

Competition for Small Firm Banking Business: Lender Actions vs. Market Structure

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Background

- Consolidation trend in U.S. and use of concentration ratios as a regulatory “filter”
- SCP, concentration, and banking outcomes (Hannan, 1991; Cetorelli, 1999; Shaffer, 2004)
- Information asymmetry, concentration and competition (Petersen and Rajan, 1995; Boot and Thakor, 2000; Dell’Arricia and Marquez, 2004)

Empirical Findings

- Challenges in empirical work (Radecki, 1998; Brevoort and Hannan, 2006)
- Mixed empirical results for association between concentration and small firm banking outcomes
 - Bank pricing (Hannan and Liang, 1993; Nathan and Nieve, 1989; Shaffer and DiSalvo, 1994)
 - Firm level (Petersen and Rajan, 1995; Jayarantne and Wolken, 1999; DeYoung et al, 1999; Beck et al, 2004; Zarutskie, 2006; Elsas, 2006), Berger et al , 2007)

An Alternative Approach

- Ask small firms about bank actions to get their financial business
- Survey question: *“Have you noticed any change in competition for your firm’s business among financial institutions now compared to 3 years ago?”*
- Responses used to address
 - How concentration is related to small firm reports of lender actions
 - Whether reports of lender actions are related to banking outcomes

Empirical Challenges

- Are firms reporting (change in) competition or favorable outcomes from recent banking experiences (e.g. loan approval)?
- Even if small firms “know competition when the see it,” do banks devise a contact strategy based on a favorable risk/return profile?

Data

- 2001 National Federation of Independent Business Credit, Banks and Small Business Survey
- 2,223 respondents
 - An 18% response rate
 - 2,124 answered the “competition” question
- Similarities/differences to Fed’s Survey of Small Business Finance
- Weighting by employment, industry, and region

Reports of Change in Competition

- 42% reported “much more” or “slightly more”; 9% reported “slightly less” or “much less”
- Change in Competition mean = .43 (based on much more = 2; slightly more = 1; no change = 0; slightly less = -1; and much less = -2)
- Correlations with
 - HHI: -0.044
 - % Δ in HHI: -0.011
 - Population density: 0.031
 - Location (MSA=1): 0.001
 - Bank size (CFI=1): 0.013

Lender Behavior and Market Structure

- “Theory” of bank contact and market structure
 - SCP and expected profits with a low share
 - Effect of firm quality, size structure, defensive reaction
- Market structure predictors
 - Change in HHI
 - Level of HHI
 - Interaction of HHI and change in HHI
 - Size structure (% of deposits from large banks)
 - Other control: population density, MSA, employment growth, recent merger

Baseline Ordered Probit Estimates of Market Structure Effects on Change in Competition

Baseline Effect of Market Structure on Reports of Change in Competition

This table presents the baseline model ordered probit estimates. The marginal effects, $d(P_j)/d(x)$, of each independent variable are presented at its median value on the reported change in competition categories. P_j is the probability of a report of Much Less, Less, Same, More and Much More, and the marginal effects sum to 0.

Independent Variables	Baseline		Marginal Effect				
	Coef.	Std. Err.	Much Less	Less	Same	More	Much More
Ln % Δ HHI	-0.230	0.206	0.020	0.014	0.054	-0.047	-0.042
HHI	-0.639	0.196 ***	0.057	0.040	0.151	-0.131	-0.117
HHI x Ln % Δ HHI	1.013	0.473 **	-0.090	-0.064	-0.240	0.208	0.186
Population density	0.030	0.018 *	-0.003	-0.002	-0.007	0.006	0.006
MSA location	-0.104	0.064 *	0.008	0.006	0.026	-0.020	-0.020
Ln % Δ Employment	-0.105	0.087	0.009	0.007	0.025	-0.022	-0.019
Large Bank Market Share	-0.245	0.146 *	0.022	0.015	0.058	-0.050	-0.045
Recent merger	-0.058	0.060	0.005	0.004	0.013	-0.012	-0.010
Northeast	0.046	0.084	-0.004	-0.003	-0.011	0.009	0.009
South	0.091	0.076	-0.007	-0.005	-0.023	0.018	0.018
Great Plains	-0.006	0.099	0.001	0.000	0.001	-0.001	-0.001
Southwest	-0.064	0.124	0.006	0.004	0.014	-0.013	-0.011
West	-0.081	0.074	0.008	0.005	0.018	-0.017	-0.014

**** indicates significance at the .01 level, ** significance at the .05 level and * significance at the .10 level. Robust standard errors are reported.

Alternative Specifications

The dependent variable is the reported change in competition that takes values from 1 (much less) to 5 (much more). Ordered probit analysis is used to estimate the models. The independent variables are described in Table 1. Robust standard errors are reported that allow for clustering by firm size. Columns 1, 2 and 3 include all observations; column 4 only includes firms located in MSAs, while column 5 only includes firms located in non-MSAs.

	(1) Baseline		(2) Local Bank Market Share		(3) Firm Characteristics		(4) MSA		(5) Non-MSA	
	Coef.	Std. Err.	Coef.	Std. Err.	Coef.	Std. Err.	Coef.	Std. Err.	Coef.	Std. Err.
Ln %ΔHHI	-0.230	0.206	-0.247	0.207	-0.236	0.205	-0.201	0.303	-0.369	0.317
HHI	-0.639	0.196 ***	-0.646	0.205 ***	-0.682	0.202 ***	-0.522	0.543	-0.477	0.364
HHI x Ln %ΔHHI	1.013	0.473 **	1.089	0.467 **	1.005	0.463 **	0.655	1.026	1.329	0.651 **
Population density	0.030	0.018 *	0.030	0.017 *	0.024	0.018	0.023	0.022	0.176	0.042 ***
MSA location	-0.104	0.064	-0.132	0.066 **	-0.110	0.070				
Ln %ΔEmployment	-0.105	0.087	-0.085	0.089	-0.107	0.086	-0.138	0.093	0.256	0.308
Large Bank Market Share	-0.245	0.146 *			-0.272	0.133 **	-0.298	0.248	-0.374	0.204 *
Locally-Focused Bank Market Share			0.282	0.161 *						
Recent merger	-0.058	0.060	-0.065	0.058	-0.057	0.066	-0.109	0.085	0.068	0.115
Northeast	0.046	0.084	0.044	0.086	0.055	0.089	0.219	0.103 **	-0.471	0.168 ***
South	0.091	0.076	0.071	0.076	0.104	0.083	0.223	0.105 **	-0.124	0.140
Great Plains	-0.006	0.099	-0.006	0.090	-0.007	0.098	-0.043	0.113	0.021	0.124
Southwest	-0.064	0.124	-0.057	0.120	-0.092	0.112	0.018	0.126	-0.256	0.177
West	-0.081	0.074	-0.093	0.076	-0.074	0.072	0.032	0.081	-0.219	0.138 **
Controls										
Size (FTE and sales)					Yes		Yes		Yes	
Years in business					Yes		Yes		Yes	
Form of business					Yes		Yes		Yes	
Industry					Yes		Yes		Yes	
No. of obs	2,110		2,110		2,110		1,320		790	
Wald chi-square	85.7		141.9		179.5		128.6		314.0	
p-value	0.000		0.000		0.000		0.000		0.000	
psuedo R-squared	0.007		0.008		0.014		0.015		0.043	

**** indicates significance at the .01 level, ** significance at the .05 level and * significance at the .10 level. Robust standard errors are reported.

Change in Competition and Market Structure Summary

- Actions of banks are
 - Independent of numbers and/or share in large markets
 - More closely related to traditional measures of market structure in smaller markets
- Increasing concentration in highly concentrated markets triggers more contact
- Locally owned (smaller) banks compete more aggressively
- Caveats

Banking Outcomes

- Usual suspects: outcome of last loan, trade credit discounts taken, most recent loan rate (typically LOC)
- Change in competition versus level of outcome
- Alternative: *“Over past 3 years, have you noticed a change in the following characteristics of the financial institution you deal with most often?”*
 - Rated better (+1), no change (0), or worse (-1)
 - Accessibility, quality of service, number of services, capability of staff, staff turnover, lending terms, credit availability, ease of doing business
- Index sums eight characteristic ratings

Banking Outcome Means and Correlations

This table presents pairwise correlation coefficients using all owners who responded to the NFIB survey question on reported changes in competition for their financial business during the previous three years. Panel B shows the pairwise correlations between the change in competition responses and changes in banking outcomes. Panel C shows the correlations between the Banking Outcome Change Index, change in competition and a number of firm characteristics. The variables shown in this table are defined in Table 1. Bold type indicates significance at the .01 level.

	Accessi- bility of loan officer	Quality of service	Number of services	Capability of staff	Staff turnover	Ease of doing business	Lending terms	Credit Avail- ability	Change in comp- etition
Panel B									
Availability of loan officer	1.000								
Quality of service	0.639	1.000							
Number of services	0.326	0.408	1.000						
Capability of staff	0.468	0.572	0.370	1.000					
Staff turnover	0.380	0.433	0.215	0.453	1.000				
Ease of doing business	0.541	0.610	0.415	0.500	0.369	1.000			
Lending terms	0.383	0.432	0.365	0.308	0.235	0.521	1.000		
Credit availability	0.425	0.474	0.353	0.330	0.258	0.599	0.643	1.000	
Change in Competition	0.111	0.131	0.116	0.087	-0.004	0.141	0.123	0.169	1.000

	Banking Outcome Change Index	Change in compe- tition	Loan Outstand- ing	Don't use credit	Turned down	Years in Business	FTE	Sales
Panel C								
Banking Outcome Change Index	1.000							
Change in competition	0.145	1.000						
Loan outstanding	0.025	0.082	1.000					
Don't use credit	-0.025	-0.060	-0.632	1.000				
Turned down	-0.152	-0.095	0.148	-0.188	1.000			
Years in business	0.001	0.006	-0.064	0.000	-0.114	1.000		
Fulltime equivalent employees	0.044	0.012	0.090	-0.078	-0.019	0.037	1.000	
Sales	0.013	0.020	0.295	-0.010	0.020	0.072	0.173	1.000

Lender Behavior and Banking Outcomes

- Banks will contact small firms if they believe the expected payoff in future business is positive
- Include both change in competition and deposit concentration
- Empirical challenges:
 - Causality: change in competition \leftrightarrow outcomes
 - Omitted variable: contact strategy = $f(\text{firm quality})$

Causality Test

Panel A presents the distribution of responses to the reported change in competition for your financial business question and the Banking Outcome Change Index. "Neutral" is the number that reported no change in all of the components; "Favorable" is the number of reports where the sum of the individual component ratings was greater than 1; and "Unfavorable" is the number of owners reporting a sum of individual component ratings less than 0. Each component, shown in Panel B, was rated 1 for "better", 0 for "no change", and -1 for "worse." A chi-square test of the null hypotheses $H_0: p_a=p_b$ and $H_0: p_c=p_d$ is shown for this example. A rejection of the null hypothesis $H_0: p_a=p_b$ means that causality runs from competition to outcomes, a rejection of the null hypothesis $H_0: p_c=p_d$ means that causality runs from outcomes to changes in competition. The critical value for the chi-square test with one degree of freedom at the .025 level is 5.024. In Panel B the chi-square test results are presented for all of the detailed questions. The sample is restricted to those owners who have not applied for a loan within three years or who never applied for a loan.

Panel A: Banks Service Quality Change Index frequency distribution

Change in competition	Banking Services Change Index			Null hypothesis	chi-square statistic
	Unfavorable	Neutral	Favorable		
More	14	5 a	2	$H_0: p_a=p_b$	91.9 reject
No change	81 c	214	56 d	$H_0: p_c=p_d$	4.6 cannot reject
Less	53	106 b	84		

Panel B: Chi-square statistics to test for causality

Banking Outcome Change Characteristics	$H_0: p_a=p_b$	$H_0: p_c=p_d$
Accessibility of account manager	71.4 *	1.7
Quality of service	60.7 *	0.1
Number of services offered	48.1 *	29.4 *
Capability of staff	56.9 *	3.0
Staff turnover	46.2 *	41.4 *
Ease of doing business	64.9 *	1.3
Lending terms	59.6 *	6.8 *
Credit availability	59.6 *	8.8 *

* indicates significance at the 2.5% level

Reduced Form Model

*Banking Outcome Change*_{*i*} = $a_0 + b_1$ Change in competition (IV) + b_2 HHI + b_3 Turndown + b_4 Current loan outstanding + b_5 Recent transactions services used + b_6 Recent loan services used + b_7 Ln(Years in business) + b_8 Ln(FTE) + b_9 Form of business + b_{10} Industry category + e

- $b_1 > 0$; $b_2 >$ or < 0
- Tests for endogeneity
- Two-stage ordered probit estimate
- Instruments include variables from part I
- Limited to firms with banks as primary FI

Ordered Probit Results of Change in Competition on Banking Outcomes

This table presents the two-stage ordered probit results of the effect of owner reports of change in competition for their banking business on their assessment of changes in various banking outcomes. The reports of change in competition were rated on a five point scale from "-2" (much less) to "+2" (much more). The Banking Outcome Change Index, shown in column (1), is computed as the sum of the changes in the eight attributes of bank service and shown in column 1. The attributes of bank service, shown in columns (2) - (9), were rated on a 3-point scale from "-1" (worse) to "+1" (better). The instruments used for the change in competition variable include the market structure variables shown in Table 3. Only firms that reported using a commercial bank as their primary institution are included in the estimation.

	<u>Banking Outcome Change Index</u>		<u>Accessibility of Loan Officer</u>		<u>Quality of Service</u>		<u>Number of Services</u>		<u>Capability of Staff</u>	
	<u>Coef.</u>	<u>Std Err</u>	<u>Coef.</u>	<u>Std Err</u>	<u>Coef.</u>	<u>Std Err</u>	<u>Coef.</u>	<u>Std Err</u>	<u>Coef.</u>	<u>Std Err</u>
<u>Change in competition (IV)</u>	0.654	0.186 ***	0.631	0.249 **	0.748	0.258 ***	0.698	0.199 ***	0.711	0.229 ***
HHI	0.862	0.173 ***	0.626	0.249 **	0.598	0.210 ***	0.800	0.290 ***	0.882	0.380 **
Turned down	-0.356	0.150 **	-0.124	0.174	0.003	0.154	-0.023	0.151	0.132	0.167
Current loan outstanding	-0.027	0.083	0.008	0.104	-0.208	0.109 *	0.032	0.088	-0.090	0.116
Don't use credit	0.100	0.120	-0.067	0.131	0.158	0.175	-0.023	0.201	-0.084	0.158
No. of obs	1,868		1,991		1,993		1,977		1,984	
psuedo R-squared	0.013		0.017		0.019		0.020		0.018	
	<u>Staff Turnover</u>		<u>Ease of Doing Business</u>		<u>Loan Terms</u>		<u>Credit Availability</u>			
	<u>Coef.</u>	<u>Std Err</u>	<u>Coef.</u>	<u>Std Err</u>	<u>Coef.</u>	<u>Std Err</u>	<u>Coef.</u>	<u>Std Err</u>		
<u>Change in competition (IV)</u>	0.501	0.229 **	0.653	0.205 ***	0.178	0.214	0.453	0.167 ***		
HHI	0.784	0.190 ***	0.334	0.246	0.738	0.229 ***	0.477	0.227 **		
Turned down	0.097	0.180	-0.296	0.153 *	-0.897	0.140 ***	-0.900	0.172 ***		
Current loan outstanding	-0.056	0.075	-0.065	0.094	-0.006	0.073	0.044	0.096		
Don't use credit	0.211	0.157	-0.100	0.134	0.011	0.092	-0.035	0.178		
No. of obs	1,972		1,918		1,926		1,976			
psuedo R-squared	0.016		0.050		0.053		0.022			

*, **, and *** indicates significance at the 10%, 5%, and 1% levels, respectively. Robust standard errors are estimated with clustering on firm size using full-time equivalent employment.

Marginal Effects of Change in Competition on Banking Outcomes

This table presents the marginal effects, $d(P_j)/d(\text{Change in competition IV})$, of the Change in Competition (IV) on the Banking Outcome Change variables at their median value. P_j is the probability of a report of Worse, No Change, or Better for each outcome variable and the marginal effects sum to 0. For the Banking Outcome Change Index, the marginal effects are presented cumulatively for Index values less than zero (-1 to -8, labeled "Worse"), No Change (0), and greater than 0 (1 to 8, labeled "Better"). For the components of the Banking Outcome Change Index, the marginal effects are presented for the three outcomes: Worse (-1), No Change (0), and Better (+1). A one standard deviation change in the Change in Competition (IV), 0.238, is multiplied by the marginal effects to estimate the economic consequence of the change at the mean of each outcome value.

	No				No		
Banking Outcome Change Index	<u>Worse</u>	<u>change</u>	<u>Better</u>	Staff Turnover	<u>Worse</u>	<u>change</u>	<u>Better</u>
$d(P_j)/d(\text{Chg. In Competition IV})$	-0.248	0.018	0.231	$d(P_j)/d(\text{Chg. In Competition IV})$	-0.191	0.151	0.040
Effect of 1 sd change in Change in Competition (IV)	-0.059	0.004	0.055	Effect of 1 sd change in Change in Competition (IV)	-0.045	0.036	0.010
Acessibility of Loan Officer				Ease of Doing Business			
$d(P_j)/d(\text{Chg. In Competition IV})$	-0.147	0.018	0.130	$d(P_j)/d(\text{Chg. In Competition IV})$	-0.192	0.037	0.155
Effect of 1 sd change in Change in Competition (IV)	-0.035	0.004	0.031	Effect of 1 sd change in Change in Competition (IV)	-0.046	0.009	0.037
Quality of Service				Loan Terms			
$d(P_j)/d(\text{Chg. In Competition IV})$	-0.238	0.095	0.143	$d(P_j)/d(\text{Chg. In Competition IV})$	-0.042	-0.002	0.044
Effect of 1 sd change in Change in Competition (IV)	-0.057	0.023	0.034	Effect of 1 sd change in Change in Competition (IV)	-0.010	0.000	0.010
Number of Services				Credit Availability			
$d(P_j)/d(\text{Chg. In Competition IV})$	-0.100	-0.145	0.244	$d(P_j)/d(\text{Chg. In Competition IV})$	-0.096	-0.023	0.118
Effect of 1 sd change in Change in Competition (IV)	-0.024	-0.034	0.058	Effect of 1 sd change in Change in Competition (IV)	-0.023	-0.005	0.028
Capability of Staff							
$d(P_j)/d(\text{Chg. In Competition IV})$	-0.208	0.088	0.120				
Effect of 1 sd change in Change in Competition (IV)	-0.050	0.021	0.029				

Sensitivity Tests for Change in Competition on Banking Outcome Change Index and Accessibility

This table shows a number of sensitivity tests to the base model results shown in Table 5. The control variable coefficients are not shown for ease of presentation. Column (1) shows the results of adding an interactive HHI term with the size of the bank (where CFI =1 if assets are under \$1 billion; column (2) adds the length of time at the current bank; and column (3) adds the year of the last loan. Two stage ordered probit is used to estimate the model.

	(1) Interactive HHI x bank size		(2) Length of time with primary bank		(3) Year of last loan	
	<u>Coef.</u>	<u>Std Err</u>	<u>Coef.</u>	<u>Std Err</u>	<u>Coef.</u>	<u>Std Err</u>
Banking Outcome Change Index						
Change in competition (IV)	0.574	0.160 ***	0.576	0.160 ***	0.554	0.165 ***
HHI	0.435	0.285	0.404	0.284	0.382	0.267
HHI x CFI	0.621	0.290 **	0.627	0.290 **	0.594	0.284 **
Time since last bank change			0.124	0.100	0.156	0.099
Last loan try: 2001					0.238	0.102 **
Last loan try: 2000					0.138	0.084 *
Last loan try: 1999					0.006	0.137
Last loan try: 1998					0.315	0.118 ***
Accessibility of Loan Officer						
Change in competition (IV)	0.521	0.232 **	0.521	0.231 **	0.484	0.244 **
HHI	-0.003	0.352	0.000	0.356	-0.033	0.346
HHI x CFI	0.882	0.320 ***	0.880	0.319 ***	0.858	0.315 ***
Time since last bank change			-0.014	0.115	0.021	0.122
Last loan try: 2001					0.265	0.111 **
Last loan try: 2000					0.210	0.121 *
Last loan try: 1999					0.140	0.164
Last loan try: 1998					0.275	0.115 **

Conclusion

- Contact is related to market structure but in a complex way
 - More concentration → less contact but mitigated in markets where contact is increasing
 - Contact more likely by single market banks
- Increased bank contact results in increased satisfaction with all banking outcomes except loan terms
 - Control for loan outstanding, any credit use, and outcome of recent loan
 - HHI significance related to bank size
 - Not affected by length of relationship or timing of recent loan
- Unanswered questions