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 for the higher loan growth of low-quality-loan banks. While high-quality-loan banks were saddled with the high volume of nonperforming loans.

The asset ratio variable used to study the Ohio sample further emphasized 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. 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.

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 the difference in loan quality before any broad conclusions can be reached. Findings from the sample of Ohio banks, however, imply that the differences in loan quality was 49 percent at low-quality-loan banks, whereas it was 46 percent at high-quality-loan banks. Of course, the low-quality-loan banks had a mean difference in loan quality of nearly three times lower than the high-quality-loan banks.

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 face significant operating costs and are often unable to offset these costs from their lending activities. The unexpected shift of the economy from inflation to disinflation has implied 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. Deposits deregulation and other measures have increased competition in the lending market, particularly in the low-quality-loan banks. The combined effect of these factors has led to a decrease in bank earnings.


1. 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 high levels of agricultural loans are classified as farm banks by the FDIC.

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

Local economic and competitive conditions where banks are headquartered have less influence on nonperforming loans. Large banks lend outside local areas, and are generally more subject to national, regional, and even international conditions. Banks generating a sizable amount of subquality loans have offices in more than one market area. These offices are subject to multiple economic conditions and competition.

To avoid the problem of estimating the overall conditions faced by large and small banks, we identified those institutions along with new institutions as "representative of the sample." New banks could bias the results because they initially hold no bad loans and have a relatively small asset base 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 high-quality-loan banks are a self-correcting institution. Since the nonperforming loan rate is less than 5 percent, the risk of bankruptcy is very low. Moreover, the high-quality-loan banks are less likely to face competitive pressures.

The low-quality-loan banks are a self-correction institution. Since the nonperforming loan rate is more than 30 percent, the risk of bankruptcy is very high. Moreover, the low-quality-loan banks are more likely to face competitive pressures.

Institutional Factors (1985)

<table>
<thead>
<tr>
<th>Low-quality-loan Banks</th>
<th>High-quality-loan Banks</th>
<th>Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Debit size (millions)</td>
<td>$64.1</td>
<td>$70.8</td>
</tr>
<tr>
<td>Loan-to-expenses ratio</td>
<td>42.5%</td>
<td>41.8%</td>
</tr>
<tr>
<td>Number of branches</td>
<td>2.9</td>
<td>3.0</td>
</tr>
<tr>
<td>Location (percent in metropolitan area)</td>
<td>40.0%</td>
<td>36.4%</td>
</tr>
</tbody>
</table>

Member of multibank holding company

- 15.0%                  - 20.0%    | -5.0%    |

Local Financial Structure (1984)

- Number of banking organizations: 10.7
- Three-bank concentration ratio: 70.7%
- Herfindahl-Hirschman index: 24.26
- Thrift deposit share: 35.6%
- Local Economic Conditions
  - Average unemployment rate (1983, 1984, 1985): 11.5%
  - Personal income growth (1977 to 1982): 48.4%
  - Per capita income (1983): $9,772
  - Total population (1983): 386,000
  - Lending Behavior (percent)
    - Loans-to-assets (1982): 57.4%
    - Loan growth (1977 to 1982): 89.0%
    - Loan growth (1982 to 1985): 12.6%
  - Loan composition (1985)
    - Commercial and industrial: 15.9%
    - Real estate: 42.6%
    - Farm: 15.4%


5. Although the 4 percent and 1 percent criteria were arbitrary, they provided reasonable samples for reasonable statistical testing.

6. The low-quality-loan bank had nonperforming loans equal to 20 percent of its total assets.

7. Only three-quarters of the sample were included in the analysis because a deviation identified by the group's behavior.

8. The Ohio sample included 84 banks: 40 with a relatively large number of subquality 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 4 percent of nonperforming loans in the nonperforming status.

9. The low-quality-loan bank group, four banks held nonperforming loans equal to more than 10 percent of their total loans. These banks were excluded from the sample.

10. The Herfindahl-Hirschman index (HHI) is calculated as follows: 

\[ HHI = \sum_{i=1}^{n} \left( \frac{q_i}{Q} \right)^2 \]

where \( q_i \) is the proportion of total market share held by the ith firm, and \( Q \) is the total market share. The HHI ranges from 0 to 10,000, with 1,000 indicating perfect competition. A high HHI indicates a market structure with a small number of firms, while a low HHI indicates a market structure with many firms.


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 low-quality loans and 44 with only a few. 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 4 percent of its loans in the nonperforming status.4

Within the low-quality-loan bank group, four banks held nonperforming loans equal to more than 10 percent of their assets; the average, 4 percent. Of those institutions along with new institutions, the sample. New banks could bias the results because they initially hold no bad loans and their loan quality is an in-process phenomenon 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.

Local economic and competitive conditions where banks are headquartered have less influence on loan decision making. Large banks lend outside local areas, often regionally, nationally, and even internationally. Banks generating a sizable amount of nonperforming loans are often located in one market that is more than one-quarter of one percent, and two of them had no nonperforming loans on their books at year-end 1983, 1984, and 1985.

High- and low-quality banks were widely and equally scattered throughout Ohio. Of the 88 counties, 30 had at least one high-quality-loan bank and 32 had at least one low-quality-loan bank. Both high and low-quality banks were located in eight counties. Two or more high-quality banks were head-quartered in 12 counties, and two or more low-quality 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 are unable to escape from the influence of conditions in their offices. Although banks can buy and sell loans and enter into loan participation with other lenders, available evidence suggests that these activities have been done on a relatively limited basis by smaller banks.5

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

<table>
<thead>
<tr>
<th>Factor</th>
<th>High-Quality Loan Banks</th>
<th>Low-Quality Loan Banks</th>
<th>Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Number of branches</td>
<td>75.5%</td>
<td>48.7%</td>
<td>26.8%</td>
</tr>
<tr>
<td>2. Location in metropolitan area</td>
<td>30.0%</td>
<td>16.4%</td>
<td>13.6%</td>
</tr>
<tr>
<td>3. Member of multibank holding company</td>
<td>15.0%</td>
<td>25.0%</td>
<td>-10.0%</td>
</tr>
<tr>
<td>4. Local Financial Structure</td>
<td>16.3%</td>
<td>12.2%</td>
<td>4.1%</td>
</tr>
<tr>
<td>5. Number of banking offices</td>
<td>128.6%</td>
<td>123.1%</td>
<td>5.5%</td>
</tr>
<tr>
<td>6. Three-bank concentration</td>
<td>70.7%</td>
<td>15.9%</td>
<td>54.8%</td>
</tr>
<tr>
<td>7. Herfindahl-Hirschman index</td>
<td>24.2%</td>
<td>23.4%</td>
<td>0.9%</td>
</tr>
<tr>
<td>8. Thrift deposit share</td>
<td>34.9%</td>
<td>33.6%</td>
<td>1.3%</td>
</tr>
<tr>
<td>9. Average unemployment rate (1983, 1984, 1985)</td>
<td>11.3%</td>
<td>10.7%</td>
<td>0.6%</td>
</tr>
<tr>
<td>10. Personal income growth (1977 to 1982)</td>
<td>48.0%</td>
<td>57.5%</td>
<td>-9.5%</td>
</tr>
<tr>
<td>11. Per capita income growth (1983)</td>
<td>$9,772</td>
<td>$9,635</td>
<td>1.4%</td>
</tr>
<tr>
<td>12. Total population growth (1983)</td>
<td>868.0%</td>
<td>305.8%</td>
<td>66.7%</td>
</tr>
<tr>
<td>13. Lending Behavior (percent)</td>
<td>57.2%</td>
<td>46.6%</td>
<td>10.6%</td>
</tr>
<tr>
<td>14. Loans-to-assets (percent)</td>
<td>51.4%</td>
<td>46.7%</td>
<td>4.7%</td>
</tr>
<tr>
<td>15. Loan growth (1977 to 1982)</td>
<td>40.0%</td>
<td>35.5%</td>
<td>4.5%</td>
</tr>
<tr>
<td>16. Loan growth minus deposit (1982 to 1985)</td>
<td>7.1%</td>
<td>6.0%</td>
<td>1.1%</td>
</tr>
<tr>
<td>17. Loan composition (1983)</td>
<td>15.9%</td>
<td>11.9%</td>
<td>4.0%</td>
</tr>
<tr>
<td>18. Commercial and industrial</td>
<td>26.5%</td>
<td>33.1%</td>
<td>-6.6%</td>
</tr>
<tr>
<td>19. Real estate</td>
<td>42.6%</td>
<td>44.6%</td>
<td>-2.0%</td>
</tr>
<tr>
<td>20. Farm</td>
<td>15.4%</td>
<td>11.5%</td>
<td>3.9%</td>
</tr>
<tr>
<td>21. Insider loans</td>
<td>3.4%</td>
<td>3.6%</td>
<td>-0.2%</td>
</tr>
</tbody>
</table>

**Notes:**

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 by collateral. 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 by collateral.

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

6. The low-quality-loan banks had nonperforming loans that were more than three times the size of those loans on their loan-loss reserve 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 quarter of 1985, only 40 of the 298 banks in Ohio with deposits under $500 million reported loan sales. The ones that did sell had average loan sales equal to only 2.3 percent of their assets.


9. Ohio banks are currently permitted to branch at any county contiguous to their home office county and statewide through merger. In 1985, more 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 bank institution. When a market share is calculated by using the HHI index to determine the total number of institutions involved in a market, the market share is multiplied by 1,000. The value of HHI varies from 0 to 10,000. The value of HHI declines with increases in the number of competitors and as the competitors become more equal in their market share. Thrift institutions include all savings and loan associations and mutual savings banks.


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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 the Federal Reserve's efforts to improve the quality of loans and bank earnings is a key determinant of loan quality.

Bank earnings nationwide, as measured by return on assets, have been falling in the 1980s.1 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. While loan losses continue to be the primary factor in the deterioration of bank earnings and are increasing, 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 profitability.

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 recession has led to many loan losses. Those with relatively large amounts of such loans are classified as farm banks by the FDIC.


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 high farm loans are classified as farm banks by the FDIC.


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 losses against earnings. Consequently, charge-offs reduce earnings.

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Federal Reserve Bank of Cleveland

ECONOMIC COMENTARY

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