

DEREGULATION AND STRUCTURAL CHANGE IN THE U.S. COMMERCIAL BANKING INDUSTRY

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INTRODUCTION

The twentieth century witnessed two periods of dramatic regulatory and structural change in the U.S. banking industry—the Great Depression and the various events of the 1980s and 1990s.¹ While important regulations were enacted during the Great Depression, many of the financial regulations were repealed or reversed in the 1980s and 1990s. Moreover, during those two decades the banking industry changed from having extensive geographic limitations to being characterized by interstate banking and branching.

The deregulation of intrastate and interstate banking and branching activities played a major role in the changing structure of the U.S. commercial banking industry. Our analysis follows two different, but complementary, paths—descriptive analysis that traces the trends in the changing structure of commercial banking and more formal analysis that considers the effects, if any, of deregulation on mergers, concentration, and net entries on a state-by-state basis.

The Federal Reserve Bank of Chicago recently posted on its web site the Report of Condition and Income (Call Report) and merger data for the period 1976 to 1998.² That important source of data is now freely available to all interested parties. In the past, such data were only available at some real dollar cost to individual researchers. We employ those data to provide a panorama of structural change occurring over that period. Our description presents geographic patterns of change, largely on a state-by-state, and occasionally on a city-by-city, basis.³ Those data also provide the inputs for our more formal, econometric analysis that uses panel data to perform fixed- and random-effects estimation.

REGULATORY AND STRUCTURAL CHANGE: AN OVERVIEW⁴

Because our forefathers were concerned about concentrations of power, the U.S. banking industry possesses more independent institutions than most other coun-

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tries.⁵ The regulatory environment changed notably in the last twenty years, including, but not limited to, the Depository Institution Deregulation and Monetary Control Act of 1980, the Depository Institution Act of 1982, and the Interstate Banking and Branching Efficiency Act of 1994.

Throughout U.S. commercial banking history, banks could not operate across state boundaries either through interpretation of regulations or by explicit legislation. That legal and administrative landscape, however, possessed loopholes. Bank holding companies could acquire banks across state lines, if such actions were explicitly permitted by the states involved. That loophole was first mined in 1975 when Maine adopted legislation permitting out-of-state holding companies to acquire Maine banks, if reciprocity existed in the other state. But substantial movement did not really begin until 1982 when New York also passed reciprocity legislation and Massachusetts passed similar legislation restricted to the New England states. Most recently, the Interstate Banking and Branching Efficiency Act of 1994 permitted bank acquisitions in other states.⁶ State legislation has generally liberalized its rules on branch banking within states' borders.⁷ Legislative activity has gradually reduced the number of states to a very few that have either unit or limited branching.

Technological and financial innovations as well as the shifting interpretations of the relevant statutes by the numerous regulatory agencies eroded the original legislative intent of those statutes. Kane [1996] calls that erosion "statutory decay" and offers a public choice rationale that he terms "Regulatory Dialectic." In effect, the political process played an important role in explaining the evolution of regulation, its interpretation, implementation, and revision, and its ultimate demise.

A few authors forecast the future structure of the U.S. banking industry. Those analysts see a two-tiered system with a group of megabanks that participate in national and global credit markets and a much larger number of community banks that participate in local credit markets. For example, Miller [1988] forecasts just over 2,000 banks in a fully operating interstate banking and branching system.⁸ More recently, Berger, Kashyap, and Scalise [1995] provide a long-run forecast of between 2,000 to 4,000 banks under interstate banking and branching.⁹ Moreover, they forecast that the decrease in organizations should occur largely within five years. Our actual count of banks (not organizations) at the end of 1994 equals 11,698 (see Table 1). This count falls to 9,839 in 1998, or 84 percent of the 1994 level.¹⁰

Those last observations suggest that the consolidation in the banking industry may be proceeding more slowly than Berger, Kashyap, and Scalise [1995] projected. The growth of *de novo* banks, and "new" banks by conversion and relocation explains the slower rate of consolidation. Between 1976 and 1998, the merger data at the Federal Reserve Bank of Chicago web site record 11,055 bank mergers (see Table 1). The number of banks did not fall from 15,264 to 4,209, but rather ended 1998 at 9,839. Over that same period, the merger data record 6,679 new banks—*de novo*, conversions, and relocations of head offices.

What explains the large number of new bank entries? Several recent papers [Berger, Bonime, Goldberg, and White, 1999; Keeton, 2000; Seelig and Critchfield, 1999; Jeon and Miller, 2001a] consider that question, examining the hypothesis that

TABLE 1
Commercial Bank Mergers: 1976-1998

Year	Merger				Mergers between Different States	Total Number of Banks
	Charter Discontinued	Involving Government Assistance	Other	Total		
1976	121	16	0	137	1	15,264
1977	152	6	0	158	0	15,294
1978	166	6	0	172	0	15,418
1979	220	8	0	228	0	15,417
1980	130	6	0	136	1	15,849
1981	206	8	0	214	0	15,856
1982	272	25	0	297	1	16,062
1983	320	38	0	358	0	16,095
1984	346	74	1	421	3	15,657
1985	347	94	0	441	0	15,659
1986	343	118	1	462	1	15,340
1987	563	175	0	738	5	14,846
1988	620	198	0	818	7	14,280
1989	422	200	1	623	4	13,887
1990	394	251	2	647	17	13,518
1991	435	176	2	613	20	13,094
1992	471	144	3	618	18	12,689
1993	569	61	3	633	17	12,238
1994	614	68	9	691	15	11,698
1995	678	9	7	694	41	11,153
1996	612	5	13	630	64	10,803
1997	674	2	4	680	206	10,268
1998	638	3	5	646	193	9,839
Total	9,313	1,691	51	11,055	614	

Data include mutual savings banks, commercial banks, and non-deposit trust companies, including both state and national charters. The data are posted at http://www.frbchi.org/rcrri/rcrri_database.html.

new bank entries fill a void (market niche) left by bank mergers. That is, new entries provide services to small businesses and other bank customers formerly provided by banks that have now merged into larger organizations.¹¹ That conventional wisdom implies that bank mergers lead to new entries. Seelig and Critchfield [1999] challenge conventional wisdom with their empirical findings that mergers only dissuade entry. Berger, Bomine, Goldberg, and White [1999] support conventional wisdom with their empirical results. More recently, Keeton criticizes the methods of the prior two papers and offers an improved method, finding support for the mergers-imply-new-entries hypothesis. Moreover, Keeton concludes "... new bank formations may offset some of the harmful effects of mergers, making it more likely that banking consolidation is beneficial on balance." [2000, 35]. Most recently, Jeon and Miller [2001b] consider several issues related to new charters, failures, and mergers. They also support the mergers-imply-new-entries hypothesis.

TRENDS IN MERGER ACTIVITY

Merger activity in the U.S. banking industry over the past two decades was initially led by bank holding company acquisitions. In states with branching restrictions, bank holding companies acquired banks (offices) in locations that circumvented branching restrictions imposed on individual banks. More recently, the state legislation allowing bank holding company acquisitions across state boundaries facilitated such acquisitions. Most recently, the Interstate Banking and Branching Act of 1994 opened the door to regular bank mergers across state lines.

Intrastate and Interstate Merger Activity

Table 1 presents information on commercial bank mergers.¹² Several general observations emerge. First, bank mergers as a percentage of the total number of banks has trended upward over time reaching 6.6 percent in 1997 and 1998. Bank merger activity between states was limited to takeover of failed institutions until the implementation of the Interstate Banking and Branching Act of 1994 that went into full effect in July 1996. The between-state merger percentage of the total merger activity jumped from just over 2 percent prior to 1995 to 6 percent in 1995 to 10 percent in 1996 and to 30 percent in 1997 and 1998. Thus, this new legislation has affected between-state merger activity. Nonetheless, we note that intrastate mergers still capture a wide majority of the activity.

Second, banking problems of the mid-1980s, due largely to agricultural and energy-related loans and ending in the early 1990s, show up in the number of government-assisted mergers.¹³ The peak years were 1988, 1989, and 1990 when a total of 649 bank mergers received government assistance, representing just over 31 percent of the total bank mergers in that period. The initial increase occurred in 1982 and the problems did not end until 1995.

Charter Type of Merger Survivors and Non-Survivors

The merger data file also allows a classification of the charter (bank) type for both merger survivors and non-survivors. Charter (bank) types include the following classes: mutual savings banks and federal mutual savings banks, national banks, state banks that are members of the Federal Reserve System, state banks that are not members of the Federal Reserve System, non-deposit trust companies that are members of the Federal Reserve System, and non-deposit trust companies that are not members of the Federal Reserve System.¹⁴

Table 2 reports the charter status for merger survivors and non-survivors. Consider, for example, the column headed by NAT. This column reports the survivors of mergers that are national banks. Here 5,485 mergers resulted in a survivor who had a national charter. Of this total, 211 non-survivors were mutual savings banks, 2,743 were national banks, 378 were state banks who were members of the Federal Reserve System, 2,073 were state banks who were not members of the Federal Reserve System, and so on.

TABLE 2
Survivor and Non-Survivor Entity Types: 1976-1998

		Entity Type for Survivor						Total
		MSB	NAT	STM	NON	MTC	TRC	
Entity Type For Non-Survivor	MSB	270	211	81	214	0	0	776
	NAT	19	2743	312	858	1	1	3934
	STM	6	378	293	245	0	0	922
	NON	55	2073	501	2648	0	0	5277
	MTC	6	37	1	1	8	0	53
	TRC	0	43	10	17	6	17	93
Total		356	5485	1198	3983	15	18	11055

See notes for Table 1. The entity types are defined as follows: MSB: mutual saving banks and federal savings bank; NAT: national bank; STM: state member bank; NON: non-member bank; MTC: member, non-deposit trust company; and TRC: non-member, non-deposit trust company.

Now, consider the row for national banks. Here, 3,934 national banks merged and did not survive. Of this total, 19 were merged with a surviving mutual saving bank, 2,743 merged with a surviving national bank, 312 merged with a surviving state member bank, 858 merged with a surviving state non-member bank, and so on.

Several observations emerge. First, a substantial number of the survivors, 54 percent, have the same charter as the non-survivor, an intra-charter merger. The 54 percent comes from adding the diagonal elements in Table 2 and dividing by 11,055, the total number of mergers. The remaining 46 percent are inter-charter mergers. Second, except for state member banks, more than 50 percent of the mergers were intra-charter type with mutual saving banks having the highest percentage at 76 percent followed by non-member state banks at 67 percent. State member banks had intra-charter mergers of only 25 percent. Finally, some charter types grow, since they have more survivors than non-survivors—national banks (almost 40 percent more survivors) and state member banks (almost 30 percent more survivors).¹⁵ Alternatively, twice as many mutual savings banks disappear in mergers as survive and more than 30 percent more non-member state banks disappear in mergers as survive.

Merger Activity by State

Table 3 reports the merger activity by state in three categories—mergers of banks within the state, mergers where an out-of-state bank took over an in-state bank, and mergers where an in-state bank took over an out-of-state bank. Moreover, Table 3 sorts the states by the average number of banks over the sample period. Texas leads with the highest average number of banks; Alaska holds the rear with the lowest. Not surprisingly, the number of mergers in a state generally rises with the number of banks in that state. But that relationship is far from perfect. Colorado, Florida, Illinois, Missouri, and Texas each experienced more than 400 mergers over the sample

TABLE 3
Mergers Within and Between States: 1976-1998
(Ranked by the Average Number of Banks)

State	Within- state Merger	Between- state Merger		State	Within- state Merger	Between- state Merger	
		Survivor in Other State	Survivor in State			Survivor in Other State	Survivor in State
Texas	1,370	20	4	North Dakota	80	5	13
Illinois	655	41	17	New Jersey	207	20	12
Minnesota	317	7	17	Montana	106	0	0
Missouri	420	38	26	Mississippi	116	10	12
Iowa	275	29	6	South Dakota	80	5	3
Kansas	266	18	8	Washington	90	11	3
Wisconsin	357	4	4	Connecticut	69	7	1
New York	202	24	26	Maryland	88	19	12
Florida	901	53	16	North Carolina	124	4	95
California	374	17	42	New Mexico	46	17	2
Oklahoma	275	3	0	Wyoming	70	3	0
Georgia	299	27	6	South Carolina	69	10	1
Nebraska	217	2	18	New Hampshire	46	4	0
Colorado	407	11	3	Oregon	71	6	17
Ohio	368	8	59	Utah	73	12	5
Pennsylvania	265	12	18	Maine	33	1	1
Indiana	272	20	6	Delaware	16	14	7
Kentucky	153	15	5	Arizona	47	5	3
Michigan	263	18	19	Vermont	16	1	0
Tennessee	244	12	33	Idaho	17	8	0
Massachusetts	157	0	7	Dis. Columbia	10	9	5
Arkansas	85	39	1	Hawaii	10	2	0
Alabama	238	11	92	Rhode Island	12	4	3
Louisiana	200	10	6	Nevada	9	6	3
Virginia	285	22	14	Alaska	12	2	0
West Virginia	184	6	4				

See notes for Table 1.

period. Calculating mergers as a percentage of the number of banks in a state, those states that experienced a relatively high level of merger activity within their borders include Arizona, Florida, New Jersey, North Carolina, Utah, and Virginia, each of which averaged mergers per year over the entire sample period of more than 5 percent.

Arkansas, Florida, Illinois, and Missouri led those states where out-of-state banks took over banks within their borders at 39, 53, 41, and 38 such mergers, respectively. Calculating such mergers as a percent of the number of banks in a state, Delaware, the District of Columbia, Idaho, and Nevada have relatively large numbers of mergers where the surviving banks are out-of-state, each averaging merger rates of more than 1 percent per year over the sample period.

Reversing the focus, Alabama, North Carolina, Ohio, and California banks took over more out-of-state banks with 92, 95, 59, and 42 such mergers, respectively.

Calculating such mergers as a percent of the number of banks in a state, Alabama, the District of Columbia, and Oregon have relatively large numbers of mergers where the surviving banks are in state, each averaging more than 1 percent per year. On this percentage basis, North Carolina surpasses those three states by a large margin with mergers per year with out-of-state banks at about 5 percent.¹⁶

614 banks from different states merged (see Table 1), a large majority of which occurred since 1996. The number of mergers reported in Table 3 where an out-of-state bank took over an in-state bank and where an in-state bank took over an out-of-state bank both sum to 614, as they should. The distribution of interstate mergers, however, is more diffused for out-of-state banks taking over in-state banks (the standard deviation is 20.0). Conversely, the distribution of interstate mergers is more concentrated for in-state banks taking over out-of-state banks (the standard deviation is 11.5). In other words, the survivors of interstate mergers are not surprisingly concentrated in fewer states than the non-survivors.

Deregulation and Merger Activity

We now consider how deregulation affected merger activity for panel-data regressions using fixed- and random-effects techniques. The dependent variable for each regression is the ratio of the number of mergers in each state divided by the total number of banks in the corresponding state as a percentage—the merger rate.¹⁷

Deregulation includes two differing effects—the relaxation of restrictions on (1) intrastate and (2) interstate branching and banking. Most banking researchers employ dummy variables to distinguish between states with different intrastate branching and banking regulations—typically unit, limited, and state-wide branching and banking states. In our model, the average number of branches per bank (bch/bn) in each state captures the actual effect of intrastate branching and banking regulation.¹⁸ Three dummy variables capture a state's regulatory stance relative to interstate operation of bank holding companies. The first (dr) equals one for states that enacted legislation that allows out-of-state bank holding companies from a proscribed region to operate within the state's boundaries—either with or without reciprocity from the home state of that bank holding company. Otherwise, dr equals zero. The second (dnr) equals one for states that enacted legislation that allows out-of-state bank holding companies, irrespective of their headquarters' locations, to operate within the state's boundaries, but only if the state where their headquarters are located has similar (reciprocal) legislation. Otherwise, dnr equals zero. The third (dnn) equals one for states that enacted legislation that allow out-of-state bank holding companies, irrespective of their headquarters' locations, to operate within those states' boundaries without any requirement for reciprocity from the other state. Otherwise, dnn equals zero. Finally, the unemployment rate ($unem$) in each state as a percentage controls for the business cycle.

Table 4 reports the fixed- and random-effects regression findings on bank mergers and deregulation. The intrastate branching and banking control variable (bch/bn) proves insignificant. Each of the interstate branching and banking dummy variables emerges as significantly positive, meaning more permissive interstate branching and banking regulation states experience higher rates of merger activity. Moreover, the economic condition in each state ($unem$) does not significantly affect the

TABLE 4
Bank Mergers and Deregulation

	Fixed-Effects Models	Random-Effects Models
<i>constant</i>	1.38 (1.63)	1.12 (1.62)
<i>bch/bn</i>	0.04 (0.68)	0.08 ^b (2.28)
<i>dr</i>	1.68 ^a (3.75)	1.95 ^a (4.54)
<i>dnr</i>	4.47 ^a (9.08)	4.21* (9.94)
<i>dnn</i>	2.88 ^a (5.68)	2.61 ^a (5.50)
<i>dnem</i>	0.11 (1.15)	0.12 (1.49)
R²: Within	0.1284	0.1273
R²: Between	0.0610	0.1046
R²: Overall	0.1163	0.1218

The dependent variable is the number of mergers per bank as a percentage in each state. The independent variables include the number of branches per bank (*bch/bn*), a dummy variable for states that enacted legislation that allows out-of-state bank holding companies from a proscribed region to operate within its boundaries—either with or without reciprocity from the home state of that bank holding company (*dr*), a dummy variable for states that enacted legislation that allows out-of-state bank holding companies irrespective of their headquarters' locations, to operate within its boundaries, but only if the states where their headquarters are located have similar (reciprocal) legislation (*dnr*), a dummy variable for states that enacted legislation that allow out-of-state bank holding companies, irrespective of their headquarters' locations to operate within their boundaries without any requirement for reciprocity from the other states (*dnn*), and the unemployment rate (*unem*).

a. Significantly different from zero at the 1 percent level.

b. Significantly different from zero at the 5 percent level.

merger rate. Interestingly, the deregulation of the interstate operations of bank holding companies had significant effects on merger activity while the intrastate banking and branching variable did not. We comment further on that observation in the conclusion.

How can one interpret the findings? In a state before the deregulation that permitted intrastate and interstate branching and banking, the independent variables equal zero. Ignoring the insignificant unemployment rate, the constant term measures the mergers as a percentage of the number of banks in that state, that is, just over 1 percent. Now, the introduction of bank holding company acquisition activity within specified regions raises the merger percentage to around 3 percent (the constant plus the coefficient of *dr*). The introduction of nationwide bank holding company acquisition activity, but with reciprocity, raises the merger percentage to over 5 percent. Finally, the introduction of nationwide bank holding company acquisition activity without reciprocity only raises the merger percentage to about 4 percent.¹⁹

CONCENTRATION IN COMMERCIAL BANKING

This section examines commercial-bank concentration on a national and a state-by-state basis.²⁰ We first examine megabank size over our sample period. In 1976, the largest bank holds assets of \$73.0 billion. By 1998, the largest bank holds \$317.1 billion, a 6.9 percent annual geometric growth rate.²¹ But the growth process is not smooth. Between 1976 and 1988, the largest bank grows to \$150.2 billion, a 6.2 percent annual growth rate. The largest bank grows by 2.2 percent annually between 1988 and 1992, and by 11.6 percent annually between 1992 and 1998. A similar growth pattern occurs for the 10th, 50th, and 100th largest banks, moving from \$16.2, \$2.8, and \$1.4 billion in assets in 1976 to \$74.4, \$22.8, and \$9.9 billion in assets in 1998, or 7.2, 10.0, and 9.3 percent annual growth rates. While the 50th and 100th largest banks experience slower annual growth of 3.9 and 4.6 percent between 1988 and 1992, the 10th largest bank declines in size from \$35.2 to 32.3 billion, or -2.1-percent annual growth. Finally, while the 10th and 50th largest banks resume double-digit annual growth of 14.9 and 11.4 percent between 1992 and 1998, the 100th largest bank only experiences 5.2 percent annual growth.

Table 5 reports the percentages of total bank assets that the top 5, 10, 20, 50, and 100 banks hold in each year from 1976 through 1998.²² An interesting pattern emerges in that all categories depict U-shapes over time.²³ The top 5, 10, 20, 50, and 100 banks hold higher percentages in 1976 than in 1991. Further, the percentage in 1998 exceeds that in 1976 for each category. For example, the top 100 banks hold 47 percent of all bank assets in 1976. This percentage remains at 47 percent through 1981 and then falls slowly to 43 percent in 1990 and 1991. Since then, the percentages increase slowly to 49 percent in 1995 and then more quickly to 62 percent in 1998.²⁴ Similar patterns exist for the top 5, 10, 20, and 50 banks as well.

While national bank concentration provides interesting information, concentration on a state-by-state basis also proves useful.²⁵ We calculate the percent of total assets held by the top 5 and top 10 banks in each state (not reported, available from authors). The average concentration across all states hovers around 45 percent for the top 5 banks from 1976 to 1983. It then rises gradually to 50 percent in 1990 and then 62 percent in 1998. For the top 10 banks, the average concentration hovers around 56 percent from 1976 to 1983. It then rises gradually to 61 percent in 1990 and to 71 percent in 1998. In sum, state-level concentration began rising in 1983 and continued through 1998.²⁶

Table 6 reports states ranked by top 5 concentration in assets in 1978, 1983, 1988, 1993, and 1998. The median states in each year include Mississippi (36), Pennsylvania (40), Connecticut (47), Massachusetts (53), and New Jersey (63).²⁷ The median lies below the mean in 1978 (45), 1983 (46), 1988 (49), and 1993 (54) and lies above the mean in only 1998 (62).

While the rankings possess some stability, movements do occur. The correlation between the 1978 and 1983 rankings equals 0.96; between 1983 and 1988, 0.90; between 1988 and 1993, 0.93; and between 1993 and 1998, 0.82. Thus, more movement occurred in the last five years. Moreover, the longer the time between observations, the lower the correlation. For example, the correlation between the 1978 and 1998 rankings equals 0.63. In addition, we calculated the average ranking and its stan-

TABLE 5
Top Bank Fractional Holding of Total Assets

Year	Top 5 Banks	Top 10 Banks	Top 20 Banks	Top 50 Banks	Top 100 Banks
1976	0.18	0.25	0.32	0.40	0.47
1977	0.18	0.26	0.32	0.40	0.47
1978	0.18	0.25	0.32	0.40	0.48
1979	0.19	0.27	0.34	0.42	0.49
1980	0.17	0.25	0.32	0.40	0.47
1981	0.17	0.25	0.31	0.39	0.47
1982	0.16	0.24	0.30	0.39	0.46
1983	0.15	0.22	0.29	0.37	0.45
1984	0.14	0.21	0.28	0.36	0.45
1985	0.14	0.21	0.27	0.36	0.44
1986	0.13	0.20	0.26	0.35	0.44
1987	0.12	0.18	0.24	0.35	0.44
1988	0.11	0.17	0.23	0.34	0.44
1989	0.11	0.17	0.23	0.33	0.44
1990	0.11	0.17	0.23	0.33	0.43
1991	0.11	0.16	0.23	0.33	0.43
1992	0.13	0.17	0.23	0.34	0.44
1993	0.13	0.18	0.24	0.35	0.46
1994	0.14	0.19	0.26	0.37	0.48
1995	0.14	0.20	0.27	0.38	0.49
1996	0.17	0.23	0.30	0.42	0.53
1997	0.19	0.27	0.36	0.49	0.60
1998	0.21	0.29	0.38	0.51	0.62

See Table 1. The columns report the percentage of total bank assets in each year held by the top 5, 10, 20, 50, 100 banks based on assets.

dard deviation for each state in 1978, 1983, 1988, 1993, and 1998. For example, Illinois ranked 22, on average, with a standard deviation of 13. Illinois moved from a rank of 36 in 1978 to 7 in 1993 before moving back to 12 in 1998. Those states with standard deviations above 10, indicating significant movement within the rankings, include Alabama, Delaware, Idaho, Illinois, Louisiana, New Hampshire, and Wyoming.

Deregulation and Bank Concentration

We now consider how deregulation affected bank concentration using the same set of independent variables—to capture changes in intrastate (*bch/bn*) and interstate (*dr*, *dnr*, and *dnn*) branching and banking regulation and to capture changes in the state's economy (*unem*)—in fixed- and random-effects regressions. Two concentration measures (discussed above) are the percentage of state bank assets held by the top 5 (*top5*) and top 10 (*top10*) banks in each state. The third concentration measure (not discussed above) is the Herfindahl-Hirschman index (*hhi*) of bank assets in each state. That index equals the sum of the squared percentage market

TABLE 6
States Ranked by Top 5 Bank Concentration of Assets (Lowest to Highest)

Rank	1978	1983	1988	1993	1998
1	Florida (12)	Iowa (13)	Kansas (15)	Arkansas (20)	Arkansas (17)
2	Iowa (14)	Kansas (13)	Iowa (16)	Iowa (22)	Florida (24)
3	Kansas (14)	West Virginia (14)	Arkansas (16)	Kansas (25)	Kansas (26)
4	West Virginia (15)	North Dakota (15)	Montana (17)	Wisconsin (26)	Iowa (34)
5	Arkansas (19)	Montana (19)	West Virginia (17)	West Virginia (27)	Nebraska (35)
6	Montana (20)	Arkansas (20)	Wyoming (20)	Oklahoma (29)	Oklahoma (37)
7	New Jersey (20)	Wisconsin (22)	Oklahoma (21)	Illinois (33)	Texas (37)
8	Wisconsin (24)	Nebraska (23)	Wisconsin (24)	North Dakota (35)	Wisconsin (38)
9	North Dakota (24)	Wyoming (24)	Indiana (28)	Missouri (36)	West Virginia (41)
10	Louisiana (25)	Louisiana (24)	Missouri (29)	Colorado (36)	Kentucky (42)
11	Indiana (25)	Florida (25)	N. Hampshire (31)	Nebraska (36)	North Dakota (42)
12	N. Hampshire (26)	Indiana (25)	Nebraska (31)	Florida (38)	Illinois (45)
13	Nebraska (27)	New Jersey (25)	Colorado (31)	Kentucky (39)	Georgia (46)
14	Wyoming (27)	N. Hampshire (25)	North Dakota (31)	Indiana (39)	Colorado (47)
15	Ohio (27)	Missouri (26)	New Jersey (31)	Montana (40)	New York (49)
16	Texas (29)	Oklahoma (28)	Texas (33)	New York (40)	Missouri (52)
17	Missouri (29)	Texas (28)	Florida (33)	Ohio (41)	Montana (52)
18	Oklahoma (30)	Tennessee (31)	Ohio (34)	New Jersey (42)	Indiana (52)
19	Tennessee (31)	Ohio (33)	New York (36)	Louisiana (43)	New Mexico (56)
20	Alabama (32)	Kentucky (35)	Kentucky (37)	New Mexico (44)	Mississippi (57)
21	Maine (32)	Colorado (35)	Illinois (39)	Delaware (47)	Idaho (59)
22	Kentucky (32)	New Mexico (35)	Tennessee (40)	Texas (48)	Maine (59)
23	Massachusetts (34)	Mississippi (38)	Pennsylvania (42)	Wyoming (49)	Maryland (61)
24	Colorado (35)	Maine (40)	New Mexico (42)	Tennessee (49)	Virginia (62)
25	Minnesota (36)	Massachusetts (40)	Louisiana (46)	Pennsylvania (53)	Pennsylvania (63)
26	Mississippi (36)	Pennsylvania (40)	Connecticut (46)	Massachusetts (53)	New Jersey (63)
27	South Dakota (37)	Michigan (41)	Massachusetts (46)	Georgia (53)	S. Carolina (64)
28	Connecticut (37)	Minnesota (42)	Delaware (47)	Minnesota (54)	Vermont (66)
29	New Mexico (37)	Alabama (42)	Minnesota (50)	Connecticut (54)	Ohio (67)
30	Pennsylvania (39)	New York (45)	Georgia (51)	Mississippi (55)	Massachusetts (68)
31	Virginia (40)	Connecticut (46)	Vermont (52)	Vermont (56)	Wyoming (70)
32	Michigan (42)	Delaware (47)	Michigan (52)	Maryland (56)	California (70)
33	Georgia (45)	Georgia (48)	Mississippi (53)	California (58)	Delaware (71)
34	New York (50)	Illinois (52)	Maryland (55)	N. Hampshire (59)	South Dakota (71)
35	Vermont (53)	Vermont (55)	California (56)	Alabama (62)	Oregon (71)
36	Illinois (54)	Virginia (59)	Alabama (61)	Michigan (64)	Louisiana (71)
37	Maryland (56)	Maryland (60)	Virginia (63)	Maine (67)	Washington (72)
38	S. Carolina (63)	South Dakota (63)	Maine (64)	South Dakota (67)	Michigan (72)
39	Washington (66)	California (65)	Washington (67)	Washington (68)	Tennessee (72)
40	N. Carolina (70)	Washington (66)	Utah (74)	Virginia (68)	Connecticut (74)
41	Alaska (73)	Alaska (70)	S. Carolina (74)	S. Carolina (71)	Minnesota (74)
42	Utah (73)	S. Carolina (73)	Oregon (77)	N. Carolina (74)	Nevada (76)
43	Delaware (76)	Utah (75)	South Dakota (77)	Utah (75)	N. Hampshire (81)
44	Oregon (79)	Oregon (75)	N. Carolina (80)	Oregon (77)	Utah (86)
45	Rhode Island (80)	N. Carolina (76)	Rhode Island (84)	Arizona (84)	Arizona (86)
46	California (82)	Rhode Island (83)	D. Columbia (84)	D. Columbia (85)	Alabama (87)
47	Idaho (87)	Idaho (86)	Idaho (87)	Idaho (89)	D. Columbia (89)
48	D. Columbia (91)	D. Columbia (89)	Hawaii (88)	Nevada (90)	N. Carolina (95)
49	Hawaii (92)	Hawaii (89)	Alaska (90)	Hawaii (91)	Alaska (95)
50	Nevada (92)	Arizona (93)	Arizona (92)	Rhode Island (92)	Hawaii (98)
51	Arizona (94)	Nevada (95)	Nevada (95)	Alaska (93)	Rhode Island (99)
Mean	(45)	(46)	(49)	(54)	(62)

Numbers in parentheses are percentage of assets held by the top 5 banks. The mean across all states is given at the bottom of each column.

shares and ranges from 0 to 10,000. Banking markets with a Herfindahl-Hirschman index over 2,000 receive scrutiny by the Department of Justice.

Table 7 reports the fixed- and random-effects results on bank concentration and deregulation. First, more permissive intrastate branching and banking regulation associates significantly with higher concentration across all three concentration measures. Second, more permissive interstate branching and banking regulation also significantly associates with higher concentration. The unemployment rate does not exhibit significant effects, although the sign is consistently negative such that a good economy associates with higher concentration. Thus, the deregulation of interstate and intrastate banking and branching correlates with higher concentration within a state.²⁸

The constant term again provides the percentage of assets held by the top 5 and top 10 banks as well as the Herfindahl-Hirschman index for a state with no interstate or intrastate branching and banking. The top 5 and top 10 banks hold about 40 and 50 percent of assets and the Herfindahl-Hirschman index equals about 475. The dummy variable for nationwide bank holding company acquisition activity with reciprocity possesses the largest effect, suggesting that after adopting such legislation the percentage of assets held by the top 5 and top 10 banks rises by about 7 percent and that the Herfindahl-Hirschman index rises by 167. But the number of branches per bank clearly has an important effect. Easing intrastate branching legislation such that the number of branches per bank rises by 10 causes the percentage of assets held by the top 5 and top 10 banks to increase by between 10 to 15 percent while the Herfindahl-Hirschman index rises by 700.

THE LOCATION OF MEGABANKS

This section examines the geographic distribution of megabanks, defined as the top 100 banks by asset size. Table 8 reports the location of the top 5, 10, 20, 50, and 100 banks by state in 1978, 1983, 1988, 1993, and 1998, where we sort the states by average real gross state product (GSP) over the sample period. We observe that more mega banks are located in states ranking high in average real GSP than in states with a lower average real GSP. But that association is less than perfect. California, for example, has the highest average real GSP, but falls far behind New York in the number of mega banks within its borders.

New York and California split the top five banks—four in New York and one in California—in the first four years reported; then in 1998, North Carolina enters the picture with two top 5 banks, drawing New York down from four to two. Moving to the top 10 banks boosts the numbers in New York and California with Illinois capturing up to two. The top 20 list solidifies the position of New York, California, and Illinois. Now, however, Massachusetts, and Pennsylvania appear as permanent players. California, Illinois, Massachusetts, Michigan, New York, North Carolina, Pennsylvania, Texas, and Washington all have banks in the top 50 each year in Table 5. For the top 100 banks, we add Arizona, Connecticut, Georgia, Maryland, Minnesota, New Jersey, Ohio, Rhode Island, and Virginia to that list.²⁹

Examining the number of large banks by state and city prompts questions about unexpected outcomes (for example, the absence of top 50 banks in Los Angeles).

TABLE 7
Bank Concentration and Deregulation

	Fixed-Effects Models			Random-Effects Models		
	top5	top10	hhi	top5	top10	hhi
<i>constant</i>	39.49 ^a (28.9)	51.12 ^a (42.0)	475 ^a (6.9)	38.87 ^a (15.7)	50.43 ^a (21.1)	470 ^a (4.2)
<i>bch/bn</i>	1.35 ^a (12.6)	1.15 ^a (12.1)	70 ^a (13.0)	1.43 ^a (13.9)	1.24 ^a (13.5)	71 ^a (14.0)
<i>dr</i>	3.14 ^a (4.4)	3.72 ^a (5.8)	18 (0.5)	3.06 ^a (4.2)	3.63 ^a (5.6)	15 (0.4)
<i>dnr</i>	6.61 ^a (8.4)	7.04 ^a (10.0)	167 ^a (4.2)	6.41 ^a (8.2)	6.79 ^a (9.7)	167 ^a (4.3)
<i>dnn</i>	3.15 ^a (3.9)	4.23 ^a (5.8)	-14 (-0.3)	3.00 ^a (3.7)	4.08 ^a (5.6)	-17 (-0.4)
<i>unem</i>	-0.23 (-1.5)	-0.28 ^b (-2.0)	-9 (-1.2)	-0.21 (-1.4)	-0.25 (-1.9)	-9 (-1.2)
R²: Within	0.37	0.40	0.28	0.37	0.40	0.28
R²: Between	0.50	0.55	0.38	0.50	0.54	0.38
R²: Overall	0.46	0.48	0.36	0.46	0.48	0.36

The dependent variables include the percentage of assets in each state held by the top five and top ten banks (*top5* and *top10*), and the Herfindahl-Hirschman index (*hhi*) of bank assets in each state. See Table 4 for the definitions of the independent variables.

a. Significantly different from zero at the 1 percent level.

b. Significantly different from zero at the 5 percent level.

Banks provide services that probably depend on the number of people and/or their income. To gain some insight here, we use each state's percentage of nominal U.S. gross domestic product to allocate the top 100 banks. Those are then compared to the actual allocation of top 100 banks across the states. While crude, it does provide an evaluation of the existing distribution that has an economic basis.

We first distribute the number of top 100 banks where each state gets its share of the top 100 banks based on its share of nominal gross domestic product. We then compare those results to the actual location of top 100 banks by state. Furthermore, we distribute all commercial banks, not just the top 100, across states based on each state's share of the sum of all states' nominal gross state product. We then compare this benchmark to the actual number of banks by state. Table 9 provides the means across the sample period for the actual and benchmark number of banks in each state out of the top 100 and all banks.³⁰ Once again, we sort states by average real GSP over the sample period.

Several interesting observations emerge. First, California, New York, Pennsylvania, and Texas have actual top 100 banks that differ by three or more from their respective benchmarks. New York has 22 and Pennsylvania has three more top 100 banks than their benchmark while California has six and Texas has three fewer top 100 banks than their benchmark. Second, Alaska, Arizona, California, Connecticut, the District of Columbia, Hawaii, Idaho, Maryland, Nevada, New Jersey, New York, North Carolina, Oregon, Rhode Island, and Washington all have at least twice as many benchmark total banks as actual banks, suggesting that they are under banked.

TABLE 8
Location of Top Banks by State (Ranked by Average Real GSP)

State year	top 5 banks			top 10 banks			top 20 banks			top 50 banks			top 100 banks													
	78	83	88	93	98	78	83	88	93	98	78	83	88	93	98											
California	1	1	1	1	1	2	2	3	2	2	5	5	4	2	2	6	6	5	4	3	9	9	8	4	3	
New York	4	4	4	2		6	6	6	4		9	9	11	9	7	17	19	21	20	14		31	31	31	30	33
Texas								1			1	1	1	1		4	4	2	3	2		5	6	5	4	2
Illinois						2	2	1	1		2	2	2	1	1	4	4	4	2	3	3	5	4	4	4	6
Florida																1	1	1	2			1	2	4	2	
Pennsylvania											2	2	1	2	2	6	4	5	3	2		10	8	8	6	3
Ohio											1	1		1	1	1	1	1	1	4		3	4	3	3	6
New Jersey																3	1	1	2	2		1	1	1	2	2
Michigan									2		1	1	1	1		3	1	1	1	2		3	3	4	3	4
Georgia																1	1	1	1			2	2	2	4	1
North Carolina				2							1	1	1	1	3	2	3	3	3	4		3	3	3	4	4
Massachusetts											1	1	1	1	2	1	1	3	3	2		3	3	5	5	2
Virginia																1	1	1	1			2	3	3	5	1
Washington																2	2	1	1			3	2	2	2	1
Indiana																						2			1	1
Missouri																						2	1		1	1
Maryland																						1	1	1	1	1
Wisconsin																						1	1			
Minnesota															1	1	1	1	2	2		3	3	2	2	2
Tennessee																						2	3	3	2	2
Connecticut																						2	3	3	2	2
Colorado																						2	2	2	2	1
Arizona																1	1					2	2	2	2	1
Louisiana																										
Alabama																										
Kentucky																										
Oregon																										
South Carolina																										
Utah																										
Dis. Columbia																										
Hawaii																										
Delaware																										
Rhode Island																										
South Dakota																										

See notes for Table 5. Several states do not have any top-ranked banks: Alaska, Arkansas, Idaho, Indiana, Iowa, Maine, Mississippi, Montana, Nebraska, Nevada, New Hampshire, New Mexico, North Dakota, Oklahoma, Vermont, West Virginia and Wyoming. Also, Puerto Rico has a top-100 bank in several years.

But, of course, the major part of the explanation is that these states are all statewide branching states. Similarly, Arkansas, Colorado, Iowa, Kansas, Minnesota, Missouri, Montana, Nebraska, North Dakota, Oklahoma, South Dakota, West Virginia, Wisconsin, and Wyoming all have twice as many actual total banks as benchmark banks, suggesting that these states are over banked. But, once again, these states except South Dakota have unit or limited branching.³¹

ENTRY AND EXIT OF BANKS

As noted above, the fall in the actual number of banks hides significant events on the number of entries and exits to the industry. Exits from the industry may occur because of mergers, charter conversions, or relocations across state lines; entries may occur because of *de novo* entries, charter conversions, or relocations across state lines.

Our data on exits and entries compare bank identification numbers between two adjacent years and divide banks into three categories—banks in the first year and not in the second (exits), banks in the second year but not in the first (entries), and banks in both years (survivors). Focusing on the 50 states and the District of Columbia, the total number of banks fell from 14,842 in 1976 to 9,653 in 1998. That decrease of 5,389 banks was accomplished with 11,921 exits and 6,532 entries.

Table 10 reports the average number of entries, exits, and net entries (entries minus exits) by state for 1977 to 1979, 1980 to 1984, 1985 to 1989, 1990 to 1994, and 1995 to 1998. We now sort states by the average number of banks over the sample period. Several observations emerge. First, the quantity of new entries achieves its highest levels between 1980 and 1984 where new entries averaged 446 per year. A number of states average over 20 new banks per year from 1977 through 1998—California, Florida, New York, and Texas. Texas has the highest average of over 40 new banks per year followed by California of over 32 banks per year.³² If we consider the number of new entries as a fraction of the number of banks in the state, then the states with the highest fractions include Arizona, California, Delaware, Nevada, North Carolina, and Oregon. Arizona leads the list with new entries each year at 10 percent of existing banks; Nevada and Delaware follow with 9 percent and 8 percent, respectively.

The pattern for exits paints a different picture. The data suggest a regime change between 1983 and 1984. Before 1984, the number of exits averages just fewer than 260 while after 1983 it averages almost 675. For exits, several states average over 20 per year—California, Colorado, Florida, Illinois, Missouri, New York, and Texas. Texas has the highest number of exits per year at over 63 followed by Florida at over 42 per year. Relative to the number of banks in a state, Arizona, Colorado, Massachusetts, New Hampshire, New Jersey, and Rhode Island have the highest percentage of exits per year. Florida and Rhode Island lead the pack with 9 percent exits per year followed by New Hampshire with 8 percent per year.

The pattern for net entries (entries minus exits) mirrors the pattern uncovered for the exits. That is, a regime change seems to have occurred between 1983 and 1984. Prior to 1984, net entries average plus 101 while after 1983 they average minus 406. That is, net entries are positive between 1977 and 1983 and negative (with

TABLE 9
Actual and Benchmark Banks by State
(Ranked by Average Real GDP)

State	Top 100 Banks		Total Banks	
	Actual	Benchmark	Actual	Benchmark
California	7	13	507	1,754
New York	31	9	522	1,195
Texas	4	7	1,379	997
Illinois	5	5	1,175	710
Florida	2	4	508	577
Pennsylvania	7	4	334	627
Ohio	4	4	337	594
New Jersey	2	4	151	495
Michigan	4	4	294	509
Georgia	3	2	413	332
North Carolina	3	2	90	336
Massachusetts	4	3	290	373
Virginia	3	2	194	339
Washington	2	2	115	269
Indiana	1	2	328	287
Missouri	1	2	600	270
Maryland	1	2	101	258
Wisconsin	0	2	531	258
Minnesota	2	2	669	250
Tennessee	1	2	289	238
Connecticut	2	2	111	223
Colorado	0	1	389	194
Arizona	2	1	38	167
Louisiana	0	2	243	260
Alabama	1	1	245	180
Kentucky	0	1	321	178
Oregon	1	1	66	147
South Carolina	0	1	79	153
Iowa	0	1	584	152
Oklahoma	0	1	444	161
Kansas	0	1	554	134
Arkansas	0	1	254	100
Mississippi	0	1	142	104
Nevada	0	1	17	70
Utah	0	1	59	80
Nebraska	0	1	412	87
D. Columbia	1	1	20	98
New Mexico	0	1	84	76
West Virginia	0	1	188	81
N. Hampshire	0	0	75	55
Hawaii	1	1	18	70
Delaware	2	0	43	46
Idaho	0	0	23	47
Maine	0	0	48	54
Rhode Island	1	0	18	50
Alaska	0	0	12	64
South Dakota	1	0	135	34
Montana	0	0	146	39
Wyoming	0	0	83	40
North Dakota	0	0	158	34
Vermont	0	0	31	26
USA	99	100	13,870	13,870

Actual total of top 100 banks equals 99 because of rounding.

the exception of 1985) between 1984 and 1998. Several states have positive net entries over the whole sample period—Arizona, California, Delaware, Hawaii, North Carolina, Nevada, and New York. Several other states experience net entries of minus 300 or lower—Florida, Illinois, Missouri, and Texas. Once again, some states make these lists because of the large number of banks in the state. Based on net entries as a fraction of total banks in a state, the states with the highest percentage of net entries are Nevada at 5 percent followed by Delaware at 3 percent. New Hampshire has the distinction of the lowest percentage of net entries (highest percentage of net exits) at minus 6 percent followed by Rhode Island at minus 5 percent.

In sum, we find that those states with a large number of banks generally experience a large number of entries, exits, and net entries. Using fractions of banks in a state, the results suggest that those areas with growing population and booming economies (for example, Arizona and North Carolina) experience larger percentages of entries of banks while those states with slow population growth and stagnant economies (for example, Rhode Island and New Hampshire) experience larger percentages of exits.³³

Deregulation and Net Entry Activity

Once again, we use the same set of independent variables on intrastate and interstate branching and banking regulation and the state of the state's economy in fixed- and random-effects regressions of the number of net entries to the total number of banks (*net*) in a state as a percentage. Table 11 reports the findings. First, the intrastate branching variable does not significantly affect the net entry rate and switches sign between the fixed- and random-effects specifications. Second, all interstate branching and banking regulatory dummy variables are significant. More permissive interstate branching and banking regulation associates with a lower rate of net entries—which could reflect fewer entries or more exits. Finally, a stronger state economy—a lower unemployment rate—associates significantly with a higher rate of net entries. If one interprets higher net entry rates as signaling more competitive banking, then deregulation (and a weaker state economy) leads to less competition.

More specifically, a state without branch banking, no legislation permitting out-of-state bank holding companies to acquire banks, and a 4 percent unemployment rate expects about 3 percent net entries, using the fixed-effect model—5 percent from the constant minus 2 percent from the 4 percent unemployment rate times its coefficient of about -0.5 (about 1 percent net entries for the random effects model). If the unemployment rate rises to 10 percent, net entries fall to about 0 percent. Further, adopting legislation permitting interstate bank holding company acquisitions with reciprocity lowers the net entry percentage by just over 5 percent.

CONCLUSION

In the early 1980s, the U.S. banking industry began unprecedented regulatory and structural change from a dual banking system with banks chartered at the state and the national levels, but prohibited from operating across state lines even for those banks with national charters. Several regulatory and legislative decisions opened

TABLE 10
Average Bank Entry, Exit, and Net Entry by State
(Ranked by the Average Number of Banks)

Year	Bank Entries				Bank Exits				Net Bank Entries						
	77-79	80-84	85-89	90-94	95-98	77-79	80-84	85-89	90-94	95-98	77-79	80-84	85-89	90-94	95-98
Texas	27	100	33	10	14	1	10	190	77	58	26	91	-157	-67	-43
Illinois	17	11	9	17	18	3	10	37	52	60	14	2	-28	-36	-42
Minnesota	4	3	3	3	6	0	7	28	18	18	4	-4	-25	-15	-12
Missouri	6	8	6	2	8	0	10	37	17	31	6	-3	-31	-15	-23
Iowa	0	1	2	1	7	1	7	14	13	25	-1	-5	-12	-12	-19
Kansas	1	5	3	2	3	1	3	16	25	19	0	2	-13	-23	-16
Wisconsin	3	3	2	6	5	1	12	19	24	19	2	-9	-16	-18	-14
New York	30	43	22	12	10	11	29	17	25	29	19	14	5	-14	-19
Florida	13	42	37	9	14	65	56	41	23	41	-52	-15	-3	-14	-27
California	24	84	22	14	14	6	17	22	33	41	18	67	0	-19	-27
Oklahoma	7	13	4	0	2	0	4	30	16	12	7	8	-26	-16	-10
Georgia	1	6	22	10	11	2	14	16	12	22	0	-8	6	-2	-11
Nebraska	2	6	1	3	3	0	3	16	11	12	1	3	-15	-8	-9
Colorado	17	36	14	4	6	0	26	20	39	27	16	10	-5	-34	-21
Ohio	3	3	3	9	7	29	20	11	11	16	-26	-17	-7	-2	-9
Pennsylvania	4	2	9	12	6	6	12	12	15	19	-3	-10	-3	-3	-13
Indiana	2	1	1	3	4	2	6	16	20	18	0	-6	-15	-17	-14
Kentucky	1	2	2	3	7	1	3	2	13	13	0	-1	1	-10	-6
Michigan	6	3	2	2	7	1	5	25	16	14	5	-1	-23	-14	-8
Tennessee	3	3	5	5	6	1	15	11	9	17	1	-12	-5	-3	-12
Massachusetts	3	3	27	1	3	2	29	12	19	11	1	-27	15	-18	-8
Arkansas	1	2	1	2	5	0	2	2	2	18	0	0	-1	0	-14
Alabama	6	4	7	1	2	2	13	12	4	14	5	-9	-5	-3	-12
Louisiana	4	9	3	3	3	1	1	21	8	16	3	8	-18	-5	-13
Virginia	6	3	7	2	6	22	14	4	6	9	-16	-11	3	-4	-3
West Virginia	4	3	1	0	3	0	4	8	14	11	4	-2	-7	-13	-8
North Dakota	2	1	0	0	1	1	1	6	4	7	1	1	-5	-4	-6
New Jersey	1	1	8	7	6	8	12	8	12	11	-6	-11	1	-5	-5
Montana	3	1	2	0	3	0	1	2	11	9	3	1	-1	-11	-6
Mississippi	2	0	0	1	2	2	6	6	3	6	0	-6	-6	-2	-4

TABLE 10 (cont.)
Average Bank Entry, Exit, and Net Entry by State
(Ranked by the Average Number of Banks)

Year	Bank Entries				Bank Exits				Net Bank Entries						
	77-79	80-84	85-89	90-94	95-98	77-79	80-84	85-89	90-94	95-98	77-79	80-84	85-89	90-94	95-98
South Dakota	1	1	3	0	2	1	3	5	2	6	-1	-3	-2	-2	-4
Washington	8	5	5	6	6	1	4	7	6	9	8	2	-2	-1	-4
Connecticut	1	1	8	1	3	4	6	3	9	9	-3	-5	5	-8	-6
Maryland	2	2	5	2	3	4	4	1	5	6	-2	-2	4	-3	-4
North Carolina	1	3	6	15	7	4	6	2	7	11	-3	-3	4	8	-4
New Mexico	1	2	0	1	2	0	1	1	5	5	1	2	-1	-5	-3
Wyoming	5	5	1	0	1	0	1	11	4	1	5	4	-11	-4	0
South Carolina	0	1	5	1	6	2	3	3	2	5	-2	-2	2	-1	1
N. Hampshire	1	1	3	1	2	1	5	4	9	5	0	-4	0	-7	-4
Oregon	12	6	1	1	3	1	6	6	2	4	12	0	-5	-1	-1
Utah	8	2	4	1	4	4	5	4	4	2	3	-3	0	-3	2
Maine	0	0	1	1	1	1	5	2	1	1	-1	-5	-2	0	-1
Delaware	2	5	5	2	3	0	1	3	4	4	2	4	2	-1	-1
Arizona	2	7	2	1	5	1	3	4	3	3	1	4	-2	-2	2
Vermont	1	0	1	0	1	1	1	0	1	1	0	-1	1	-1	0
Idaho	2	0	0	1	2	0	1	1	2	3	1	0	-1	-1	-1
D. Columbia	1	2	2	1	0	0	0	0	2	3	1	1	2	-2	-3
Hawaii	1	3	0	0	0	0	1	1	1	1	1	2	0	-1	-1
Rhode Island	0	1	1	0	1	0	1	2	1	2	0	-1	-1	-1	-1
Nevada	1	2	1	1	3	0	1	1	0	2	0	1	0	1	1
Alaska	0	0	1	0	0	0	0	3	0	1	0	0	-2	0	-1
USA	247	446	302	184	235	197	408	717	624	701	50	38	-415	-440	-466

the door to across-state banking operations, first by bank holding companies and then by banks themselves. The Interstate Banking and Branching Efficiency Act of 1994 permitted banks to acquire banks in other states.

We examine the changes in the structure of the banking industry using the Report on Condition and Income (Call Report) and merger data recently posted on the web by the Federal Reserve Bank of Chicago. Several general conclusions follow from our analysis. First, consolidation in the banking industry has begun and the pace of consolidation has increased in recent years. That pace, however, seems slower than expected, reflecting the larger than anticipated number of new entries.

Second, the major part of consolidation within the banking industry, with some notable exceptions, has been within states and not between states. Even after the recent passage of the Interstate Banking and Branching Efficiency Act of 1994, still about 70 percent of the merger activity between banks occurs within states. Of course, as the consolidation process continues, eventually the opportunities for intrastate mergers will exhaust themselves and by necessity the action will shift to the interstate level. Some few individual bank organizations, prompted probably by the entrepreneurial instincts of their chief executive officers, have already pursued aggressive strategies of interstate mergers and acquisitions. Those few banks have made major movements up in the rankings of largest banks based on total assets.

Interestingly, fixed- and random-effects regressions that explain the rate of merger activity within a state show that the merger rate increases with more permissive interstate branching and banking regulation. The merger rate does not respond significantly to our measure of intrastate branching and banking regulation.³⁴ So even though most merger activity remains within state boundaries, the rate of merger activity is affected by the permissiveness of interstate branching and banking regulation. Those findings may suggest that banks merge within a state in an attempt to reduce the possibility of a takeover (merger) by an out-of-state bank.

Third, some groups raise concerns about the potential concentration of power amongst a few megabanks. The facts belie this concern to some extent. For example, the percent of total bank assets controlled by the top 5, 10, 20, 50, and 100 banks in the United States declined from 1976 through about 1990, depending on the top bank category considered. Their share of total assets has risen in recent years, but that movement does not yet seem like a serious issue.

Such concerns about concentration of power generate a bit more support at the state level. The top 5 bank concentration ratio averages about 45 percent until 1983 and then rises gradually to 62 percent in 1998. And the average top 10 concentration ratio averages about 56 percent until 1983, then rises to 71 percent in 1998. At what point, however, do increases in concentration become relevant for policymakers?

Still on this point, the concerns about concentration of power at the state level gain more credence in our fixed- and random-effects regressions. Here, both more permissive intrastate and interstate branching and banking regulation associates significantly with higher concentration.³⁵ Thus, the recent deregulation associates with higher concentration.

Fourth, another concern of some analysts is the availability of credit to small- and medium-sized firms. Those firms, by and large, do not have access to other sources of credit. Moreover, smaller community banks are major players in the extension of

TABLE 11
Bank Net Entries and Deregulation

	Fixed-Effects Models	Random-Effects Models
<i>constant</i>	5.07 ^a (4.3)	2.39 ^a (2.6)
<i>bch/bn</i>	-0.17 (-1.8)	0.07 (1.6)
<i>unem</i>	-0.57 ^a (-4.3)	-0.40 ^a (-3.57)
<i>dr</i>	1.91 ^a (-3.1)	-2.18 ^a (-3.7)
<i>dnr</i>	-5.45 ^a (-7.9)	-5.68 ^a (-9.8)
<i>dnn</i>	-3.64 (-5.1)	-3.87 ^a (-5.9)
R²: Within	0.1	0.1
R²: Between	0.007	0.07
R²: Overall	0.05	0.09

The dependent variable is the ratio of net entries to total banks in each state. See Table 4 for the definitions of the independent variables.

a. Significantly different from zero at the 1 percent level.

b. Significantly different from zero at the 5 percent level.

credit to small- and medium-sized firms. The large and frequent entry of new banks provides some assurance that smaller community banks are not an endangered species. Nonetheless, as the share of bank assets held by smaller community banks falls, reasonable concerns emerge about the availability of credit to small- and medium-sized firms.

Finally, clear evidence exists that the deregulation begun in the early 1980s began to have an effect on the relationship between entries and exits to the banking industry. Net entries were positive through 1983. From 1984 onward, net entries have been negative. That is, the banking industry has been contracting. The overall decline in over 5,000 banks between 1976 and 1998 hides the fact that the decline occurred because of over 11,000 exits and over 6,000 entrances.

Moreover, our fixed- and random-effects regressions indicate that more permissive interstate branching and banking regulations associate significantly with lower rates of net entry, even allowing for differences in the state of its economy. And, as noted above, the more permissive interstate branching and banking regulation also associates with a higher merger rate.

NOTES

We acknowledge the helpful comments of L. Karstenson, three referees, and the editor of this *Journal*.

1. That statement ignores, of course, the events leading up to the passage of the Federal Reserve Act of 1913.
2. That data provide the necessary information for the analysis of the banking industry — ranging from the economies of scale [Clark, 1988; Noulas, Ray, and Miller, 1990] and scope [Clark 1988; Noulas, Miller, and Ray, 1993], X-efficiency [e.g., Berger and Humphrey, 1997], effectiveness of mergers in

- achieving improved banking performance [e.g., Akhavein, Berger, and Humphrey, 1997], how deregulation affects individual banks and the industry as a whole [Jayaratne and Strahan, 1998], and so on. Moreover, the amount of deregulation in U.S. over the past two decades provides an excellent case study where the typical questions of deregulation can receive econometric verification [Jayaratne and Strahan, 1998; Jeon and Miller, 2001b].
3. Rhoades [2000] discusses similar issues using data not publicly available. The data at the Federal Reserve Bank of Chicago web site (<http://www.chicagofed.org/economicresearchanddata/data/bhcdatabase/bhcdatabase.cfm>) significantly levels the research playing field between those inside and outside the Federal Reserve System.
 4. Our brief historical discussion of banking regulation relies heavily on the more lengthy discussions in Kane [1996] and Kroszner and Strahan [1999].
 5. At the other extreme, Canada currently has 8 domestic banks and 43 foreign banks.
 6. States could opt out of this legislation, if they so chose. To date, only Texas and Montana have opted out of interstate banking and branching.
 7. Historically, states were divided into three groups: (i) those states that allowed statewide branching with few restrictions, (ii) those states that allowed limited statewide branching with numerous restrictions, and (iii) those states that allowed only unit banking with essentially no branching activity [see Kaparakis, Miller, and Noulas 1994].
 8. Miller [1988, n. 9] uses the existing distribution of banks in California, a state with statewide branching rules, to estimate that 49 of the banks in the interstate banking and branching equilibrium would hold \$1,551 billion in assets for an average size of \$31 billion.
 9. Berger, Kashyap, and Scalise [1995] employ the distribution of California banks to forecast the distribution of banks under interstate banking and branching. Hannan and Rhoades [1992] also use California to forecast the number of banks under interstate banking and branching at around 3,500 organizations in 2010.
 10. We use banks rather than bank organizations as the unit of analysis. Bank organizations consolidate the financial information of all banks within a multibank holding company. The choice between banks and bank organizations depends, we argue, on where the decision-making authority lies. Banks within a holding company must establish a Board of Directors that oversees the management team responsible for the operation of the bank. Now, the holding company sets the parameters within which the bank, its Board of Directors and management team, can function. Even when the bank organization desires complete control over the banks that it owns, how effectively can it exercise such control over the individual banks' Board of Directors and management teams? A clear answer probably does not exist and may vary depending on the holding company in question. Our analysis probably overstates the number of effective banks in the system, the number of bank mergers, (i.e., a merger between banks in a bank organization does not count as a merger, if bank organizations is the unit of analysis), the number of entries, the number of exits, and so on. On the other hand, the use of bank organizations probably understates all these items. Consider, for a moment, bank entries. Suppose a new bank enters an existing multibank holding company. Should it count as a new entry or not? Using bank organizations as the unit of analysis, the answer is no; using banks, yes. The same problem arises for bank exits. In sum, the reader needs to remember when considering our findings that our analysis uses the bank as the unit of analysis.
 11. Keeton [2000] uses that cause-and-effect argument. An alternative hypothesis views increased merger activity as a signal that bank charters go at a premium. Thus, new entries acquire a bank charter solely to have it acquired by another bank through merger.
 12. See the merger data file for commercial banks posted at the Federal Reserve Bank of Chicago web site. The merger file contains information that can be used to identify all bank acquisitions and mergers that have occurred from 1976 to 1998.
 13. More specifically, Illinois experienced a number of bank failures in the early 1980s. Then Iowa, Kansas, Louisiana, Minnesota, Missouri, Nebraska, Oklahoma, Oregon, Tennessee, Texas, Utah, and Wyoming followed with numerous failures in the mid- to late 1980s. Finally, more than 60 percent of the states then saw unusual numbers of failures in the late 1980s and early 1990s.
 14. National banks are automatically members of the Federal Reserve System; mutual savings banks, state banks, and non-deposit trust companies may or may not be members of the Federal Reserve System.
 15. Many of the regulatory reforms instituted in the 1980s have reduced the cost of membership in the Federal Reserve System. Consistent with those cost reductions, national banks and state member banks grew as a result of merger activity, whereas the other categories declined.

16. North Carolina is home to three major banks that have gone on acquisition binges: Wachovia (Charlotte, NC), First Union (Charlotte, NC) and Nations Bank (Charlotte, NC).
17. One referee raised a concern about “special-purpose” banks such as credit-card banks. We also performed all regressions excluding Delaware and South Dakota. The results did not change in any essential way. Those findings are available from the authors on request.
18. Jeon and Miller [2001b] provide more discussion of using the number of branches per bank to capture intrastate branching and banking regulation.
19. The legislation for national multibank holding company acquisition activity without reciprocity came late in the game. That is, such activity was authorized in many places, but with reciprocity. Thus, much merger activity had already occurred. This may explain the fall in the coefficient estimated for the national non-reciprocity dummy variables.
20. The data here include domestic banks as well as agencies and branches of foreign banks.
21. While we refer to the largest or 10th largest bank between different years, it may not be the same bank.
22. Rhoades [2000] using a different data source also provides information on the top 100 banking organizations, where all banks in a bank holding company are treated as an organization. In our data, such banks are treated as distinct.
23. A referee suggests that the U-shape must turn into a J-shape. That is, deregulation provides the opportunity for many banks to expand, leading initially to a decrease in concentration. But, over time, the acquisition momentum should lead to increasing concentration. Table 5 does illustrate that concentration in 1998 does exceed that in 1976, supporting that conjecture.
24. Rhoades [2000] reports the concentration in bank deposits rather than assets for the top 100 organizations at 47, 61, 66, and 71 percent in 1980, 1990, 1994, and 1998, respectively. Our concentration of assets for the top 100 banks (not organizations) is 47, 43, 48, and 62 percent, respectively. Thus, using organizations paints a picture of more concentration. An important issue is whether decision-making authority resides more at the bank holding company or individual bank level.
25. Rhoades [2000] provides information on concentration at the MSA and non-MSA county level. He does not report concentration information at the state level.
26. A referee notes that Shaffer [1986] cautions against associating increasing concentration with lessened competition. That is, the dynamics of industry structure as captured through the Gibrat [1931] process causes competitive markets to experience increasing levels of concentration over time.
27. The numbers in parentheses are the percentage of assets held by the top 5 banks in the state. Similar information is available for the top 10 bank concentration ratio from the authors on request.
28. As noted above in footnote 26, increasing concentration does not necessarily signal reduced competition. One needs to link concentration to a measure of firm performance. Jeon and Miller [2001a] consider the correlation between bank concentration on a state-by-state basis and average bank profitability within a state, finding strong support for a positive correlation. They also test for temporal causality, finding that bank concentration leads to bank profitability.
29. We also locate the top 50 banks by city (not reported, available from authors). Boston, Buffalo, Charlotte, Chicago, Dallas, Detroit, New York, San Francisco, Seattle, and Winston-Salem are cities with a top 50 bank for each year in our sample. Boston, Chicago, Dallas, New York, and San Francisco all are home to Federal Reserve Banks. Further, Buffalo, Charlotte, Detroit, and Seattle are home to Federal Reserve Branches. Thus, only Winston-Salem is not home to a Federal Reserve Bank or Branch. Federal Reserve Bank cities were the home to about 30 top 50 banks while the Federal Reserve Branch cities were the home to just over 10 top 50 banks. Viewed differently, only the home of the Federal Reserve Bank of Kansas City does not have a top 50 bank in any year during the sample period. Finally, we also note that Los Angeles has not had a bank in the top 50 since 1995.
30. Tables for the benchmark location of the top 100 banks, and the benchmark and actual location for all banks by state, are available from the authors.
31. While South Dakota is classified as a statewide branching state, Kaparakis, Miller, and Noulas [1994, Tb. 5] classify it as limited since each bank had an average of only 1.5 branches.
32. Once again, the Tables for the number of entries, exits, net entries, as well as the percentages of total banks in each year are available from the authors.
33. Jeon and Miller [2001b] examine entries, exits, and mergers in U.S. banking from 1976 to 1998 on a state-by-state basis using FDIC data.
34. We also experimented with the traditional dummy variables for unit, limited, and state-wide branching and banking regulation, using the same specification as in Kaparakis, Miller, and Noulas [1994, Tb. 5], finding the same results as for our continuous measure (bch/bn).

35. As noted above, Jeon and Miller [2001a] demonstrate that higher concentration in banking at the state level associates significantly with higher profitability. Moreover, simple temporal (Granger) causality tests imply that the timing is one-way from concentration to profitability.

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