Financial Restructuring and Regional Economic Activity

by Brian A. Cromwell

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Introduction

The relationship between the performance of the financial sector and economic activity has received increasing attention from economists in the past decade. The "credit view" holds that variation in the supply of financial services not captured in monetary aggregates can help to explain real economic activity. Empirical studies of the importance of the banking sector have been conducted at both the macro and the regional level and in general support the view that financial structure and stress can have real effects.

Interest in this view coincides with the dramatic restructuring of the financial sector that has accompanied both the advent of deregulation and interstate banking and the significant increase in bank failures in the 1980s. By the end of 1988, all but three states permitted some form of interstate acquisition of their banks, 14,600 offices of banking organizations existed outside of the organizations' home state, and more than half of these were permitted to offer all banking services.[1] Bank failures, which averaged 75 per year in the 1970s, rose from less than 50 per year in the early 1980s to more than 200 per year by 1987. Financial-sector restructuring in the form of bank mergers, takeovers, or failures can affect investment and consumption decisions by disrupting the links between borrowers and creditors.

This paper explores the impact of financial restructuring on economic activity using an alternative data set that in some respects more completely measures change in the local banking sector than do data used in previous research. Restructuring in the local banking sector is measured by the birth, expansion, contraction, and death of banks within a standard metropolitan statistical area (SMSA), as estimated by the Small Business Administration using Dun and Bradstreet files.

These data, known as the U.S. Establishment and Longitudinal Microdata (USELM), attempt to

■ 1 These figures come from a recent comprehensive review of interstate banking by King, Tschinkel, and Whitehead (1989). Earlier surveys include Whitehead (1983a, 1983b, and 1985), and Amel and Keane (1986).

record the location and employment levels of all establishments in all industries. For multi-establishment firms, ultimate ownership of each establishment is tracked. With respect to banking, an establishment equals a bank, a bank subsidiary, or branch office.[2] (Although the USELM establishment framework does not account for the variations in bank organizations across states, its advantage is that it is applied consistently.)

The USELM data are aptly suited for examining the disruption of credit relationships, since Dun and Bradstreet collects these data for the purpose of recording the creditworthiness of firms. A "death" is recorded if a firm fails or is taken over by management sufficiently different from existing management to warrant a reexamination of the firm's credit. To the extent that takeovers, management changes, and branch closings affect local credit relations, the employment effects from bank deaths can potentially measure the disruption of credit links between borrowers and lenders.

The empirical analysis presented here uses employment changes resulting from the birth, death, expansion, and contraction of small, midsized, and large banks as a proxy for restructuring in the banking industry. These measures are linked to the local economic performance of 217 SMSAs in the periods 1980-82 and 1984-86. If the credit view is supported, the impact of employment changes from a bank death should be negative and significantly greater in magnitude than the impact of a bank contraction, since a bank closing should be more disruptive to credit relations than simply a reduction in the bank's staff.

The results suggest that the deaths of midsized banks—those employing between 100 and 500 employees—have a negative but short-lived impact on economic activity. Exploration of the channels for this impact indicates that bank deaths affect employment in other midsized firms that presumably rely principally on local banking markets and that are the most likely customers of midsized banks. The results control for overall financial restructuring and lagged economic activity, and are robust across several specifications.

I. Local Economic Effects of Financial Stress

Restructuring due to financial stress—reflected in bank failures, closings, and mergers—is potentially detrimental to local economic growth.[3] In the case of a bank failure, several types of economic agents may be affected. Bank shareholders and uninsured depositors, for example, may suffer declines in wealth. For a local economy, however, any wealth effect is likely to be small. If the failed bank is merged with another bank, as is commonly the case, uninsured depositors may suffer no losses. Moreover, even if a failed bank is closed, these depositors generally recover (over time) a high percentage of their funds when the bank's assets are liquidated.

Another effect on local economic activity takes place through reductions in bank employment when banks fail or are taken over. In addition to this direct consequence for local employment, unemployed bank workers suffering a loss of personal income will also likely reduce their consumption expenditures, sending a further negative ripple (or multiplier) effect through the economy. The following section presents direct measures of the employment losses caused by bank deaths and looks for employment effects in nonbank sectors. More important, it examines a direct measure of employment losses in banking due to bank contractions to see if the spillovers from bank employment losses are different for failures than for contractions.

Credit Disruptions

In addition to these two potential effects, bank closings can disrupt credit relationships. The credit-view literature holds that the principal channel of a bank failure's economic impact is the disruption of borrower-lender relationships. Each lender is assumed to have more information on its existing borrowers than do other potential lenders.[4] When bank failure results in closure rather than reorganization, borrowers are forced to seek credit from new sources. During the period in which a new long-term credit

■ 2 In practice, Dun and Bradstreet tracks all banking establishments listed in telephone directories, including branch offices.

■ 3 This section in part follows Gilbert and Kochin's (1990) presentation.

■ 4 Gertler (1988) surveys the literature on credit and aggregate economic activity. Articles on the theory of financial intermediation include Diamond (1984) and Campbell and Kracaw (1980).

relationship is established, borrowers are likely to face higher costs of credit or credit rationing.

Even if the failed bank is merged into a surviving bank, borrowers may encounter new loan policies and new senior management if they apply for extensions of their credit. Again, the terms of credit are likely to be less favorable than those offered by the previous management.

The USELM data count bank takeovers and mergers as bank deaths *only* if there is a change in operating management sufficient for Dun and Bradstreet to reexamine the new organization's credit rating. To the extent that takeovers, management changes, and branch closings affect local credit relations, USELM's measures of change in bank employment due to bank deaths can be used to estimate the disruption of credit links between borrowers and lenders. Because we can also measure employment changes due to bank contractions, we use the difference between the impact of bank contractions and bank deaths to distinguish between the direct employment effects of a bank death and the impact of credit disruptions.[5]

Empirical Evidence

Empirical studies of the importance of the banking sector at both the macro and the regional level generally support the view that financial structure and stress can affect economic activity.

In a study of the macro effects of financial stress, Bernanke (1983) argues that extensive bank runs and defaults in the 1930-33 financial crisis reduced the efficiency of the financial sector in performing its intermediation function, and that this had adverse effects on real output through other than monetary channels . He examines the effect of the real value of the change in deposits of failed banks on the growth rate of industrial production. Using regression analysis with monthly data for the years 1919 through 1941, Bernanke finds that bank failures have a negative and statistically significant effect on industrial output. Samolyk (1988) conducts a similar test on British data, using corporate and noncorporate insolvencies as proxies for the health of the financial sector, and also finds that credit factors matter empirically in explaining output. Using Canadian data, Haubrich (1990) also determines that the credit disruptions resulting from bank failures, as opposed to expansions or contractions, affect economic activity.

The credit view would also predict an impact of stress in local banking markets on local economies. Calomiris, Hubbard, and Stock (1986) examine the impact of bank failures on real farm output. Using annual state data for farm output, they find that the number of bank failures lagged one year has a negative and statistically significant effect. Gilbert and Kochin (1990) test the hypothesis that bank failures have adverse effects on sales subject to sales tax and on county employment using rural county-level data. They find that bank closings have a negative impact on local sales and on nonagricultural employment.

II. Alternative Data on Financial Restructuring: The USELM File

Financial restructuring at the local level is analyzed here by the birth, expansion, contraction, and death of banking establishments at the SMSA level, as measured in the USELM data for the periods 1980-82 and 1984-86. The longitudinal establishment data files of the U.S. Establishment and Enterprise Microdata (USEEM) were constructed primarily from data in the Dun and Bradstreet Duns Market Identifier Files (DMI). The Small Business Administration then assembled more than 16 million establishment records contained in the DMI files to construct the USELM file. A team from the Brookings Institution merged DMI data longitudinally and associated each establishment with its owners. The longitudinal detail in the data makes it possible to measure employment change of establishments in a given size class. It also allows employment change to be decomposed by establishment birth or death, or by the growth (or contraction) of continuing establishments, and allows for the tracking of mergers, acquisitions, and divestitures.

The data base includes employment figures and industry classifications for all establishments and enterprises, sales data for all enterprises and subsidiaries, age of all nonbranch establishments, and organizational status and geographic data for each establishment. In principle, every establishment in the United States is covered, except for federal agencies.

Dun and Bradstreet's principal business is provision of credit ratings, which must be

■ 5 We maintain the assumption that the local economic effect of a bank contraction results solely from the multiplier effect of reduced employment, rather than from credit disruptions.

updated to reflect discontinuances of business management. Among other activities, the firm tracks court proceedings in bankruptcy cases in order to record the creditworthiness of establishments. A death is recorded if the establishment is closed or is taken over by management that is sufficiently different to warrant reexamining the firm's credit.[6]

In the case of banking, a death could represent the takeover of a bank by another bank (recorded simultaneously as a death and an expansion), a major change in ownership and management (recorded simultaneously as a death and a birth), or a true failure (recorded solely as a death). As such, it is an imperfect measure of liquidations of financial institutions. To the extent that takeovers and management changes affect local credit relations, the USELM measure of bank deaths can proxy for the disruption of credit links between borrowers and lenders.

Advantages of the USELM Data

In an exploration of the impact of bank structure on regional development, Bauer and Cromwell (1989) show that the private banking sector appears to be systematically related to firm births. This study, however, is limited by the inadequacy of data on the location of financial institutions. Bank data were obtained from the Federal Financial Institutions Examination Council's Reports on Condition and Income, known as call reports, for 1980. For some financial measures such as total loans, however, it is not possible to determine where the loans were made, even though their dollar value is known. For example, loans made by an Ohio bank to firms in Florida and Ohio are counted in the same way. An additional measurement problem is that a call report for a consolidated banking unit may include data for branches not located in the SMSA. In states that allow branch banking, activity at the branches may be reported solely in the headquarter's SMSA.

In principle, the USELM data report the location and employment levels of banking establishments with a greater degree of accuracy than the call report data, which record bank statistics at the firm (headquarters) level for many establishments (subsidiaries or branches). For example, a bank headquartered in Cincinnati could report data for its Columbus and Dayton branches in its call report, resulting in a distortion of the measured banking activity in Cincinnati. For purposes of the USELM data, however, branches in Columbus and Dayton are recorded as establishments in those SMSAs. Out-of-state ownership of establishments is also recorded, allowing examination of the impact of interstate banking.

Disadvantages of the USELM Data

The USELM data set, while having advantages for this analysis, is not problem free. The major reasons to question the validity of statistics derived from DMI files stem from three characteristics of the underlying data-collection effort. First, the employment figures are self-reported by establishments, usually in telephone interviews. Second, employment figures are not routinely updated; updates are primarily a result of requests for credit checks. Jacobson (1985) reports that substantial lags can occur between the date the file is extracted and the last time the firm was surveyed. Employment statistics are often more than two years out of date, which may lead to infrequent reports for smaller and slower-growing establishments with less need for credit checks, and to delays in picking up shutdowns and status changes for these firms. Third, there are delays in recognizing the creation of new establishments. A business may be in existence three to five years before it is recorded as a birth in the USELM data.

To deal with some of these shortcomings, the Small Business Administration has modified the Dun and Bradstreet data in several ways in constructing the USELM file.[7] Establishments for which employment data were missing were assigned the state-level median employment for organizations in their standard industrial classification (SIC) code. Some 8.7 percent of establishments in finance, insurance, and real estate (FIRE) received estimated employment figures in

■ 6 In practice, a death is identified when a firm appearing in the Dun and Bradstreet file in an initial year does not appear in an end-year file. The reason could be either that the firm was actually closed or that its identifying number was changed as a result of new management. Similarly, a birth is identified by the appearance of a firm in the end-year file. The Small Business Administration uses two-year intervals to track firms

■ 7 See Harris (1983) and Armington and Odle (1983, 1984).

TABLE 1

Bank Employment Share: Small, Midsized, and Large Banks

Bank Size	1980	1982	1984	1986
Type 1: 0 to 100 employees	0.247 (0.277)	0.247 (0.269)	0.256 (0.260)	0.229 (0.224)
Type 2: 100 to 500 employees	0.237 (0.282)	0.232 (0.271)	0.188 (0.206)	0.190 (0.196)
Type 3: More than 500 employees, in-state HQ	0.480 (0.351)	0.486 (0.344)	0.511 (0.308)	0.519 (0.294)
Type 4: More than 500 employees, out-of-state HQ	0.035 (0.127)	0.035 (0.120)	0.046 (0.119)	0.062 (0.145)

NOTE: Numbers are expressed as SMSA means. Standard deviations are in parentheses.
SOURCE: Author's calculations based on USELM data.

1980 (Harris [1983]). Furthermore, when total firm-level employment exceeded the aggregate establishment-level employment data, it was assumed that the number of branches had been underreported. Branches were then imputed from this excess employment according to the average branch size for the particular industry-size classification. In 1980, 17 percent of the establishments in FIRE were imputed. The imputed branches lack geographic information beyond the state, however.

Finally, records that were not updated during the sample period were removed from the data set. The remaining updated records were then weighted to reflect the underlying population. Weights were assigned on the basis of the level of reporting in firm categories based on size, organization type, and industry. Reporting problems within the banking sector led analysts at the Brookings Institution to separate commercial banking from the rest of FIRE, resulting in a much more accurately weighted population in both parts of this sector. The level of reporting problems is higher outside SMSAs than within them (Armington and Odle [1983]), which does not present a problem for the analysis where the SMSA is the unit of observation.

In general, geographic errors from nonreporting of branches appear to be more severe for large firms with several establishments. Errors resulting from records that are not routinely updated and from inaccurate geographic distribution of weighting are more severe for small firms that have infrequent credit checks under the Dun and Bradstreet system. The employment statistics and location of independent midsized firms with few establishments or branches however, appear to be more accurately measured. The midsized firms undergo more frequent credit checks than small businesses and are less likely to be widely distributed geographically. The following estimation presents plausible and significant results for the economic impact of midsized banks on midsized firms, but weaker results for small and large banks. Whether these results are due to the true importance of midsized banks or to measurement error is uncertain, so the findings should be interpreted with caution.

III. Model Specification

This paper assumes that banking employment losses due to bank deaths, as measured in the USELM data, are a reasonable proxy of credit disruptions during restructuring in local banking markets. To control for the direct effects of the job losses of bank employees and the credit effects of restructuring, I use the difference between the impact of bank contractions and bank deaths on local economic activity to identify real economic effects resulting from disruption of credit channels. Data were collected for 217 SMSAs for the periods 1980-82 and 1984-86.[8] The sample was limited to those SMSAs for which complete information was available.

Four types of establishments are identified through an extract of the USELM data base. Type 1 establishments belong to independent firms with fewer than 100 employees—typically single-establishment small businesses. Type 2 establishments belong to independent firms with 100 to 500 employees—midsized firms that may have more than one establishment. Type 3 establishments belong to firms with greater than 500 employees headquartered within the same state. Type 4 establishments belong to firms with greater than 500 employees headquartered out of state.

The percentage of bank employees in the four types of firm categories used in this study (averaged across SMSAs) is given in table 1. The

8 The Small Business Administration's time-series construction of the files compels the use of two-year periods.

TABLE 2

Distribution of Bank Employment by Asset Category, 1980

Asset Class ($ millions)	Number of Banks	Number of Employees	Employees per Bank
0 to 5	874	3,113	3.6
5 to 10	1,937	16,282	8.4
10 to 25	4,662	80,604	17.3
25 to 50	3,553	125,868	35.4
50 to 100	1,972	144,710	73.4
100 to 300	1,156	220,047	190.4
300 to 500	198	79,216	400.1
500 to 1,000	158	112,331	711.0
1,000 to 5,000	157	280,302	1,785.4
5,000 and more	37	419,908	11,348.9

SOURCE: Federal Deposit Insurance Corporation, *Annual Report*, 1980.

TABLE 3

Bank Employment by Asset Category over Time

Asset Class ($ millions)	Employees per Bank		Percent Change
	1980	1986	
0 to 25	13.4	11.3	13.2
25 to 100	49.0	33.3	32.1
100 to 1,000	272.2	150.1	44.9
1,000 and more	3,609.3	2,710.3	24.9

SOURCES: Federal Deposit Insurance Corporation, *Annual Report*, 1980, and *Statistics on Banking*, 1986.

impact of financial restructuring is suggested by changes in these employment categories over time. Employment in small banks declined from an average 24.7 percent in 1980 to 22.9 percent in 1986; employment in midsized banks declined from 23.7 percent to 19.0 percent. Employment in large in-state banks, however, increased from 48.0 percent to 51.9 percent, while employment in out-of-state banks almost doubled, from 3.5 percent to 6.2 percent, reflecting the growing importance of interstate banking.

Bank Employment as a Proxy for Financial Structure

Before concluding that changes in bank employment represent changes in financial structure, one must assess the validity of bank employment as a proxy for bank size, the impact of labor productivity in the banking sector, and changes in the size distribution of banks.

Table 2 reports the distribution of bank employment in 1980 across banks categorized by asset size. In general, the standard definition of a midsized firm as having 100 to 500 employees matches up well with the standard definition of a midsized bank as having assets between $100 million and $1 billion. Average employment per bank ranges from 73 employees for banks in the $50 million to $100 million category to 711 employees for banks in the $500 million to $1 billion category. Similarly, our measures of small and large firms match up with standard definitions of small and large banks.

The data suggest large improvements in labor productivity (measured as employees per bank, controlling for assets) for all bank size categories over the 1980-86 period. As shown in table 3, average employment per bank declined over the period for banks in all asset categories. Decreases ranged from 13 and 32 percent for small banks in the $0 to $25 million and $25 million to $100 million categories, respectively, to 45 percent for midsized banks in the $100 million to $1 billion category. Productivity gains for large banks with assets of greater than $1 billion averaged only 25 percent. Again, our definition of a midsized firm is consistent with the definition of midsized banks, which averaged 150 employees per bank in 1986.

Table 4 reports shifts in the relative importance of small, midsized, and large banks over the 1980-86 period. In general, small banks declined in both number and relative importance, midsized banks were little changed, and large banks increased in importance.

Small banks with less than $25 million in assets constituted 50.8 percent of all banks in 1980 but held only 5.1 percent of all assets. By 1986, they had declined to 34 percent of all banks and their share of assets stood at 2.4 percent. Declines in the share of assets also occurred in banks in the $25 million to $50 million and $50 million to $100 million categories. The number and share of assets of midsized banks were little changed over the 1980-86 period. As a percentage of all banks, those in the $100 million to $300 million category increased from 7.9 percent to 13.4

TABLE 4

Distribution of Banks by Asset Category

Asset Class ($ millions)	Number of Banks	Percent of Banks	Percent of Assets
1980:			
0 to 25	7,473	50.8	5.1
25 to 50	3,553	24.2	6.8
50 to 100	1,972	13.4	7.3
100 to 300	1,156	7.9	9.8
300 to 500	198	1.3	4.1
500 to 1,000	158	1.1	5.8
1,000 and more	194	1.3	61.1
Total	14,704	100.0	100.0
1986:			
0 to 25	4,823	34.0	2.4
25 to 50	3,685	26.0	4.5
50 to 100	2,899	20.4	6.8
100 to 300	1,903	13.4	10.4
300 to 500	334	2.4	4.3
500 to 1,000	216	1.5	5.1
1,000 and more	340	2.4	66.5
Total	14,200	100.0	100.0

SOURCES: Federal Deposit Insurance Corporation, *Annual Report*, 1980, and *Statistics on Banking*, 1986.

TABLE 5

Nonbank Employment Rates: Small, Midsized, and Large Firms

Firm Size	1980	1982	1984	1986
Total employment	0.385	0.385	0.390	0.411
	(0.064)	(0.066)	(0.065)	(0.072)
Type 1: 0 to 100 employees	0.133	0.138	0.130	0.136
	(0.027)	(0.030)	(0.026)	(0.025)
Type 2: 100 to 500 employees	0.056	0.053	0.053	0.053
	(0.017)	(0.016)	(0.015)	(0.014)
Type 3: More than 500 employees, in-state HQ	0.080	0.077	0.077	0.080
	(0.045)	(0.044)	(0.044)	(0.048)
Type 4: More than 500 employees, out-of-state HQ	0.119	0.112	0.110	0.114
	(0.050)	(0.046)	(0.046)	(0.046)

NOTE: Numbers are expressed as SMSA means. Standard deviations are in parentheses.
SOURCE: Author's calculations based on USELM data.

percent, but their share of assets rose only from 9.8 percent to 10.4 percent. Banks in the $300 million to $500 million category increased their share of assets slightly, while those in the $500 million to $1 billion range showed a small decline in asset share. Banks with assets of greater than $1 billion constituted only 1.3 percent of all banks in 1980 but accounted for 61.1 percent of assets. By 1986, the asset share of large banks rose to 66.5 percent.

In general, the changes in bank structure suggested by the employment shifts in table 1 reflect transformations observed in the distribution of banks by asset size. Small banks declined in importance, while large banks gained. The drop of employment in the midsized banks, however, is most likely the result of strong labor productivity gains, which exceeded those of both the small and large banks, rather than a decline in their importance in terms of assets. Bank employment at any particular time, however, does appear to track closely with asset size. Thus, the use of bank employment losses due to bank deaths appears to be a reasonable proxy of credit disruptions. In addition, the definitions of small, midsized, and large firms used here correspond with standard definitions of small, midsized, and large banks.

Dependent Variable and Specification

County-level employment data from the Bureau of Labor Statistics aggregated to the SMSA level are used to measure local economic activity. Bank employment, as reported in the USELM data, is subtracted from the aggregate employment. An alternative proxy for output (personal income) yielded qualitatively similar results to those reported here, but in order to compare total employment rates with the employment rates in firms of various size classes, it is not used. Thus, specifications are also estimated with employment in small, midsized, and large firms (nonbank) as dependent variables. These average employment rates (employment divided by population) are reported in table 5. Total employment rose over the period, which began in recession, from 38.5 percent in 1980 to 41.1 percent in 1986. Employment in small and midsized firms was essentially flat. Employment in large firms headquartered within the state changed little over the period, as did employment in out-of-state firms.

The effects of bank deaths on local economic activity are estimated using regression

TABLE 6

Summary Statistics: Independent Variables

WAGE	9.256	*CONTRACT* 1	0.011
	(1.875)		(0.035)
TAX	0.404	*CONTRACT* 2	0.014
	(0.038)		(0.047)
EXPAND 1	0.033	*CONTRACT* 3	0.034
	(0.073)		(0.075)
EXPAND 2	0.020	*CONTRACT* 4	0.005
	(0.055)		(0.034)
EXPAND 3	0.057	*DEATH* 1	0.020
	(0.151)		(0.056)
EXPAND 4	0.009	*DEATH* 2	0.011
	(0.101)		(0.046)
BIRTH 1	0.015	*DEATH* 3	0.040
	(0.032)		(0.110)
BIRTH 2	0.025	*DEATH* 4	0.001
	(0.068)		(0.004)
BIRTH 3	0.099		
	(0.302)		
BIRTH 4	0.024		
	(0.173)		

NOTE: Numbers are expressed as SMSA means. Standard deviations are in parentheses.
SOURCE: Author's calculations based on USELM data.

analysis. The dependent variable is the employment rate at the end of the period. (Using employment levels and including population as an independent variable yielded similar results, as did using changes in employment and changes in employment rates.)

The following measures potentially affecting employment growth are included as independent variables:

1) *LWAGE* = average (log) wage of production workers in the SMSA as measured by the Census of Manufacturers.

2) *TAX* = effective corporate tax rate for the state.

3) *DUM*86 = a dummy variable equaling 1 for the 1984-86 period.

4) *BIRTH* 1-4 = percent change in banking employment due to the births of banks of types 1 through 4.

5) *EXPAND* 1-4 = percent change in banking employment due to the expansion of banks of types 1 through 4.

6) *CONTRACT* 1-4 = percent change in banking employment due to the contraction of banks of types 1 through 4.

7) *DEATH* 1-4 = percent change in banking employment due to the deaths of banks of types 1 through 4.

8) lagged employment rates.

The means and standard deviations for these variables are given in table 6. Financial restructuring is measured by the percent change in bank employment due to births, expansions, contractions, and deaths (*BIRTHi, EXPANDi, CONTRACTi,* and *DEATHi; i* = 1, ...4) for banks of types 1 through 4. Note that the credit-disruption hypothesis cannot explain why an expansion or birth of a bank would have an effect on nonbank employment. All components of change in banking are included for completeness, however. In particular, the expansion and contraction variables appear separately in case the multiplier effect of changes in bank employment on local economies is not symmetric. Differences in the estimated coefficients of *CONTRACT* and *DEATH* variables are meant to measure the impact of credit disruptions. On average, 2.0, 1.1, 4.0, and 0.1 percent of SMSA bank employment is lost over a two-year period, due to deaths of bank types 1 through 4, respectively.

As suggested in the literature on firm location, wages and tax rates are included to control for their impact on economic growth. A dummy variable for the 1984-86 period controls for any fixed effect associated with this period of economic expansion.

Following previous empirical studies, the specification includes lagged values of the dependent variables as independent variables to control for the possibility of a spurious relationship between bank deaths and employment. Suppose the causality between bank deaths and employment actually runs from employment to bank deaths. Banks tend to close after periods of relatively slow regional economic growth. If the lagged values of the dependent variables were not included as independent variables, the coefficients on the bank death variables would tend to be negative and significant even if bank deaths had no true effect on employment. The regression results thus indicate whether lagged bank deaths explain employment after accounting for employment in the past year.

Timing problems in the data make it impossible to entirely discount a spurious correlation.

The dependent variables are 1) overall employment data for the SMSA—an average rate for the ending year—and 2) employment rates for various-sized firms reported in the USELM data, based on end-of-calendar-year employment. The bank death data are employment changes due to deaths that occur in the two-year period from December of the beginning year to December of the ending year. The lagged dependent variables are employment rates at the beginning and middle of the two-year period. Bank deaths at the end of the two-year period (part of our independent variable) are thus potentially caused by adverse economic conditions at the end of the period (our dependent variable).

To explore the simultaneity problem further, however, we examine the effect of bank deaths on economic activity in the year following the two-year period. We also examine the impact of economic conditions at the beginning of the period on bank deaths. Finally, we test whether our results are driven by adverse shocks occurring in the oil states. The results, while not conclusive, suggest that our measure of the impact of banks deaths on regional activity is not being driven by simultaneous-equation bias.

IV. Estimation Results

The model was estimated on the pooled sample of 434 observations using ordinary least squares, which are presented in table 7.

Model 1 (in column 1), which uses the total employment rate as the dependent variable, suggests that high wages have a negative impact on total employment, while taxes have no significant effect. Lagged employment rates have a significant effect, as does the 1984-86 dummy variable.

The expansion and births of large in-state banks (*EXPAND* 3 and *BIRTH* 3) have a small but statistically significant effect on nonbank employment. The coefficient on *EXPAND* 3 is 0.012 and is significantly different from zero at the 95 percent confidence level, which indicates that a 10 percent increase in bank employment from the expansion of large banks raises the nonbank employment rate by 0.12 percentage point. A 10 percent increase from the birth of large banks raises the employment rate by 0.07 percentage point.

The contraction of bank employment (*CONTRACT* 1 through *CONTRACT* 4) does not have a statistically significant effect on nonbank employment for any of the bank types. The death of midsized banks (*DEATH* 2), however, has a statistically significant negative effect on the nonbank employment rate. The estimated coefficient is -0.053 with a standard error of 0.020, suggesting that a 10 percent decrease in bank employment from the death of midsized banks reduces the nonbank employment rate by 0.53 percentage point. Given that the average employment rate in the sample is 39.8 percent, this represents a drop in nonbank employment of 1.3 percent. The estimated coefficient for midsized bank contraction (*CONTRACT* 2) is -0.004 and is statistically not significantly different from zero. The difference between the estimated coefficients of *DEATH* 2 and *CONTRACT* 2 suggests that the effect of midsized bank deaths on employment is almost entirely due to credit disruptions as opposed to the multiplier effect of lost bank jobs. An F-test rejects the hypothesis that the coefficients are identical at the 90 percent confidence level.

The coefficients for *DEATH* 3 and *DEATH* 4 are negative, and the coefficient for *DEATH* 1 is positive, but all are statistically insignificant. These insignificant effects for deaths of types 1, 2, and 3 banks could result from the relative importance of midsized banks to local economies, from a difference in the type of deaths they represent (for example, small-bank deaths being takeovers rather than true failures), or from the relative accuracy of the midsized bank data previously discussed. Results should thus be taken as positive evidence for the importance of midsized banks, rather than as evidence for the lack of importance of small and large banks.

To investigate further the local economic impact of bank deaths, the model was reestimated with the small-, midsized-, and large-firm employment rates as dependent variables in models 2, 3, and 4, respectively (shown in columns 2, 3, and 4 of table 7). In model 2, the expansion of midsized banks has a positive effect on small-business employment, while the contraction of small banks has a negative effect. Bank deaths do not have a significant effect on small businesses, which is contrary to the common view that small firms are the first to suffer the effects of a credit crunch. It is possible, however, that these firms, many of which are relatively new or small "mom-and-pop" operations, rely more on informal sources of capital—such as loans from friends and relatives, retained earnings, and personal savings—than on funds from commercial banks. This would make small firms less likely to be affected by bank deaths. It

TABLE 7

Regression Results: Impact of Financial Restructuring on Employment Rates

Coefficient	(1) Total Employment Rate	(2) Small-Firm Employment Rate	(3) Midsized-Firm Employment Rate	(4) Large-Firm Employment Rate
LWAGE	-0.013[a]	0.001	-0.001	0.005
	(0.005)	(0.001)	(0.001)	(0.004)
TAX	0.029	0.003	0.0002	0.038[a]
	(0.024)	(0.007)	(0.0060)	(0.018)
EXPAND 1	0.009	0.0002	-0.005	0.001
	(0.013)	(0.0038)	(0.003)	(0.010)
EXPAND 2	0.002	0.010[a]	-0.003	0.011
	(0.017)	(0.005)	(0.004)	(0.013)
EXPAND 3	0.012[a]	0.002	-0.0002	0.004
	(0.006)	(0.002)	(0.0015)	(0.005)
EXPAND 4	-0.009	0.002	0.006[a]	-0.007
	(0.009)	(0.003)	(0.002)	(0.007)
BIRTH 1	-0.032	-0.006	-0.002	-0.009
	(0.031)	(0.009)	(0.008)	(0.023)
BIRTH 2	-0.001	0.003	-0.001	-0.004
	(0.014)	(0.004)	(0.003)	(0.010)
BIRTH 3	0.007[a]	0.001	0.0005	0.004[b]
	(0.003)	(0.001)	(0.0008)	(0.002)
BIRTH 4	-0.002	-0.002	0.001	0.003
	(0.005)	(0.002)	(0.001)	(0.004)
CONTRACT 1	-0.030	-0.013[b]	-0.009	-0.016
	(0.027)	(0.008)	(0.007)	(0.020)
CONTRACT 2	-0.004	-0.002	-0.004	-0.025[b]
	(0.019)	(0.006)	(0.005)	(0.014)
CONTRACT 3	0.007	0.002	-0.004	0.003
	(0.012)	(0.004)	(0.003)	(0.009)
CONTRACT 4	0.017	-0.001	-0.0003	0.011
	(0.028)	(0.008)	(0.0070)	(0.021)
DEATH 1	0.022	0.002	-0.001	0.005
	(0.017)	(0.005)	(0.004)	(0.013)
DEATH 2	-0.053[a]	-0.006	-0.017[a]	0.001
	(0.020)	(0.006)	(0.005)	(0.015)

is also possible that these results are driven by the errors in the data for small firms discussed above.

The impact of financial restructuring on midsized firms is measured in model 3. Midsized firms are more likely to rely on local commercial banks than on national credit markets (such as with large firms) or on informal sources of capital (such as with small firms); see Elliehausen and Woken (1990). They are thus more likely to be affected by stress in the financial sector. The results support this conclusion. The estimated coefficient for *DEATH* 2 is -0.017 with a t-statistic of 3.40, indicating that a 10 percent decrease in bank employment from bank deaths reduces the employment rate of midsized firms by 0.17 percentage point. With an average employment rate of 5.3 percent, this represents a 3.2 percent drop in midsized firms' employment. Again, an F-test rejects at the 90 percent confidence level the hypothesis that the coefficient for *DEATH* 2 equals the coefficient for *CONTRACT* 2.

TABLE 7 continued

Regression Results: Impact of Financial Restructuring on Employment Rates

Coefficient	(1) Total Employment Rate	(2) Small-Firm Employment Rate	(3) Midsized-Firm Employment Rate	(4) Large-Firm Employment Rate
DEATH3	-0.002	0.003	-0.003	-0.005
	(0.009)	(0.002)	(0.002)	(0.006)
DEATH4	-0.008	0.020	-0.062	0.026
	(0.254)	(0.074)	(0.063)	(0.189)
CONSTANT	0.036[a]	-0.002	0.002	-0.040[a]
	(0.016)	(0.005)	(0.004)	(0.012)
DUM86	0.010[a]	-0.002[a]	0.002[a]	0.007[a]
	(0.002)	(0.001)	(0.001)	(0.002)
EMPRTB	1.624[a]	0.308[a]	0.047[a]	0.001
	(0.088)	(0.026)	(0.022)	(0.066)
EMPRTA	-0.697[a]	-0.291[a]	-0.036	0.031
	(0.092)	(0.027)	(0.023)	(0.069)
SEMPRTA	—	0.975[a]	—	—
	—	(0.013)	—	—
MEMPRTA	—	—	0.885[a]	—
	—	—	(0.019)	—
GEMPRTA	—	—	—	0.970[a]
	—	—	—	(0.017)
Log likelihood	1122.7	1661.8	1726.3	1250.9
R^2	0.933	0.965	0.912	0.912
Mean of the dependent variable	0.398	0.137	0.053	0.079
Number of observations	434	434	434	434

a. Significant at the 95 percent confidence level.
b. Significant at the 90 percent confidence level.
NOTE: Numbers are expressed as estimated coefficients. Standard errors are in parentheses.
SOURCE: Author's calculations.

The impact of midsized bank deaths on midsized firms is small but statistically significant. This result is plausible because these firms are most likely to rely on local banks and because midsized commercial banks are more likely to concentrate on lending to such firms. This finding controls for lagged total employment rates and for the lagged midsized-firm employment rate. A spurious correlation is still possible, however, if these lagged measures are inadequate controls due to timing problems in the data.

Model 4 measures the impact of financial restructuring on large firms. These firms are more likely to have access to national credit markets and thus may be less affected by local restructuring. The results suggest that the expansion or birth of large banks has a positive impact on large-firm employment, while the contraction of midsized banks has a negative impact. These findings are significant at the 90 percent confidence level, but not at the 95 percent level, implying that changes in local bank structure do not have powerful effects on large firms.

To explore the robustness of the results and the potential for simultaneous-equations bias, other specifications of the model were also tested. First, the employment rate in the year following the two-year period used in the USELM

file was used as a dependent variable, with lagged employment rates for the beginning, middle, and end of the period included as independent variables. The estimated coefficient on *DEATH 2* was -0.013 (compared with an estimated coefficent of -0.053 in model 1) with a t-statistic of 1.024. This smaller (and statistically insignificant) effect suggests that either the effect of bank deaths dampens out quickly over time, or that the original result was driven by simultaneity bias. This specification, however, allows bank deaths to have an effect up to three years after they occur. Such long-term influences of credit disruptions are unlikely if banking markets are competitive.

Second, the impact of local economic conditions on bank deaths was explored by using midsized bank deaths as a dependent variable and the beginning-of-period economic conditions as an independent variable. The economic conditions (total employment rates and employment rate of midsized firms) had no explanatory effect on *DEATH 2*. (T-statistics of the economic variables in various specifications were never larger than 0.50.) This suggests that bank deaths were not statistically driven by our measures of local economic conditions.

Finally, robustness of the results was tested by including geographic dummy variables to control for effects from economic distress in oil-producing states, which had an especially large number of bank failures. In particular, we tested whether the findings were solely due to bank failures in Oklahoma, Louisiana, and Texas between 1984 and 1986. Controlling for these states did not affect the results. The coefficient on *DEATH 2* in model 1 remained above -0.040 in the various specifications tested, and the t-statistic did not fall below 2.60.

In sum, the structure of the data in this experiment does not permit standard tests of Granger causality or simultaneity bias. The alternative specifications tested, however, suggest that the results are not being driven by the occurrence of bank deaths in economically distressed states or by any obvious feedback of economic conditions on bank deaths.

V. Conclusion

Restructuring of the financial sector in the form of bank mergers, failures, or takeovers potentially affects investment and consumption decisions by disrupting the links between borrowers and creditors. Empirical evidence at both the macro and regional levels has shown that financial structure and stress can have real economic effects.

This paper further explores the impact of financial restructuring on local economies using a data set that measures change in the local banking sector by the birth, expansion, contraction, and deaths of banks at the metropolitan level.

The empirical analysis suggests that, controlling for overall financial restructuring and lagged economic activity, the deaths of midsized banks—employing between 100 and 500 employees—have a negative but short-lived impact on local economic activity. Furthermore, employment in other midsized firms appears to be most directly affected by these deaths. These firms presumably rely on local banking markets and are the most likely customers of midsized banks. The results are robust across several specifications.

The strongest effects of bank deaths are found for midsized banks and firms, but this should not be interpreted to mean that the deaths of small and large banks have no effect. Measurement problems, which exist for all size categories, are least severe for midsized banks and firms, which can account for the statistical significance of these results and the statistical insignificance of the results for the other two types. Nonetheless, the results suggest that midsized banks are an important source of funds for midsized firms and that a disruption of this link through financial restructuring can have negative short-run local economic effects.

The effects of credit disruption appear to be short run. In particular, the impact of bank deaths on employment rates appears to die out after two years. One would expect such a result if banking markets were competitive and contestable. In such markets, firms that found their source of credit disrupted by a bank death would quickly be able to establish credit relations with another institution. Thus, the results presented here, while consistent with the credit-view theory that disruption in financial markets can have real effects, also suggest that these effects are short-lived, as one would expect in a competitive environment.

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