

# ECONOMIC COMMENTARY

## Loan-Quality Differences: Evidence from Ohio Banks

by Paul R. Watro

Bank earnings nationwide, as measured by return on assets, have been falling in the 1980s.<sup>1</sup> Sixteen percent of the more than 14,000 commercial banks in the United States incurred net losses in 1985, up fourfold from the 1980 level.

Bank loan quality continues to deteriorate and is causing increasing concern among regulators, investors, and analysts. Loan charge-offs have more than doubled in the last four years and have been a large contributing factor to the decline in bank earnings.<sup>2</sup>

The general deterioration in loan quality and bank earnings stems largely from the depressed farm and energy sectors of the economy, as well as from the foreign debt problem and from the weak commercial real estate market in certain domestic regions. Banks continue to pay for overly optimistic credit decisions that were made years ago. The unexpected shift of the economy from inflation to disinflation has amplified the repayment difficulties of borrowers, particularly those in or exposed to depressed economic sectors.

In addition to general economic factors, the banking industry also faces an increasingly competitive environment that has been fostered by financial innovation and deregulation. Deposit deregulation and broader lending powers of thrift institutions, for example, have significantly expanded the number of deposit and credit alternatives for consumers and businesses. Some economists argue that the increased competition for both deposits and loans has squeezed profit

margins and thus motivated lenders to take greater risks. It is also argued that the mispricing of deposit insurance has encouraged additional risk-taking by federally insured banks.<sup>3</sup>

This *Economic Commentary* uses a sample of Ohio banks to examine nonperforming bank loans, and identifies some factors that contributed to loan-quality differences between individual banks. The sample of banks used include those with relatively large amounts of nonperforming loans and those with small amounts of such loans. An analysis of the sample reveals differences in local economic conditions and in lending behavior between the two groups of banks. Since the bank sample was limited to smaller institutions, the findings are not geared to macropolicy issues. They may be useful, however, for banking regulators in monitoring the financial condition of individual banks.

### Method Used and Bank Sample

Analysts often use the volume of nonperforming loans to measure loan quality. Nonperforming loans are loans that are still on the books, but that are past due by 90 days or more, are nonaccruing, or have been renegotiated.<sup>4</sup> Nonperforming loans are also generally viewed as good indicators of future loan losses. Data on these loans have been publicly available only since 1983.

For each of the high- and low-quality loan banks in Ohio, data were collected on a variety of factors, such as institutional size, location, branches, owner-

ship, growth, loan composition, and asset structure. Data were also gathered on local competitive and economic conditions, such as the number of banking organizations, bank concentration, deposit share of thrift institutions in the local markets, unemployment rates, population, per capita income, and personal income growth. For each of these variables, a mean value was computed for the high-quality-loan group and for the low-quality-loan group. Using a t-test, the mean values were examined to determine if there are significant differences between the two groups of banks.

The sample of Ohio banks used in this study included all those institutions that held either a large or small amount of nonperforming loans in the 1983-85 period. Specifically, the sample consisted of those banks with a three-year average of 4 percent or more of their loan volume classified as nonperforming and those banks with a three-year average of less than 1 percent of their loan volume in the nonperforming status.<sup>5</sup>

A three-year average was used to minimize any differences in nonperforming loans due to differences in charge-off policies among banks. For example, some banks may have had a lower level of nonperforming loans on the books at a given time simply because they wrote off loans aggressively in prior periods.

Some banks, including those established in the last 10 years, those with deposits over \$500 million, and those with a substantial presence in more

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1. The average return on banking assets fell from 0.82 percent in 1980 to 0.64 percent in 1985. See Ross Waldrop, "Commercial Bank Performance in 1985," *Banking and Economic Review*, Federal Deposit Insurance Corporation, vol. 4, no. 3, April 1986, p. 21.

2. Net loan charge-offs as a percentage of bank loans rose from 0.34 percent in 1981 to 0.82 percent in 1985. When banks write off loans, they charge their loan-loss reserves, rather than their earnings. Consequently, charge-offs reduce earn-

ings in the current period only to the extent that banks add funds to their loan-loss reserves to offset all or part of the charge-offs.

3. See James B. Thomson, "Equity, Efficiency, and Mispriced Deposit Guarantees," *Economic Commentary*, Federal Reserve Bank of Cleveland, July 15, 1986.

than one local market, were excluded from the selection process. Metropolitan statistical areas and counties were used to approximate local markets.

The Ohio sample included 84 banks: 40 with a relatively large number of sub-quality loans and 44 with only a few sub-quality loans. The average high-quality-loan bank had nonperforming loans equal to only 0.5 percent of total loans, while the average low-quality-loan institution had 6.4 percent of its loans in the nonperforming status.<sup>6</sup>

Within the low-quality-loan bank group, four banks held nonperforming loans equal to more than 10 percent of their loans outstanding; the highest one held 14.5 percent in the last three years. Two-fifths of the institutions in the sample held between 4 percent and 5 percent in nonperforming loans.

Within the high-credit-quality bank group, 21 banks had less than one-half of one percent of nonperforming loans, and the other 23 banks had between one-half to one percent of nonperforming loans. Nine banks held less than one-quarter of one percent, and two of them had no nonperforming loans on the books at year-end 1983, 1984, and 1985.

High- and low-credit-quality banks were widely and equally scattered throughout Ohio. Of the state's 88 counties, 30 had at least one high-credit-quality bank and 32 had at least one low-credit-quality bank. Both a high- and low-credit-quality bank were located in eight counties. Two or more high-quality-loan banks were headquartered in 12 counties, and two or more low-quality-loan banks were located in six counties.

Competitive and economic conditions in local areas should influence the volume of nonperforming loans held by banks. Except for the largest ones, banks generally confine lending activity to areas in close proximity to their offices. Although banks can buy and sell loans and enter into loan participations with other lenders, available evidence suggests that these activities have been done on a relatively limited basis by smaller banks.<sup>7</sup>

**Table 1 Differences Between High- and Low-Quality-Loan Ohio Banks**

|   | Low-Quality-Loan Banks | High-Quality-Loan Banks | Difference <sup>a</sup> |
|---|------------------------|-------------------------|-------------------------|
| <b>Institutional Factors (1985)</b>             |                        |                         |                         |
| Deposit size (millions)                         | \$64.1                 | \$70.8                  | -6.7                    |
| Single office banks                             | 42.5%                  | 43.2%                   | -0.7                    |
| Number of branches                              | 2.9                    | 3.0                     | -0.1                    |
| Location (percentage in metropolitan area)      | 40.0%                  | 36.4%                   | 3.6                     |
| Member of multibank holding company             | 15.0%                  | 25.0%                   | -10.0                   |
| <b>Local Financial Structure (1984)</b>         |                        |                         |                         |
| Number of banking organizations                 | 10.7                   | 12.3                    | -1.6                    |
| Three-bank concentration ratio                  | 70.7%                  | 73.0%                   | -2.3                    |
| Herfindahl-Hirschman index                      | 2,246                  | 2,340                   | -94.0                   |
| Thrift deposit share                            | 35.6%                  | 31.6%                   | 4.0                     |
| <b>Local Economic Conditions</b>                |                        |                         |                         |
| Average unemployment rate (1983, 1984, 1985)    | 11.5%                  | 10.7%                   | 0.8 <sup>b</sup>        |
| Personal income growth (1977 to 1982)           | 48.0%                  | 57.3%                   | -9.3 <sup>b</sup>       |
| Per capita income (1983)                        | \$9,772                | \$9,635                 | 137.0                   |
| Total population (1983) (thousands)             | 286.6                  | 308.5                   | -21.9                   |
| <b>Lending Behavior (percent)</b>               |                        |                         |                         |
| Loans-to-assets (1982)                          | 57.2                   | 46.2                    | 11.0 <sup>d</sup>       |
| (1985)  | 51.4                   | 48.6                    | 2.8                     |
| Loan growth (1977 to 1982)                      | 49.0                   | 33.5                    | 15.5                    |
| (1982 to 1985)                                  | 15.7                   | 45.0                    | -29.3 <sup>d</sup>      |
| Loan growth minus deposit growth (1977 to 1982) | 2.6                    | -16.7                   | 19.3 <sup>d</sup>       |
| (1982 to 1985)                                  | -13.1                  | 6.0                     | -19.1 <sup>d</sup>      |
| <b>Loan composition (1985)</b>                  |                        |                         |                         |
| Commercial and industrial                       | 15.9                   | 11.9                    | 4.0 <sup>c</sup>        |
| Consumer  | 26.5                   | 33.1                    | -6.6 <sup>c</sup>       |
| Real estate                                     | 46.2                   | 44.6                    | 1.6                     |
| Farm <sup>e</sup>                               | 15.4                   | 11.5                    | 3.9                     |
| Insider loans <sup>f</sup>                      | 0.4                    | 1.1                     | -0.7 <sup>d</sup>       |

a. A t-test was used to determine if mean values are statistically different from zero.

b. Denotes significance at 10 percent level.

c. Denotes significance at 5 percent level.

d. Denotes significance at 1 percent level.

e. Includes farm loans secured by real estate.

f. June 30, 1984, figures were used for this ratio. One high-quality-loan bank was excluded from the analysis because it deviated dramatically from the group's behavior.

SOURCE: Condition reports of banks; Federal Reserve System Board of Governors; Ohio Bureau of Employment Services; and U.S. Bureau of Census.

4. Banks are permitted to count as income any interest that is due but not received, provided that the interest and principal are less than 90 days overdue, or the obligation is well-secured and in the process of collection. Nonaccruing loans are overdue loans that do not meet either of the above conditions. Renegotiated loans are those that have been restructured or renegotiated to provide a reduction of either interest or principal because of a deterioration in the borrower's financial position.

5. Although the 4 percent and 1 percent criteria were arbitrary, they provided a large enough sample for reasonable statistical testing.

6. The low-quality-loan banks had nonperforming loans that were more than three and one-half times their loan-loss reserves and over one-third of their primary capital.

7. Although condition reports of banks do not give loan purchases, they do disclose loan sales. During the fourth quarter of 1985, only 60 of the

292 banks in Ohio with deposits under \$500 million reported loan sales. The ones that did sell loans had average loan sales equal to only 2.3 percent of their total loans.

8. See Lynn A. Nejezchleb, "Declining Profitability at Small Commercial Banks: A Temporary Development or a Secular Trend?" *Banking and Economic Review*, Federal Deposit Insurance Corporation, vol. 4, no. 5, June 1986, p. 19.

Local economic and competitive conditions where banks are headquartered have less influence on loan portfolios of large and geographically diversified banks. Large banks lend outside local areas and compete with banks on a regional, national, and even international basis. Banks generating a sizable amount of business from branch offices located in more than one market are subjected to multiple economic and competitive conditions.

To avoid the problem of estimating the overall conditions faced by large and geographically dispersed banks, those institutions along with new institutions were omitted from the sample. New banks could bias the results because they initially hold no bad loans and experience enormous growth in their formative years.

## Findings

The mean values for the high- and low-quality-loan banks and the statistical differences between the two groups are presented in table 1.

The effect of institution size on bank loan quality has public policy implications. Much concern has been expressed about the future viability of small independent banks in a deregulated environment. Lending opportunities for small banks are typically limited to local residents and small businesses. Loans to smaller firms generally carry more risk because the bankruptcy rate has traditionally been higher at smaller firms.

Findings for the Ohio sample indicated that the average deposit size of the high-quality-loan banks was \$70.8 million, compared to \$64.1 million for the low-quality-loan banks. This size difference, however, was statistically insignificant. Also, no meaningful differences in location, branching, or ownership were found between the high- and low-quality-loan banks. About 60 percent of the banks in both groups operate in nonmetropolitan counties; about 20 percent of them belong to multibank holding companies. The average high- and low-quality-loan bank operates three branch offices.

9. Ohio banks are currently permitted to branch *de novo* into counties contiguous to their home office county and statewide through merger. In 1989, *de novo* branching on a statewide basis goes into effect.

10. The Herfindahl-Hirschman index (HHI) is calculated by adding the squared market share of each competing banking institution. When a market has only one institution, the HHI attains its maximum value of 10,000. The value of HHI declines with increases in the number of competi-

Rate, geographic, and product deregulation have greatly intensified deposit and loan competition. Rate deregulation has forced banks, particularly smaller ones, to rely more and more on market-rate deposits, thereby increasing the cost of funds for banks. In the long term, deregulation will enable banks to become more cost-efficient, but in the transition period of the last few years, bank costs have risen, particularly at small retail institutions.<sup>8</sup> Liberalization of branching restrictions has reduced geographic barriers to entry and has fostered a greater degree of existing and potential competition in banking. Ohio, for example, moved from home-county branching to essentially statewide branching in 1979.<sup>9</sup>

In addition to rate and geographic deregulation, expanded asset and liability powers of thrift institutions have dramatically increased the number of institutions providing a full range of banking services. These developments have increased pressure on bank profit margins, which may have encouraged lenders to accept more credit risk.

Several variables that are thought to mimic the intensity of market competition were examined in relation to the Ohio sample. They include the number of banking organizations, the three-bank concentration ratio, the Herfindahl-Hirschman index, and the percentage of market deposits held by thrifts.<sup>10</sup>

Findings indicated that low-quality-loan banks operated in markets with fewer competitors, less concentration, and a larger deposit share held by thrifts. These differences were relatively small and statistically insignificant. Thus, contrary to expectations, both groups of banks operated in markets with similar levels of bank concentration and nearly equal presence of thrift institutions. This does not necessarily imply that local competition is unimportant. Perhaps traditional market-structure variables are poor measures of the competitive environment in local markets. Alternatively, these findings are consistent with the contestable market view, which indicates that the threat of entry by new

tors and as the competitors become more equal in their market share. Thrift institutions include all savings and loan associations and mutual savings banks that are federally insured.

11. See Gary Whalen, "Competition and Bank Profitability: Recent Evidence," *Economic Commentary*, Federal Reserve Bank of Cleveland, November 1, 1986.

businesses keeps markets competitive, regardless of the number of actual competitors or market concentration.<sup>11</sup>

General economic conditions were approximated for the Ohio bank sample by four variables—the level of per capita income, population, income growth, and average unemployment rates in local markets. These economic variables can serve as crude proxies for loan demand. Weaker credit demand exerts downward pressure on loan rates and perhaps also on loan quality. The unemployment rate is also assumed to reflect the ability of borrowers, or at least individuals, to repay debt. Higher unemployment rates have been linked to higher loan delinquencies in past studies.<sup>12</sup> Therefore, low-quality-loan banks are more likely to operate in markets with slower income growth, less population, higher unemployment rates, and lower per capita income levels. As expected, personal income growth was slower and the unemployment rate was higher in the markets of the low-quality-loan banks, as compared with markets served by the high-quality-loan banks.

Although bank management has little or no influence over the competitive and economic environment, it has direct control over asset structure, lending growth, and loan type within its own banks. When economic conditions deteriorate, one would expect loan demand to fall and banks to cut back on lending and to direct more funds toward buying securities and other investments. Alternatively, banks could choose to make more risky loans in order to maintain profit margins consistent with stronger loan demand.

Past studies have pointed largely to management, either explicitly or implicitly, as the key element in bank performance.<sup>13</sup> When using loan quality as a measure of performance, results found in our analysis are consistent with previous findings. Several variables were used to capture managerial decisions regarding the lending behavior of individual institutions—the bank's loan growth, loan-to-asset ratio, loan composition, percentage of insider loans, and loan growth relative to deposit growth.

12. See, for example, Gene D. Sullivan and R. Mark Rogers, "Residential Mortgage Delinquencies and Foreclosures: Improvement's Underway," *Economic Review*, Federal Reserve Bank of Atlanta, December 1983, pp. 34-44; Charles A. Luckett, "Recent Developments in the Mortgage and Consumer Credit Markets," *Federal Reserve Bulletin*, vol. 68, no. 5, May 1982, pp. 281-290; and George M. Von Furstenberg and Jeffrey R. Green, "Home Mortgage Delinquencies: A Cost Analysis," *Journal of Finance*, December 1977, pp. 1545-1548.

The lending behavior of the high- and low-quality-loan banks differed sharply. Between 1977 and 1982, loan growth was 49 percent at low-quality-loan banks, compared to 34 percent at high-quality-loan banks. Although this difference was statistically insignificant, the difference in loan growth relative to deposit growth for the five-year period was significant at the 1 percent level. Low-quality-loan banks apparently directed nearly all of their deposit inflows to lending, while high-quality-loan banks used a sizable amount of their deposit growth to expand their investments in securities and other assets. Low-quality-loan banks were indeed aggressive lenders, particularly given relatively weak economic conditions in their market areas. The rapid expansion of loans in slower-growing areas was apparently a primary reason why the low-quality-loan banks became saddled with the high volume of nonperforming loans.

The loan-to-asset ratio variable used to study the Ohio sample further emphasizes that the low-quality-loan banks were aggressive lenders. In 1982, they held 57 percent of their assets in loans, compared to 46 percent for high-quality-loan banks. Of course, the low-quality-loan banks, seeing their nonperforming loans mounting, reacted by cutting back on lending. Between 1982 and

1985, their loan growth was only 16 percent, or nearly three times lower than the loan growth at the high-quality-loan banks. This caused the loan-to-asset ratio of the low-quality-loan banks to fall and to approach the level maintained by the high-quality-loan banks.

The loan composition of the high- and low-quality-loan banks was also significantly different. Low-quality-loan banks made a larger share of business loans, which are often riskier than consumer loans. They held nearly 16 percent business loans and 26 percent consumer loans, compared to 12 percent business loans and 33 percent consumer loans for the high-quality-loan banks. No meaningful differences were detected between the two groups of banks in their share of real estate and farm loans.<sup>14</sup>

Finally, the low-quality-loan banks in Ohio had nearly three times as many insider loans than the high-quality-loan banks. Insider transactions have often been cited in financial circles as being a common contributing factor in bank failures. Insider loans, as defined in Federal Reserve Regulation O, are extensions of credit to all executive officers, to principal stockholders, and to their related interests.

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### Summary and Conclusions

Local economic conditions and lending behavior differed significantly between the high- and low-quality-loan banks in Ohio. The low group operated in areas

with higher unemployment rates and slower economic growth. Despite presumed weaker credit demand, the low-quality-loan banks were aggressive lenders with faster loan growth relative to deposit growth, higher loan-to-asset ratios, and more business and insider loans. No appreciable differences either in local bank concentration or in the presence of thrift institutions were found between the two groups of banks.

More research is needed on loan quality before any broad conclusions can be reached. Findings from the sample of Ohio banks, however, imply that if lenders were more cautious in making loans, particularly in areas with less-favorable economic conditions, the volume of nonperforming loans would be much lower than it is today.

While all lenders face increasingly competitive pressures, the local banking structure did not seem to have an effect on bank-loan quality. Perhaps the threat of potential competition is strong enough to offset any differences in the existing local banking structure.

Regardless of the competitive conditions, however, the evidence suggests that unfavorable economic conditions increase nonperforming loans and that bank management is a key determinant of loan quality.

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13. See Larry D. Wall, "Why Are Some Banks More Profitable?" *Economic Review*, Federal Reserve Bank of Atlanta, vol. 68, no. 9, September 1983, pp. 42-48; Donald R. Fraser, "The Determinants of Bank Profits: An Analysis of Extremes," *The Financial Review*, 1976, pp. 69-87; Marvin M. Phaup, Jr., "Characteristics of

High Performance Banks 1969-1975," *Economic Review*, Federal Reserve Bank of Cleveland, Fall 1976, pp. 12-22; John A. Haslem, "A Statistical Analysis of the Relative Profitability of Commercial Banks," *Journal of Finance*, vol. 23, no. 1, March 1968, pp. 167-176.

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14. There were seven low-quality-loan and six high-quality-loan banks with more than 25 percent of their loans made to farmers. Banks with such concentration of farm loans are classified as farm banks by the FDIC.

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