulation		0.0022 (0.0077)	0.1012 (0.0770)	0.0885 (0.0654)	0.1194 (0.0911)
State-weighted residuals three years before interstate deregulation		0.0020 (0.0072)	0.391 (0.0251)	0.0373 (0.0231)	0.0447 (0.0296)
Controls	yes	yes	yes	yes	yes
No. of observations	310	275	275	275	275

B. Interstate branch deregulation

	(1)	(2)
Dep var	*INTER-BRANCH*	
State-weighted residuals one year before Branching deregulation	–0.0049 (0.0087)	–0.0030 (0.0094)
State-weighted residuals two years before Branching deregulation		–0.0119 (0.0109)
State-weighted residuals three years before Branching deregulation		–0.0066 (0.0075)
Controls	yes	yes
No. of observations	773	682

Results using state-time measures

The relation between disclosure quality and state-time indicators of bank regulatory reforms

Table 3
Disclosure quality and deregulation

	(1)	(2)	(3)	(4)	(5)
INTER	−0.5123***				
	(0.1482)				
Ln(# of states)		−0.0434***			
		(0.0057)			
Ln(# of states-distance weighted)			−0.0508***		
			(0.0077)		
Ln(# of BHCs from other states)				−0.0357***	
				(0.0052)	
INTER-BRANCH					0.5604***
					(0.0963)
logSIZE	0.0554	0.0618	0.0576	0.0628	0.0278
	(0.0391)	(0.0395)	(0.0398)	(0.0394)	(0.0450)
LLP_Lag	4.2726	4.7338	5.0100	6.5030*	6.2413
	(4.1693)	(3.3719)	(3.4172)	(3.3329)	(4.1119)
LOSS	1.4040***	1.4094***	1.4044***	1.3973***	1.3224***
	(0.0593)	(0.0589)	(0.0619)	(0.0611)	(0.0656)
CAP	1.7315**	1.7310**	1.7105**	1.7266**	1.3900*
	(0.7055)	(0.6847)	(0.6670)	(0.6742)	(0.6984)
% change in y with one standard deviation change in continuous deregulation measures	–	0.08	0.08	0.08	–
Quarter fixed effects	yes	yes	yes	yes	yes
BHC fixed effects	yes	yes	yes	yes	yes
N	27,137	27,137	27,137	27,137	27,137
R-sq	0.3078	0.3124	0.3107	0.3087	0.3233

Results: BHC level analyses

Table 4
Disclosure quality and BHC-specific deregulation measures

	(1)	(2)	(3)	(4)	(5)	(6)
BHC competition	−0.0543***			−0.0530***		
(distance weighted)	(0.0187)			(0.0187)		
BHC competition		−0.0474***			−0.0462***	
(distance and # of BHCs weighted)		(0.0151)			(0.0152)	
BHC competition			−0.0555***			−0.0540***
(distance and GSP weighted)			(0.0170)			(0.0172)
logSIZE				0.0114	0.0097	0.0089
				(0.0386)	(0.0355)	(0.0359)
LLP_Lag				5.1550	5.6918*	5.5342
				(3.4411)	(3.3731)	(3.4399)
LOSS				1.3780***	1.3759***	1.3668***
				(0.0732)	(0.0753)	(0.0744)
CAP				2.0979***	2.0236***	2.0327***
				(0.7203)	(0.7255)	(0.7257)
% change in y with one standard deviation change in continuous deregulation	0.10	0.10	0.11	0.09	0.10	0.10
BHC fixed effects	yes	yes	yes	yes	yes	yes
State-quarter fixed effects	yes	yes	yes	yes	yes	yes
First-stage using deregulation interactive terms	yes	yes	yes	yes	yes	yes
F-test: H: state and quarter fixed effects model = state-quarter fixed effects model						
F-test (p value)	0.00	0.00	0.00	0.00	0.00	0.00
N	25,803	25,803	25,803	25,803	25,803	25,803
R-sq	0.2426	0.2425	0.2425	0.2856	0.2857	0.2846

Restatements with the SEC

The frequency with which banks restate their earnings as an alternative proxy of disclosure quality.

- *RESTATEMENT*=1(A BHC restated its earnings in a year.)
- The analyses are based on annual data.
- The sample starts in 1993 and runs through 2006, and the focus is on the relation between interstate **branch** deregulation and bank restatements.

Table 5
Financial restatement after the banking deregulation

MODEL	(1) Probit	(2) OLS	(3) Probit	(4) OLS
Dep var	RESTATEMENT		NONERROR RESTATEMENT	
Years 1 before INTER-BRANCH	0.0084	0.0053	0.0160	0.0092
	(0.0477)	(0.0269)	(0.0544)	(0.0298)
Year 1 after INTER-BRANCH	−0.0727	−0.0489	−0.0608	−0.0423
	(0.0454)	(0.0375)	(0.0445)	(0.0372)
Year 2 after INTER-BRANCH	−0.1451***	−0.1087***	−0.1164**	−0.0856*
	(0.0339)	(0.0397)	(0.0434)	(0.0460)
Year 3 after INTER-BRANCH	−0.1549**	−0.1176**	−0.1320**	−0.0992*
	(0.0438)	(0.0534)	(0.0508)	(0.0550)
Year 4 after INTER-BRANCH	−0.2054***	−0.1749***	−0.1833***	−0.1512***
	(0.0324)	(0.0581)	(0.0350)	(0.0558)
Year 5+ after INTER-BRANCH	−0.2548**	−0.1578**	−0.1917*	−0.1227*
	(0.0909)	(0.0667)	(0.0929)	(0.0659)
logSIZE	−0.0057	0.0030	0.0014	0.0089
	(0.0333)	(0.0223)	(0.0428)	(0.0271)
CAP	1.2351**	0.4488	1.5572**	0.4990
	(0.5860)	(0.3082)	(0.7683)	(0.3520)
Other BHC traits	yes	yes	yes	yes
Year fixed effects	yes	yes	yes	yes
BHC fixed effects	yes	yes	yes	yes
N	2,875	5,520	2,819	5,520
R-sq	0.1620	0.3065	0.1558	0.2984

Robustness tests

- One concern is that the analyses might capture the effects of BHCs expanding into different states and not the effects of competition on BHCs.
  - limit the sample to those BHCs that never expand into other states.
- Selection into and out of banking (since there was considerable exit and entry during this deregulatory period.)
  - limit the sample to BHCs that exist for the entire period.
- Additional models of loan loss provisioning
- They find that interstate bank deregulation did not have a significant effect on charge-offs.

Conclusion

- The paper contributes to our understanding of how regulations influence the private governance and regulatory oversight of banks.
- Bank regulatory reforms that eased impediments to competition among U.S. BHCs reduced bank opacity.
- Exposing BHCs to greater competition will facilitate the monitoring of banks, with potentially beneficial repercussions on the governance and regulation of banks.

Discussion

The identification strategy

- BHC level measures on competition $\rightarrow$ State-year FE
- A test on whether the LLPs in a state predict the timing of bank regulatory reforms

Future research ideas

- Research on bank opacity
- Interstate bank deregulation $\rightarrow$ exogenous shocks to bank competition, or credit availability