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Are Some Agricultural Banks Too Agricultural?

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By several financial performance measures, agricultural banks are some of the strongest financial institutions in the country. Compared with nonagricultural banks of similar size, agricultural banks are both well-capitalized and profitable. Accordingly, it has been several years since policymakers have been concerned about the performance of agricultural banks. This is in marked contrast to the situation that prevailed about a decade ago when high and rising inflation, a sharp recession, falling farmland prices, record debt levels, and declining farm exports all contributed to large numbers of agricultural bank failures.

Banks can limit their chances of failure by diversifying their loan portfolios so that their losses resulting from adverse conditions in any sector of the economy do not exceed their capital. Agricultural banks' limited portfolio diversification opportunities may have been the cause of many agricultural bank failures in the 1980s.¹

Has the banking industry reduced its vulnerability to a downturn in the agricultural sector? Although the degree of specialization in agricultural lending has declined since the early 1970s, several hundred agricultural banks are as susceptible to adverse changes in the farm economy as those that failed in the 1980s. Despite the strong financial condition of most of these banks, they and the Federal Deposit Insurance Corporation (FDIC)

remain vulnerable to a major downturn in the agricultural sector.

In this article we first examine the distinguishing characteristics of agricultural banks and then look at the financial performance measures of agricultural banks and two classes of nonagricultural banks since 1970. Finally, we assess whether the agricultural banking industry is prone to another wave of bank failures should another farm crisis arise.

CHARACTERISTICS OF AGRICULTURAL BANKS

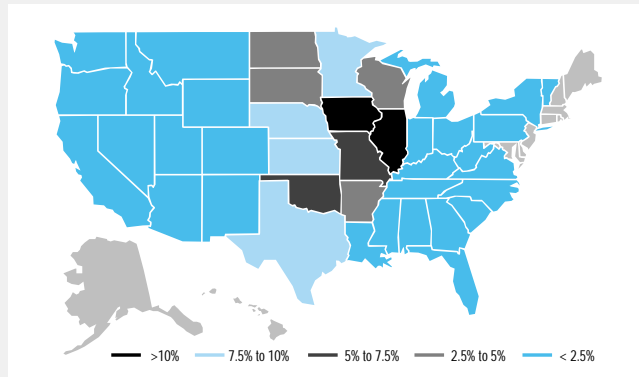
The definition of an agricultural bank is rather arbitrary. Generally, an agricultural bank is identified as a commercial bank whose ratio of agricultural loans (real estate and production loans) to total loans is greater than the unweighted mean for all commercial banks. In calculating this unweighted mean, the agricultural loan ratio of each bank gets an equal weight, irrespective of the bank's size. That unweighted mean fell from 25.5 percent in 1970 to 16.6 percent in 1989, but climbed to 17.9 percent in 1994. Among agricultural banks themselves, the percentage of loans to farmers has declined over time, offset by a small increase in recent years. The concentration of loans in the agricultural sector has declined since 1970 among the agricultural banks themselves. The mean ratio of agricultural loans to total loans among agricultural banks was 50.8 percent in 1970. That ratio declined to 41.6 percent in 1987, but has since rebounded to 43.6 percent in 1994.

Farm banks' agricultural loan portfolios are about evenly distributed between farm real estate loans and production loans. For example, in fourth quarter 1994, 52.7 percent of all agricultural loans at farm banks were classified as secured by farmland. Proceeds of loans secured by farmland are used not only to buy land, but also for capital improvements, purchases of farm

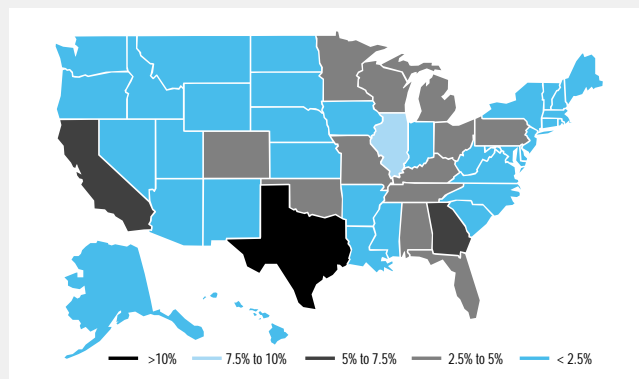
¹ Gilbert and Belongia (1988) found that the ratios of agricultural loans to total assets among rural banks depend on the size of the parent organizations. Rural banks in larger organizations tended to have lower ratios of agricultural loans to assets. They interpreted this result as evidence of the limited opportunities of small, rural banks in small organizations to diversify their assets. Belongia and Gilbert (1990) present evidence of the effects of asset composition on agricultural bank failures.

Figure 1

Distribution of Agricultural Banks in the United States (1994)



Distribution of Small Nonagricultural Banks in the United States (1994)



machinery and livestock, and to cover farm production costs. The other category of agricultural loans, termed *production loans*, offset variable agricultural expenses, such as the planting and harvesting of crops.

Where Agricultural Banks Are Located

Not surprisingly, agricultural banks tend to be clustered in states where agricultural production represents a significant percentage of the state's economy. The upper part of Figure 1, from December 1994, shows that more than half of farm banks were located in six states: Iowa (12.3 percent), Illinois (10.2 percent), Texas (9.3 percent), Kansas (9.3 percent),

Minnesota (9.2 percent), and Nebraska (8.5 percent). By contrast, small, nonagricultural banks—usually termed *peer banks* for comparison purposes—are more dispersed across the country, although Texas and Illinois also have a considerable number of these banks.²

The six states with the largest share of farm banks are also ranked in the top 10 in terms of the total sales of agricultural products. For example, the U.S. Department of Agriculture (1994) reports that Texas, Iowa, Nebraska, Illinois, Kansas, and Minnesota rank numbers two through seven, respectively.³

Two interesting exceptions are California and Florida. Despite being the largest agricultural producer, California has only 15 small agricultural banks. Florida, the eighth largest agricultural producer, has only 12. This suggests that, contrary to patterns in midwestern agricultural-producing states, larger banks, which have lower concentrations of agricultural loans than those classified as agricultural banks, finance most of California's and Florida's agricultural production. This should not be surprising because a significant percentage of agricultural production in these two states is devoted to labor-intensive, high-value crops like fruits and vegetables, grown mostly by large producers. In addition, California has long permitted statewide branch banking. Branches of large banks in California therefore fulfill the roles in farm communities that much smaller banks do in many other states.

Balance Sheet Characteristics

Besides their geographical differences, agricultural and nonagricultural banks also tend to have distinctly different balance sheets. Table 1 depicts balance sheet characteristics for three classes of banks: (1) agricultural banks with total assets less than \$500 million; (2) small, nonagricultural banks with assets less than \$500 million (*peer banks*); and (3) medium-size, nonagricultural banks (often in urban and suburban areas) with assets between

² *Peer banks* are those with total assets less than \$500 million and ratios of agricultural loans to total loans less than the unweighted mean for all banks.

³ State rankings of farm marketings are based on 1994 data.

\$500 million and \$1 billion.

The average agricultural bank as of June 30, 1994, had total assets of \$44.9 million—\$57.6 million less than peer banks and \$656 million less than medium-size, nonagricultural banks. Agricultural loans constituted about 23 percent of total assets at an average agricultural bank, compared with about 2 percent at small, nonagricultural banks and about 1 percent at medium-size, nonagricultural banks.

Agricultural banks tend to hold lower percentages of their assets in cash than their nonagricultural counterparts. They also hold higher percentages of their assets in securities and lower percentages in loans. One explanation for the lower loan-to-asset ratio at farm banks involves limited opportunities to diversify the credit risk of their loan portfolios. To limit their chances of failure, agricultural bankers keep the percentages of assets invested in loans low, investing remaining noncash assets in securities that have a lower default risk than agricultural loans. Nonagricultural banks, with greater opportunities to diversify the credit risk in their loan portfolios, can operate safely with higher loan-to-asset ratios.

During some periods agricultural banks have had serious financial problems. This was demonstrated clearly during the early to mid-1980s when agricultural banks, mirroring the deterioration in the farm economy, began to experience financial distress not seen since the Great Depression. The shaded insert (p.26), “The Farm Sector’s Boom and Bust Years,” summarizes this period. As the farm economy worsened in the 1980s, the asset quality of agricultural banks steadily deteriorated. Plummeting farmland prices, declining commodity prices, and increasing input costs put the squeeze on both farmers and their creditors. Falling income undermined the ability of farmers to repay their debts, and falling land prices reduced the value of collateral that farmers had pledged to their creditors.

Agricultural banks’ fortunes have improved dramatically since the troubled 1980s. This turnabout, not surprisingly,

Table 1

Balance Sheet Characteristics—1994¹

Percentage of Total Assets

	Agricultural	Small Nonagricultural	Medium-size Nonagricultural
Cash	0.9%	1.5%	2.7%
Securities	37.5	31.2	28.3
Loans	52.4	56.1	59.8
Agricultural	22.8	2.1	1.1
Equity	10.5	9.6	8.3

Percentage of Total Liabilities

Deposits	97.0%	96.4%	88.4%
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Other Characteristics

Asset Size (\$ millions)	\$44.9	\$102.5	\$700.9
Number of Banks	3,685	6,323	247

¹ As of June 30, 1994. Categories of assets defined as a percentage of total assets; deposits expressed as a percentage of total liabilities; equity capital expressed as a percentage of total assets. Securities are marked at market value rather than book value. Credit card banks are deleted from the sample.

Comparisons of balance sheet ratios are based on data for June 30 for two reasons. First, the balance sheets of agricultural banks have distinct seasonal patterns. Agricultural production loans for each year generally are made by June. By December, however, many of those loans have been repaid. Second, many banks engage in window dressing their year-end balance sheets. Use of second quarter data prevents those effects.

Source: FDIC Call Report data.

coincides with the return of financial stability to the farm sector: The debt-to-asset ratio, after reaching an all-time high of 0.23 in 1985, fell to 0.16 in 1993—the lowest level since 1964. Similarly, the rate of return on farm assets equaled 4.9 percent in 1994, down from 5.3 percent in 1993, but still up substantially from the average 5.2 percent *negative* rate of return that prevailed from 1980 to 1986.⁴

PAST AND PRESENT FINANCIAL PERFORMANCE

From the Great Depression to 1980, farm bank failures—indeed, all bank failures—were comparatively few and far between. Table 2 (p.27) shows that since 1981, failures at agricultural banks have exhibited a bell curve-like pattern, with

⁴ The rate of return on farm assets measures the rate of return on assets from current farm income and real capital gains (USDA, forthcoming).

THE FARM SECTOR'S BOOM AND BUST YEARS

The financial performance of agricultural banks tends to mirror that of the farm sector because loan demand typically rises with farm income (as do bank profits). But when the farm economy experiences downturns, agricultural banks tend to experience sharp increases in nonperforming loans and loan losses. This pattern occurred during the boom and bust period of the 1970s and 1980s.¹

Farm income began rising rapidly in the early 1970s. Aggregate farm prices, reflecting a significant increase in the demand for farm commodities, rose 58 percent from 1971 to 1973. During this period, the prices farmers paid rose by 28.1 percent, less than half the rate of the increase in prices they received. By 1973 real farm income thus reached a record high of \$92.1 billion, nearly double the \$48.4 billion reached three years earlier.² Subsequently, real farm income began to drop—although from 1972 to 1975 it averaged well above that which prevailed over the previous decade.

The prosperous years, however, helped to sow the seeds of the troubled 1980s. The value of farm assets (largely farmland) began to rise at phenomenal rates beginning in the early 1970s. At the same time, real farm business debt began increasing at substantial rates. Rising farm incomes and speculative behavior by farmers and investors to counter the corrosive effects of high and rising inflation caused the average price of an acre of farmland to rise to a record high in 1981.

It was clear by 1981 that the financial imbalances that accrued during the mid-to-late 1970s were unsustainable. In addition, the farm sector was reeling from the effects of the 1979 oil crisis that precipitated a near tripling of oil prices between 1978 and 1981. Also contributing to the downturn, the domestic and worldwide demand for U.S. farm products was falling because of the rising value of the dollar and the 1981-82 worldwide recession. The predictable result was a fall in farm prices and income. Real farm income fell 52.6 percent in 1980 to \$22.8 billion; by 1983, farm income had fallen much further, totaling just \$8.2 billion—a far cry from the record high reached 10 years earlier.

¹ Belongia (1986) discusses the causes of the farm crisis during the 1980s.

² Real farm income (RFI) is expressed in 1992 dollars and refers to farm proprietors' income measured in the National Income and Product Accounts and adjusted for inventory changes and depreciation of fixed capital. RFI is a nominal series (current dollars) deflated by the GDP chain-type price index.

few failures in the early 1980s and early 1990s, but many during the intervening period. Agricultural bank failures represented a large share of all the banks that failed from 1984 to 1987: Of the 548 banks that failed, nearly 43 percent (234) were farm banks. During the late 1980s, however, when the largest number of bank failures occurred, the farm bank percentage was substantially smaller.

The timing of failures among agricultural banks, coming several years after the peak in farmland prices, reflects the capacity of equity to absorb losses. Initially, farmers'

and their bankers' equity absorbed losses generated by dwindling farm incomes and falling land prices. Eventually, however, the losses overwhelmed the equity accumulated during prosperous years.

The Bank Insurance Fund (BIF) incurs losses when banks fail. Table 3 lists total BIF losses for the years 1981-94, the years for which the number of agricultural bank failures are available. The BIF incurred its largest losses between 1988 and 1992. During this five-year period, BIF losses averaged just under \$5.5 billion per year, an average loss per bank of \$33.8 million.

By contrast, during the period when agricultural bank failures were the greatest (1984-87), BIF losses were substantially less—both in terms of absolute losses and average loss per bank. From 1984 to 1987, BIF losses averaged less than \$1.6 billion per year. Moreover, the average loss per bank was just \$12.4 million. This difference in the average loss to the FDIC per bank failure reflects the fact that agricultural banks are relatively small, as shown in Table 1. Thus, the average loss per failed bank was relatively low during the years when agricultural banks accounted for large shares of total bank failures.

Focusing on the number of farm bank failures in the 1980s belies the strong financial performance of the agricultural banking sector over time compared with that of their nonagricultural counterparts. Except during periods of financial distress in the farm sector, small agricultural banks have generally outperformed their urban counterparts by several measures. Figure 2 (p.28) indicates that over most of the period since 1970, net income as a percentage of total assets has been higher for agricultural banks than for their peer banks or medium-size nonagricultural banks. Table 4 (p.29), which lists various financial performance measures for these three classes of banks, also illustrates stronger financial performance for agricultural banks except in their troubled years of 1984-87.⁵

Somewhat surprisingly, agricultural bank equity capital ratios were higher in the midst of the farm crisis than they were when farm incomes were rising to record levels. The large number of agricultural bank failures from 1984 through 1987 eliminated those banks that had operated with relatively low capital ratios, limiting the effects of problems in the agricultural sector on the mean capital ratio of the surviving banks.

The relatively high profits of agricultural banks in most years may appear surprising since these banks have limited investment opportunities and typically face higher loan delivery costs. Ellinger and Barry (1991) found that agricultural loan delivery

Table 2

Bank Failures: 1981-94

Year	Agricultural Banks	All Banks	Percentage of Agricultural Bank Failures
1981	1	10	10.0%
1982	11	42	26.2
1983	7	48	14.6
1984	32	79	40.5
1985	68	120	56.7
1986	65	145	44.8
1987	69	203	34.0
1988	36	221	16.3
1989	22	207	10.6
1990	17	169	10.1
1991	8	127	6.3
1992	7	122	5.7
1993	5	41	12.2
1994	0	13	0
1981-94 Total	348	1,547	22.5

Source: Board of Governors of the Federal Reserve System and the Federal Deposit Insurance Corporation.

Table 3

Total Bank Insurance Fund Losses and Average Loss Per Bank—1981-94

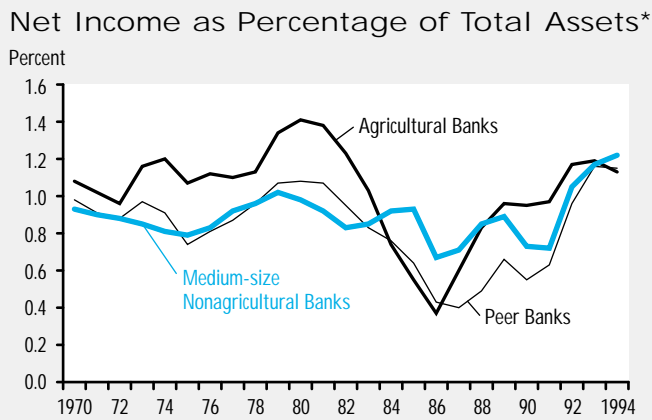
Year	BIF Losses (\$ millions)	Average Loss per Bank (\$ millions)
1981	\$776.16	\$77.62
1982	1,148.34	27.34
1983	1,418.59	29.55
1984	1,497.44	18.72
1985	1,098.55	9.15
1986	1,721.76	11.87
1987	2,007.34	9.89
1988	6,720.74	30.41
1989	6,272.81	30.30
1990	2,855.92	16.90
1991	6,739.39	53.07
1992	4,694.75	38.48
1993	570	13.90
1994	139.02 ¹	10.69

¹ Estimate.

Source: Federal Deposit Insurance Corporation.

⁵ Data in Table 4 for each bank are averaged throughout each year, rather than using Call Report data for a particular quarter of each year. Such averaging is particularly important in a study of agricultural banks because their seasonal fluctuations in loans and total assets tend to be relatively large. For example, calculation of a bank's agricultural loans for 1994 gives a weight of 1/8 to the observation for December 1993; weights of 1/4 each to the observations for March, June, and September 1994; and a weight of 1/8 to that for December 1994. For this reason, the number of agricultural banks noted in Table 4, and denoted throughout the paper, differ from the number reported in Table 1, which uses the number of observations at a single point in time (June 30, 1994).

Figure 2



*Total assets are indexed backwards based on total assets in the entire industry.

costs (the sum of labor expenses and information retrieval and processing costs) at small banks (those having less than \$50 million in deposits) was 2.3 percent of loan volume; whereas the cost at banks having assets greater than \$50 million was 1.7 percent. They also report that small banks (those having less than \$50 million in deposits) had marginally lower deposit costs because these banks generally have little competition for deposits. An examination of the average interest rate paid on nontransaction deposits between 1984 and 1993, however, shows that agricultural banks, except from 1988 to 1990, tended to pay on average about 31 basis points *more* than peer banks. The spread vs. medium-size, nonagricultural banks was somewhat more—48 basis points. The puzzle therefore is why agricultural banks tend to be more profitable. Perhaps one reason is that—except during the debt-crisis years—the share of nonperforming loans (which directly reduce profitability) at agricultural banks is usually considerably less than at nonagricultural banks.

AGRICULTURAL BANKS AND PUBLIC POLICY

Agricultural bank performance in the 1980s indicates a vulnerability to sharp downturns in the agricultural sector. Agri-

cultural banks' current strong financial performance does not eliminate that vulnerability. Many agricultural banks with similarly strong performance in the 1970s eventually failed in the 1980s. This section considers the public policy issues raised by the existence of many small banks with high percentages of their assets invested in agricultural loans.

Is There a Social Mandate for Agricultural Lending by Banks?

The existence of many small banks that specialize in agricultural lending may be one manifestation of a mandate for channeling credit to farmers. Formation of the Farm Credit System and the Farmers Home Administration reflects such a mandate from Congress.⁶ In addition, the federal government may have decided that the social benefits of agricultural lending by banks outweigh the costs in terms of exposure of the FDIC to potential losses due to the undiversified loan portfolios of insured banks. In that case, the existence of many small banks with high percentages of their loans invested in agricultural loans would not reflect a problem for banking supervision and regulation, but merely the result of a policy to favor such banking.

Congress reaffirmed its mandate to channel credit to the agricultural sector by enacting the Agricultural Credit Act of 1987 (ACA), which recapitalized the Federal Farm Credit System after it suffered massive losses because of the farm debt crisis.⁷ Embedded within the ACA was the mechanism to create the Federal Agricultural Mortgage Corporation (Farmer Mac), which allows financial institutions to sell certain agricultural and rural housing loans in a secondary market.

Since the ACA was enacted, there have been numerous changes in bank regulations. To our knowledge, however, there have been no additional attempts explicitly to channel credit to agricultural producers through depository institutions. Moreover, there have been no policy directives from bank supervisors that provide unusual dispensation from normal regulatory com-

⁶ Although this mandate to channel credit to the agricultural sector may simply reflect the Jeffersonian commitment to farmers, other reasons may be at the root of this mandate. For example, see Calomiris and Himmelberg (1994), who argue that inadequate credit may exist in a rural economy because of an information asymmetry—a capital market failure that does not allow lenders to assess properly their risk exposure. Presumably, the advent of the Farm Credit System was an attempt to mitigate the effects of these information asymmetries.

⁷ For a discussion of the effects of the farm debt crisis on the Federal Farm Credit System, see Belongia and Gilbert (1985), the Federal Reserve Bank of Chicago (1985), and the General Accounting Office (1986). For a discussion of the Agricultural Credit Act of 1987, see the series of papers in the *Journal of Agricultural Lending* (1988).

Table 4

Condition of Banks 1970-94¹

Year	Percentage with Negative Net Income			Equity as Percentage of Total Assets			Nonperforming Loans Less Loan Loss Reserves as a Percentage of Total Assets		
	Agricultural Banks	Small Nonagricultural Banks	Medium Nonagricultural Banks	Agricultural Banks	Small Nonagricultural Banks	Medium Nonagricultural Banks	Agricultural Banks	Small Nonagricultural Banks	Medium Nonagricultural Banks
1970	1.17	2.48	1.33	9.03	8.40	7.32	NA ²	NA	NA
1971	1.62	3.19	1.52	8.85	8.19	7.02	NA	NA	NA
1972	1.14	3.71	0.80	8.51	7.94	6.83	NA	NA	NA
1973	0.47	3.62	1.99	8.09	7.9	6.71	NA	NA	NA
1974	0.67	5.38	3.20	8.13	8.29	6.83	NA	NA	NA
1975	1.89	9.13	4.20	8.23	8.61	6.9	NA	NA	NA
1976	1.47	8.39	3.99	8.57	8.75	7.27	NA	NA	NA
1977	1.62	6.64	0.75	8.77	8.52	7.17	NA	NA	NA
1978	1.45	5.03	2.28	8.80	8.41	7.02	NA	NA	NA
1979	1.03	4.12	0.78	9.04	8.61	7.14	NA	NA	NA
1980	1.07	4.57	2.23	9.35	8.79	7.23	NA	NA	NA
1981	2.19	6.09	2.94	9.51	8.98	7.28	NA	NA	NA
1982	4.06	8.51	6.27	9.45	8.00	7.25	NA	NA	NA
1983	7.44	10.45	5.63	9.61	9.06	7.04	1.06	1.10	0.98
1984	13.55	11.70	3.88	9.59	8.94	6.98	1.40	1.02	0.86
1985	19.42	14.41	5.18	9.60	9.01	7.22	1.83	1.15	0.84
1986	21.17	19.49	11.33	9.43	8.87	6.99	2.04	1.32	0.95
1987	14.39	19.50	11.68	9.35	8.82	6.99	1.60	1.32	0.76
1988	8.68	16.57	9.70	9.52	8.83	6.95	1.04	1.22	0.59
1989	5.72	14.28	10.73	9.71	9.02	7.00	0.69	1.09	0.89
1990	5.25	15.71	13.30	9.70	9.15	7.41	0.49	1.03	1.09
1991	4.38	14.13	11.59	9.71	9.09	7.20	0.38	1.06	1.12
1992	1.94	8.42	7.42	9.94	9.24	7.59	0.25	0.85	0.82
1993	1.51	5.85	3.93	10.30	9.52	8.11	0.03	0.49	0.27
1994	1.50	4.59	3.10	10.47	9.69	8.41	-0.16	0.17	-0.02

¹In 1994, the other small banks were not classified as agricultural banks and had average total assets less than \$500 million. Other nonagricultural banks had average total assets greater than \$500 million but less than \$1 billion. The criteria for other small banks and other nonagricultural banks (in terms of total assets) are indexed backwards over time based on the total assets of the banking industry. Other small banks in 1970, for instance, were not agricultural banks and had total assets less than \$46.5 million, which equals the total assets of banks in 1970, divided by total assets for 1994, multiplied by \$500 million.

² Data are not available.

Table 5

Banks' Agricultural Loan Ratios
Number of Agricultural Banks by Agricultural Loan Ratio

Year	< 30%	30%-50%	50%-60%	60%-70%	> 70%	Total
1970	662 (12.1%) ¹	2,275 (41.6%)	842 (15.4%)	746 (13.6%)	946 (17.3%)	5,471
1975	1,148 (20.4)	2,207 (39.2)	883 (15.7)	680 (12.1)	705 (12.5)	5,623
1980	1,510 (28.3)	1,982 (37.2)	771 (14.5)	576 (10.8)	496 (9.3)	5,335
1985	1,471 (30.8)	1,725 (36.1)	582 (12.2)	527 (11.0)	476 (10.0)	4,781
1990	1,314 (32.5)	1,364 (33.7)	567 (14.0)	430 (10.6)	369 (9.1)	4,044
1991	1,198 (30.5)	1,357 (34.6)	548 (14.0)	435 (11.1)	389 (9.9)	3,927
1992	1,118 (29.3)	1,340 (35.2)	536 (14.1)	430 (11.3)	387 (10.2)	3,811
1993	1,115 (30.1)	1,305 (35.2)	508 (13.7)	403 (10.9)	373 (10.1)	3,704
1994	1,051 (29.8)	1,250 (35.4)	478 (13.5)	374 (10.6)	377 (10.7)	3,530

Mean of Total Assets
(\$ Millions)

1994	\$62.5	\$45.8	\$34.4	\$31.9	\$27.4
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¹ Numbers in parentheses indicate percentage of total.

sector. Table 5 categorizes agricultural banks by their agricultural loan ratios. Since 1970 there has been a large drop in the number of banks with high ratios of agricultural loans to total loans, but many banks continue to invest very high percentages of their loans in agriculture. In 1994, for instance, 377 banks had agricultural loan ratios greater than 70 percent, a number that has changed little since 1990. Furthermore, 1,229 farm banks had more than half of their loans in the agricultural sector, with another 1,250 banks having had ratios of agricultural loans to total loans between 30 percent and 50 percent. Vulnerability of farm banks and the FDIC to the fortunes of the agricultural sector thus appears to remain a potential problem for public policymakers. Exposure of the FDIC to specialization in agricultural lending is limited, however, by a tendency for the banks with higher agricultural loan ratios to be smaller banks, as illustrated in the bottom row of Table 5 for 1994. This pattern was similar for other years.

Have Agricultural Banks Reduced The Risks of Specialization?

The hundreds of banks that specialize in agricultural lending may take steps to mitigate this risk. One way such banks can reduce risk is by requiring higher percentages of production loans to be secured with collateral. Figure 3 plots an index that measures the level of collateral required at agricultural banks in four Federal Reserve Districts.

Beginning in the late 1970s and continuing well into the 1980s, agricultural banks (responding to the heightened riskiness of farm lending) began to increase their lending collateral requirements. From this perspective, it appears that agricultural banks responded appropriately to the deteriorating situation evolving in the farm economy. However, such action did not prevent large numbers of agricultural bank failures. The higher collateral requirements on production loans was not a permanent feature of agricultural lending.

pliance measures. For example, Congress restated the objectives of bank supervision and regulation in the Federal Deposit Insurance Corporation Improvement Act of 1991 (FDICIA) and indicated in great detail how supervisors are to do their tasks. FDICIA provides no exemptions for agricultural banks from these supervisory standards. In other words, recent legislation indicates no federal mandate for agricultural banks to assume greater credit risk than other banks.⁸

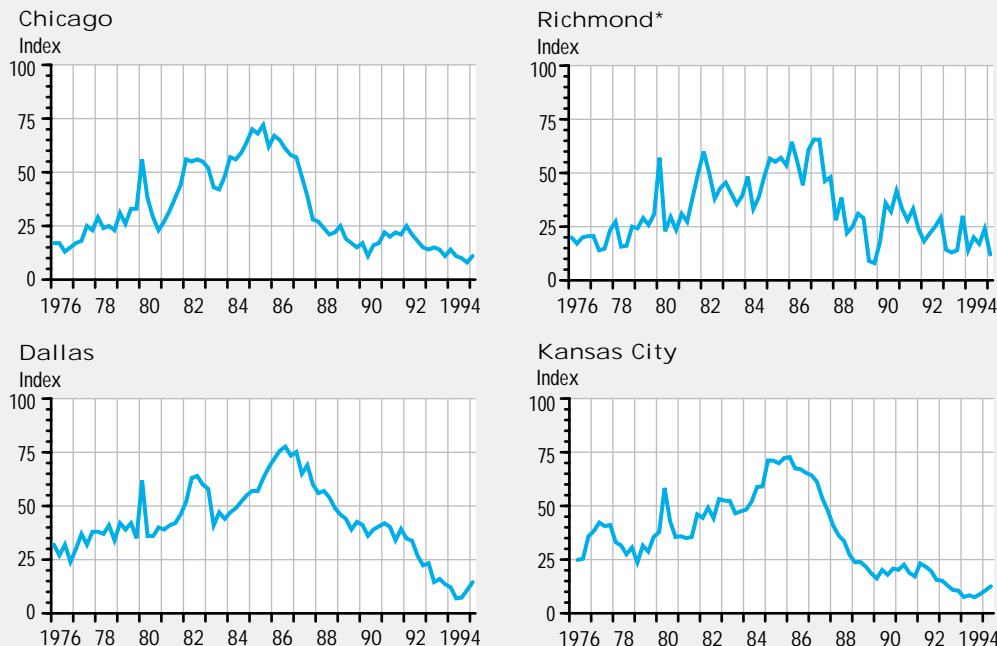
Have Agricultural Banks Diversified Their Credit Risk?

Perhaps the agricultural banks that survived the 1980s have reduced their vulnerability to a potential future crisis in the agricultural sector by limiting the percentages of their loans to firms in that one

⁸ The Competitive Equality Banking Act of 1987 (CEBA) created a special program for banks with total assets less than \$100 million and agricultural loans that exceeded 25 percent of their total loans. Qualifying banks were permitted to charge off their loan losses over several years. This provision of CEBA did not reflect special regulation for agricultural banks, but a temporary program for agricultural banks in distress. The CEBA legislation was also intended to benefit banks in energy-producing areas.

Figure 3

Collateral Required for Farm Nonreal Estate Lending Commercial Banks by Selected Federal Reserve Districts



* Richmond's 1983:1 observation is an interpolation between 1983:1 and 1983:2.

Note: These numbers are diffusion indexes that we calculated from quarterly surveys of agricultural banking conditions conducted by the Federal Reserve Banks of Chicago, Dallas, Kansas City, and Richmond. Briefly the surveys, which are published by the Federal Reserve Board in the Agricultural Finance Databook, ask the surveyed bank to indicate whether collateral required for farm nonreal estate lending compared with a year earlier is lower, the same, or higher. These responses are used to derive a diffusion index, which measures the percentage of items in a given population that are rising during a given time interval. The index is calculated using the following equation: $\text{Index} = 2\{H + 0.5 \times U\} - 100$; where H is the percentage of responses indicating that the level of collateral required rose and U is the percentage of responses indicating no change.

As the worst of the agricultural crisis passed (around 1987), agricultural banks began reducing their collateral requirements on production loans. As a result, in each of the four Federal Reserve Districts surveyed in Figure 3, the index of collateral requirements has fallen to levels comparable to those in 1976—several years before the farm credit crisis. This evidence is inconsistent with the argument that agricultural banks have changed their lending practices to reduce the credit risk associated with a given concentration of their assets invested in agricultural loans.

Bank Holding Company Affiliation And Diversification of Risk

Belongia and Gilbert (1990) and Gilbert (1991) have reported that one

way agricultural banks can protect themselves from the vicissitudes of the agricultural sector is by affiliating with large banking organizations. Table 6 (p.32) describes the 3,530 agricultural banks (1994 data) in terms of the size of their parent organizations. The 809 that were not subsidiaries of holding companies were relatively small, with average assets of just more than \$35 million. Although a significantly higher number (2,112) were in holding companies with banking assets less than \$100 million, that asset level is still too small for such banks to provide significant support to their small agricultural bank subsidiaries. Approximately 83 percent of the agricultural banks were part of small banking organizations, which, moreover, accounted for about two-thirds of the total agricultural loans by all agricultural banks.

Table 6

Distribution of Agricultural Banks in 1994 by the Size of their Parent Organizations

Characteristic	Nature of Parent Organization			
	Not in a Bank Holding Company	Total Assets < \$100 Million	Total Assets > \$100 Million but < \$1 Billion	Total Assets > \$1 Billion but < \$10 Billion
Number of Agricultural Banks	809	2,112	577	32
Mean of Total Assets (\$ Millions)	\$35.5	\$36.6	\$95.3	\$182.3
Share of Agricultural Loans, Among Those at Agricultural Banks (Percentage)	15.8%	50.3%	31.4%	2.5%
Sum of Agricultural Loans as Percentage of the Sum of Total Assets	18.1%	21.6%	18.8%	14.1%

Agricultural banks in organizations with banking assets in excess of \$100 million tend to be larger themselves but have relatively low average ratios of agricultural loans to total assets, a pattern similar to that reported by Gilbert and Belongia (1988). Table 6 highlights the vulnerability of agricultural banks to problems in the farm sector: Those banks which are part of relatively small organizations have the highest ratios of agricultural loans to total assets. In other words, those with the greatest exposure to the agricultural sector have the least protection through affiliation with their parent organizations.

Diversification of Credit Risk Through Interstate Banking

One approach to dealing with the credit risk assumed by banks that specialize in agricultural lending would be to let the Riegle-Neal Interstate Banking and Branching Act of 1994 deal with the problem. The act permits nationwide interstate banking as of September 1995. A bank holding company located in one state can now buy banks located in other states. Beginning in June 1997, bank holding companies with subsidiaries in more than one state will be permitted to merge the banks, that is, convert them to branches.

The exception will be banks in those states which choose before that date to opt out of interstate branching.

Interstate banking may be one method of reducing the risk concentration of agricultural banks. This hypothesis rests on the assumption that, when given the opportunity, interstate banking organizations will purchase many of the agricultural banks. These bank holding companies would meet the credit needs of farmers through their rural branches, while holding loan portfolios more diversified than those of the agricultural banks they have acquired. Evidence in Table 7, however, raises doubts about the assumption that relatively large interstate banking organizations will begin to acquire agricultural banks under the interstate banking legal framework.

Table 7 lists the states ranked in the top 12 in terms of agricultural banks that are not part of large banking organizations (those with total assets less than \$1 billion). These 12 states account for 83 percent of the agricultural banks in small organizations or not in a holding company. Each of these states has permitted the acquisition of banks by multibank holding companies at least since 1990. The largest banking organizations located in these states, therefore, have had the opportunity for many years to buy the agricultural banks located

Table 7

Branching Restrictions in the Top 12 States Based on the Number of Agricultural Banks in Small Organizations

Rank	State	Number of Agricultural Banks in Small Organizations ¹	Branching Restrictions Within the State as of December 1990
1	Iowa	432	L ²
2	Illinois	360	L
3	Kansas	327	S ³
4	Texas	322	L
5	Minnesota	319	L
6	Nebraska	299	L
7	Missouri	204	S
8	Oklahoma	180	S
9	Wisconsin	133	S
10	North Dakota	119	L
11	Arkansas	105	L
12	South Dakota	102	S

¹ Small banking organizations are those with total banking assets less than \$1 billion.

² L indicates limited branch banking.

³ S indicates statewide branch banking.

Source: Conference of State Bank Supervisors (1990).

in their states but have not acquired them. Table 7 provides branching restrictions as of December 1990, but some of these states have changed their branching laws since then. At that time, the Conference of State Bank Supervisors characterized five of these states as having statewide branching; the other seven states permitted limited forms of branching. It appears that the relatively large banking organizations in these states found hundreds of agricultural banks to be unattractive acquisition prospects. These observations suggest that nationwide branch banking organizations might bypass these agricultural banks, leaving them in operation as small banking organizations that specialize in agricultural lending.

Limiting Risk through Capital Requirements

Since there is reason to doubt that agricultural banks will be absorbed into

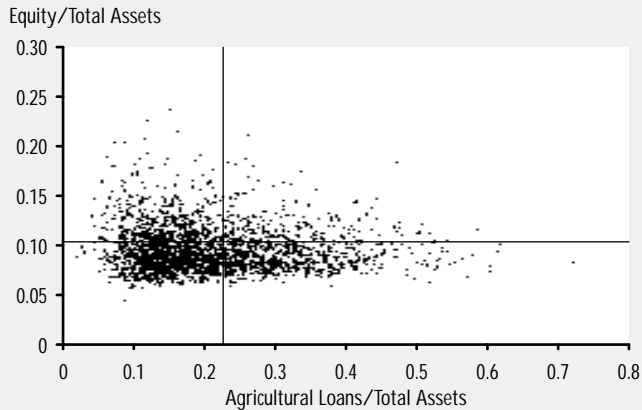
large banking organizations, the task of dealing with the lack of diversification of their credit risk falls to the banks' government supervisors. Supervisors may have acted to limit the risks inherent in specialization in agricultural lending by requiring those banks with the highest percentages of their assets invested in agricultural loans to maintain higher ratios of equity to total assets. Effects of such a policy by supervisors would be evident in Figure 4 (p.34), which plots the ratios of equity to assets and agricultural loans to total assets for the 3,530 agricultural banks in 1994.⁹ Figure 4, however, does not indicate a positive association between equity ratios and the concentration of assets in agricultural loans.¹⁰ Observations in Figure 4 indicate that few of the banks had ratios of equity to total assets below about 6 percent, consistent with the view that supervisors impose a minimum capital ratio. Banks that meet this minimum capital requirement appear to have great

⁹ The horizontal and vertical lines indicate the means of the ratios of equity to assets and agricultural loans to assets, respectively.

¹⁰ Because a scatter plot can sometimes mask the true extent of the statistical relationship, a regression using the two series from Figure 4 was estimated. Specifically, we regressed the equity-to-total capital ratio (the series on the vertical axis) on the agricultural loan ratio (the series on the horizontal axis). For the 3,530 observations in Figure 4, the results indicate a statistically significant negative relationship. This would tend to support the idea that banks which tend to have a larger share of agricultural loans to total loans tend to have lower capital ratios. However, the coefficient on the loan ratio was on -0.012 ($t = -2.62$), with an adjusted R^2 of 0.0017. Thus, this regression should be interpreted cautiously.

Figure 4

Association Between Capital Ratios and Agricultural Loan Ratios in 1994



Note: All of the banks represented in Figure 4 have ratios of agricultural loans to total loans above 17.9 percent. For many of them, however, agricultural loans are less than 17.9 percent of their total assets because, on average, loans of these agricultural banks are about 52 percent of their total assets.

latitude in choosing their ratios of agricultural loans to total assets.¹¹

Supervisors could limit the vulnerability of agricultural banks to failure in the event of a downturn in the agricultural sector by requiring banks with higher ratios of agricultural loans to total assets to maintain high capital ratios.

CONCLUSION

Agricultural banks, which are currently well-capitalized and profitable compared with nonagricultural banks of similar size, also appear relatively safe and stable. Nevertheless, as history suggests, a severe downturn in the agricultural sector probably would cause many agricultural bank failures because several hundred farm banks continue to have more than half of their loan portfolio made up of agricultural loans. These failures would also increase the losses of the FDIC. The losses to the Bank Insurance Fund for each farm bank failure, however, would probably be relatively small, as they were in the 1980s, since agricultural banks are relatively small.

If the objectives of public policy include a reduction in the vulnerability of agricultural banks to a downturn in

the agricultural sector, or for that matter, any other "one-industry" banks, then such a policy would appear to require actions of bank supervisors. In this vein, several hundred banks continue to invest relatively high percentages of their loans in agricultural loans. Although some may have few alternatives, many are not choosing greater diversification in their loan portfolios. Interstate banking may not offer much of a solution either. Patterns in banking structure indicate that large interstate banking organizations are not likely to buy these agricultural banks. In the final analysis, supervisors could reduce the vulnerability of the banking industry to a downturn in the agricultural sector by requiring the banks with relatively high ratios of their assets invested in agricultural loans to maintain relatively high capital ratios.

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¹¹To counter the possibility of a replay of the 1980s, supervisors could induce agricultural banks to reduce the concentration of their credit risk in one industry by implementing section 305 of FDICIA. This section calls for supervisors to base capital requirements on the concentration of credit risk assumed by banks.

REVIEW

JANUARY/FEBRUARY 1996

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