U.S. Banking Sector Trends: Assessing Disparities in Industry Performance

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Introduction

The U.S. banking industry has a long tradition of decentralization as measured by geographic market structure. This feature largely reflects the impact of both inter- and intrastate branching restrictions as well as regulatory policies toward mergers and acquisitions. As a result of these policies, the industry comprises many small banks that operate in relatively localized and structurally diverse markets. In states allowing branching, banks tend to be fewer but larger than in unit banking states.

The phenomenon of bank holding companies emerged in the 1950s and 1960s as a response to restrictions on the scale and scope of banking activities. By holding banks as affiliates, a holding company can expand the geographic scale of its banking operations and broaden the scope of its nonbank activities to certain permissible lines of financial services. During the 1970s and 1980s, both the number of bank holding companies and the share of banks so affiliated increased, partly as a response to regulatory changes (Savage [1982], Amel and Jacowski [1989]). However, the trend also reflects changes in the environment in which these organizations operate.

While the U.S. banking industry has been consolidating into holding companies, it also appears to be shrinking. Domestic nonfinancial-sector debt grew substantially faster than GDP in the past decade, but the share of intermediated funds advanced by banks fell from 50 percent to 36 percent. The number of banks contracted by nearly 21 percent, from more than 14,400 in 1982 to about 11,400 at the end of 1992. The decade also witnessed a dramatic rise in bank failures and a spate of asset quality problems that translated into low industry profitability.

In assessing these trends, analysts have devoted considerable attention to the regional nature of the banking industry. Disparities in bank profitability over the past decade have been widely attributed to differences in local economic fortunes. Bank failures were largely concentrated in states experiencing economic difficulties. More recently, the poor performance of banks in New England and California has been associated with the so-called bicoastal recession.

Regional banking conditions also reflect the structural diversity across state banking sectors. Historically, bank failures have tended to occur in unit banking states, whereas institutions in branch banking states seem to have fared better

during periods of economic adversity.[1] In the past several years, however, the problems concentrated in large banks have raised concerns that a "too big to fail" regulatory policy is encouraging excessive risk-taking.[2]

Differences in economic fortunes and in bank structure across states complicate the assessment of industry performance. Are certain types of banks performing poorly because they are inherently different from other types of banking organizations, or do they happen to be concentrated in regions where the local economy is faltering? In this paper, I exploit the differences both within and across states in an attempt to evaluate how these factors were related to banking sector performance during the past decade. *Performance* refers to standard measures of banking conditions, including bank profitability, asset quality, capitalization, and lending. Data are compiled from individual Federal Financial Institutions Examination Council's *Reports of Condition and Income* (call reports) for each year between 1984 and 1992. I disaggregate state-level balance sheets and income statements to construct performance measures for banks that differ in size as well as in their holding company relationships. Then, controlling for state-specific economic factors, I examine the extent to which disparities in performance have been associated with differences in these bank characteristics.

The tone of this analysis is descriptive; the parsimonious number of relationships examined precludes a more causal interpretation. The findings reveal that the health of the local economy is indeed important in assessing the performance of the local banking sector. However, differences in banking conditions also appear to be associated with bank size and holding company affiliation; moreover, the emergent relationships are consistent with microeconomic studies that examine individual bank performance (Berger, Hanweck, and Humphrey [1987]). The results indicate that, controlling for local economic factors, relatively small banks (assets between $100 million and $1 billion in 1987 dollars) turned in the best performance over the past decade. In addition, smaller institutions that were affiliated with

multibank holding companies had fewer problems with asset quality than did other small banks. Alternatively, the largest institutions — almost all of which belong to multibank holding companies — were less profitable. Hence, although banking fortunes reflect those of the local economy, performance also appears to be related to local industry structure. Judging at least by the experience of the 1980s, it seems that banks *can* be too large.

I. Industry Structure and Performance: An Overview

Assessments of the banking industry frequently describe it as a composite of banks that differ in size and location. For example, the *FDIC Quarterly Bulletin* presents industry data on banks classified by size and geographic region.[3] This focus reflects the view that such factors are important determinants of banking conditions.

The term *bank structure* is frequently used when referring to the characteristics of banking markets as well as those of individual institutions. Individual bank characteristics, such as the scale and scope of operations, can affect the costs at which banks produce financial services; hence the rationale for the focus on bank size. Market structure, measured by the relative size and number of firms, can influence the degree of local competition and, by extension, the quality, quantity, and price of financial services ultimately available to bank customers.

Researchers have studied how both market structure and individual bank characteristics are related to bank performance. One genre of studies looks at how market concentration is related to bank profitability and to the customer's cost of banking services.[1] Most findings reveal a positive relationship between market concentration and bank profitability. This result has been cited as evidence that more concentrated markets are less competitive. However, it also has been interpreted as an indication that more efficient firms tend to dominate the marketplace. A second line of research looks at how the costs associated with producing financial services are related to a

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1 This trend is less true in recent years. With the exception of Texas, failures during the past decade were not disproportionately located in unit banking states. Moreover, Wheelock (1993) notes that the choice of unit banking restrictions was popular in states with relatively cyclical economies, such as agricultural states.

2 See Boyd and Gertler (1993) for a recent evaluation of this perspective.

3 Similarly, assessments of changes in the structure of banking markets focus on how the geographic distribution of banks and the attendant concentration of banking markets have evolved (Amel and Jacowski [1989]).

4 For example, see Berger and Hannan (1989).

BOX 1: DEFINITIONS

Structural Characteristics of Bank Cohorts

Size Classes (1987 dollars)

Very small: Less than $100 million in assets.
Small: $100 million to $500 million in assets.
Medium: $500 million to $1 billion in assets.
Large: $1 billion to $10 billion in assets.
Very large: More than $10 billion in assets.

Holding Company Affiliations

MBHC: Bank holding company holding more than one bank.
SBHC: Bank holding company holding only a single bank.
Independent: Not affiliated with a bank holding company.

Performance Measures of Industry Conditions

Lending and Capitalization

Capitalization: Bank equity capital as a percentage of total assets.
C&I lending: Commercial and industrial loans as a percentage of total assets.
CRE lending: Commercial real estate loans as a percentage of total assets.
Total bank lending: Total loans (including C&I loans, CRE loans, home mortgages, consumer loans, and other loans) as a percentage of total assets.

Bank Profitability and Asset Quality

ROA: Return on assets as measured by the ratio of annual net income to total assets.
Nonperforming assets: Past due loans (more than 90 days) plus nonaccruing assets plus other real estate owned, as a percentage of total assets.
Net loan charge-offs: The ratio of annual net charge-offs for loan losses to total bank loans as defined above.

NOTE: All measures use fourth-quarter data from the Federal Financial Institutions Examination Council's *Reports of Condition and Income* (call reports). Each performance measure is constructed from the cohort-level balance sheet or income statement. For example, ROA for each size class of banks is measured as the ratio of net income to total assets for each respective cohort of banks.

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bank's structural characteristics.[5] Although the results are mixed, these cross-sectional assessments of bank efficiency have found evidence of modest economies of scale; the costs of providing banking services decline as firm size increases up to a relatively small size (Berger, Hanweck, and Humphrey [1987]).

The potential for the characteristics of banks and banking markets to affect industry performance motivates our interest in the phenomenon of bank holding companies. The importance of

viewing holding company affiliation as a structural characteristic of banks depends on whether a bank in a holding company behaves differently than it would as an unaffiliated entity. At one extreme, holding companies may be passive vehicles that diversify across a number of banks and allow almost all decisions to be made at the subsidiary level. In this case, holding company affiliation might be unrelated to a bank's performance because it does not affect the bank's behavior. At the other extreme, if a bank can draw on its relationship with its holding company (for example, by reducing certain operating costs or increasing portfolio diversification through interbank loan sales), it may perform more like a larger institution.

Here, my focus on the link between the structural characteristics of banks and industry performance at the state level is more macroeconomic than microeconomic in nature. To the extent that banking conditions may impact credit availability, they may also affect economic activity. In a previous study using state-level data from the past decade (Samolyk [1992]), I found evidence suggesting that the health of the local banking sector plays a role in local economic fortunes. Banking conditions were more strongly related to current real personal income growth in states where the health of the banking sector was poor than in states where it was sound. Moreover, this relationship was not simply mirroring a correlation between banking conditions and past income growth. These findings suggest that if local bank characteristics affect local industry performance, they may have important economic consequences.

Both market factors and regulatory policies determine the structural characteristics of banks and banking markets. Here, I merely examine whether these characteristics have been associated with differences in banking sector performance. For example, small, localized banks may be more vulnerable to local economic distress, while larger banks are able to diversify over regional or even national markets. Thus, the state is not defined as the relevant "market" for banks of all types. Nevertheless, performance differentials across the various types of banking institutions within a state may provide evidence as to how bank characteristics can affect local banking conditions.

■ **5** The scale of a bank's activities is usually defined in terms of balance sheet stocks, such as the volume of lending. The scope of a bank's activities refers to the composition of financial services it provides (for example, making loans versus funding securities). See Clark (1988) for a survey of these studies.

TABLE 1

Banks and Banking Assets

Panel A	By Individual Bank Size		By Size of Largest Banking Organization	
	1984	1992	1984	1992
	Number of Banks			
Total	14,451	11,419	14,451	11,419
Very small	11,769	8,823	9,830	7,399
Small	2,171	2,037	1,985	2,196
Medium	210	229	412	344
Large	274	293	1,445	855
Very large	27	37	779	625
	Percentage of Banking Assets			
Total	100.0	100.0	100.0	100.0
Very small	15.2	11.6	12.0	9.2
Small	15.1	13.6	9.9	10.1
Medium	5.3	5.5	3.8	3.3
Large	28.7	32.1	27.2	18.8
Very large	35.7	37.2	47.1	58.6

Panel B	In Multibank Holding Company		In Single Bank Holding Company		Not in a Bank Holding Company	
	1984	1992	1984	1992	1984	1992
	Number of Banks					
Total	3,748	3,295	4,967	4,891	5,736	3,233
Very small	2,426	2,030	4,088	3,932	5,255	2,861
Small	989	871	728	828	454	338
Medium	132	141	58	64	20	24
Large	176	220	91	63	7	10
Very large	25	33	2	4	0	0
	Percentage of Banking Assets					
Total	67.0	72.7	23.2	20.7	9.8	6.6
Very small	3.7	3.0	5.5	5.3	6.0	3.3
Small	7.4	6.2	4.8	5.3	2.9	2.1
Medium	3.3	3.4	1.5	1.5	0.5	0.6
Large	18.7	26.2	9.6	5.3	0.4	0.6
Very large	33.9	33.9	1.8	3.3	0.0	0.0

SOURCE: Author's calculations.

II. Trends in Industry Structure

At the end of 1992, 11,419 domestic commercial banks filed call reports. Of these institutions, 71.7 percent were affiliates of a bank holding company. Of holding company affiliates, 40.3 percent were part of multibank holding companies and 59.7 percent were affiliates

of single bank holding companies. Following convention, I characterize a bank's size in terms of the dollar value of its assets. Banks are placed in five size categories, which are adjusted for inflation so that a bank's classification will change only if its asset size has changed in real terms.[6] The inflation-adjusted (constant dollar) ranges for the five size cohorts are presented in box 1. Between 1984 and 1992, the unadjusted (current dollar) ranges of these size classes rose by approximately one-third.

Panel A of table 1 shows the distributions of banks and bank assets across the five categories. It also presents the distributions of banks and banking assets when each bank is classified by the size of its largest related organization. For example, in classifying a $100 million bank that is a subsidiary of a holding company with assets of $5 billion, I include that bank's data in the larger size cohort. This classification illustrates the distribution of banking assets by firm size when multibank holding companies are treated as branches of the holding company.[7] Panel A shows the trend toward fewer, larger banks in the industry: The number of very small banks has declined markedly. It also indicates that at the holding company level, the past decade has witnessed very large banking organizations growing into even larger ones.

Panel B of table 1 presents the distribution of banks and of banking assets classified by both size and holding company affiliation as defined in box 1. It indicates that the decline in the number of small and very small banks reflects decreases in both holding company affiliates and unaffiliated (independent) institutions. These data also underscore the emergence of the bank holding company as a prominent organizational entity. However, independent banks continue to be well represented, especially among smaller institutions.

Panel B of table 1 is also useful for understanding the measures employed in assessing banking conditions at both the national and

■ **6** Both the *FDIC Quarterly Report* and the *Federal Reserve Bulletin* publish data on performance trends for banks classified by nonindexed size cohorts. Empirical studies that use cross-sectional data in a given year do not need to index nominal asset size classifications. However, studies that pool data on banks across time should deflate asset values into real terms to evaluate differences associated with bank size. For example, Avery and Berger (1991) index their classification of large and small banks in assessing the implications of risk-based capital on these segments of the industry.

■ **7** The data on the number of banks require more clarification, as this category refers to the number of banks *affiliated with* holding companies of a given size, not the number of holding companies of that size. This indicates the potential misclassification associated with ignoring holding company affiliations.

TABLE 2

Bank Balance Sheets:
Lending and Capitalization
(percentage of bank assets)

	All Banks	Very Small	Small	Medium	Large	Very Large
Bank lending						
1984	60.2	52.9	56.5	58.5	60.5	65.0
1989	62.4	52.9	60.0	65.2	65.4	63.4
1992	58.0	51.6	56.7	60.0	60.1	58.3
Commercial and industrial loans						
1984	22.6	13.1	16.8	18.9	21.0	30.9
1989	18.8	10.7	13.9	16.9	18.8	23.5
1992	15.3	8.8	10.5	12.2	14.8	20.0
Commercial real estate loans						
1984	7.3	6.9	10.1	9.4	8.3	5.2
1989	11.3	9.2	13.5	14.8	13.2	8.8
1992	10.4	10.2	14.1	14.5	11.4	7.5
Capitalization						
1984	6.1	8.6	7.2	6.9	5.8	4.8
1989	6.2	8.9	7.6	6.7	6.1	4.8
1992	7.5	9.3	8.3	7.7	7.6	6.6

SOURCE: Author's calculations

the state level. The focus here is on how performance differs across banks of various sizes and holding company affiliations. I construct national-level fourth-quarter performance measures for each of the five size classes (and each size class disaggregated by the three types of holding company relationships) by first aggregating the call report data for U.S. commercial banks in the size cohorts illustrated in panel B. The aggregated balance sheet and income statement of each cohort is then used to construct measures of capitalization, lending, bank profitability, and asset quality. These measures are defined in box 1. The state-level measures analyzed in the study are also constructed in this manner—albeit with the call report data on the individual banks for a given state. As a point of reference, I first examine the recent trends in banking conditions evident at the national level.

III. Trends in Bank Lending and Capitalization

Table 2 illustrates bank lending and capitalization (as percentages of bank assets) for the five size cohorts of commercial banks in selected years. Despite distinct differences in both loan/asset and capital/asset ratios across the size classes, these balance sheet measures have moved somewhat in concert during the past decade.

Larger banks appear to have invested a greater percentage of assets in loans than did smaller banks. While loan/asset ratios moved procyclically in medium and large banks, very small and very large banks did not exhibit this portfolio shift.[8] However, banks of all sizes changed the types of loans they funded over the period. The percentage of assets invested in commercial and industrial (C&I) loans declined and the percentage held as commercial real estate (CRE) loans rose in all segments of the industry. Large and very large banks moved most aggressively into CRE lending in the mid-1980s and have subsequently retrenched. For smaller banks, the monotonic shift to funding CRE loans is more indicative of a secular trend than of a cyclical real estate boom (and subsequent bust).
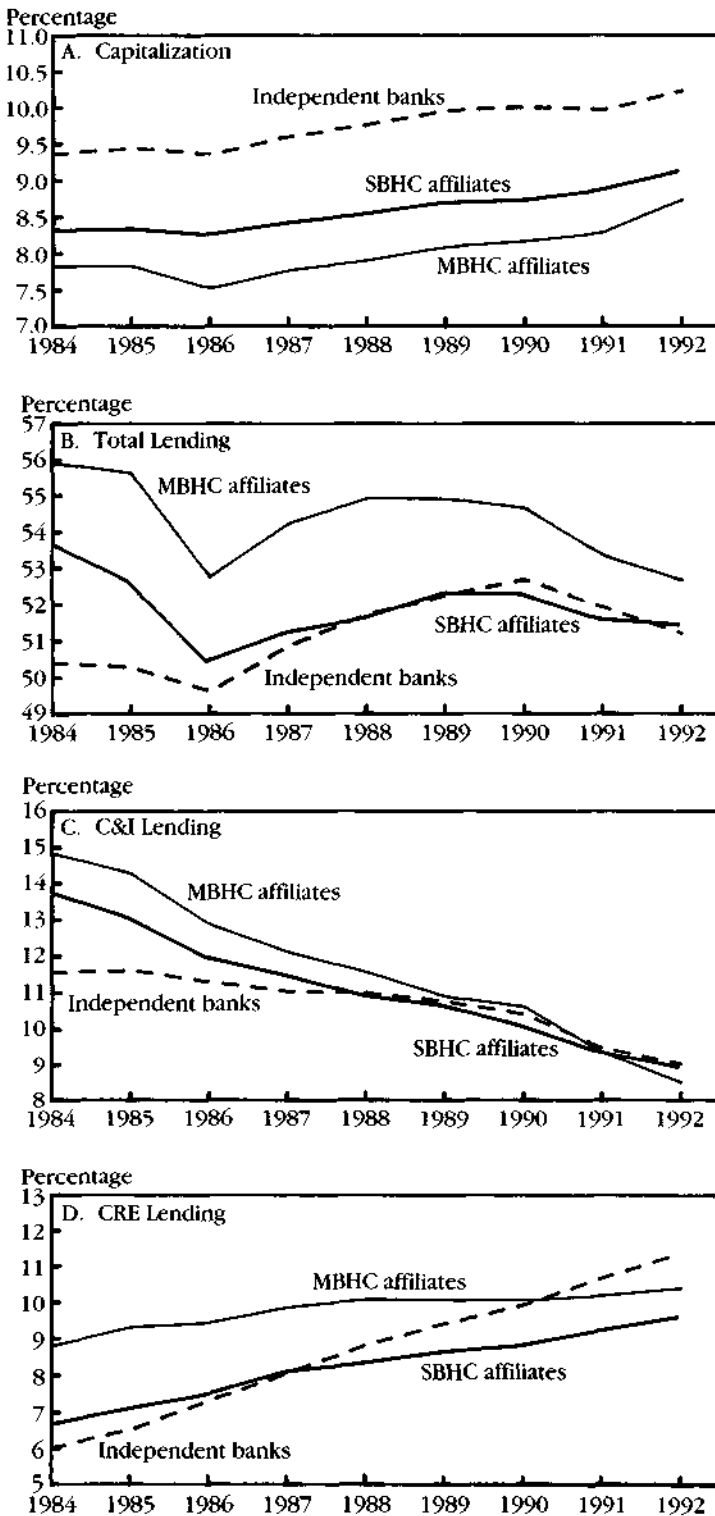
Larger banks also appear to have been less capitalized than smaller banks. However, the greatest disparities across the size classes occurred early in the 1980s, when industry capitalization was below 6 percent. Until the late 1970s, smaller banks faced higher capital requirements: They were viewed as riskier because they could not diversify as much as larger institutions. Subsequently, regulatory changes have eliminated differences in capital ratios based on size in favor of requirements associated with portfolio risk. The result has been that capitalization has increased in the industry as a whole, but by relatively more in larger banks.

There also appear to be differences in bank lending and capitalization across similar-sized banks that vary in holding company affiliation. The panels in figure 1 depict capitalization and loan/asset ratios for very small banks sorted by their holding company relationships. Multibank holding company affiliates were less capitalized than otherwise affiliated institutions and made more loans than other very small banks,

FIGURE 1

Capitalization and Loan/Asset Ratios for Very Small Banks: by Holding Company Affiliation

Percentage

A. Capitalization

- Independent banks
- SBHC affiliates
- MBHC affiliates

1984 1985 1986 1987 1988 1989 1990 1991 1992

Percentage

B. Total Lending

- MBHC affiliates
- SBHC affiliates
- Independent banks

1984 1985 1986 1987 1988 1989 1990 1991 1992

Percentage

C. C&I Lending

- MBHC affiliates
- Independent banks
- SBHC affiliates

1984 1985 1986 1987 1988 1989 1990 1991 1992

Percentage

D. CRE Lending

- MBHC affiliates
- SBHC affiliates
- Independent banks

1984 1985 1986 1987 1988 1989 1990 1991 1992

SOURCE: Author's calculations.

although the differences in loan/asset ratios diminished over the decade. Thus, in terms of lending and capitalization, industry-level data suggest that multibank holding company affiliates behaved more like "larger" institutions than did other very small banks. This also appears to have been the case for small banks.

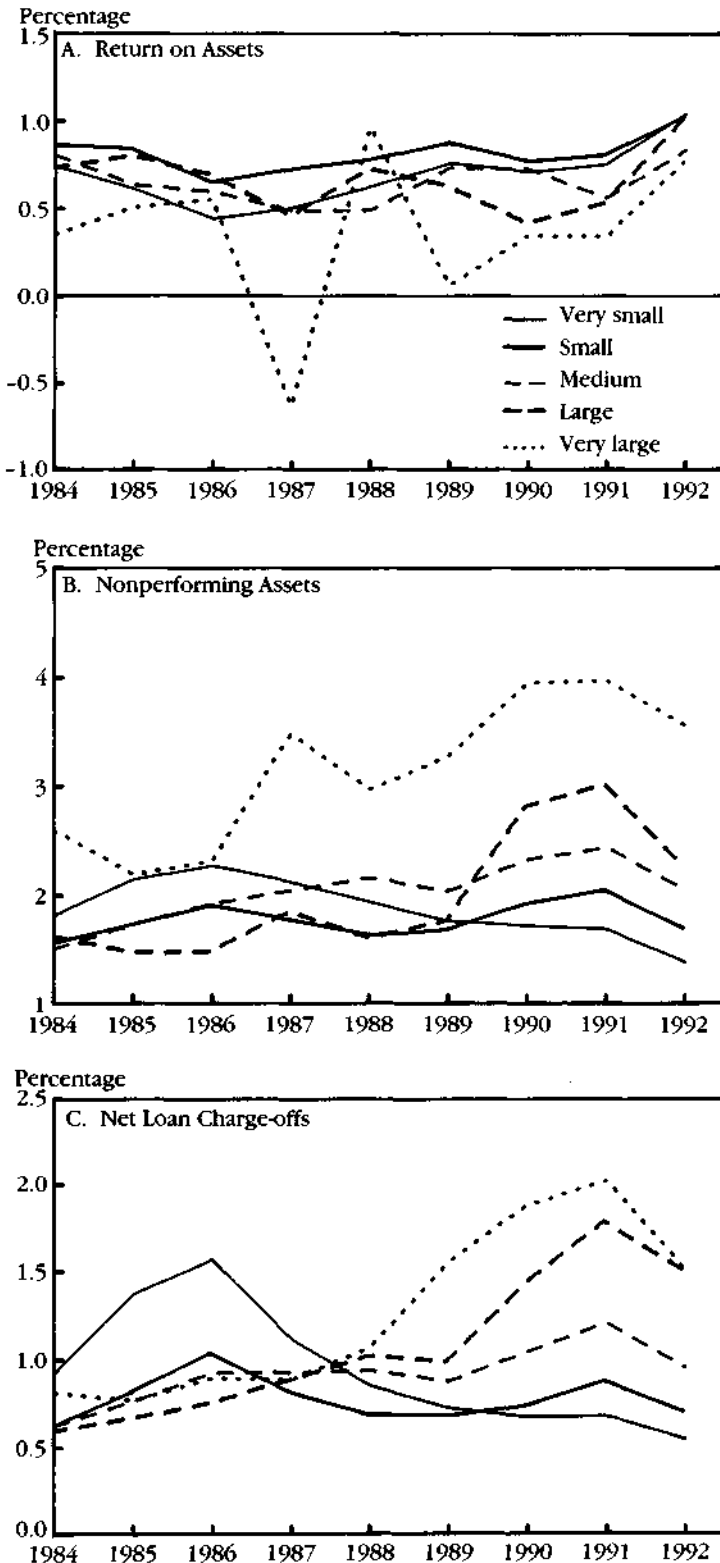## IV. Trends in Bank Profitability and Asset Quality

Differences in loan/asset ratios and bank capitalization are important factors in assessing the relative profitability and risk of banks. However, these variations do not inevitably translate into differences in risk or profitability. Although loans are a relatively risky class of investments (compared to securities), banks that have higher loan/asset ratios do not necessarily have riskier portfolios. Larger banks (or those affiliated with multibank holding companies) may be able to diversify the risks in their loan portfolios more successfully than smaller, more localized institutions. Moreover, larger banks may be profitable in spite of lower profit margins because their higher leverage allows them to pay a greater return to stockholders for a given return on their assets.

As evidenced by capital requirements in the past, smaller banks were viewed as riskier because of their limited ability to diversify. In the 1980s, government policies may have changed the relationship between bank size and bank risk by reducing the incentives for banks to manage losses prudently (Boyd and Graham [1991]). Deregulation, in tandem with changes in the treatment of problem institutions, may have increased the risks that uninsured investors allow banks — especially larger ones — to assume. The policy that banks can be too big to fail and the usual method of resolving bank failures (via purchase and assumption by healthy banks) shift the cost of bank failure from these investors to the Federal Deposit Insurance Corporation (and ultimately to taxpayers).

Unfortunately, ex ante portfolio risk and expected risk-adjusted yields are unobservable, so I examine data on ex post performance to infer indirectly how the risk–return relationship may vary across types of banks. I employ standard industry ratios used to measure bank profitability and asset quality (see box 1). Bank profitability is measured by the return on assets (ROA) for each class of banks. Problems with asset quality are measured by nonperforming

FIGURE 2

Industry Performance Measures by Bank Size

Percentage

A. Return on Assets

(legend)
—— Very small
—— Small
– – Medium
—– Large
····· Very large

1984 1985 1986 1987 1988 1989 1990 1991 1992

Percentage

B. Nonperforming Assets

1984 1985 1986 1987 1988 1989 1990 1991 1992

Percentage

C. Net Loan Charge-offs

1984 1985 1986 1987 1988 1989 1990 1991 1992

SOURCE: Author's calculations.

assets as a percentage of total assets, and net charge-offs for loan losses as a percentage of total loans.

The panels in figure 2 illustrate how bank profitability and problems with asset quality varied across the five size classes of banks between 1984 and 1992. These performance measures reveal less of a discernible relationship to bank size and holding company affiliation than do bank lending and capitalization. Panel A indicates that the ROA for very large banks was more volatile than for smaller institutions. However, the differences in ROA do not indict size per se as an indicator of profitability. This is especially true from the perspective of bank stockholders; since larger banks are more leveraged, stockholders can earn a higher return on equity for a given ROA.

Panels B and C of figure 2 illustrate that smaller (primarily agricultural) banks experienced problems with asset quality in the mid-1980s. These problems have been widely attributed to the impact of local economic conditions. The dramatic rise in both nonperforming assets and loan charge-offs by larger institutions from 1988 to 1991 is commonly viewed as stemming from the troubled commercial real estate markets on the East and West coasts. These disparate economic conditions make it difficult to identify a consistent relationship between bank size and asset quality in the national-level data.

V. A Regional Perspective on Banking Sector Performance

Both banking sector performance and broader economic conditions varied widely across states during the past decade. At the same time, restrictions on branching and on bank holding company acquisitions were being eased in many states. In spite of these regulatory changes, a great deal of structural diversity remains both within and across state banking sectors. This diversity reflects the interaction of current regulatory environments with inherent market factors (such as size or population density).

Table 3 summarizes the differences in banking sector conditions across states in 1984 and 1992 in terms of the maximum, median, and minimum values of each measure as well as their means and standard deviations. The data mirror the trends evident at the national level, yet the variation across states is striking.

TABLE 3

State-Level Commercial
Banking Industry Ratios
(percentage of total assets)

	Capitalization		CRE Lending		C&I Lending		Return on Assets		Nonperforming Assets		Net Loan Charge-offs	
	1984	1992	1984	1992	1984	1992	1984	1992	1984	1992	1984	1992
Maximum	9.7	12.8	22.0	22.5	30.3	24.4	1.6	3.0	3.6	7.0	2.0	5.1
Median	6.7	7.9	8.2	11.0	17.5	12.0	0.8	1.1	1.6	1.4	0.5	0.8
Minimum	5.2	6.5	1.6	2.4	7.2	5.7	-0.1	0.0	0.4	0.6	0.2	0.3
Mean	7.0	8.2	8.4	11.0	18.0	12.8	0.8	1.1	1.8	1.9	0.7	1.2
Standard deviation	1.0	1.3	3.5	3.9	4.5	4.1	0.3	0.5	0.8	1.3	0.5	1.0

NOTE: Net charge-offs are expressed as a percentage of total loans.
SOURCE: Author's calculations.

Table 4 presents the distribution of banks within and across states by their holding company affiliation in 1984 and 1992. Each state is ranked according to its total number of banks in 1984. Industry consolidation has been the rule rather than the exception in state banking sectors. The number of banks fell in 42 states during this period, and for 20 of these states the numbers dropped by more than 20 percent, although 38 states still had more than 50 banks at the end of 1992. These declines were accompanied by a decrease in the number of independent banks in 42 states. Overall, the percentage of smaller holding company affiliates also fell. This, however, is due to significant decreases in some states (most notably, Texas), which outweigh the increases in these affiliates in other states.

A trend toward one organizational type is not evident at the state level. Savage (1993) argues that the coexistence of holding company affiliates and independent banks within states indicates that there is not yet a dominant form of banking organization. The distribution of banks by size varies more substantially across states. In states with a tradition of unit banking, the industry tends to be populated by a large number of smaller institutions. As of year-end 1992, only 10 states had banks in the largest size cohort. Seven states had no banks with more than $1 billion (1987 dollars) in assets. However, except for very large banks, each size class is fairly well represented within and across states.

VI. Assessing Disparities in Industry Conditions

The diversity in the types of banks within and across states suggests a simple way of assessing the extent to which variance in bank performance can be attributed to differences in bank characteristics versus local economic conditions. In the following analysis, each state is treated as an individual sector composed of banks that vary in size and holding company affiliation. I then test for differences in industry profitability and asset quality that can be attributed to these structural characteristics, controlling for local economic conditions and other state-specific fixed effects.

The analysis features state-level data over the nine-year sample period of 1984 to 1992. As with the evaluation of national-level trends, I disaggregate state-level measures of industry conditions into cohort-level measures for the five bank size categories, crossed with the three types of holding company relationships. Hence, the annual data yield 15 potential observations in each year on industry conditions within a state. Not all states have banks in each class.[9] The nine years of data for 51 states (including the District of Columbia) yielded a data set of 4,062 observations on a given measure of bank performance.

The rationale for analyzing the performance of a cohort of banks rather than that of each

9 For example, almost all very large banks are multibank holding company affiliates (two are affiliates of single bank holding companies). The distribution of the data is discussed in the final section.

Banks by
Holding Company Affiliation

	Total Number		In Multibank Holding Company		In Single Bank Holding Company		Not in a Bank Holding Company	
			Percent		Percent		Percent	
	1984	1992	1984	1992	1984	1992	1984	1992
Rhode Island	13	12	7.7	16.7	69.2	41.7	23.1	41.7
Alaska	15	8	20.0	37.5	33.3	37.5	46.7	25.0
Nevada	16	18	18.8	38.9	18.8	27.8	62.5	33.3
Washington, D.C.	19	22	5.3	40.9	52.6	31.8	42.1	27.3
Hawaii	21	17	23.8	23.5	4.8	11.8	71.4	64.7
Idaho	25	20	20.0	45.0	32.0	15.0	48.0	40.0
Maine	26	22	34.6	22.7	15.4	50.0	50.0	27.3
Vermont	27	21	22.2	28.6	33.3	42.9	44.4	28.6
Delaware	32	40	46.9	50.0	15.6	25.0	37.5	25.0
Arizona	46	38	2.2	42.1	32.6	31.6	65.2	26.3
Connecticut	50	48	16.0	18.8	20.0	29.2	64.0	52.1
New Hampshire	59	28	35.6	25.0	18.6	50.0	45.8	25.0
Utah	60	54	18.3	13.0	38.3	25.9	43.3	61.1
North Carolina	63	78	1.6	21.8	28.6	25.6	69.8	52.6
Oregon	72	48	13.9	20.8	20.8	27.1	65.3	52.1
South Carolina	73	81	1.4	18.5	28.8	38.3	69.9	43.2
Maryland	88	96	30.7	38.5	11.4	26.0	58.0	35.4
New Mexico	95	84	41.1	44.0	32.6	38.1	26.3	17.9
Washington	102	94	16.7	14.9	21.6	21.3	61.8	63.8
Wyoming	116	63	56.0	36.5	24.1	41.3	19.8	22.2
Massachusetts	124	63	48.4	19.0	23.4	46.0	28.2	34.9
New Jersey	125	106	38.4	23.6	20.8	37.7	40.8	38.7
South Dakota	140	121	23.6	28.9	32.9	47.1	43.6	24.0
Mississippi	153	121	0.0	5.0	46.4	53.7	53.6	41.3
Montana	167	120	44.9	35.8	29.3	40.8	25.7	23.3
Virginia	176	170	26.1	27.1	10.2	22.4	63.6	50.6
North Dakota	177	143	24.9	21.7	46.3	64.3	28.8	14.0
New York	190	177	30.0	19.8	21.1	46.9	48.9	33.3
West Virginia	227	164	18.5	59.8	16.3	18.9	65.2	21.3
Arkansas	258	259	16.7	34.0	39.9	44.4	43.4	21.6
Alabama	269	215	26.0	25.1	25.3	49.3	48.7	25.6
Tennessee	293	248	17.1	27.4	38.6	54.0	44.4	18.5
Louisiana	302	221	0.0	7.2	52.0	60.2	48.0	32.6
Ohio	320	271	31.3	32.1	12.2	26.6	56.6	41.3
Pennsylvania	326	281	15.3	33.1	22.7	40.6	62.0	26.3
Kentucky	336	311	4.5	37.3	49.7	46.9	45.8	15.8
Michigan	365	215	54.5	42.3	8.5	38.1	37.0	19.5
Indiana	378	270	2.1	43.3	46.3	39.3	51.6	17.4
Georgia	383	397	25.6	30.0	26.9	39.5	47.5	30.5
Florida	427	394	44.0	29.9	23.4	32.0	32.6	38.1
Colorado	446	349	49.6	47.6	30.3	29.5	20.2	22.9
California	449	451	6.9	8.9	34.7	31.9	58.4	59.2
Nebraska	472	374	10.0	26.5	61.4	52.9	28.6	20.6
Oklahoma	538	393	8.7	15.0	57.6	59.3	33.6	25.7
Wisconsin	590	445	32.0	40.2	28.3	35.7	39.7	24.0
Kansas	628	508	3.3	17.7	66.6	61.8	30.1	20.5
Iowa	629	542	21.8	29.7	49.4	54.8	28.8	15.5
Missouri	713	510	45.4	36.9	28.5	42.7	26.1	20.4
Minnesota	738	593	24.4	27.2	47.8	54.3	27.8	18.5
Illinois	1,241	1,006	25.9	37.0	33.1	40.6	41.0	22.5
Texas	1,853	1,089	40.9	20.7	23.0	40.8	36.0	38.6

SOURCE: Federal Financial Institutions Examination Council, *Reports of Condition and Income,* 1984 fourth quarter and 1992 fourth quarter.

individual bank is to mitigate the effects of outliers and bank mergers. The cohort measures are averages of the individual banking data, where each bank is effectively weighted by its share of the cohort.[10] However, the findings should be similar to those obtained using individual bank data to assess differences across these classes of banks. Moreover, in examining the performance of classes of institutions, I can construct estimates of the performance differentials associated with bank size and holding company affiliation. These adjusted measures are directly comparable to the national-level data presented in figures 1 and 2.

Data on banks sorted by size and holding company affiliation within each state are used as cross-sectional observations on banking conditions in each year of the sample period. I then pool the data for each year to estimate reduced-form regressions for six measures of bank performance. To identify variance in performance that may be attributed to differences in bank size and holding company affiliation, I control for other factors that affect banking conditions both within each state and over time. In each regression, the following control variables are included: 1) a dummy variable identifying the state of an observation to control for state-specific differences in banking conditions during the sample period; 2) a dummy variable indicating the year of an observation to control for economywide variation in banking conditions over time; 3) the contemporaneous and lagged values of both the growth rate of state personal income and the volume of per capita failed business liabilities to control for the effect of local business conditions on banking sector performance; and 4) the ratio of state banking assets to state personal income in each year to control for variation in banking sector activity relative to that of the broader state economy.

Finally, to test whether bank size and holding company affiliation can explain differences in bank performance, I include dummy variables in each regression that measure intercept shifts for all classes of banks. Two different specifications for each measure of industry conditions are estimated; these vary the ways in which the dummy variables are interacted with

time to examine whether performance differentials changed over the sample period. Both regression specifications include the same control variables and differ only in their treatment of the dummy variables.

VII. Evidence on Banking Sector Performance

Specification 1 includes an intercept shift for each size class (*Size*) and type of bank holding company affiliation (*HCA*) as well as the set of control variables. This specification takes the form

$$(1) \quad Ratio_{n,t,s,b} = \alpha + \beta_n^{State} + \beta_t^{Year} + \beta_S^{Size} + \beta_b^{HCA}$$

$$+ \sum_{i=1}^{5} \beta_i^E Econ_{i,n,t} + \varepsilon_{n,t,s,b}.$$

where $Ratio_{n,t,s,b}$ is an observation of a bank performance measure, in the nth state and t^{th} year, of banks in *Size* class s and *HCA* class b. $Econ_{i,n,t}(i = 1, ..., 5)$ is the set of state-level economic variables that includes current and lagged personal income growth, current and lagged per capita failed business liabilities, and the ratio of bank assets to personal income. Here, the intercept shifts associated with *Size* and *HCA* will measure how the average performance of banks with these characteristics varies. It is possible to estimate performance differentials only relative to a base group in each class. Very small banks are the *Size* base group and multibank holding company affiliates are the *HCA* base group.

Table 5 presents selected results of the regressions on six measures of banking conditions (summarized in table 3) obtained using specification 1. For brevity, the individual coefficient estimates of the intercept shifts for each state are not reported. However, they suggest that significant differences in banking conditions across states can be attributed to state-specific factors (other than current economic conditions) during the sample period. These may reflect average differences in local industry structure, including the structure of the banking sector. Similarly, the estimated intercept shifts for each year of the sample (relative to the base year, 1992) indicate that in evaluating bank performance over time, it is important to control for economywide trends that affect banks in all states. These coefficient estimates mirror the trends in banking conditions evident in the national-level data shown in

T A B L E 5

Dependent Variable	Capitalization	CRE Lending	C&I Lending	Return on Assets	Nonperforming Assets	Net Loan Charge-offs
R^2	0.146	0.407	0.397	0.164	0.285	0.188

Explanatory Variables

State Dummies

	(a)	(a)	(a)	(a)	(a)	(a)

Year Dummies

	(a)	(a)	(a)	(a)	(a)	(a)

Economic Controls

Personal income growth	−0.0155	−0.1816	−0.1464	0.07447	−0.2622	−0.0931
	(−0.37)	(−3.41)[a]	(−2.72)[a]	(6.65)[a]	(−15.69)[a]	(−7.21)[a]
Lagged personal income growth	0.0038	0.1043	0.0787	0.0661	−0.1780	−0.1071
	(0.09)	(1.99)[b]	(1.49)	(5.99)[a]	(−8.42)[a]	(−8.41)[a]
Failed business liabilities	−0.0010	−0.0025	−0.0003	−0.0017	0.0009	0.0010
	(−1.06)	(−2.09)[b]	(−1.16)	(−0.66)	(2.24)[b]	(3.33)[a]
Lagged failed business liabilities	−0.0018	−0.0027	−0.0009	−0.0009	0.0029	0.0014
	(−1.99)[b]	(−2.34)[a]	(−2.81)[a]	(−2.85)[a]	(7.59)[a]	(4.97)[a]
Bank assets to personal income	−0.0027	−0.0081	−0.0056	0.0053	0.001	0.003
	(−1.10)	(−2.66)[a]	(−1.81)	(8.25)[a]	(1.00)	(4.11)[a]

Holding Company Affiliation Dummies

Not in a bank holding company	0.0070	−0.0258	−0.0272	0.0031	0.0022	0.0013
	(3.33)[a]	(−9.78)[a]	(−10.20)[a]	(5.65)[a]	(2.51)[a]	(1.99)[b]
In single bank holding company	−0.0062	−0.0084	0.0026	0.0012	0.0016	0.0005
	(−3.33)[a]	(−3.69)[a]	(1.13)	(2.53)[a]	(2.16)[b]	(0.89)
In multibank holding company	—	—	—	—	—	—

Size Dummies

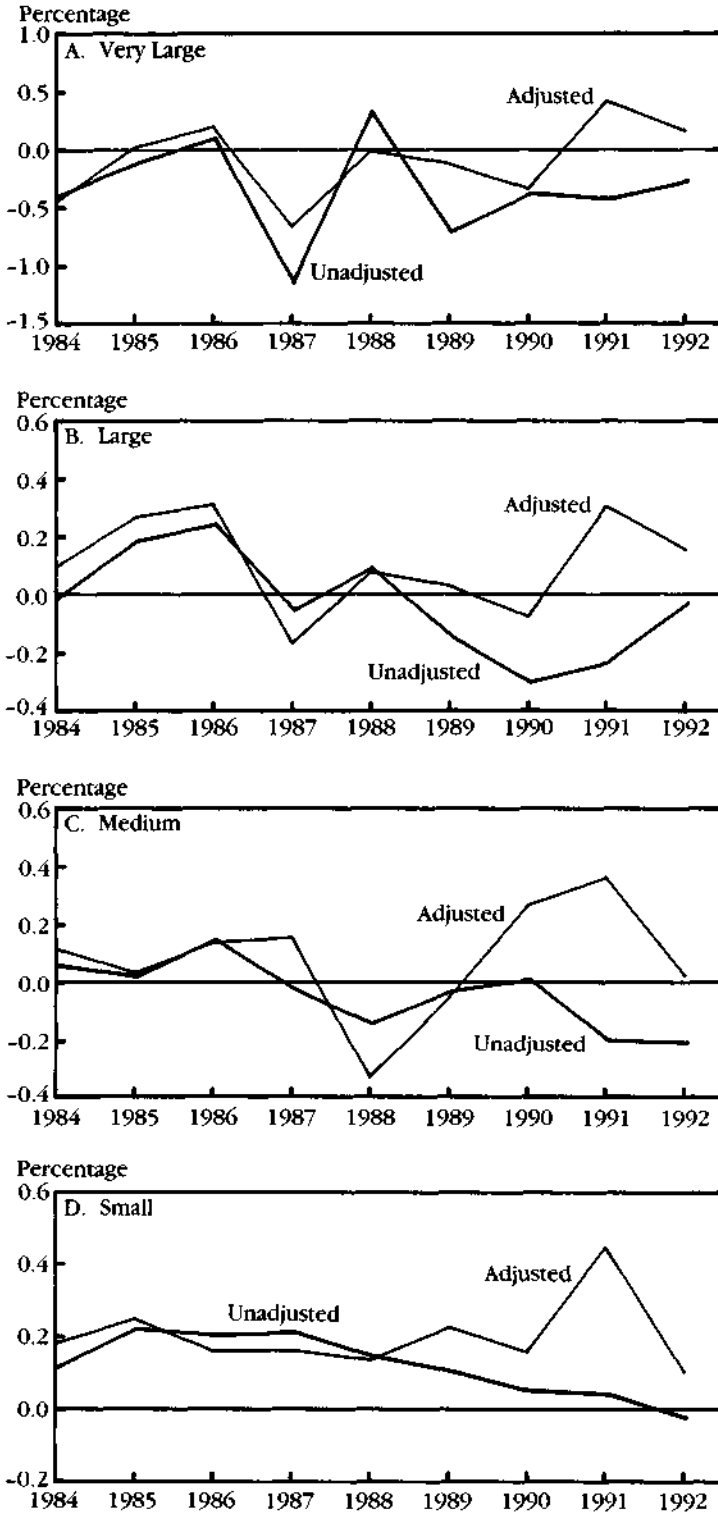|						
Very small	—	—	—	—	—	—
Small	−0.0173	0.0222	0.0150	0.0020	0.0003	−0.0009
	(−10.37)[a]	(10.54)[a]	(7.04)[a]	(4.49)[a]	(0.50)	(−1.77)
Medium	−0.0229	0.0188	0.0340	0.0008	0.0016	0.0009
	(−10.71)[a]	(6.99)[a]	(12.47)[a]	(1.34)	(1.80)	(1.34)
Large	−0.0304	0.0087	0.0432	0.0011	0.0021	0.0012
	(−14.42)[a]	(3.28)[a]	(16.10)[a]	(1.98)[b]	(2.38)[a]	(1.83)
Very large	−0.0389	−0.0276	0.0856	−0.0008	0.0066	0.0039
	(−9.93)[a]	(−5.60)[a]	(17.20)[a]	(−0.77)	(3.99)[a]	(3.23)[a]

a. Significant at the 1 percent level.
b. Significant at the 5 percent level.
NOTE: T-statistics are in parentheses. Coefficients of dummy variables indicate the intercept shift relative to the omitted category, as indicated by dashed lines.
SOURCE: Author's calculations.

FIGURE 3

Adjusted and Unadjusted Performance Differentials in Return on Assets by Bank Size (Relative to Very Small Banks)

Percentage

A. Very Large

Adjusted

Unadjusted

1984 1985 1986 1987 1988 1989 1990 1991 1992

Percentage

B. Large

Adjusted

Unadjusted

1984 1985 1986 1987 1988 1989 1990 1991 1992

Percentage

C. Medium

Adjusted

Unadjusted

1984 1985 1986 1987 1988 1989 1990 1991 1992

Percentage

D. Small

Adjusted

Unadjusted

1984 1985 1986 1987 1988 1989 1990 1991 1992

SOURCE: Author's calculations

table 2 and figure 3 (again, for brevity, the individual coefficients are not reported).

Bank performance does appear to reflect local economic conditions, particularly in regard to bank profitability and asset quality. Both income growth and failed business liabilities help explain ROA, nonperforming assets, and loan charge-offs in the expected ways. Profitability as measured by bank ROA is positively related to income growth and negatively related to failed business liabilities. Symmetrically, asset problems measured in terms of both nonperforming assets and loan charge-offs are negatively related to income growth and positively related to failed business liabilities. C&I lending—and to a lesser extent CRE lending—is negatively related to failed business liabilities; banks appear to fund fewer loans when the credit quality of the local business sector deteriorates. However, the coefficients on state income growth suggest that end-of-year lending as a share of assets is also lower when recent income growth has been higher. The coefficients on the ratio of banking assets to state personal income are positive in the regressions explaining both ROA and loan charge-offs. Hence, when banking activity is high relative to economic activity, both bank profitability and problems with asset quality are higher as well. Finally, bank capitalization is relatively unrelated to the economic control variables.

These findings, then, reveal that the profitability and asset quality of different segments of the industry to a large degree reflect the economic conditions impacting these institutions: When the local economy has been faring poorly, it is likely that the banking sector will follow suit. This analysis is consistent with most interpretations of banking trends. However, the results also hint that differences in bank performance can be attributed to differences in bank characteristics.

The results for specification 1 yield significant variations in banking conditions among institutions having different holding company relationships. Both single bank holding company affiliates and independent banks had a smaller share of assets invested in CRE loans than did multibank holding companies, while only independent banks held a significantly smaller share of C&I loans. Controlling for size, independent banks were, on average, more capitalized than multibank holding company affiliates, while single bank holding company affiliates were less capitalized. All else equal, both independent banks and single bank holding company affiliates earned a higher ROA

FIGURE 4

Adjusted and Unadjusted Performance
Differentials in Nonperforming Assets by
Bank Size (Relative to Very Small Banks)

Percentage

A. Very Large

Unadjusted

Adjusted

1984 1985 1986 1987 1988 1989 1990 1991 1992

Percentage

B. Large

Adjusted

Unadjusted

1984 1985 1986 1987 1988 1989 1990 1991 1992

Percentage

C. Medium

Adjusted

Unadjusted

1984 1985 1986 1987 1988 1989 1990 1991 1992

Percentage

D. Small

Adjusted

Unadjusted

1984 1985 1986 1987 1988 1989 1990 1991 1992
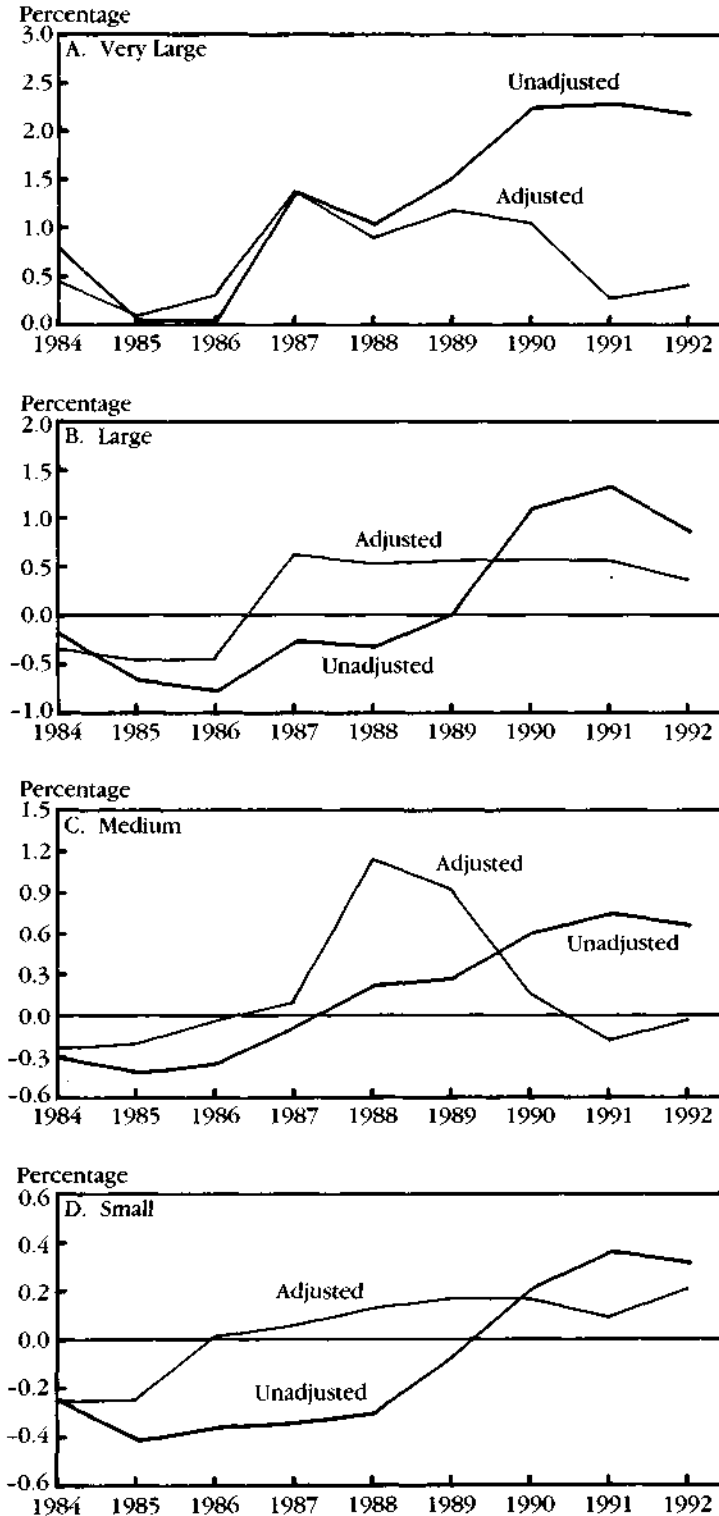
SOURCE: Author's calculations.

than banks in multibank holding companies. However, independent banks and single bank holding company affiliates also had more problems on average with asset quality, as reflected in nonperforming assets and loan charge-offs.

Thus, controlling for size, the performance of banks in multibank holding companies differed from otherwise affiliated institutions; the former earned a lower average ROA, but also had fewer problems with asset quality. These affiliates invested a larger share of their portfolios in loans, but they appear to have been better risks than both single bank holding company affiliates and independent banks in terms of their performance during the past decade.

Bank performance also varied significantly across the five size classes. As illustrated in table 5, the differences in capitalization and in lending mirror those evident in the national-level data. The coefficients measuring the average differences in capitalization for each size class indicate that controlling for other factors, capitalization is inversely related to bank size. These coefficients imply that on average, the capital/asset ratio of very large banks was 3.9 percentage points lower than that of very small banks. C&I lending as a share of assets is positively related to bank size. Alternatively, while the middle three size classes of banks invested a higher percentage of assets in CRE loans than did very small banks, very large banks held a significantly smaller share.

Perhaps not surprisingly, I find a less consistent relationship between bank size and bank performance in terms of profitability and asset quality. All else equal, small and large banks earned significantly higher ROAs than did either very small or very large banks. Large and very large banks had higher loan charge-offs and lower nonperforming asset ratios than did very small banks. Relatively small banks ($100 million to $500 million in assets, 1987 dollars) seem to have turned in the best performance in terms of profitability and asset quality. Interestingly, these banks are about the size that some studies have shown to maximize economies of scale (Berger, Hanweck, and Humphrey [1987]).

In summary, specification 1 estimates the average differences in bank performance that can be attributed to bank size and holding company relationships, controlling for local economic factors and aggregate trends that affect banking conditions. Thus, the results measure the extent to which the variation in bank performance within states is related to these structural characteristics. I find systematic

FIGURE 5

Adjusted and Unadjusted Performance Differentials Relative to the Base Group by Bank Size (Relative to Very Small Banks)
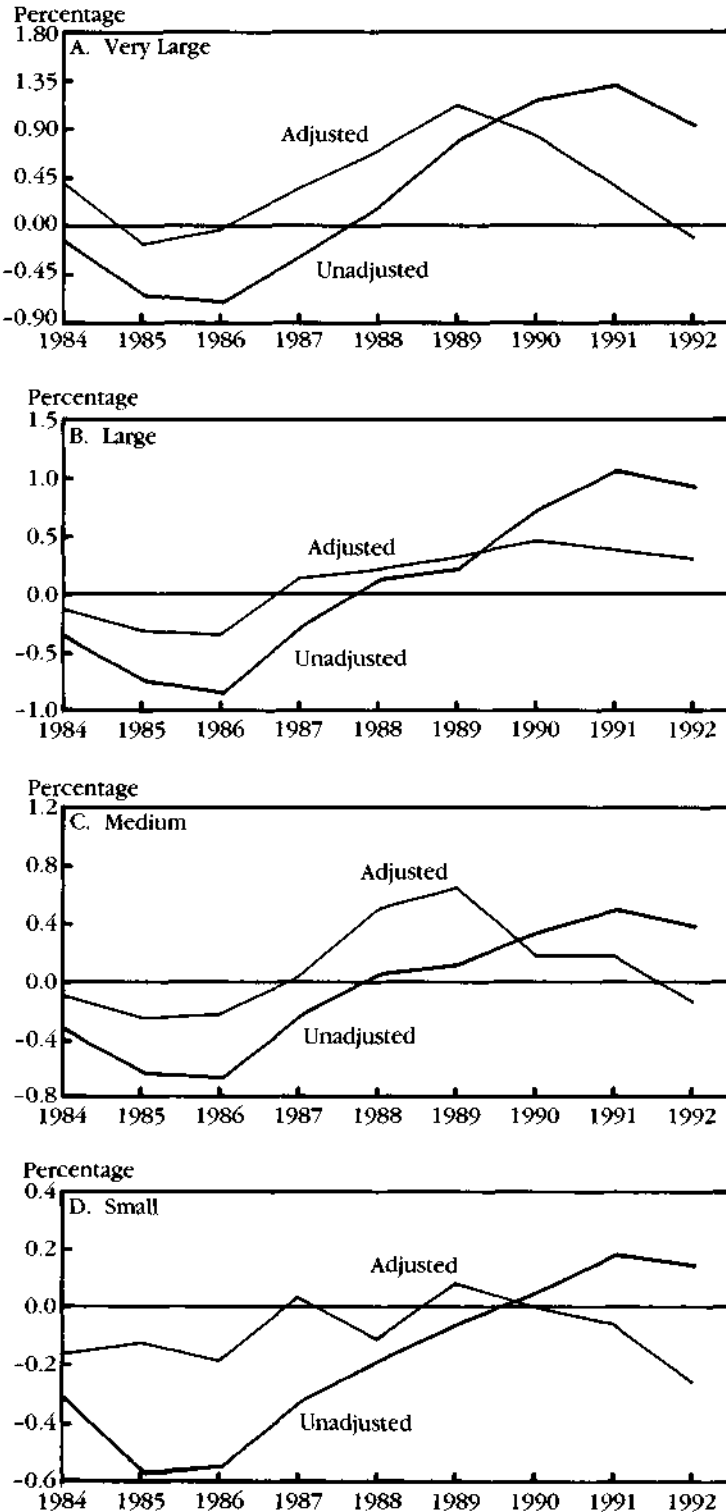
SOURCE: Author's calculations.

differences in capitalization and lending across banks that vary in their size and holding company relationships. Indeed, the disparities in capitalization and lending observed at the national level appear to largely reflect these structural differences. The results also indicate some variation in bank profitability and asset quality across the different types of banks during the past decade.

VIII. Will Performance Differentials Continue?

The observed differences between large and small banks may have changed during the past decade. Estimating how the average performance of one type of bank (over a number of years) compares to that of another may obscure emerging differences in performance. For example, because of greater asset diversification, the asset quality of larger banks could have been significantly better than that of smaller banks early in the 1980s. If, indeed, these institutions have increased the relative risk of their investments (because they are too big to fail), they may still be on par with small banks in terms of average performance although their asset quality has been declining.

To examine the possibility that structural disparities in bank performance have changed in the past decade, I estimate a second set of regressions:

$$(2) \quad Ratio_{n,t,s,h} = \alpha + \beta_n^{State} + \beta_{s,t}^{Size*Year} + \beta_{h,t}^{HCA*Year} + \sum_{i=1}^{5} \beta_i^E Econ_{i,n,t} + \varepsilon_{n,t,s,h}$$

Specification 2 includes an intercept shift for each Size and HCA class for each year in the sample period, as well as the control variables included in specification 1. Again, it is possible to estimate differences only relative to a base group in each class; hence the choice of very small banks as the Size base group and multibank holding company affiliates as the HCA base group. In these regressions, each intercept shift associated with a class of banks measures the estimated difference between the performance of that class and its respective base group in a particular year. Therefore, the estimated performance differentials associated with bank size and holding company relationships are allowed to vary over time.

Here, I present the evidence of performance differentials in ROA, nonperforming assets, and loan charge-offs obtained using specification 2. The results for the control variables in these regressions are similar to those presented in table 5. Thus, I focus on patterns in the time-varying intercept shifts associated with bank size and holding company affiliation. The intercept shifts can be interpreted as annual bank performance differentials that have been adjusted for state-specific factors, local economic conditions, and economy-wide trends. These adjusted performance differentials are therefore estimates of the within-state variations in bank performance attributable to structural characteristics.

In figures 3, 4, and 5, the green lines illustrate the *adjusted performance differentials* in ROA, nonperforming assets, and loan charge-offs for each *Size* class of banks. It is instructive to compare these estimates to measured differences in performance that have not been adjusted for other economic factors. The national-level performance measures presented in table 2 are used to construct *unadjusted performance differentials* of this sort for each *Size* class of banks. For example, the unadjusted differential in the ROA of very large banks in each year is simply the ROA for this cohort of banks minus the ROA for very small banks (as illustrated in figure 2). The *unadjusted performance differentials* in ROA, nonperforming assets, and loan charge-offs are depicted by the blue lines in figures 3, 4, and 5.

The panels in figure 3 illustrate both the adjusted and unadjusted differences in ROA for each *Size* class of banks (relative to very small banks). A comparison of these series indicates that controlling for other economic factors mitigates the relatively poor performance of larger banks in recent years. The adjusted differentials in ROA for small banks suggest that, all else equal, they were more profitable than very small banks during the entire sample period. However, the adjusted differentials for the three largest classes reveal no emerging trends in profitability differentials that can be attributed to bank size per se.

The panels in figure 4 depict the unadjusted and adjusted differentials in nonperforming assets by *Size* class. The adjusted series do not exhibit the increasing disparities between sizes that are evident in the unadjusted data. Panels A and B do indicate that, all else equal, larger banks had significantly higher nonperforming asset ratios than did smaller banks in the late 1980s. Subsequently, however, the differences attributable to size decreased.

Finally, the panels in figure 5 illustrate both the adjusted and unadjusted differences in loan charge-offs for various-sized banks. The adjusted differentials are measurably smaller than the unadjusted ones. As in the case of nonperforming assets, controlling for other economic factors mitigates the emerging relationship between size and asset quality problems suggested by the unadjusted measures. However, again, it does appear that larger banks showed more asset quality problems than did smaller banks during the late 1980s.

The key result yielded by these series is that, controlling for economic factors, there is no evidence of a trend toward increasing disparities in bank performance that can be attributed to bank size as a structural characteristic. Similarly, the estimated performance differentials for the *HCA* classes do not suggest emerging disparities in bank profitability and asset quality associated with holding company relationships.

IX. Banking Sector Performance: Assessing the Trends

One interpretation of observed bank performance in the past decade is that the disparities between larger and smaller banks may indicate that increasing risks are being borne by the largest players (Boyd and Gertler [1993]). Accordingly, the trend toward larger banks has been viewed with some concern. This paper investigates the merits of this perception by descriptively assessing the extent to which differences in banking conditions can be attributed to variations in bank size and holding company affiliation.

Taking local economic factors into consideration reduces the disparities in bank performance attributable to these structural characteristics. There is some evidence that, after controlling for state-specific fixed effects, local economic conditions, and national-level trends, larger banks performed worse during the 1980s than did smaller institutions. However, the trend appears to have since reversed. In addition, the results indicate that, all else equal, banks that are associated with larger organizations through multibank holding company affiliations tended to perform better than otherwise-affiliated institutions.[11]

One potential explanation for the finding that large banks performed relatively poorly is that these institutions may be more likely to make loans outside their locality. To the extent that this is true, I do not control for economic conditions where they made loans. An obvious example is the case of the huge write-offs associated with loans to developing countries. The rationale for controlling for local economic conditions is that certain institutions are more subject to these conditions. Thus, evidence that less constrained firms are riskier may suggest that they could and did take on more risk during the past decade.

In assessing the performance of large banks, it is also important to note that most of these institutions are part of multibank holding companies. Thus, a study of the behavior of large banks is effectively a study of the joint effects of both large size and this form of banking organization. On the other hand, the evidence indicates that, all else equal, multibank holding company affiliations appear to benefit banks. This suggests that smaller affiliates have not experienced the same problems with asset quality as have larger institutions. Thus, it seems that the performance of larger banks reflects the effects of size rather than holding company status per se. Indeed, riskier loans may have been channeled to larger banks in the holding companies.

The results of this analysis indicate that the U.S. banking industry during the 1980s may have been characterized by a duality related to bank size. Although reregulation in the past several years has attempted to address this possibility, the evolving role of banks indicates that the link between bank size and bank performance merits further study from a regulatory perspective.

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