changes in the ex ante spread between the average rate on term loans above the prime rate relative to the same measure of funds for all banks, large banks, and small banks over the same interval. Changes in the spread between the average rate on loans made at rates above the prime and the average prime rate for all sample banks, large banks, and small banks over the 1979-80 period are shown in chart 3.

Ex ante spreads generally widened after August 1979, except during the first quarter of 1980 (see charts 1 and 2). This appeared to be true particularly for loans at rates above the prime—loans presumably made to smaller, marginal borrowers and hence entailing more risk. Similar spread changes were evident at both large and small banks. Small banks have attempted to widen spreads on riskier loans at rates above the prime, as shown in charts 2 and 3. Generally 80 percent or more of all term loans were at rates above the prime (see table 1).

Conclusions

In summary, commercial banks altered both their long-term lending and loan pricing practices over the 1979-80 interval in a manner suggesting an adjustment required to offset interest-rate risks stemming from asset-liability mismatch. Sufficient evidence has not been collected to determine whether these adjustments have effectively insulated margins at banks. Small banks exhibited more of these adjustments. This might reflect differences in initial asset-liability mismatch, goals or preferences for risk, access to other risk reduction techniques, competitive pressures, or other reasons.

Long-term lending and pricing practices obviously changed in 1980. Borrowers desiring term loans from banks, particularly from smaller banks, would be prepared to accept the interest-rate risk that accompanies floating-rate loans.

Interest rates rose to unusually high levels in 1980, fluctuating widely and sharply throughout the year. The prime rate reached an unprecedented high of 20 percent in April, fell to 11 percent in July, then climbed to a historical high of 21 percent in December. Unexpectedly large fluctuations in interest rates create problems for commercial banks, since their profitability crucially depends on their net interest margins—the difference between their interest income and expense. Margins change as earning asset and liability volumes, maturities, and rates are adjusted in response to actual and expected market rate changes.

Commercial banks traditionally borrow short, often at fixed rates; this strategy, however, is potentially dangerous if market rates rise unexpectedly to very high levels. Higher risks stemming from more volatile movements in interest rates have forced commercial banks to alter their traditional pricing and asset-liability management policies. Although various adjustments in these areas have been under way for some time, evidence suggests that commercial banks have made strenuous efforts since 1979 to protect their margins from the effects of high and variable interest rates. This Economic Commentary explores recent changes in long-term commercial bank lending and loan pricing that reflect this adjustment process.

Impact of Rate Changes on Net Interest Margins

The shorter the average maturity of an institution's fixed-rate instruments and the greater the proportion of its assets or liabilities bearing floating vs. fixed rates of interest, the more rapidly average asset or liability rates can be adjusted in response to market rate changes. Short-maturity instruments roll over frequently and bear rates that approximate market rates. Similarly, floating-rate instrument rates are, by contrast, adjusted periodically to current market levels prior to final maturity. Short-maturity and floating-rate assets or liabilities are accordingly called rate-sensitive.

A rough measure of a commercial bank's exposure to interest-rate changes in the short run can be constructed by comparing the institution's volumes of rate-sensitive assets (RSAs) with rate-sensitive liabilities (RSLs). If a bank's volume of RSAs exceeds its volume of RSLs, the net interest margin of the institution will rise as market rates rise, and not necessarily those of the Federal Reserve Bank of Cleveland or of the Board of Governors of the Federal Reserve System.

The data suggest that banks altered at least the loan portion of their asset portfolios over the 1979-80 period. The most notable changes were the decrease in the proportion of long-term loans beginning in February 1980, the shortened average loan maturities, and the increased use of floating-rate loans on both fixed- and floating-rate loans were sharply reduced.

Changes in Loan Pricing

Banks also may attempt to offset perceived interest-rate risks by increasing rates on long-term commercial loans relative to expected funding costs. Suggestive evidence drawn from the surveys of terms of lending appears in charts 1 through 3. Chart 1 shows changes in the ex ante spread between the average rate on all term loans and a measure of the expected cost of funds for all sample banks, large banks, and small banks over the 1979-80 interval.

Chart 2 Average Rate on Above-Prime Loans Minus Expected Funds Cost

<table>
<thead>
<tr>
<th>Percent</th>
<th>Large banks</th>
<th>Large banks</th>
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margin impact produced by a given change in rates will be directly related to the size of the RSA-RSL mismatch in the promise of the RSA-RSL mismatch on the extent to which any reference point will be able to be adjusted in the appropriate direction.

Commercial banks traditionally have had liability-sensitive (RSAs have exceeded RSLs), although asset/liability postures have been markedly different. As long as a liability-sensitive posture resulted constrained and the relationship among the various interest rates was expected to decline sharply, when interest rates increased unexpectedly, margins were squeezed or that bank interest expense rose faster than interest income.

Such behavior was not necessarily a problem in the past, when rates were more stable and the relationship between short-term and long-term rates was more predictable. As long as a liability-sensitive posture resulted constrained and interest rates were expected to decline sharply, when interest rates increased unexpectedly, margins were squeezed or that bank interest expense rose faster than interest income.

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The survey data for all banks generally corresponded in 1979 and 1980, and so loan term adjustments to changes in current economic conditions may have been somewhat constrained.

Large vs. Small Banks

Changes in long-term commercial and industrial lending practices are compared with the average terms reported in the first three quarterly surveys conducted in 1979. Selected aspects of long-term lending practices are presented in table 1, both for all sample banks and for two size classes so that differential adjustments may be discerned.

All Sample Banks

The survey data for all banks generally indicate that the expected interest rate adjustments have been occurring over the past several quarters. The volume of long-term loans was below the 1979 three-quarter average in two subsequent quarters. Further, the proportion of long-term commercial and industrial loans fell below the 1979 reference point beginning in May 1980. The proportion of long-term loans at floating rates was considerably higher than the 1979 three-quarter average in all subsequent quarters.

The average maturity of all types of loans showed a marked inverse relationship to the reference point average in all subsequent surveys. There are two possible explanations of why the maturity shortening was not greater. First, the sharp increase in floating-rate loans may have effectively shortened long-term loan maturities and thus served to protect margins. In comparing the average maturities of floating-rate and fixed-rate loans, it was found that the average maturity of floating-rate loans was higher than the reference point level in all subsequent surveys. The average maturity of fixed-rate loans, however, exhibited the expected sharp decrease. Second, and a large and increasing proportion of loans were made under commitments in 1979 and 1980, and so loan term adjustments to changes in current economic conditions may have been somewhat constrained.

Long-term loans as percent of total

Loans at rates above the prime, percent

Floating-rate loans 39.1 53.6 46.1 44.6 48.4

Fixed-rate loans 55.5 61.0 51.6 57.7 61.9

Other long-term loans

Loan volume, millions 870 516 702 510 704

Floating-rate, percent 13.0 11.1 14.0 6.6 10.7

Weighted average maturity—all loans 50.0 38.3 37.7 36.7 37.6

Floating-rate loans 44.1 37.4 35.1 37.3 33.7

Fixed-rate loans 52.6 54.0 57.5 59.1 59.1

All banks

Loans under commitment, percent 49.2 63.3 71.4 71.1 72.6

Loans at rates below the prime, percent 10.6 18.5 14.1 14.4 11.6

Loans at rates below the prime, percent 10.6 18.5 14.1 14.4 11.6

Table 1 Terms of Lending on Long-Term Commercial and Industrial Loans

<table>
<thead>
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</tr>
</thead>
<tbody>
<tr>
<td>Long-term loans as percent of total</td>
<td>14.4 16.2 14.9</td>
<td>9.7 11.0</td>
<td>13.0 11.1 14.0</td>
<td>6.6 10.7</td>
<td>14.4 16.2 14.9</td>
<td>9.7 11.0</td>
</tr>
<tr>
<td>Floating-rate, percent</td>
<td>52.6 71.7 65.6</td>
<td>74.0 67.7</td>
<td>50.2 60.3 54.3</td>
<td>42.9 45.8</td>
<td>52.6 71.7 65.6</td>
<td>74.0 67.7</td>
</tr>
<tr>
<td>Weighted average maturity—all loans</td>
<td>41.0 49.6 42.8</td>
<td>42.5 44.3</td>
<td>41.0 49.6 42.8</td>
<td>42.5 44.3</td>
<td>41.0 49.6 42.8</td>
<td>42.5 44.3</td>
</tr>
<tr>
<td>Fixed-rate loans</td>
<td>53.3 45.7 43.1</td>
<td>43.7 42.9</td>
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<td>14.4 11.6</td>
</tr>
<tr>
<td>Long-term loans as percent of total</td>
<td>615 1031 1095</td>
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</tr>
<tr>
<td>Floating-rate, percent</td>
<td>15.0 19.5 15.6</td>
<td>13.7 11.3</td>
<td>15.0 19.5 15.6</td>
<td>13.7 11.3</td>
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<td>13.7 11.3</td>
</tr>
<tr>
<td>Weighted average maturity—all loans</td>
<td>76.7 86.5 80.3</td>
<td>85.0 80.2</td>
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<td>Fixed-rate loans</td>
<td>42.5 54.7 47.2</td>
<td>46.6 48.2</td>
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<td>All banks</td>
<td>55.5 61.0 51.6</td>
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2. Although space considerations and data availability do not permit examination of lending practice and pricing changes in this article, there is some suggestive evidence that RSLs were reduced over the past year. Quarter-to-quarter changes in managed liabilities at commercial banks in billions beginning with the fourth quarter of 1979 were: $8.6, $10.1, $3.2, and $12.0, respectively.

3. Interest-rate risk is not eliminated by these adjustments; it is shifted to borrowers.

Chart 1 Average Loan Rate Minus Expected Funds Cost

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<th>Small banks</th>
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<tr>
<td>Feb. 79</td>
<td>5.0 8.0 11.0</td>
<td>7.0 10.0 13.0</td>
<td>3.0 6.0 9.0</td>
</tr>
<tr>
<td>Aug. 79</td>
<td>5.0 8.0 11.0</td>
<td>7.0 10.0 13.0</td>
<td>3.0 6.0 9.0</td>
</tr>
<tr>
<td>Feb. 80</td>
<td>5.0 8.0 11.0</td>
<td>7.0 10.0 13.0</td>
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5. The effective maturity of a floating-rate loan is the interval between periodic loan rate adjustments.