

Economic Review



FEDERAL RESERVE BANK OF KANSAS CITY

June 1988

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In the Tenth District States

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Banking Performance In the Tenth District States 3

By William R. Keeton and Julia Reigel

The average profitability of banks in Tenth District states edged up in 1987 after five years of decline. Agricultural banks showed the greatest recovery, combining faster loan growth with lower loan losses and higher profits.

A New Era In Farm Lending: Who Will Prosper? 22

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Agriculture's strong financial recovery after six recession years and the Agricultural Credit Act of 1987 mark a new era in farm lending. Some farm lenders are likely to gain in the new lending environment, while others may lose.

Should the Federal Reserve Continue To Monitor Credit? 39

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The erratic behavior of credit aggregates in recent years has led to questions about whether any credit measure is useful in conducting monetary policy. Empirical evidence suggests that the private component of total credit may provide useful information to monetary policymakers.

Banking Performance In the Tenth District States

By William R. Keeton and Julia Reigel

The overall performance of commercial banks in Tenth District states stabilized in 1987. The number of banks declined and growth at the remaining banks continued to slow. Average profitability edged upward, however, after five straight years of decline.

Not all district banks shared in the stabilization of performance. While many banks did better in 1987, others continued to do poorly. **Improvement** in performance was most dramatic at agricultural banks. Their loan losses fell sharply in 1987, boosting their earnings above those of nonagricultural banks for the first time in several years. Banks in Oklahoma and Wyoming—two states heavily dependent on energy **production**—also showed great improvement. However, these banks still had much ground to make up, thanks to the collapse in oil prices the previous year.

This article examines district banking **perform-**

mance in 1987, focusing on both the stabilization in overall performance and the differences in performance among banks. The article first reviews two key aspects of performance, growth and profitability. Next, the article discusses the impact of net interest income and loan losses on profitability. The article then turns to another aspect of performance, the adequacy of banks' capital. The article concludes with a brief analysis of performance in each of the Tenth District states—Colorado, Kansas, Missouri, Nebraska, New Mexico, Oklahoma, and Wyoming (Figure 1).

Growth

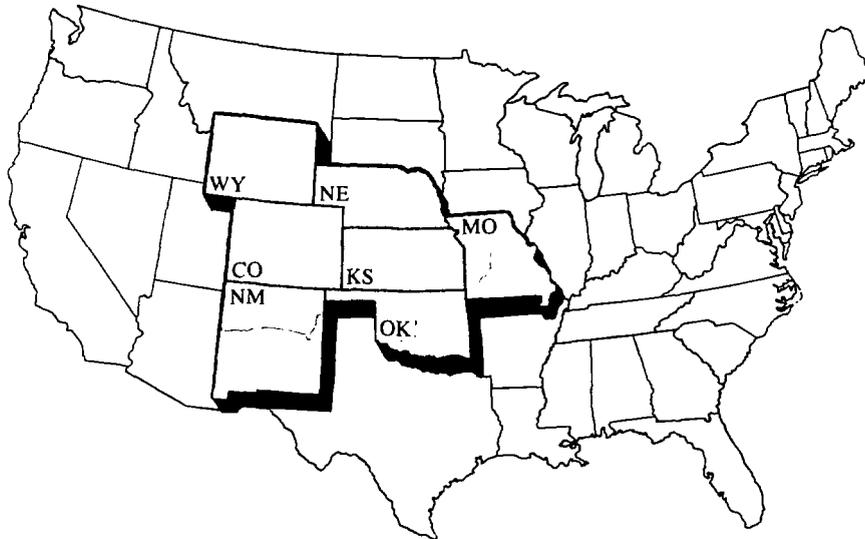
One aspect of performance is growth, the increase in the amount of resources banks use and the amount of services they provide. The banking industry can expand or contract in two **ways**—through changes in the number of banks and changes in the size of banks.

Changes in number

In 1987, the rate of bank failures remained high

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FIGURE 1
Tenth District states



Shaded area is Tenth District

by historical standards and the rate of new bank formation continued to slow. As a result, the total number of commercial banks in Tenth District states declined for the third year in a row. Table 1 shows that only 11 banks were started during the year, down from 18 the year before. Also, 71 banks either failed or closed voluntarily, slightly more than in 1986. Of the banks that failed, only four were succeeded by new banks formed to take over their deposits. The rest were either merged with existing banks or liquidated altogether. Finally, 51 open banks disappeared in 1987 through mergers with other banks. The net effect of the above changes was a reduction of 107 commercial banks in the district, a slightly smaller decline than in 1986 but a much greater decline than in 1985.

Changes in size

At those banks that remained in business,

overall growth in loans and assets continued to slow in 1987 (Table 2). Assets fell 1.2 percent after increasing 3.8 percent in 1986. Also, loans rose only 1.2 percent, down from a sluggish 2.1 percent in 1986.

The slowdown in growth was far from uniform across banks. Table 2 compares the growth in assets and loans at banks in three size categories. Each of the three size categories holds a third of total bank assets in the district. In 1987, small banks had assets of less than \$62 million, medium-size banks had assets between \$62 million and \$378 million, and large banks had assets of more than \$378 million.¹ Table 2 also

¹ Because inflation and economic growth tend to increase the assets of all banks, the two size thresholds have risen over time. In defining size groups, many studies of bank performance use the same dollar thresholds in early years as in later years. That approach can produce distortions over long periods, because the tendency for all banks to grow in dollar terms causes the small size group to shrink relative to the larger groups.

TABLE 1

Changes in number of insured commercial banks, Tenth District states'

	<u>1985</u>	<u>1986</u>	<u>1987</u>
Banks established de novo	38	18	11
- Failed banks†	63	69	71
+ Banks established to succeed failed banks	22	11	4
- Open banks merged with other banks	56	76	51
= Net change in number of banks	-59	-116	-107

*Excludes the change due to banks switching from uninsured to insured status. Seventeen banks made this switch in 1985, five in 1986, and six in 1987.

†Includes one bank that closed voluntarily in 1985, five banks that closed voluntarily and three banks that converted to savings banks in 1986, and five banks that closed voluntarily in 1987.

TABLE 2

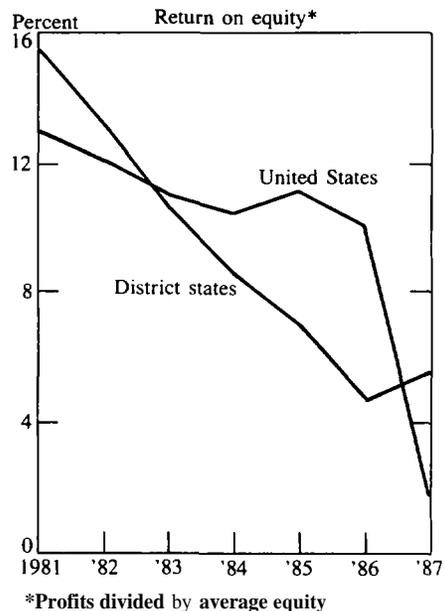
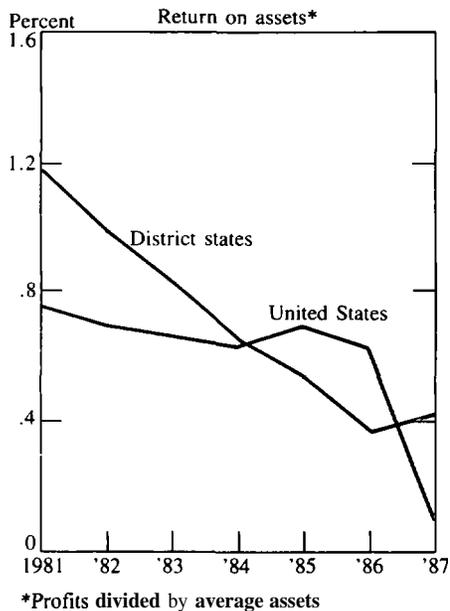
Growth in total assets and loans, commercial banks in Tenth District states*

(percent)

	Number of banks, <u>1987</u>	Growth in assets		Growth in loans	
		<u>1986</u>	<u>1987</u>	<u>1986</u>	<u>1987</u>
All banks	2,727	3.8	-1.2	2.1	1.2
Small banks	2,227	4.6	1.8	-0.5	3.2
Agricultural	1,099	3.6	1.6	-5.3	3.2
Nonagricultural	1,128	5.4	1.9	2.9	3.2
Medium banks	459	4.5	-1.0	0.5	1.5
Agricultural	74	3.2	0.7	-5.1	1.6
Nonagricultural	385	4.7	-1.3	1.2	1.5
Large banks	41	2.4	-4.2	6.2	-0.7

*Growth from beginning to end of year at banks in operation the entire year

CHART 1
Profitability of commercial banks



shows how growth within the two smaller size groups differed between agricultural banks and nonagricultural banks. Agricultural banks are defined as those with at least 25 percent of their loan portfolios in farm real estate or farm operating loans. More than 90 percent of these banks were small in 1987 and the rest were medium-size.

As Table 2 shows, growth slowed most in 1987 at large banks and least at the two sizes of agricultural banks. Growth in assets declined at banks of all sizes but especially at large banks, where assets fell 4.2 percent after increasing 2.4 percent the year before. Also, growth in loans accelerated in the two smaller size groups but decelerated in the large group, decreasing from 6.2 percent to -0.7 percent. Within the two smaller size groups, Table 2 shows that the growth rates of agricultural banks and nonagri-

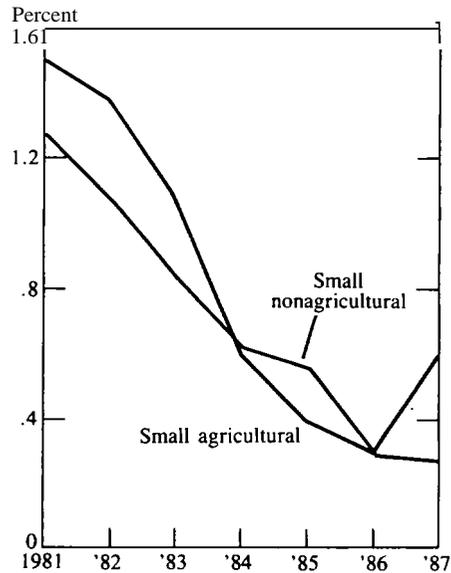
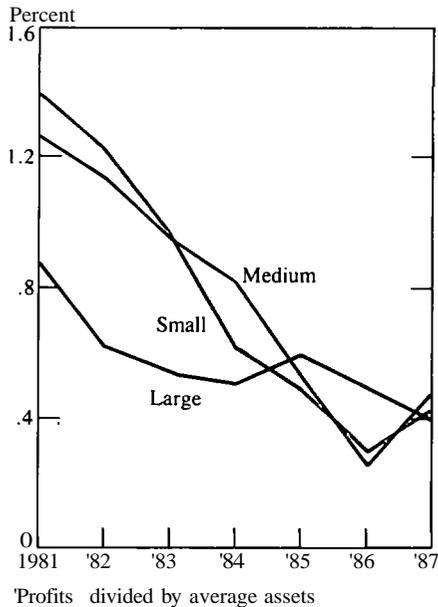
cultural banks converged in 1987. At both types of banks, assets grew slower in 1987 than 1986 and loans faster. However, for agricultural banks the slowdown in asset growth was somewhat smaller and the acceleration in loan growth much more dramatic. After falling more than 5 percent the year before, the loans of small agricultural banks increased 3.2 percent and the loans of medium-size agricultural banks 1.6 percent.

Profitability

A second dimension of performance is profitability, the ability of banks to generate revenue to cover their costs and pay dividends to their shareholders. To compare profitability across time or across banks, profits must be deflated by some measure of bank size. Return on equity (ROE) deflates a bank's profits by its equity, the amount

CHART 2

Return on assets at banks in Tenth District states'



owners have invested in the bank through the purchase of stock or retention of earnings. Return on assets (ROA) deflates profits by total assets, including both financial and physical assets.

Measured by either ROE or ROA, the profitability of commercial banks in Tenth District states edged upward in 1987, bringing to a halt the steep decline that began in 1982 (Chart 1).² The modest improvement in profitability last year left ROA at 0.43 percent, about a third of the 1981 peak. Also, ROE reached 5.7 percent, compared

to a return of 15.6 percent in 1981. As the chart shows, the stabilization in earnings at banks in Tenth District states was in sharp contrast to the performance of banks in the United States as a whole, where large increases in loan loss provisions at money center banks caused both average ROA and average ROE to plummet in 1987.

As in past years, figures on the average profitability of **district** banks were influenced by the high failure rate. Some banks that incurred heavy losses and depressed average profitability in 1986 were closed in 1987, removing their influence from the figures. Thus, among banks that remained in business throughout 1986 and 1987, the change in profitability was somewhat less favorable than shown in Chart 1. For example, while the average ROA of all banks in the district increased slightly from 1986 to 1987, the average ROA of banks that remained open both years was unchanged.

² All data in this article were taken from the Reports of Condition and Income filed by insured commercial banks. Balance sheet data for 1981 to 1983 were adjusted for mergers at the Board of Governors of the Federal Reserve System to ensure that the assets and liabilities of merging banks were combined as close as possible to the date they began reporting their income jointly. Data for 1984 to 1987 were adjusted the same way by the authors.

TABLE 3
Income and expense of insured commercial banks in Tenth District states'
 (percent)

	<u>1981</u>	<u>1985</u>	<u>1986</u>	<u>1987</u>
Net interest income (NIM)†	4.70	4.35	4.12	3.97
+ Net security gains‡	-0.13	0.10	0.16	.05
- Loan loss provisions	0.30	1.05	1.20	.92
- Net noninterest expense	2.24	2.37	2.29	2.27
- Total taxes	0.86	0.49	0.43	.39
= Profits (ROA)	1.18	0.55	0.37	0.43

*All variables are expressed as a percentage of average annual assets net of loan loss reserves. Average annual assets are computed from beginning, middle, and end-of-year figures with weights of one-quarter, one-half, and one-quarter, respectively. Data for each year are for banks in operation the entire year.

†Interest income is calculated on a taxable-equivalent basis. That is, each bank's tax-exempt income from state and local securities is adjusted by its marginal tax rate.

‡Includes net gains on extraordinary items

Profitability by size and type

In 1987, earnings performance continued to vary by size and type of bank. Large banks as a group failed to share in the recovery. And within the two smaller size groups, agricultural banks tended to experience significantly greater improvements in earnings than nonagricultural banks.

The left panel of Chart 2 shows how profitability has changed at the three size groups as measured by ROA. The ROA of small banks increased in 1987, making up for most of the previous year's decline. At medium-size banks, average ROA rose by an even greater amount, but only because of changes in the composition

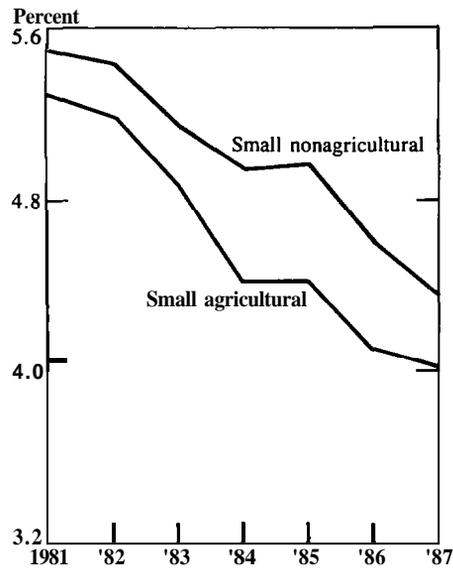
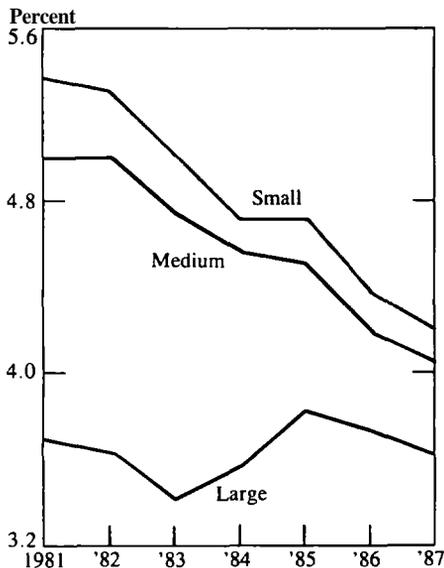
of the group.³ The worst performance in 1987 was by large banks. Their profitability fell for the second year in a row, giving them the lowest ROA of the three size groups.

In 1987, a sharp rebound in earnings left district agricultural banks with a higher profit rate than similar-size nonagricultural banks for the first time in four years. As noted earlier, the vast majority of agricultural banks are small. The right

³ In 1987, many highly unprofitable banks dropped out of the medium size group, some by failing and others by growing slowly and moving down to the small size group. At the same time, some highly profitable banks in the small size group grew fast enough to move up to the medium size group. Both effects tended to increase the average profitability of the medium size group.

CHART 3

Net interest margin at banks in Tenth District states*



*Net interest income divided by average assets

panel of Chart 2 compares the recent earnings performance of small agricultural banks with that of small nonagricultural banks. In 1987, the ROA of small agricultural banks doubled, offsetting the decline of the previous two years. At small nonagricultural banks, by contrast, ROA was virtually unchanged. Within the medium size group, profitability also increased substantially more at agricultural banks than nonagricultural banks. In this case, however, most of the difference was due to shifts in the composition of the two subgroups: adjusted for such shifts, ROA rose slightly at agricultural banks and fell slightly at nonagricultural banks.⁴

⁴ In the agricultural subgroup, a significantly higher proportion of unprofitable banks grew slowly enough to move down to the small size group. As a result, sample shifts had a greater tendency to increase ROA in the agricultural subgroup than in the non-agricultural subgroup.

Although some categories of banks performed significantly better than others, there continued to be important differences within each of the categories. In 1987, 18 percent of agricultural banks had net losses, down from 26 percent in 1986. At the other end of the spectrum, 34 percent of agricultural banks earned more than 1 percent on their assets, up from 28 percent in 1986. Similar differences existed among nonagricultural banks. In 1987, 24 percent of nonagricultural banks had net losses, about the same as the year before. But 27 percent of nonagricultural banks earned more than 1 percent on their assets—fewer than the 34 percent that earned such returns in 1986, but a significant number just the same.

Determinants of profitability

The modest improvement in profitability in 1987 resulted from a sharp decrease in loan loss

TABLE 4

Changes in interest income and expense at banks in Tenth District states

(percentage-point change in ratio to average assets)

	<u>1985-86</u>	<u>1986-87</u>
Change in interest income ratio	-1.11	-.64
Portfolio shifts	-0.10	0
Rate changes	-1.01	-.64
Change in interest expense ratio	-.88	-.49
Portfolio shifts	+.01	+.05
Rate changes	-.88	-.54
Change in NIM	-.23	-.15
Portfolio shifts	-.11	-.05
Rate changes	-.13	-.10
Memo:		
Change in 6-month Treasury bill rate	-1.63	+.02

provisions that slightly outweighed substantial decreases in net interest income and net security gains. Profits can be defined as net interest income and net gains from security sales minus loan loss provisions, net noninterest expense and taxes. Table 3 deflates each of these components by total assets for the years **1981** and **1985-87**.

As shown in the table, the major factor depressing profitability in **1987** was a decline in net interest income relative to assets. The net interest margin (NIM) of district banks fell to **3.97** percent of assets in the year, about **70** basis points lower than the peak reached in **1981**. Reinforcing the decline in NIM was a decrease in net security gains, as the turnaround in interest rates and the high security sales of the two previous years left district banks with fewer undervalued securities on which capital gains could be realized.

The major factor boosting ROA in **1987** was a decline in loan loss provisions. For district banks as a whole, loss provisions fell to **0.92** per-

cent of assets in **1987**, the first decrease since provisions turned sharply upward at the beginning of the decade. Small decreases in net noninterest expense and taxes also helped sustain ROA last year. Thus, despite the fall in NIM and net security gains, the ROA of district banks increased on balance, edging up from **0.37** percent of assets in **1986** to **0.43** percent in **1987**.

Net interest margin

The decrease in NIM in **1987** was smaller than the year before but substantial nevertheless (Table 3). After declining **23** basis points in **1986**, NIM fell an additional 15 points in **1987**, ending up below 4 percent for the first time since the mid-**1970s**.

NIM by size and type

In **1987**, NIM declined almost as much at large

banks as at small and medium-size banks. As shown in the left panel of Chart 3, this similarity in performance represented a departure from the previous three years. From 1983 to 1986, changes in **NIM** were much more favorable at large banks than at small and medium-size banks, reducing the gap between them. In 1987, the gap stayed the same, with the NIM of large banks remaining **45** points below that of medium-size banks and 60 points below that of small banks.

NIM fell less at agricultural banks than at nonagricultural banks in 1987, partially explaining the bigger increase in profitability at agricultural banks. As shown in the right panel of Chart 3, NIM fell less than half as much at small agricultural banks as at small nonagricultural banks in 1987, after decreasing by about the same amount at the two types of banks in 1986. Within the medium size group, the story was similar, with NIM remaining unchanged at agricultural banks and decreasing substantially at **nonagricultural** banks.

Determinants of NIM

Banks' interest income and interest expense can change either through shifts in the composition of their assets and liabilities or through changes in the rates of return on their assets and liabilities. Table 4 shows the contribution of such portfolio shifts and rate changes to the behavior of district banks' NIM since 1985. These estimates were obtained by splitting banks' assets and liabilities into broad categories. The impact of portfolio shifts between categories was estimated by calculating the amount by which interest income, interest expense, and NIM would have changed if the average rate of return earned or paid on each category had remained constant. The rest of the change is the "rate effect," the part due to changes in the average rates of return on different categories.⁵

As shown in Table 4, the **NIM** of district banks

suffered less from adverse portfolio shifts in 1987 than in 1986. Shifts in the composition of assets reduced interest income by 10 basis points in 1986 but had no effect in 1987. During the year, banks experienced a continued shift out of loans and state and local securities into other, lower-yielding securities. However, the negative impact of this shift on interest income was completely offset by a simultaneous shift from cash to other securities. On the liability side, interest expense was boosted by a small shift in the composition of funds from demand deposits to interest-bearing retail deposits. Nevertheless, the total effect of portfolio shifts on **NIM** was only **5** basis points, half as much as in 1986.

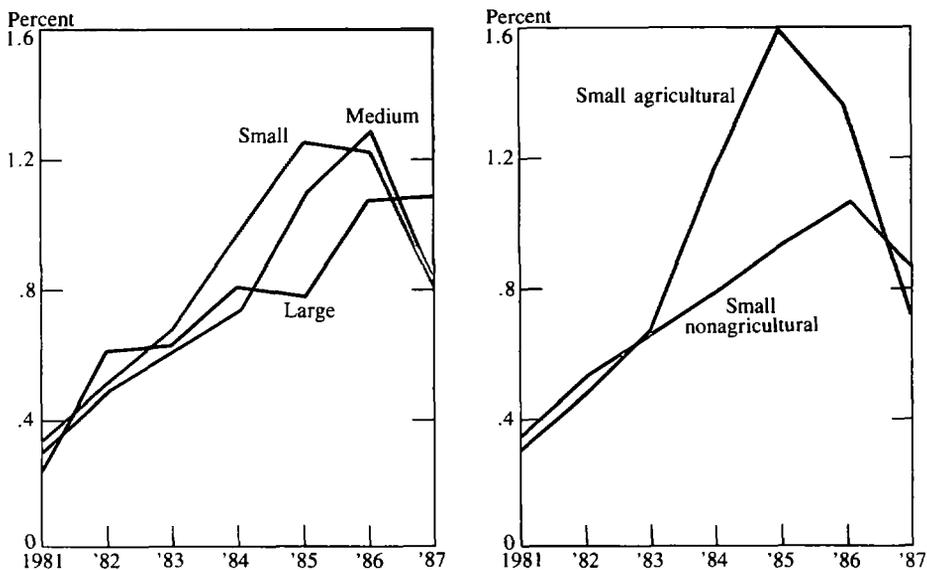
Although portfolio shifts were less important in 1987, district banks suffered almost as large an adverse rate effect as in 1986. As measured by the 6-month T-bill rate, the average level of market interest rates rose only 2 basis points in 1987. During the year, however, banks' average returns on assets and liabilities responded with a lag to the substantial decline in market rates in 1985 and 1986, when the 6-month T-bill rate fell **214** basis points and 163 basis points, respectively. As shown in Table 4, this fall in banks' average returns reduced the ratio of interest income to assets by 64 basis points and the ratio of interest expense to assets by **54** basis points.

Two factors help explain why the rate effect was stronger for interest income than expense in 1987, hurting NIM on balance. The first factor was the turnover and growth in banks' holdings of long-term securities. Banks purchased substantial amounts of new securities in 1987, not only to roll over securities that were maturing but also to replace securities sold on secondary markets

⁵ For a more detailed explanation of the decomposition, see William R. Keeton and Lyle Matsunaga, "Profits of Commercial Banks in Tenth District States," *Economic Review*, Federal Reserve Bank of Kansas City, June 1985.

CHART 4

Loan loss provisions at banks in Tenth District states'



*Provisions divided by average assets

and make up for declines in loans. Because market interest rates were much lower in 1987 than earlier in the decade, the securities purchased last year had relatively low yields, causing the average return on banks' security holdings to fall. The second factor depressing interest income was the elimination of the tax deductibility of interest on state and local securities as a result of the Tax Reform Act of 1986. This change sharply reduced the tax-adjusted yield on banks' holdings of state and local securities, contributing about 5 basis points to decline in their interest income ratio.

Loan loss provisions

Relative to assets, loan loss provisions fell 28 basis points in 1987 (Table 3), the first decline since provisions began rising in the early 1980s. The fall in loss provisions was accompanied by an equally steep decline in loan chargeoffs. Thus,

provisions continued to exceed chargeoffs, with the excess representing net additions to banks' loan loss reserves.⁶

Provisions by size and type

Changes in loan loss provisions differed sharply among the three size groups, with large banks faring the worst for the second year in a row (Chart 4). In 1987, provisions fell sharply at both small and medium-size banks, reaching 0.8 percent of assets at both groups. At large banks, on the other hand, provisions remained virtually unchanged at 1.1 percent of assets.

⁶ When banks write off bad loans, they charge their loan loss reserves, not their earnings. Writeoffs affect earnings only to the extent that banks provide enough funds for their reserves to make up for the chargeoffs.

TABLE 5

Net chargeoffs by type of loan, Tenth District states

(percent of end-of-year loans)

	<u>1985</u>	<u>1986</u>	<u>1987</u>
Real estate loans	0.6	0.8	0.7
Consumer loans	1.0	1.4	1.4
Agricultural operating loans	4.3	4.2	1.8
C&I and all other loans	2.1	2.6	2.2
Total loans	1.7	1.9	1.4

TABLE 6

Nonperforming loans by size and type of bank, Tenth District states*

(percent of total loans)

	<u>Dec. 1986</u>	<u>Dec. 1987</u>
All banks	4.1	4.0
Small banks	4.8	4.3
Agricultural	5.8	5.0
Nonagricultural	4.2	3.9
Medium banks	4.4	4.0
Agricultural	5.9	5.0
Nonagricultural	4.2	3.9
Large banks	3.3	3.8

***Nonperforming** loans at banks in operation all of 1987. Includes renegotiated loans in compliance with modified terms.

TABLE 7

Nonperforming loans by type of loan, Tenth District states'

(percent of total loans)

	<u>Dec. 1986</u>	<u>Dec. 1987</u>
Real estate loans	3.9	3.9
Consumer loans	1.3	1.1
Agricultural operating loans	7.0	5.6
C&I and all other loans	5.1	5.3
Total loans	4.1	4.0

***Nonperforming** loans at banks in operation all of 1987. Includes renegotiated loans in compliance with modified terms.

TABLE 8
Nonperforming real estate loans,
Tenth District states*
 (percent of total loans)

	Dec. 1986	Dec. 1987
Residential real estate loans	1.6	0.7
Nonresidential real estate loans	3.4	5.1
Construction loans	8.7	8.7
Farm real estate loans	9.8	8.5
Total real estate loans	3.9	3.9

*Nonperforming loans at banks in operation all of 1987. Estimated for subcategories by regression analysis.

As in 1986, changes in loan loss provisions were more favorable at agricultural banks than at nonagricultural banks of similar size. As shown in the right panel of Chart 4, the ratio of provisions to assets fell three times as much at small agricultural banks as at small nonagricultural banks, leaving small agricultural banks with a lower ratio for the first time since the early 1980s. Within the medium size group, relative performance was similar, with provisions falling sharply at both types of banks but especially at agricultural banks.

Further insight into loan loss trends can be obtained from loss rates on different types of loans. Table 5 breaks down the net chargeoffs of district banks by major categories of loans for the years 1985-87.⁷ Given the sharp decrease in loan losses at agricultural banks last year, it comes

⁷ At the end of 1987, real estate loans accounted for 39 percent of total loans, consumer loans for 18 percent, agricultural operating loans for 8 percent, and C&I and all other loans for 35 percent.

as no surprise that the biggest decline in chargeoffs was for agricultural operating loans, from 4.2 percent of loans in 1986 to 1.8 percent in 1987. Despite the widely publicized problems of the commercial real estate sector, the average chargeoff rate on real estate loans edged downward in 1987. Also, the chargeoff rate on C&I and all other loans decreased moderately, just making up for the previous year's increase.

Nonperforming loans

Future loan losses are closely related to the current level of nonperforming loans. These loans are loans that have not been written off but are at least 90 days overdue, nonaccruing or **renegotiated**.⁸ Although some nonperforming loans may be fully repaid and others partly salvaged, banks with high levels of nonperforming loans today are likely to have high rates of loan losses in the future.

In 1987, the proportion of nonperforming loans failed to increase for the first time since banks began publicly reporting such data in the early 1980s. As shown in Table 6, the average delinquency rate of district banks edged downward from 4.1 percent at the end of 1986 to 4.0 percent at the end of 1987. The stability in the overall delinquency rate masked significant differences among banks. At large banks, nonperforming loans increased half a percentage point to 3.8 percent of total loans. At the two sizes of agricultural banks, by contrast, the delinquency rate fell almost a percentage point to 5.0 percent. Small and medium-size nonagricultural banks fell in the

⁸ Banks are allowed to count as income any interest that is due but not received, provided the interest and principal are less than 90 days overdue or the loan is well secured and in process of collection. Nonaccruing loans are overdue loans that do not meet either of these conditions. Renegotiated loans are troubled loans with terms that have been eased to facilitate repayment by the borrower.

middle, experiencing modest decreases in nonperforming loans and ending up with about the same average delinquency rate as large banks.

Evidence of lessening agricultural credit problems can also be found in the behavior of nonperforming loans by type of loan. As shown in Table 7, delinquency rates were relatively flat for real estate loans, consumer loans, and C&I and all other loans in 1987, but fell sharply for agricultural operating loans. By the end of the year, agricultural operating loans still had the highest delinquency rate of the four categories, 5.6 percent. However, that rate was only slightly higher than the delinquency rate on C&I and all other loans, 5.3 percent.

Although the percent of nonperforming real estate loans was unchanged in 1987, there were signs of continued deterioration in the nonresidential sector. Delinquency rates for different types of real estate loans are not reported directly but can be estimated by comparing total real estate delinquencies at banks with different lending specializations. As shown in Table 8, delinquency rates estimated in this manner declined for residential real estate loans and farm real estate loans and remained unchanged for construction loans.⁹ For loans backed by nonresidential real estate, however, the estimated delinquency rate continued to rise, reaching 5.1 percent by the end of the year.

Capital

A final dimension of performance is capital,

⁹ At the end of 1987, residential real estate loans accounted for 46 percent of total real estate loans, nonresidential real estate loans for 31 percent, construction loans for 16 percent, and farm real estate loans for 7 percent. The estimates in Table 8 were obtained by regressing the total delinquency rate on real estate loans against the shares of real estate loans in the four subcategories, weighting each observation by the square root of the bank's total real estate loans.

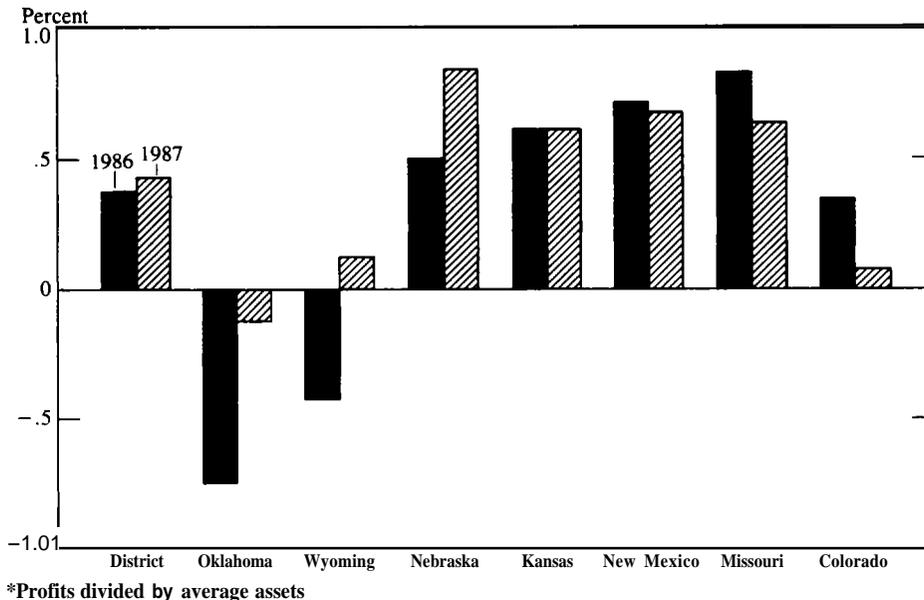
the cushion banks build to protect themselves against unforeseen losses. Like profitability, a bank's capital can be measured in various ways. The measure used in this article is primary capital, the sum of equity capital and loan loss reserves.¹⁰

Thanks to slow asset growth and the stabilization of earnings, district banks were able to increase their capital-asset ratios moderately in 1987. At banks in operation the entire year, primary capital rose from a little more than 8.3 percent of assets at the end of 1986 to just under 8.7 percent at the end of 1987. Some of the improvement in the capital-asset ratio was due to the contraction in assets over the course of the year. However, loan loss reserves continued to grow, and with the increase in profitability, banks managed to add a small amount to their equity through earnings retention.

Although most banks shared in the increase in capital-asset ratios in 1987, the reasons for the increase varied. Among the different sizes and types of banks, large banks reported the biggest increase in capital-asset ratios, a rise of over 60 basis points. However, this achievement was due entirely to an increase in loan loss reserves and a sharp decline in assets. **Indeed**, large banks as a group paid out slightly more in dividends than they earned in 1987, reducing their total equity. Agricultural banks had more modest increases in capital-asset ratios in 1987 but achieved those increases mainly by building up their equity and not by running down their assets. Regardless of the sources of the increase, capital-asset ratios ended up high in all categories of banks, ranging from 8.0 percent at large banks to 10.2 percent at small agricultural banks.

¹⁰ In calculating primary capital to meet regulatory requirements, banks include minority interests in consolidated subsidiaries and mandatory convertible instruments and exclude intangible assets such as goodwill. These items are relatively unimportant at most district banks.

CHART 5
Return on assets at banks in Tenth District states'



The adequacy of capital must be judged relative to the potential for future losses. As suggested earlier, a useful indicator of future loan losses is the level of nonperforming loans. At the end of 1987, 86 percent of the region's 2,700 banks had more than twice as much primary capital as nonperforming loans. Furthermore, only 126 banks ended the year with less primary capital than nonperforming loans, down from 165 a year earlier.

Performance by state

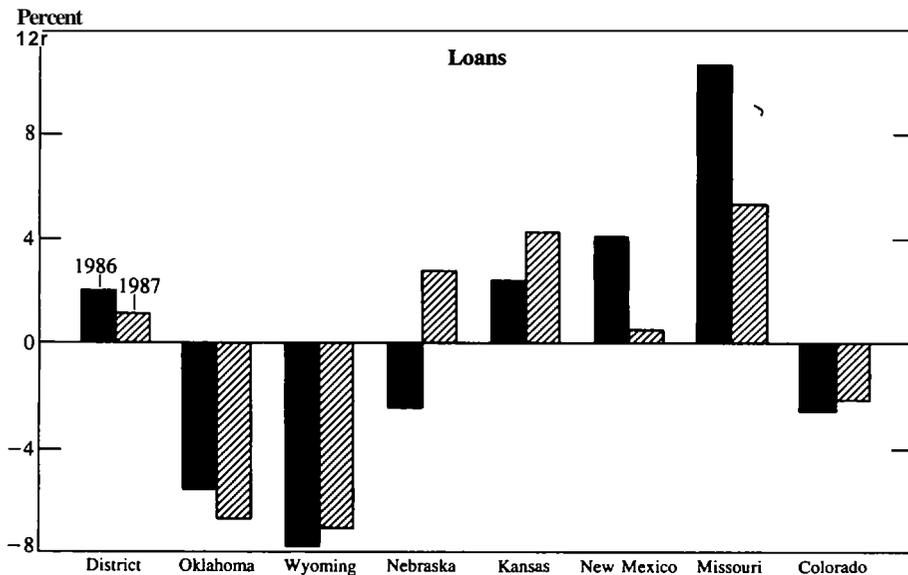
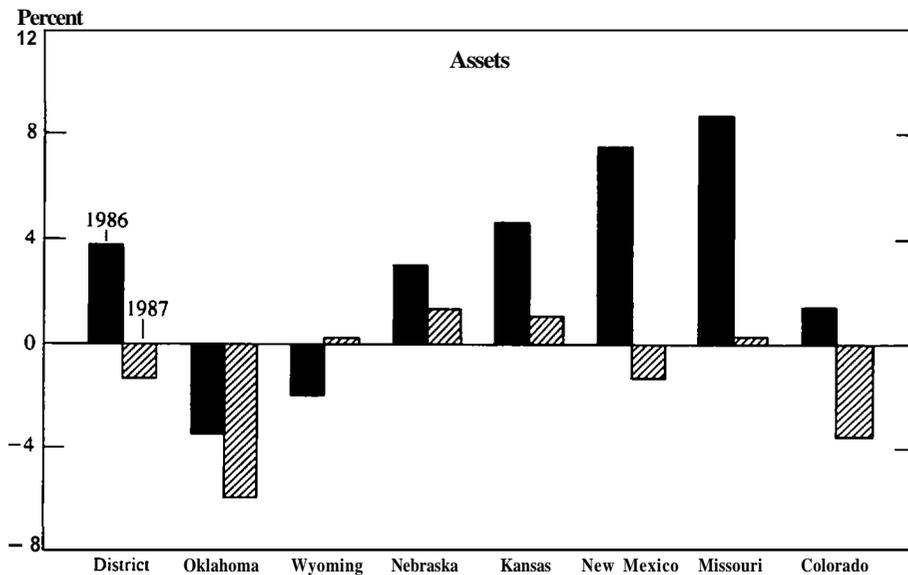
The recovery in banking performance was not uniform across states in 1987. By most measures, performance improved sharply in Oklahoma, Wyoming, and Nebraska, remained stable in Kansas and Nebraska, and declined in Missouri and Colorado. This section briefly reviews the banking performance of each state in order of the increase in ROA last year.

Oklahoma

The stabilization of oil prices in 1987 helped banks in energy-dependent Oklahoma recover from a sharp deterioration in performance the year before. ROA rose more in Oklahoma than any other district state, 60 basis points (Chart 5). However, 31 of Oklahoma's 510 banks failed during the year, twice as many as in 1986. And at remaining banks, both assets and loans continued to fall (Chart 6).

Despite the improvement in earnings in 1987, Oklahoma **banks** suffered losses equal to 0.1 percent of their assets, the lowest ROA in the **district**. About half of the increase in ROA was due to the elimination of banks that had incurred heavy losses the year before. Among remaining banks, most of the improvement was at large banks, whose losses declined to 0.6 percent of assets. Medium-size banks enjoyed somewhat greater increases in ROA than in the district as a whole

CHART 6
Growth in bank assets and loans in Tenth District states



and small banks somewhat smaller increases. Despite these improvements, all categories of banks continued to earn significantly less than in the district as a whole.

Just as previous declines in ROA were due to sharp increases in loan loss provisions, so was last year's recovery due to a steep decline in provisions. Among banks that were in business throughout **1986** and **1987**, provisions fell about **50** basis points, with nonagricultural banks enjoying the same decrease as agricultural banks. Despite the decline, provisions were 1.3 percent of assets for the state as a whole, a third higher than the district average. Reinforcing the decline in provisions at large banks was a steep increase in noninterest income that far outweighed the rise in their noninterest expense.

At the end of **1987**, **7.6** percent of loans at Oklahoma banks were nonperforming. This figure was slightly lower than a year earlier, but only as a result of the failure of banks with very high delinquencies. The delinquency rate on agricultural operating loans was below the average for the district. However, the delinquency rate on real estate loans was almost six percentage points higher and the delinquency rate on **C&I** and all other loans over three percentage points higher.

Wyoming

The relative stability in energy and mining also enabled banks in Wyoming to make up ground lost the previous year. ROA rose over **50** basis points in **1987**, the second largest increase in the district (Chart **5**). Four of the state's **105** banks failed during the year, fewer than in **1987**. At other banks, assets were unchanged and loans continued to fall (Chart **6**).

Even with the rebound in profitability, Wyoming banks earned an ROA of only **0.1** percent in **1987**. No banks in Wyoming fell into the large size group in **1987**. Among nonagricultural banks, medium-size banks reported a bigger increase in

profitability than small banks; nevertheless, medium-size banks failed to break even while small banks earned a modest profit. Performance at the state's agricultural banks was highly diverse, with small banks experiencing a big increase in ROA and medium-size banks a big decrease.

As in Oklahoma, the main cause of the **1987** earnings recovery was a large decrease in loan loss provisions. The decline left provisions at **0.9** percent of assets, the same as in the district as a whole. Chargeoffs fell by a much smaller amount, however, forcing Wyoming banks to draw down their loan loss reserves during the year. Partially offsetting the impact of lower provisions on ROA was a sharp decrease in net security gains at all categories of banks.

At the end of **1987**, **7.1** percent of loans at Wyoming banks were **nonperforming**, considerably more than in the district as a whole but less than a year earlier. The delinquency rate was about average for agricultural operating loans but significantly higher than average for all other categories, especially **C&I** and all other loans.

Nebraska

Banking performance improved markedly in Nebraska, reflecting the turnaround in the state's all-important agriculture sector. ROA increased almost **40** basis points in **1987**, the third largest increase in the district (Chart **5**). Of the state's **440** banks, six banks failed, the same number as in **1986**. At other banks, asset growth continued to slow but loans increased substantially following two consecutive years of decline (Chart **6**).

The improvement in earnings in **1987** was widespread, with both agricultural banks and non-agricultural banks sharing in the increase. As a result of the increase, both types of banks earned more than **0.8** percent on their assets, significantly more than their counterparts in other states.

The rebound in profitability at Nebraska banks

resulted from a very large decrease in loan loss provisions. At agricultural banks, loss provisions fell by more than a half to **0.7** percent of assets, slightly less than the district average. Provisions also fell sharply at nonagricultural banks, reaching **0.6** percent of assets. The large banks in this group also benefited from an unusually large increase in NIM which outweighed the reduction in net security gains and the increase in net non-interest expense.

At the end of **1987**, **3.1** percent of loans at Nebraska banks were nonperforming, less than in the district as a whole and down from a year earlier. Delinquency rates were slightly below average on real estate loans and agricultural operating loans and far below average on **C&I** and all other loans.

Kansas

In keeping with recent experience, banking performance in Kansas changed very little in **1987**. ROA remained the same (Chart 5). During the year, eight of the state's **610** banks failed, about half as many as in **1986**, and one new bank was started.¹¹ At remaining banks, assets grew much slower than before but loans somewhat faster (Chart 6).

Despite the lack of improvement in **1987**, the ROA of Kansas banks remained higher than the district average at **0.6** percent. The profitability of agricultural banks increased, but by a smaller amount than in the district as a whole. Among nonagricultural banks, ROA declined slightly at large and medium-size banks but was virtually unchanged at small banks. Even with the decline, the state's large banks had the highest ROA in the district for their size group, over 1.1 percent.

¹¹ In this section, the term "new banks" refers only to banks established *de novo* and not to banks formed to take over the deposits of failed banks.

The reason the average ROA of Kansas banks failed to change is that steep declines in NIM and net securities gains were just offset by a sharp drop in loan loss provisions. Provisions fell more at agricultural banks than at nonagricultural banks, ending up at **0.8** percent of assets in both groups. In contrast to the district as a whole, large banks shared in the decline in loss provisions. However, these banks also suffered a steep decline in net security gains, preventing their ROA from rising.

Nonperforming loans were **3.0** percent of total loans at the end of **1987**, below the district average and down moderately from the previous year. As in the past, delinquency rates on consumer loans and agricultural operating loans were about the same as elsewhere, while rates on real estate loans and C&I and all other loans were lower.

New Mexico

Banking performance was also stable in New Mexico. Profitability was virtually the same in **1987** as in **1986** (Chart 5). None of the state's **90** banks failed during the year, but asset growth and loan growth both fell sharply (Chart 6).

With profitability little changed, the ROA of New Mexico banks remained at **0.7** percent, well above the district average. The state's agricultural banks experienced about the same increase in earnings as in other states. Among nonagricultural banks, ROA edged downward at small and medium-size banks but was unchanged at large banks. The state's large banks continued to enjoy much higher profitability than smaller banks, earning an average ROA of just under 1.1 percent.

As in the district as a whole, the stability of profits resulted from offsetting declines in NIM and loan loss provisions. Provisions remained below district averages at small and large banks but above the district average at medium-size

banks. For the state as whole, provisions were 0.8 percent of assets, the same as in Kansas.

At the end of 1987, 4.1 percent of New Mexico bank loans were nonperforming. The delinquency rate on C&I and all other loans was higher than the district average, having risen a full percentage point over the course of the year. Delinquency rates on other categories were about the same as elsewhere.

Missouri

Banking performance declined in Missouri after several years of relative stability. ROA fell 20 basis points, the largest decline in the state this decade (Chart 5). Four of the state's 610 banks failed in 1987 but seven new banks were started. During the year, 18 open banks disappeared through mergers, about a third as many as in 1986. At remaining banks, growth in loans declined significantly and growth in assets fell almost to zero (Chart 6).

The decline in profitability left ROA a little below 0.7 percent, higher than in the district as a whole but lower than in first-place Nebraska. The unusually sharp decline in average earnings was due entirely to the state's large banks, where ROA fell over 40 basis points. As in other states, Missouri's agricultural banks enjoyed a substantial increase in earnings. And among nonagricultural banks, small and medium-size banks suffered only slight declines in ROA that left them with the highest profit rates in the district.

The cause of the steep decline in ROA at large banks was a sharp increase in loan loss provisions. After many years of low loss provisions, Missouri's large banks set aside 1.1 percent of their assets in 1987, the same percentage as for other large banks in the district. All of the increase in provisions at the state's large banks represented net additions to loan loss reserves, as the ratio of chargeoffs to assets remained unchanged.

Missouri continued to have the lowest propor-

tion of nonperforming loans in the district, 2.5 percent. However, the delinquency rate on C&I and all other loans moved closer to the district average, reflecting a large increase in such delinquencies at the state's large banks.

Colorado

Banking performance declined most in Colorado, as problems in the state's energy, mining and construction industries continued to take their toll. ROA fell almost 30 basis points (Chart 5). Thirteen of the state's 440 banks failed during the year and five closed voluntarily, while only three new banks were started. Nineteen more banks were eliminated through mergers. At those banks remaining in business, both loans and assets fell (Chart 6).

The drop in profitability left the ROA of Colorado banks just below 0.1 percent, the third lowest rate of return in the district after Oklahoma and Wyoming. At agricultural banks, ROA increased only slightly to 0.3 percent. Among nonagricultural banks, all three size categories experienced significant declines in ROA, but especially large and medium-size banks.

The decline in profitability in Colorado resulted from a steep decrease in NIM that was only partially offset by lower loan loss provisions. Even with the decrease, provisions exceeded 1.2 percent of assets for the state as a whole, second only to Oklahoma. Provisions fell somewhat more at the state's large banks. However, at these banks the favorable impact on earnings was outweighed by a sharp drop in interest income and a reversal of the previous year's unusually large gain in non-interest income.

At the end of 1987, 4.8 percent of loans at Colorado banks were nonperforming. This proportion was down slightly from the previous year but still higher than the district average, reflecting above average delinquency rates in all categories except consumer loans.

Conclusions

The year 1987 witnessed a stabilization in the overall performance of commercial banks in Tenth District states. As in the previous two years, more banks were closed than were opened and growth at other banks was sluggish. However, loan losses fell sharply enough to offset a decline in banks' net interest income. As a result, average profitability increased slightly, ending five consecutive years of decline. The combination of slower asset growth and stable earnings enabled district banks to increase their capital asset ratios during the year, and the number of highly vulnerable banks with more delinquent loans than capital declined.

Performance continued to vary greatly across banks. Agricultural banks showed the strongest signs of recovery, combining faster loan growth with lower loan losses and higher profits. Banks in the two states most dependent on energy production also reported large increases in earnings, but because profitability had declined so much in previous years, **these** banks continued to earn much less than banks in other states. Among different size groups, large banks did

the worst in 1987. Not only did their growth slow dramatically, but their loan losses failed to come down and their profitability continued to slide.

Prospects are good for a continued recovery in district banking performance in 1988. The surprisingly strong growth of the national economy should spill over to the regional economy, boosting loan demand and speeding loan repayments. At district agricultural banks, high farm income, stable land values and declining delinquencies all point to a further reduction in loan losses and increase in profits. With oil prices having recovered little from the 1986 collapse and with loan delinquencies still very high, the outlook for banks in energy-producing states is less bright. Nevertheless, continued stability in oil prices should give these banks time to work through their problem loans and move closer to profitability. Finally, it should be remembered that there is a positive side to the current contraction in the district banking industry. The industry that emerges from this period of retrenchment is likely to be both leaner and stronger, an industry less prone to the excesses of the late 1970s and early 1980s and better able to withstand future recessions.

A New Era In Farm Lending: Who Will Prosper?

By Alan Barkema, Mark Drabenstott, and Landell Froerer

American agriculture is embarking on a strong recovery after six years of deep recession. The recovery, coming on the heels of one of the biggest financial restructurings in agriculture's history, marks the beginning of a new era for the industry and for lenders to agriculture.

The Agricultural Credit Act of 1987, passed late last year, also marks the beginning of a new era in farm lending. The law was a help to agriculture's largest and most beleaguered commercial lender, the Farm Credit System (FCS). But the law does much more than provide federal assistance to the FCS. Among its major provisions, the act enables the creation of a new secondary market for farm and rural housing mortgages. This new market could revolutionize farm lending by changing the competitive balance among new and existing farm lenders.

These two developments, a watershed in the farm economy and landmark legislation, mark a new era in farm lending—an era that means new

challenges for farm lenders. This article addresses two questions: How have agriculture's financial restructuring and the new legislation changed the farm lending market? And, which lenders will win and which will lose in the new lending environment?

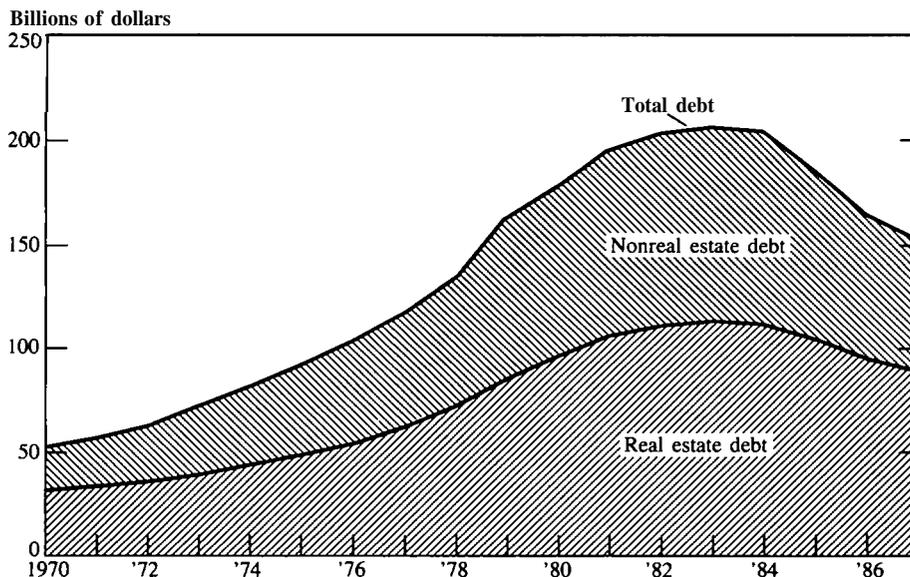
The analysis suggests that farm borrowers are settling into two **groups**: large commercial farmers who will be difficult to distinguish from other commercial borrowers, and small-scale **farmers** who will participate in credit markets much as consumer borrowers do. The article further concludes that traditional small agricultural banks will lose market share, both **large** agricultural and large **nonagricultural** banks will gain market share, and the Farm Credit System will at best maintain market share.

The analysis proceeds in three steps. The first section sketches agriculture's dramatic financial turnaround and reviews trends in farm lending for both borrowers and lenders. The second section describes the new legislative environment, focusing on the Agricultural Credit Act of 1987. The third section considers which lenders are likely to gain in the new lending environment and which are likely to lose. A final section summarizes the

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CHART 1

Total farm debt, excluding Commodity Credit Corporation loans



main conclusions.

Trends in farm lending

Agriculture's deep recession and its recent move toward recovery have significantly affected the structure of the farm lending market. Though structural change is not new to agriculture, the prosperous 1970s slowed the pace of structural change. The downturn of the 1980s revived these changes and then accelerated past trends. This section describes the signs of agriculture's recovery and the corresponding changes in the agricultural lending market, from both the borrower and lender sides. Trends in debt distribution among borrowers and lenders are considered, as are the performances of various lender groups.

Agriculture's recovery

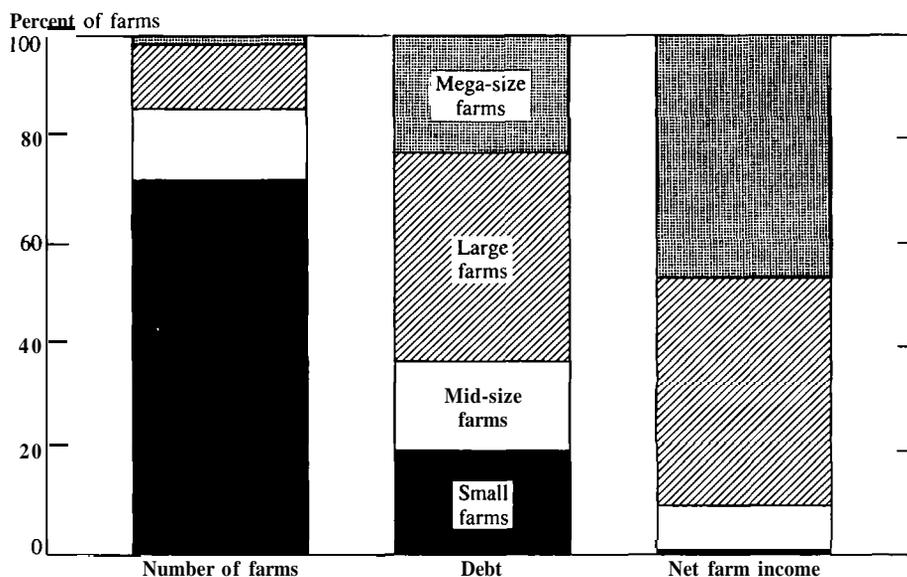
Telltale signs of agriculture's recovery are soar-

ing farm income, recovering land values, and plummeting debt. Real farm income, clearly the driving force behind the recovery, has strengthened markedly in recent years. And large farm income, in turn, has contributed to a turnaround in farmland values. Land values in the Tenth Federal Reserve District increased an average of 5 percent in 1987, the first increase after a six-year decline of 55 percent? The rise in land values has given both farm borrowers and farm lenders renewed confidence in handling the loan problems that remain.

Soaring farm incomes have also contributed to a sharp reduction in farm debt. Total farm debt

¹ Average farmland values increased 3 percent nationwide during the 12 months ended February 1, 1988, after falling a third during the preceding six years. See Economic Research Service, U.S. Department of Agriculture, "Agricultural Land Values and Markets: Outlook and Situation Report." 1988, and the *Financial Letter*, Federal Reserve Bank of Kansas City, February 1988.

CHART 2
Farm structure, 1986



increased nearly fourfold between **1970** and **1983**, when it peaked at about \$200 billion (Chart 1). Debt has since fallen more than a fourth to about \$150 billion at the end of **1987**. Roughly a third of the reduction in debt, about \$15 billion, has probably been written off by farm lenders.² High farm incomes, cautious capital budgeting, and lender writedowns all contributed to the sharp decline in farm debt.

Trends in farm income, farm asset values, and farm debt all support the conclusion that agriculture is recovering from six years of recession. Much of the farm recovery so far has been underwritten by Washington, and agriculture has not yet determined how the recovery will be sustained when government supports are reduced. Though

the future of agriculture's recovery is tenuous, the industry's recent performance has sharply reduced pressures on farm borrowers and lenders.

Farm borrower trends

As agriculture emerges from six years of recession and adjustment, a new assessment of long-term trends in farm borrowing is warranted. Who owns the farm debt? And how is the debt distributed among farm borrowers? To answer these questions, a look at the two-tiered nature of U.S. farming is useful. The 2.2 million farms in the United States can be grouped into two tiers: (1) small farms with less than \$40,000 a year in sales and relying primarily on income from non-farm sources and (2) commercial operations with **annual** sales of \$40,000 or more. Commercial-size farms can be further divided into three groups: middle-size farms with sales between \$40,000 and \$99,000; large farms with sales between \$100,000

² Lenders are likely to have written off about \$20 billion of farm loans by 1989. See Gregory Hansen, "Potential Losses of Farmers and Lenders." ERS/USDA Bulletin No. 530, September 1987.

and \$499,000; and mega-size farms with sales of \$500,000 or more.

Nearly three-fourths of the farms are small farms (Chart 2). These farms have consistently poor earnings, receive a negligible share of the country's total net farm income, and rely almost entirely on off-farm income. These farms account for about a fifth of total farm debt, a small proportion relative to the number of small farms but a large proportion relative to the share of net farm income they receive.

About one-fourth of all farms, approximately 600,000, are commercial-size operations. These farms receive nearly all of the nation's net farm income and account for the remaining four-fifths of the farm debt. Net farm income and farm debt are even further concentrated in the larger two classes of commercial farms—the large and **mega**-size farms. These larger commercial farms, though only 14 percent of all farms, account for 90 percent of the net farm income and nearly two-thirds of the farm debt.

Therefore, these two tiers of farms—small part-time farms and large commercial farms—differ sharply in their financial positions and represent different markets for farm lenders. Small farms hold a significant share of the farm debt, but their debt is serviced primarily from off-farm income. Though there are fewer commercial-size farms, these large-scale operations are clearly the dominant force in U.S. agriculture, in terms of both earnings and debt. And, net farm income and debt are further concentrated in larger commercial **farms**. These large-scale operations clearly represent the heart of the agricultural lending market of the future.

Farm lender trends

Who has loaned to farmers and how have lender market shares changed? The answers differ for the farm real estate and non-real estate lending markets. Trends in market shares for the two types

of debt are considered for five major lenders: commercial banks, the FCS, the Farmers Home Administration (FmHA), life insurance companies, and individuals and others. Also reviewed are trends in market share of farm debt among several diverse types of banks.

The dominant farm mortgage lenders since the early 1970s have been the FCS and individuals (Chart 3, Panel A).³ The market share held by the FCS grew steadily to a peak of 44 percent in 1984 before slipping back to just under 40 percent in 1986. The increase in the FCS share came largely at the expense of individuals and insurance companies. The proportion of real estate debt held by individuals fell steadily to a fourth of the market in 1986, and the proportion held by insurance companies fell to 11 percent. With the slippage in the FCS domination of the market, the share held by commercial banks has increased to 13 percent.

The most prominent feature in the market for non-real estate debt was the **abrupt** increase in the FmHA share, from comparatively low levels in the mid-1970s to about a fourth of the market by 1986 (Chart 3, Panel B). The FmHA, the government's agricultural lender of last resort, saw its share of the market increase as agriculture's financial problems intensified and Congress underwrote a bigger role for government lending to agriculture. The share of the market held by commercial banks, long the dominant force in short-term lending to farmers, has recently increased to about 44 percent, after a long erosion that ended in 1981. Recent gains in market share by the FmHA and commercial banks have come mainly at the expense of the FCS.

An important trend is evident in the share of farm debt held by commercial banks (Table 1). Banks' share of the farm lending market is shift-

³ Farm debt held by individuals and others includes farm real estate sales financed with contracts for deed and shorter-term credit extended by merchants, dealers, processors, and other individuals.

CHART 3
Market shares of farm debt

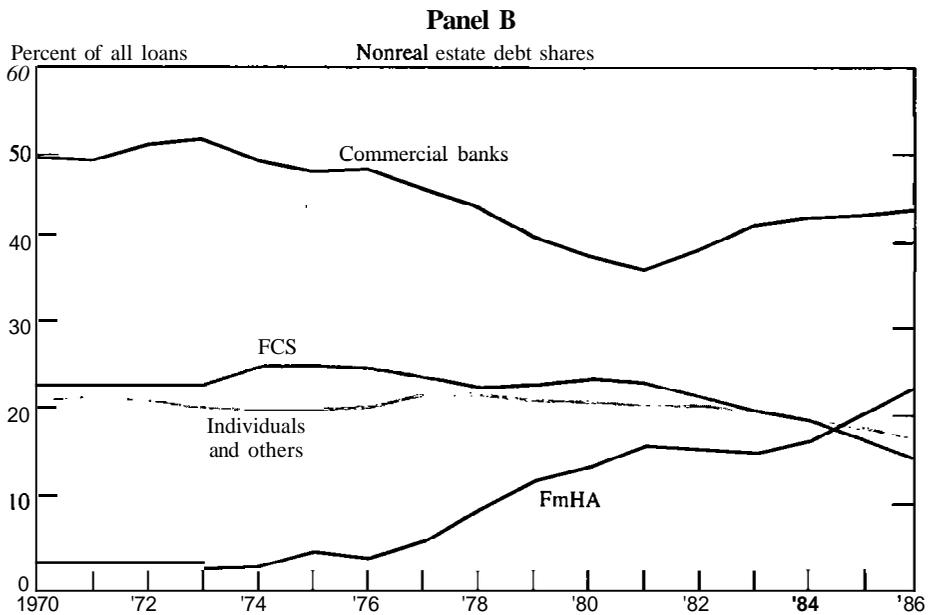
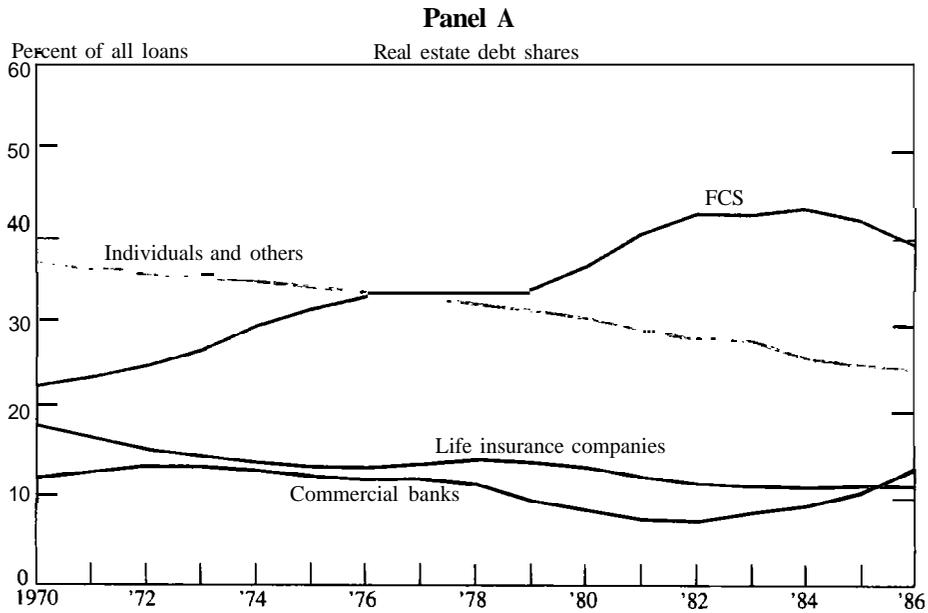


TABLE 1
U.S. commercial bank structure

	Total Assets (millions of dollars)*	Number of Banks		Market Share**			Agricultural Concentration***
		1978	1987	1978	1983	1987	1987
Agricultural Banks†		5,445	4,491	65.3	67.4	60.2	35.2
Small	<25	3,190	2,325	20.2	18.1	16.1	43.7
Medium\$	≥25	2,255	2,166	45.2	49.2	44.1	32.9
Nonagricultural Banks		8,904	9,047	34.7	32.6	39.8	1.4
Small	<25	2,268	2,090	2.0	1.7	1.5	3.4
Medium	25-249	5,809	5,941	18.4	15.9	17.2	2.6
Large	250-999	618	687	5.7	5.1	6.0	1.3
Mega‡	≥1,000	209	329	8.6	10.0	15.1	0.9

*In constant 1987 dollars

**Share of bank-held farm debt, percent

***Ratio of farm loans to total loans, percent

†**Agricultural banks** are insured commercial banks at which the ratio of total farm loans to total loans is above the unweighted average of such ratios at all banks at the end of the year (15.5 percent at the end of 1987).

‡**Only eight** medium-size agricultural banks had more than \$250 million in assets in 1987. The mega-size nonagricultural bank class excludes the nation's 20 largest banks, each of which had more than \$18 billion in assets at the end of 1987.

ing from specialized agricultural banks—banks with more than an average proportion of loans to farmers—to nonagricultural banks. Bank-held farm debt is becoming concentrated more in the hands of larger banks with diversified loan portfolios.

Medium-size agricultural banks hold the largest share of bank-held farm debt, a share that crested in 1983 before returning to the levels of the late 1970s. The market share held by small agricultural banks has slipped four percentage points during the last ten years as the number of these smaller specialized lenders shrunk more than a fourth.⁴ Small, medium-size, and large nonagricultural banks have maintained nearly stable market shares. But the mega-size nonagricultural banks

⁴ The recent national decline in the share of bank-held farm debt at agricultural banks, and especially at small agricultural banks, could be caused in part by a concentration of these banks in regions most severely affected by the farm recession. That is, the decline in farm loans at the disproportionately large number of agricultural banks in the Midwest may have been sufficient to lower the market share of farm debt held by agricultural banks nationally. Approximately 80 percent of all agricultural banks and 85 percent of small agricultural banks are located in the Seventh (Chicago), Ninth (Minneapolis), Tenth (Kansas City), and Eleventh (Dallas) Federal Reserve Districts of the Midwest, but only 60 percent of all banks are located in these districts. Continued recovery in the farm economy could enhance the competitiveness and farm-debt market share of agricultural banks relative to nonagricultural banks in these strongly agricultural regions. However, declining market share at small agricultural banks and rising market share at medium-size, more-diversified agricultural banks from 1978 to 1983, before the farm recession had deepened, suggest that a stronger farm economy would not be likely to reverse the decline in market share at small agricultural banks.

made large gains in market share. These banks now hold nearly as much of the farm loan market as small agricultural banks, even though farm lending is only a very small part, less than 1 percent, of the business done at these huge diversified banks.

Thus, the extraordinary financial adjustments in recent years have been accompanied by significant shifts in lender shares of the farm loan market. The government lender, the **FmHA**, has taken a much larger share of the market as a direct result of the agricultural recession. Severely weakened in the recession, the FCS has lost a significant part of the market share it gained from commercial banks during the 1970s. Market share held by larger diversified banks has increased, largely at the expense of small agricultural banks. Medium-size agricultural banks hold by far the largest share of bank-held farm debt. And **mega**-size nonagricultural banks have increased their market share sharply in recent years, even though farm loans are a small part of their business.

Trends in farm lender performance

A look at market shares provides an important view of the farm lending market's recent dynamics, but the perspective is incomplete. Underlying trends in lender performance, including trends in earnings and loan quality, complete the picture. This section focuses on the recent performance of the three farm lenders most affected by the Agricultural Credit Act of 1987: commercial banks, the FCS, and the FmHA.

Commercial banks. Earnings, as measured by return on assets, have varied widely in the 1980s, especially at agricultural banks (Table 2). Earnings were stronger at agricultural banks than at nonagricultural banks in the early part of the decade, but agriculture's recession drove earnings at these specialized banks to a postwar low in 1986, well below earnings at nonagricultural banks. Earnings at agricultural banks turned up in 1987.

TABLE 2
Return on assets by bank type and size'

	<u>1980</u>	<u>1986</u>	<u>1987</u>
Agricultural Banks†	1.27	0.42	0.68
Small	1.31	0.25	0.50
Medium	1.26	0.47	0.73
Nonagricultural Banks	0.84	0.66	0.54
Small	0.88	-0.23	-0.11
Medium	1.03	0.61	0.66
Large	0.89	0.61	0.65
Mega	0.67	0.72	0.49

*Source: Federal Reserve Board call report data. Return on assets calculated by using total assets at yearend.
†See Table 1 for definition.

But earnings did not rebound at small agricultural banks like they did at medium-size agricultural banks, which hold smaller concentrations of agricultural loans. Earnings at larger banks, agricultural and nonagricultural, have been generally more resilient to market shocks than earnings at small banks.

Trends in earnings at commercial banks have **generally** followed trends in loan quality, measured by nonperforming loans. As is the case of earnings, fluctuations in nonperforming loans have been sharper at agricultural banks than at nonagricultural banks (Chart 4). **Nonperforming** loans at agricultural banks rose sharply from very low levels in the early 1980s to a peak of 4.4 percent of all loans as earnings bottomed in 1986. Similarly, nonperforming loans at agricultural banks declined as earnings bounced back in 1987. The comparatively stable level of nonperforming loans at nonagricultural banks stands in stark contrast to the wide fluctuations in nonperforming loans at agricultural banks.

Gauged by both earnings and loan quality, bank

CHART 4
Nonperforming loans at agricultural and nonagricultural banks

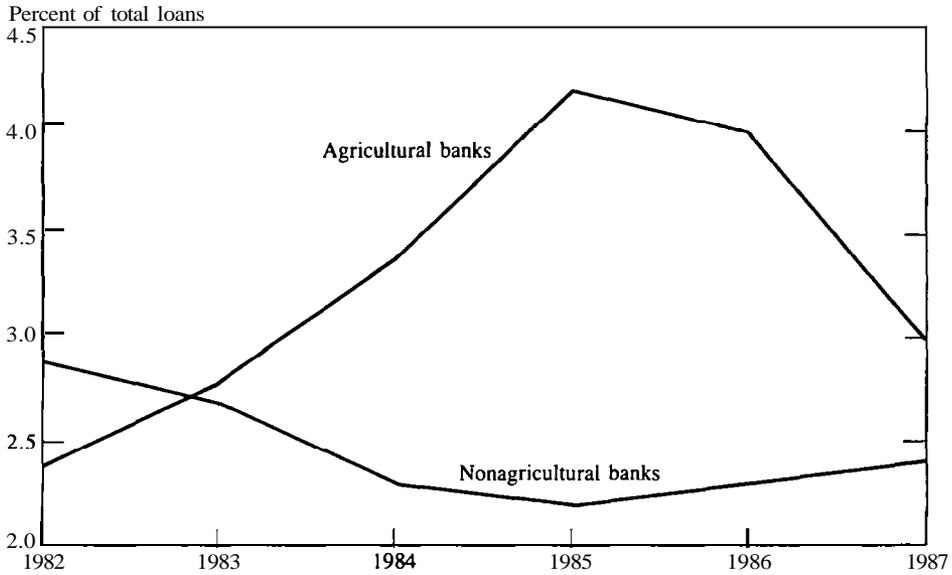
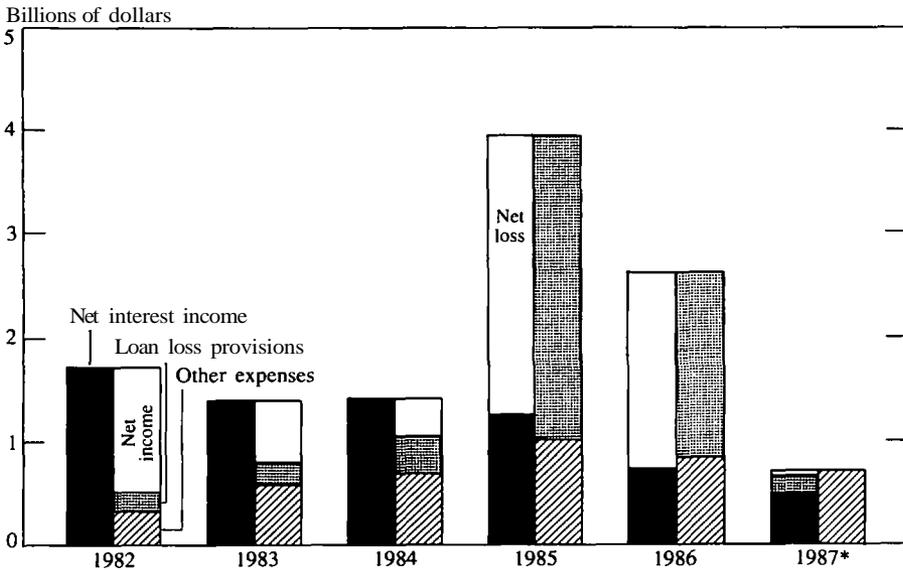


CHART 5
Farm Credit System income components



*\$196 million was deducted from loan loss reserves and added to earnings in 1987. The change effectively reduced the size of the system's net loss for the year.

performance has been generally more stable for large banks that do not specialize in **farm** lending. Earnings at small agricultural banks outpaced earnings at the larger, more diversified banks during agriculture's boom years. But smaller, more specialized banks were hard hit by agriculture's recession, and these banks are now struggling to make up for their losses. These data suggest that, on balance, large diversified banks have the staying power to be an increasing force in the farm lending market.

Farm Credit System. Trends in earnings at the FCS, a lender specialized strictly in agricultural lending, follow the same pattern as earnings at small agricultural banks. Like small agricultural banks, the FCS was hard hit during agriculture's recession. The system lost **\$2.7 billion** in **1985** and **\$1.9 billion** in **1986** before cutting its losses to only **\$18 million** in **1987** (Chart 5).

The system's huge losses were due largely to burgeoning problems with the quality of loans. **Nonperforming** loans were a growing percentage of the system's shrinking loan portfolio since the early **1980s**. Total nonaccrual and other high-risk loans jumped to a high of **\$12.8 billion** in **1986** before edging down to **\$9.4 billion** in **1987**. The increase in problem loans came as the size of the system's portfolio shrank a third, to **\$52.5 billion** by **1987**. As a result, the proportion of high-risk loans to all loans increased, reaching a high of **22 percent** in **1986** before subsiding to **17 percent** in **1987**. In recognition of its loan quality problems, the system deducted loan loss provisions totaling **\$4.8 billion** from its earnings in **1985** and **1986**. The reduction in the system's inventory of problem loans in **1987** prompted the system to reduce its loan loss reserve by **\$195 million**. That **\$195 million** was then added to earnings, significantly improving the year's bottom-line performance.

In addition to the quality problems in the system's loan portfolio, two other factors have contributed to system losses. First, the system's net interest income was further squeezed by interest

expense on bonds issued between **1980** and **1982**. The bonds could not be recalled and, as a result, system interest expenses could not be adjusted to a general decline in market rates. Second, overhead expenses—salaries, bricks and mortar, and other miscellaneous expenses—have not shrunk as fast as the size of the system's loan portfolio. Instead, overhead expenses rose from **1.1 percent** of loans in **1984** to **1.5 percent** in **1987**. Some of the sluggishness in the adjustment of the system's overhead was due to the higher costs of servicing problem loans and the costs of adjusting to a changing regulatory environment.

The performance of the FCS plummeted sharply during agriculture's recession, much as the performance of other highly specialized lenders to agriculture plummeted. While the system's bottom line improved substantially as agriculture's recovery gained momentum last year, much of the system's improvement can be attributed to a somewhat discretionary reduction in loan loss reserves. Huge previous losses and a persistent inventory of distressed debt still overwhelm the system's recent financial progress and could leave the FCS depending on government assistance.

Farmers Home Administration. The performance of the FmHA has been especially bleak. As the government-subsidized agricultural lender of last resort, the FmHA **acquires** higher risk farm loans than other lenders are willing to accept. As a result, agriculture's recession caused especially sharp deterioration in the FmHA loan portfolio. In a loan portfolio of **\$26 billion**, **\$11.8 billion (46 percent)** is delinquent, and **\$7.3 billion (28 percent)** has been past due four years or more. The agency expects to write off **\$8.8 billion** of the problem loans, at least a part of those loans made uncollectable by the borrower rights provisions of the Agricultural Credit Act of **1987**.

Summary

Agriculture's recent recession and recovery have

stepped up the pace of structural change among farm borrowers. Borrowers appear to be settling into two tiers, each a different market for farm lenders. The first tier is **made** up of small-scale, part-time farms, large in number but only a small part of the nation's farm production and income. These small farms owe nearly a fifth of the farm debt, which is necessarily serviced from **off-farm** income sources. The second tier of **borrowers** are large-scale commercial farms. Although few **com-**pared with the nation's small farms, these **com-**mercial farms account for most of **farm** production and income. And like farm production and income, farm debt is becoming increasingly concentrated among the largest of these commercial-scale farms.

The **farm** recession and recovery also changed the structure of agriculture's lenders. Commercial banks have recently regained the market share they lost in the 1970s. But large diversified banks have increased their share at the expense of smaller banks that traditionally specialized in **farm** lending. A more stable record of solid earnings throughout the financially turbulent 1980s suggests that these larger, more resilient banks will be an increasing force in the farm lending market.

The Farm Credit System has lost market share. It has suffered huge losses and is plagued by a large inventory of problem loans. Recent improvement in the system's bottom line has not been enough to eliminate the system's need for government assistance. The FmHA has attained the dubious distinction of recording stellar gains in market share at the urging of Congress, only to have most of its recent gains recognized as uncollectable.

In brief, the economic events of the 1980s have increased the pace of change in the farm lending market, change that can be seen in the structure of both farm borrowers and farm lenders. But recent events in the farm economy will not be the only determinants of the future structure of the farm lending market.

A new legislative environment

Changes in the structure of agriculture and changes in the structure of the market for farm loans together describe a new era in agricultural lending. But just as important is the Agricultural Credit Act of 1987. Passed by Congress in late December 1987 and signed into law in early January 1988, the law may be the most important legislation affecting agricultural lending since the 1930s. Originally intended to provide financial assistance to the Farm Credit System, it promises to leave a lasting imprint on other farm lenders as well.

This section summarizes provisions of the act, focusing on four provisions likely to have the greatest effect on farm lending. The act provides assistance to the financially troubled Farm Credit System. It outlines guidelines for restructuring the system. It specifies certain rights for FCS and Farmers Home Administration (FmHA) borrowers. And it enables the creation of the Federal Agricultural Mortgage Corporation (FAMC or Farmer Mac).

Financial assistance

The act meets its primary goal of assisting the Farm Credit System by providing up to \$4 billion in direct financial assistance. The money will be raised by a newly created FCS Financial Assistance Corporation selling uncollateralized bonds backed by the full faith and credit of the U.S. government. The new corporation will be capitalized **by** mandatory stock purchases **by** FCS institutions. Banks and associations of the FCS must buy stock in the amount by which unallocated retained earnings exceed 5 percent of assets of banks and 13 percent of the assets of associations. This capital assessment on healthy FCS **units** is similar to the assessments tried earlier by the now defunct Farm Credit Capital Corporation.

The assistance will be administered by the Farm Credit Assistance Board, consisting of the secretaries of Agriculture and the Treasury and a third member, an agricultural producer appointed by the President. One way the new law brings discipline to bear on the FCS is by giving the assistance board almost unlimited powers in overseeing the financial and business management of FCS units that receive assistance.

The objectives of financial assistance are to protect FCS borrower stock, help make FCS institutions financially viable again, and allow units to provide credit on reasonable and competitive terms. The protection furnished to owners of FCS stock stands in stark contrast, of course, to the losses facing stockholders of commercial banks that fail.

FCS restructuring

In exchange for financial assistance to the FCS, the law calls for the restructuring of system units. The Federal Land Bank and Federal Intermediate Credit Bank in each Farm Credit District must have merged by June 1988. Within six months of the district-level merger, any Production Credit Association (PCA) and Federal Land Bank Association (FLBA) serving substantially the same geographic area must submit a plan for merging to stockholder approval. When completed, these mergers are expected to facilitate one-stop servicing of borrowers' long and short-term credit needs.

The act also requires that plans for a larger scale consolidation of system units be submitted for stockholder approval. It sets up an 18-month schedule for considering consolidation of the 12 Farm Credit districts into as few as six districts and calls for plans to merge the 12 Banks for Cooperatives and the Central Bank for Cooperatives into a single National Bank for Cooperatives. These large-scale mergers within the FCS are intended to help cut the system's overhead costs.

Borrower rights

To help fulfill its purpose of providing credit assistance to financially troubled farmers, the act contains a "bill of rights" for **farmers** borrowing from the FCS and FmHA. These rights spell out the procedures the FCS and FmHA must follow in dealing with troubled loans.

The law requires that borrowers be well informed of the terms of their loans, be granted reviews of adverse credit decisions and actions, and be given their due options before lenders can foreclose. **Borrowers** must be given 45 days' notice that their loans may be eligible for restructuring before foreclosure can proceed and, generally, loans must be restructured when restructuring would cost less than foreclosure. If foreclosure occurs, the borrower must be given the right of first refusal to lease or purchase the foreclosed property.

When viewed against the problem loans that remain, the borrower rights provisions will be costly for the FCS and the FmHA. The provisions reduce flexibility in dealing with problem loans, increase the costs of servicing these loans, and will likely make many distressed loans **uncollectable**. The spirit of the borrower rights provisions may be consistent with the **FmHA's** role as lender of last resort, but agency losses as a result of these provisions could make fewer funds available to borrowers that would otherwise qualify for FmHA loans. The provisions appear inconsistent with the position of the FCS as a commercial lender and could affect the system's ability to compete in an increasingly competitive lending market.

Secondary market

The new law enables the creation of a secondary market for farm and rural housing mortgages by giving rise to the Federal Agricultural Mortgage Corporation, or Farmer Mac. Farmer Mac's role in the new secondary market is similar to that

of its older cousins, Ginnie Mae, Fannie Mae, and Freddie Mac, in the secondary residential mortgage market (see page 37). Farmer Mac guarantees timely payment of principal and interest on securities that represent interests in pools of farm mortgages and are sold to the investing public by loan poolers certified by Farmer Mac. The guarantee is supported by a 10 percent reserve fund formed by the originators or poolers of each loan pool and ultimately supported by a \$1.5 billion line of credit at the U.S. Treasury. Treasury funds cannot be tapped until the reserve fund is depleted.

Though several questions regarding Farmer Mac are still to be answered, Farmer Mac's creation is likely to introduce a new level of opportunity and competition in agricultural lending. The secondary market gives commercial banks a new opportunity to become full-service lenders. Banks that have traditionally specialized in short-term operating credit can now also offer long-term farm mortgages without incurring the risk of holding the mortgages in their portfolios while having to fund them with shorter term deposits. Increased interest in mortgage lending by banks is likely to increase competition in a market that the FCS has dominated. The secondary market also promises to attract new entrants into agricultural lending. Major agricultural input suppliers who already have a strong market network in agricultural areas regard the secondary market as a low-cost way of adding to their range of product and financial services. Farm borrowers stand to benefit from the increase in competition and the wider array of service offerings accompanying a viable secondary market.

The future: who wins, who loses

The farm lending market is entering a new era marked by increased structural change in the farm economy and a new legislative environment under the Agricultural Credit Act of 1987. A fundamental

question is, Which lenders will gain in the new farm lending market and which will lose? This section focuses on several considerations that will help determine winners and losers. Several factors are first reviewed as likely to characterize the farm lending market of the future. With these factors as a guide, lenders can then be classified as likely losers or gainers in the new agricultural lending market. The main gauge in measuring market success is the market shares lenders can profitably maintain.

Factors governing the future

Four major factors characterizing the future structure of the farm lending market can be distilled from the discussion in the two preceding sections. The first two factors relate to the structure of farm borrowers. The second two relate to the structure of farm lenders.

First, the principal farm debt market is likely to grow slowly and become more concentrated as excess farm-production capacity continues to constrain farm loan demand. Farm borrowers will continue to favor retained earnings and accumulated equity as the preferred means of financing operations, as has been the trend in recent years.

Second, the farm lending market is likely to follow the two-tiered structure of U.S. farming, with a smaller number of financially sophisticated, large farm borrowers holding a growing part of the farm debt. Lenders will face two increasingly distinct farm loan markets. Lending to small farms will be a high-volume, low-margin business, like consumer lending. Lending to large farms will be a lower volume, higher margin business, much like commercial lending.

Third, competition in the farm lending market is likely to intensify as players jealously guard market shares and new entrants elbow their way into a crowded marketplace. Larger diversified banks with stable earnings, the institutions with competitive muscle and staying power, will

become increasingly important players in the farm loan market.

Fourth, the passage of the Agricultural Credit Act introduces unknowns that are likely to change the competitive balance. One of the unknowns the act introduces is the level of acceptance and success the new secondary market can attain. How big will the secondary market be and will it attract new lenders? This discussion assumes that the secondary market will become a major source of mortgage credit, coaxing some suppliers of farm inputs into farm lending and increasing competition. Another unknown is the response of the FCS. This discussion assumes that the FCS will follow the spirit of the act, undertaking extensive reorganization and a new capital base that encourages sound business decisions. Thus, the act is likely to preclude the system's aggressive pursuit of market share, effectively diminishing the system's competitive posture.

Lenders gaining market share

Four lender groups appear most likely to gain a larger share of the farm lending market. Medium-size agricultural banks are poised to gain market share with the continued recovery of the farm economy. Large nonagricultural **banks**—those in the medium-size, large, and mega-size classes—and nontraditional lenders appear poised to make solid gains. Insurance companies appear likely to make smaller gains.

Medium-size agricultural banks—those with assets greater than \$25 million—will confront many of the same problems as small banks, but to a less extent. Like smaller banks, many of these banks are in areas where the opportunities to buffer earnings by diversifying lending risks across industries are limited. A relatively high concentration in farm lending will continue to tie bank earnings to the performance of agriculture. But these banks, especially the larger ones, are big enough to provide the financial services larger

farm borrowers require. With continued recovery in the farm economy, medium-size agricultural banks will likely make modest gains in market share, but they will face intense competition from larger nonagricultural banks.

The larger nonagricultural banks, those with more than \$25 million in assets, appear well positioned to increase their market share. These banks are large enough to benefit from the diversification of loan portfolios across industries and regions. Their diversity lends stability to earnings and provides a base for competing in the farm loan market. These banks can **usually** maintain a record of solid earnings by balancing risks from farm lending with other loans.

Economies of size will allow these larger banks to provide the range of financial **services** that large farm **borrowers** will seek. Size economies will also give them ready access to the new secondary market. These banks have already used their commercial loan experience to advantage in attracting quality farm loans. Distinctions between farm loans and other small business loans will diminish.

The extent of market presence that mega-size banks want to attain is not clear. Their share of the farm lending market has been rising sharply, but farm lending remains an almost negligible part of their business. The gains they make in market share will likely be limited to the high-profit, large-volume business of the largest farm borrowers.

Nontraditional lenders are expected to gain a stronger foothold in farm lending through the secondary market. Farm input supply firms are likely to view the secondary market as a low-cost opportunity to offer their large customer bases one-stop shopping for farm production inputs and **financing**. Lack of experience in farm lending may be a disadvantage at first. But that disadvantage is offset, at least to some extent, by the clear advantage of having extensive customer-service networks and large client bases. Tapping secondary markets gives rise to considerable economies

of scale, and large client bases will allow these new lenders to spread fixed costs to low **per-borrower** levels. Finally, the proposed extension of the secondary market to farm operating loans would allow these firms to increase the volume of their business with little additional **cost**.⁵

Profitability in the financial services business may vary among these nontraditional lenders. For some, financial services may be simply another means of marketing traditional farm supply services. For others, the new secondary market may be an opportunity for establishing a new profit center in a crowded lending market. Either way, successful offerings of financial services will give farm suppliers a tighter grip on their current customer bases.

Agricultural lending by insurance companies is likely to follow a pattern of lending to large-volume farm borrowers similar to that of the largest commercial banks. The share of the market held by insurance companies has dwindled over the past 15 years as these companies have withdrawn from the farm mortgage market. Since insurance companies do not have large loan origination and servicing networks and usually keep farm mortgages in their loan portfolios, the new secondary market is not expected to entice them back to lending on farm mortgages. More likely, insurance companies will take advantage of the secondary market by buying securities backed by farm mortgages for their investment portfolios and by serving as poolers of farm mortgages.

Lenders losing market share

Three lenders appear likely to lose market share. Recent trends suggest that small banks in the farm

⁵ The act specifies that Farmer Mac can issue only securities backed by farm and rural housing mortgages. The act provides, however, that the General Accounting Office will conduct a study in two years to determine if Farmer Mac's authority should be extended to include operating loans to farm and rural businesses.

loan market, both agricultural and nonagricultural banks, will continue to lose share. And if the Farm Credit System abides by the spirit of the restructuring and recapitalization provisions of the Agricultural Credit Act, it too will lose market share.

Small banks—both agricultural and nonagricultural banks with less than \$25 million in **assets**—will suffer from persistently weak demand for farm loans, leaving them cash rich but earnings starved. Many of these banks in rural areas of the Midwest have loan-deposit ratios well below 50 percent, even though they would prefer higher **ratios**.⁶ Although their small size limits the services these banks can provide large farm **borrowers**, they are well positioned to serve the small farm borrower. Small farm loans will be serviced increasingly, however, from off-farm income, much like **consumer** loans, and many small banks are in communities where weak local economies limit the opportunities for off-farm employment. A business plan targeting small farm loans may be of little value in those areas.

The Farm Credit System appears likely to lose market share under the Agricultural Credit Act. Two factors point to such a conclusion. First, the restructuring encouraged in the act is likely to enhance the system's competitiveness by reducing operating expenses. But that effect may be **offset** by the increase in costs resulting from the borrower rights provisions of the act. Second, the act calls explicitly for the system to establish an insurance fund and a new capital base to backstop its operations. These provisions of the act implicitly require that the system price its loans to

⁶ Loan-deposit ratios at agricultural banks in the Tenth Federal Reserve District (Kansas City) averaged 49.5 percent at the end of 1987, and 45 percent of the agricultural banks in the district reported loan-deposit ratios lower than desired. These percentages were, respectively, 50.3 percent and 78 percent in the Seventh Federal Reserve District (Chicago), and 50.0 percent and 67 percent in the Ninth Federal Reserve District (Minneapolis).

reflect the full costs of doing business. Otherwise, the system's insurance fund and capital base would gradually be depleted by continued operating losses. **As** the system moves toward a market-based pricing policy, it denies itself the luxury of purchasing market share at the expense of profitability. Thus, the FCS of the future may be smaller but more profitable.

Reducing market share while raising profitability is one possible outcome for the FCS. Alternatively, the system may try to return to the credo that bigger is better, building market share at the expense of profitability. Trying to regain market share quickly with a pricing policy that does not reflect all its costs would, at best, leave the system with small profits and, at worst, with huge losses.

Persistent FCS losses would eventually leave the system depending on the good will of the taxpayers, and only a step removed from the FmHA. Not bound by the discipline of the market, the FCS would be free to rewrite the ground rules for competition among public and private lenders. Commercial banks would, in effect, be forced to compete against lenders that were not bound by bottom-line discipline. A loss-plagued FCS and a still large FmHA could leave a sizable part of the farm debt essentially in the hands of the government, burdening the public with a substantial ongoing cost.

Conclusions

A broad farm recovery is ushering in a new era for farm borrowers and lenders. After the deepest farm recession since the Depression, the turnaround is welcome. The beginning of the new era marks a time for reappraising significant structural changes in the farm lending environment. Farm borrowing has become more concentrated among large farms as the nation's agriculture has increased its inexorable trend toward fewer farms controlling more farm production. Farm lending has also shifted, with traditional **agricultural** banks

and the FCS losing market share while larger and better diversified banks and the FmHA have gained market share.

The farm lending market of the future promises to be more competitive than ever. Large size and consistent earnings give commercial lenders market staying power. The Agricultural Credit Act gives the FCS the means to become a competitive lender again; the system must now supply the resolve to carry out what promises to be a major restructuring of its operations. The act will stimulate competition through the creation of Farmer Mac, a new secondary market for farm mortgages. Nontraditional lenders appear poised to enter the farm lending market. Farm borrowers will benefit from the increase in competition, but lenders will have to follow sound business plans to succeed.

Current trends suggest some winners and losers in the farm lending market of the future. Large nonagricultural banks appear likely to increase their market share while small agricultural banks lose share. The small agricultural banks appear to face a difficult future characterized by weak earnings. **Nontraditional** lenders, while still largely unknown, will probably gain market presence. The FCS may lose market share or, at best, keep its current diminished share if it moves to restore profitability.

The biggest challenge ahead for all farm borrowers and lenders will be negotiating the future course of agriculture's recovery. The recovery is importantly underwritten by Washington. How long the recovery will last, and how robust it will be, depends, on the one hand, on the timing of any phasing down of farm programs, and, on the other, on further growth in export markets. The outcome is not clear. But even if the farm recovery stalls or tips into recession, both **farm** borrowers and farm lenders will be better prepared than in the early 1980s. One of the abiding hallmarks of the new era in farm lending is a financial conservatism born out of adversity.

Secondary Markets and Farmer Mac

Farmer Mac represents a new form of lending to agriculture. However, secondary markets are a time-tested tool of financing long-term debt. The secondary farm mortgage market will operate on the same principles as its more established residential mortgage cousins. The eventual size of the Farmer Mac market and the pricing of its securities are still unknown, but comparisons with existing markets offer some clues.

Residential mortgage markets

The secondary market is a major part of the nation's residential real estate lending market. Three agencies play a part in the secondary residential mortgage market similar to the role to be played by Farmer Mac in the secondary farm mortgage market. These agencies are the Government National Mortgage Association (Ginnie Mae), the Federal Home Loan Mortgage Corporation (Freddie Mac), and the Federal National Mortgage Association (Fannie Mae). Mortgage pass-through securities are claims on pools of residential mortgages. These securities were first issued in 1970 under the auspices of Ginnie Mae. Ginnie Mae guarantees full and timely payment from pools of mortgages insured by the Federal Housing Administration (FHA) or guaranteed by the Veterans Administration (VA). The Ginnie Mae guarantee is backed by the full faith and credit of the U.S. government. Under a similar program started in 1971, Freddie Mac guarantees payments from pools of conventional residential mortgages, the difference being that the Freddie Mac guarantee is not government backed. Fannie Mae, a purchaser of residential mortgages since 1938, began issuing securities backed by FHA, VA, and conventional mortgages in 1981. Like the Freddie Mac guarantee, the Fannie Mae

guarantee of payment is not government backed, but the corporation does have a \$2.25 billion line of credit at the U.S. Treasury, a credit line that has never been used.

The U.S. secondary residential mortgage market is enormous, and Ginnie Mae, Freddie Mac, and Fannie Mae are its biggest players. Outstanding principal balances of residential mortgages backing securities guaranteed by these three agencies totaled more than \$670 billion at the end of 1987, 31 percent of the total residential mortgage debt. The three agencies held another \$110 billion of mortgages in their portfolios. The largest part of these **unsecuritized** mortgages (\$96 billion) was held by Fannie Mae.

Yields on secondary mortgage market securities are usually between the yields on Aaa- and Aa-rated corporate bonds. For the past five years, for example, yields on Ginnie Mae mortgage-backed securities have averaged 110 basis points higher than the yield on 10-year Treasury bonds, 24 basis points higher than the yield on Aaa corporate bonds, and 20 basis points less than the yield on Aa bonds.

The outlook for Farmer Mac

The secondary farm mortgage market will be a far smaller market than the secondary residential mortgage market because the total value of farm real estate assets and debt is comparatively small. The value of U.S. farm real estate totaled \$576 billion at the end of 1987. Debt against this real estate totaled only \$90 billion, about 4 percent of the value of all residential mortgages outstanding. Transfers of farmland every year average roughly \$20 billion, and about \$8 billion in new farm mortgage credit is extended every year. Only part of the new farm mortgage credit

extended every year will qualify for the new secondary market, and that part will be determined by the underwriting standards qualifying mortgages must meet. Thus, as significant as the Farmer Mac market may be to farmers, it will be very small compared with other mortgage markets.

It is still unknown how yields on Farmer Mac-guaranteed securities will compare with yields on other securities. But the spread between yields on Farmer Mac securities and Treasury securities is not likely to differ much from the spread between FCS and Treasury securities. Yields on seven-year FCS bonds averaged 44 basis points higher than yields of Treasury securities in 1986 and 1987.

The estimate that yields on Farmer Mac securities are likely to be similar to those on FCS bonds is based on recognition of the similarities between the new secondary market and the FCS. First, the FCS obtains farm loan funds by tap-

ping national financial markets through sales of systemwide notes and bonds. The new secondary market will tap the same markets through the sale of mortgage-backed securities. Second, the risk of default assumed by investors in FCS securities is reduced by the joint and several liability for payment on these obligations assumed by all FCS institutions. The understanding that all system institutions back payment on FCS issues effectively reduces the investors' risk through diversification. The same sort of diversification is achieved by the secondary market by pooling a diverse group of farm mortgages. Third, and most important, investors have accepted the implied agency status of FCS securities as an implicit government guarantee against loss. Similarly, the Farmer Mac guarantee is backed by a line of credit at the U.S. Treasury that can be tapped if losses in any mortgage pool exceed the 10 percent reserve fund established by originators or poolers.

Should the Federal Reserve Continue to Monitor Credit?

By James S. Fackler

The Federal Reserve decided in 1983 to use a broad credit aggregate in the conduct of monetary policy. In doing so, policymakers responded to increased uncertainty about the relationship between monetary aggregates and economic performance. This increased uncertainty, due in part to changes in the financial system over the previous decade, lowered the usefulness of monetary growth as a policy guide.

Since 1983, the Federal Open Market Committee has set a monitoring range for a broad credit aggregate, total credit. The Committee has intended to use the information on total credit, in conjunction with the behavior of the monetary aggregates relative to their target ranges, to guide monetary policy decisions.¹

¹ Records of the February 1983 meeting of the Federal Open Market Committee indicate that "the Committee intended to

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But the relationship between total credit and economic activity has proved to be somewhat unreliable. This unreliability may have resulted in part from the unprecedented buildup of government debt and from changes in the financial system. For whatever reasons, though, total credit has been sufficiently unreliable that some analysts question whether the Federal Reserve should continue monitoring this credit aggregate. Yet the Full Employment and Balanced Growth Act of 1978 requires the Federal Reserve to report to Congress "with respect to the ranges of growth or diminution of the monetary and credit aggregates." Perhaps some credit aggregate other than total credit could be used to fulfill this Congressional mandate and to help guide monetary policy.

monitor total debt flows closely for whatever information they could provide in assessing appropriate responses to developments in the targeted monetary aggregates." For further details, see "Record of Policy Actions of the Federal Open Market Committee," *Federal Reserve Bulletin*, April 1983, p. 289.

"Total credit" and "total debt" are often used interchangeably by policymakers since the total of credit extended, from the viewpoint of lenders, is equal to the total of debt incurred, from the viewpoint of borrowers. For example, the Federal Reserve reports data on "Monetary and Credit Aggregates" and includes "debt" as one of these aggregates.

The evidence in this article suggests that the Federal Reserve should consider monitoring the private credit component of total credit. The first section of the article shows that neither total credit growth nor monetary growth has been related closely enough to policy goals to serve as the sole guide for policy. The second section reviews theoretical arguments suggesting other credit measures that might be more useful guides for monetary policy than the measure used by the Federal Reserve since 1983. The third section presents empirical evidence that one such measure, private credit, would have been a useful policy guide in the 1980s, especially if used in conjunction with monetary growth.

A framework for evaluating monetary policy strategies

No monetary or credit aggregate has been closely enough related to policy goals in recent years to serve as the sole guide for monetary policy. The Federal Open Market Committee (FOMC) has thus used several monetary and credit aggregates, in addition to other variables, in the conduct of policy. Examples of alternative policy strategies from the last decade demonstrate the changing importance of money and credit growth.

The Federal Reserve has relied traditionally on a diverse set of "information variables" in the implementation of policy. An information variable is any variable that gives reliable information about the future realization of goal variables of monetary policy. If several variables provide independent information on the state of the economy, monetary policy can be conducted by using a set of information variables. The Federal Reserve changed its set of information variables in 1983 when it adopted a monitoring range for total credit. If total credit contains independent information on policy goals, then the Federal Reserve might increase the availability of reserves

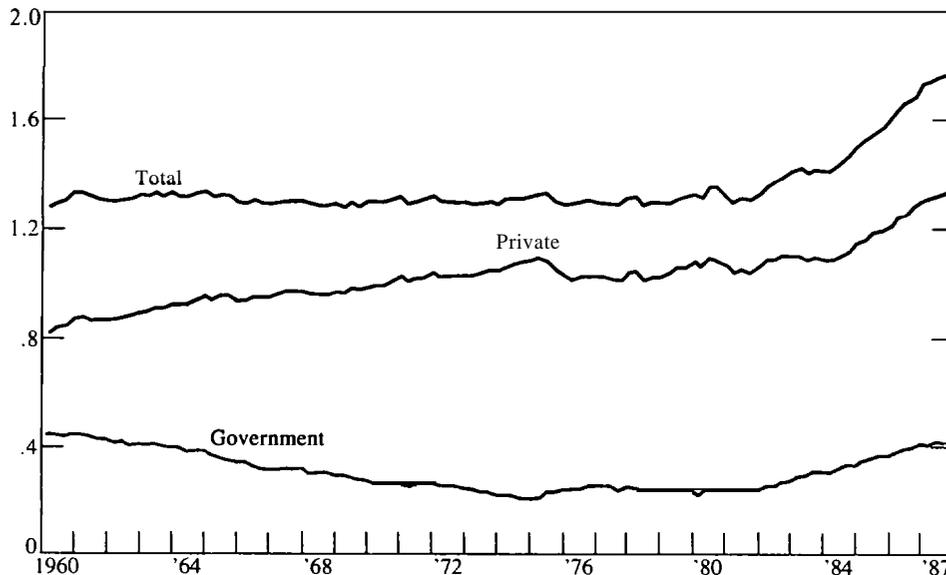
if credit, along with other information variables, indicates that the likelihood of achieving ultimate policy goals would be enhanced by an easing of policy.

In the 1970s, the FOMC moved gradually toward a procedure using rates of growth in the monetary aggregates as the primary information variables. After a sustained acceleration of inflation in the late 1970s, the Federal Reserve announced in October 1979 new operating procedures for monetary policy that placed more weight on achieving monetary growth objectives, especially for the narrow monetary aggregate, M1. Nonetheless, growth in those aggregates has often fallen outside the established target ranges. One explanation for the divergence from the established ranges is that other information available to the FOMC has indicated that strict adherence to monetary growth within the ranges is no longer desirable.

By the fall of 1982, however, the usefulness of monetary growth as a policy guide had declined. In part because of financial innovation and deregulation, growth of M1 had become increasingly erratic. The stability of the relationship between monetary growth and policy goals is often evaluated in terms of the predictability of the velocity of money, the ratio of nominal GNP to the money stock. In the early 1980s, flows of funds among various types of monetary assets rendered velocity of M1 less predictable. As a result, the FOMC deemphasized M1 as a policy guide because it was felt there was no "alternative but to attach much less than usual weight to movement in M1 over the period immediately ahead."²

² Paul A. Volcker, "Remarks on Monetary Policy," *Federal Reserve Bulletin*, November 1982. The weight placed on M1 for policy purposes was lessened in 1982, and the Federal Reserve declined in 1987 and 1988 to specify a growth rate range for M1. See "Monetary Policy Report to Congress," *Federal Reserve Bulletin*, April 1987.

CHART 1
Credit aggregates and economic activity
 (Ratios of selected credit aggregates to GNP)



As the information content of monetary growth deteriorated, growth rates of credit aggregates became increasingly important sources of information about the economy. The credit aggregate chosen for use in monetary policy was total credit, which includes all credit market funds raised by the nonfinancial sector, including funds raised by the federal government.³ The FOMC adopted

total credit as an information variable at its February 1983 meeting, noting that credit, "while not directly targeted, will be evaluated in judging the responses to the monetary aggregates."⁴ Previously, the Federal Reserve had used bank credit in the conduct of monetary policy, but financial innovation and deregulation had also reduced its usefulness. Moreover, substantial empirical work by economists documented that total credit had borne a remarkably stable relationship to nominal GNP, the broadest measure of economic activity and thus a good summary

³ For example, bank credit and related aggregates have a long history of use for policy purposes. Alan Holmes noted that the FOMC included the "bank credit proxy" in its directives to the open market manager beginning in the spring of 1966. In the absence of other information, the proxy was used to confirm preliminary indications that policy was off course. "We have felt it desirable—particularly early in the month when firm data are scant—to wait for some confirmation of any suggested movement of the proxy before beginning to shade operations towards somewhat greater firmness or ease." See Alan R. Holmes, "Operational Constraints on the Stabilization of Money Supply Growth," in *Controlling Monetary Aggregates*, Federal Reserve Bank of Boston, Conference Series 1, June 1969.

Before adoption of total credit, the FOMC specified an "associated" range of growth for bank credit along with the target ranges for monetary growth. After specifying an associated range for total credit in 1983, the FOMC now characterizes the range for growth of total credit as a "monitoring" range.

⁴ "Record of Policy Actions of the Federal Open Market Committee," *Federal Reserve Bulletin*, April 1983.

measure of ultimate policy goals.

Unfortunately, the stability of the relationship between total credit and GNP began to break down soon after total credit was adopted as a policy guide. As is evident in Chart 1, the ratio of total credit to GNP was fairly constant from 1960 to 1981, ranging only between 1.29 and 1.36.⁵ After rising to 1.45 by the fourth quarter of 1982, the ratio began to climb to levels well beyond the previous range, reaching 1.79 by the fourth quarter of 1987. Even as the relationship between total credit and GNP was deteriorating, however, economists began to explore whether alternative measures of credit might be useful in the conduct of monetary policy.

The search for alternative credit measures

Economic theory can be useful in identifying credit measures that might help policy implementation. Recent theoretical research has identified two alternative credit aggregates that could be useful for policymakers. One area of research has focused on the potential importance of distinguishing credit obtained through financial intermediaries from credit obtained directly in the open market. The second area of research has explored whether **government** debt should be distinguished from private debt.

Does the source of credit matter?

Discontent with economic theories that disregard the economic implications of the sources of credit has stimulated research into more realistic models. Traditional models of the credit market and of its implications for the economy assume

a single national credit market, which is often referred to as "the bond market." Such models thus do not take account explicitly of credit obtained through financial intermediaries. As a result, the important role of financial intermediaries is pushed into the **background**.⁶

To remedy this shortcoming, economic models have recently begun to incorporate the role of financial intermediation in determining aggregate economic activity.⁷ These new models distinguish between the two basic sources of credit. Households and small businesses borrow predominantly through financial intermediaries. Such borrowing is called intermediated or "customer market" credit. In contrast, large firms often borrow directly through the bond and commercial paper markets. Because the debt is sold to the highest bidder in the open market, such credit is called "auction market" credit. The economic models that distinguish between the two types of debt suggest that the composition of total debt may have important implications for the economy.

The models also imply that the distinction between intermediated credit and auction market credit may be important for monetary policy. The incidence of monetary policy actions on various sectors of the economy reflects in part the type

⁶ For example, one standard model, the IS-LM model, assumes that money and bonds are the only financial assets and that money is the **only** asset that needs to be **considered** explicitly in understanding the financial system. This and similar **models** thus shed **no light on the role of financial intermediaries in providing credit**.

⁷ Criticisms of standard models as well as models showing the importance of financial intermediaries in the economy are included in, for example, Ben S. Bernanke and Alan S. Blinder, "Credit, Money, and Aggregate Demand," *American Economic Review*, May 1988; Alan S. Blinder, "Credit Rationing and Effective Supply Failures," *Economic Journal*, June 1987; Alan S. Blinder and Joseph E. Stiglitz, "Money, Credit Constraints, and Economic Activity," *American Economic Review*, May 1983; and Karl Brunner and Allan H. Meltzer, "Money and Credit in the Monetary Transmission Process," *American Economic Review*, May 1988.

⁵ The ratio of credit to GNP is the inverse of the "velocity" of credit. The inverse velocity is used in the chart for ease of presentation.

of market in which each sector obtains credit. Especially before the phaseout of ceilings on deposit interest rates, restrictive monetary policy affected the economy not only through its effect on market interest rates but also through its effect on the availability of credit from financial intermediaries. In the 1960s, for example, financial intermediaries experienced several periods of disintermediation that reduced the availability of mortgage credit, consumer credit, and credit available to small businesses. The reduction in credit available to these sectors reduced spending and thus slowed the pace of economic activity. Even now, rising market interest rates can at least temporarily disrupt the flow of credit to certain sectors of the economy. Yet more borrowers now have access to auction market credit, in part because of rapid growth in the commercial paper market. As a result, restrictive monetary policies may now have less effect on economic activity than under similar circumstances in the 1960s. Therefore, monitoring such factors as the mix of intermediated and auction market credit can provide important information for the conduct of monetary policy.

In contrast to the traditional theoretical models that did not distinguish between the various types of credit, the new theoretical models shed light on the importance for monetary policy of monitoring the channels through which credit flows to the various sectors of the economy. This line of research, therefore, has implications for whether a measure of credit that distinguishes intermediated credit from auction market credit would be more useful as an information variable for monetary policy.

Distinguishing between government and private debt

Another line of research has implications for whether a distinction should be drawn between government debt and private debt in designing

credit measures for use in monetary policy. One stimulus for such research has been the rapid growth of government debt in recent years resulting from the massive federal budget deficits in the 1980s. Unless offset by a reduction in growth of private debt, large budget deficits could distort the historical relationship between growth of total debt and growth of GNP. On the surface, it appears that the previous stability in the relationship between total credit and GNP may have resulted from offsetting changes in private debt and government debt. As shown in Chart 1, the stability of the relationship between total credit and GNP appears to have been the result of an inverse relationship between the government and the private components of total debt. During the 1960s and 1970s, the ratio of government debt to GNP generally declined, while the ratio of private debt to GNP increased.

According to one recent theory, this inverse relationship is not merely a coincidence but is rather a reflection of how the private sector perceives government debt. This theory, which is referred to as the ultra-rationality hypothesis or the Ricardian equivalence hypothesis, assumes that people perceive government debt as the equivalent of their own debt. This implies that households will have a full understanding of the higher taxes that will ultimately be required to service and retire an increase in government debt. One implication of this hypothesis is that the additional government bonds do not represent an increase in wealth to the private sector since the value of these bonds is just offset by the implied rise in future taxes. Rather, a current increase in government debt raises private saving by an equal amount so that households can meet the implied higher future tax liabilities. As a result, private spending (and the need to finance this spending) declines, so that private sector indebtedness declines with the rise in government debt. Thus, ultra-rationality by households could explain the inverse relationship between government debt and

private debt in the 1960s and 1970s.⁸

Experience in the 1980s seems to cast doubt on the ultra-rationality hypothesis, however. The rapid growth of federal debt in recent years has not been offset by a commensurate decline in growth of private debt. Instead, the trend of private debt relative to GNP has remained fairly stable in the 1980s. As a result, the ratio of total credit to GNP has increased, as is apparent in Chart 1. The breakdown in the relationship between total credit and GNP has thus spurred research into why the private sector does not seem to have behaved in the way predicted by the ultra-rationality hypothesis. The reasons offered for the failure of the ultra-rationality hypothesis include an inability of the public to understand fully the tax implications of government debt.⁹

⁸ Detailed discussion of the Ricardian equivalence hypothesis is contained in Robert J. Barro, "Are Government Bonds Net Wealth?" *Journal of Political Economy*, November/December 1974.

It should be noted that other explanations can be given for the stability of the total credit-GNP ratio during most of the postwar period. One alternative, referred to as the "capital leveraging hypothesis," exploits the fact that most borrowing requires collateral. If assets of the private sector include both tangible assets and government bonds, then a decline in government indebtedness leads the private sector to hold additional tangible assets that can then be used to support more borrowing. Thus, private and public borrowing are negatively related. Assuming that private agents hold a stable ratio of assets to income then leads to a stable total credit-GNP relationship. Yet another explanation, the "asset demand hypothesis," assumes that individuals want to maintain proportionality between both tangible assets and income as well as between financial assets and income. Then a decline in government bonds outstanding will be associated with an increase in the demand for privately issued securities. If asset demands are interest insensitive, then a negative relationship between government and private debt will exist along with a constant total credit-GNP ratio. For a complete discussion of these hypotheses, see Benjamin M. Friedman, "Debt and Economic Activity in the United States," in Benjamin M. Friedman, ed., *The Changing Roles of Debt and Equity in Financing in U.S. Capital Formation*, University of Chicago Press, Chicago, 1982.

⁹ Additional reasons that have been offered for the failure of this hypothesis include the distortions to resource allocation at

Just as the development of new theoretical models has led to questions about whether intermediated credit should be distinguished from auction market credit, experience in the 1980s and the challenges to the ultra-rationality hypothesis have led to questions about whether private debt rather than total debt bears a closer relationship to GNP. The answers to these questions will shed light on what measure of credit may be a useful information variable for the conduct of monetary policy. The questions can only be answered, however, by empirical tests of which credit measure provides the most information about economic performance.

Empirical evidence on choosing a credit measure

Two types of empirical evidence that are relevant for evaluating credit measures as information variables for monetary policy are presented in this section. The first type of evidence is the extent to which the empirical analogues of the credit measures discussed above would have improved forecasts of GNP in the 1980s. Assuming GNP is an adequate proxy for the goals of monetary policy, the credit aggregate that helps the FOMC most in understanding the future course of GNP would be the most useful as an information variable. The second type of evidence is an analysis of how the most promising of the credit aggregates, private credit, could have been used together with M2 for the conduct of policy in the 1980s. Because of the limited number of observations in the 1980s, such empirical results do not provide decisive evidence on which credit

the margin caused by taxes introduced to finance spending and an inability or unwillingness of individuals to transfer resources to future generations. For further discussion, see B. Douglas Bernheim, "Ricardian Equivalence: An Evaluation of Theory and Evidence," in Stanley Fischer, ed., *NBER Macroeconomics Annual 1987*. The MIT Press, Cambridge, Mass., 1987.

TABLE 1
Relationships among the credit aggregates

<u>Credit aggregate</u>	<u>Amount</u> <u>(Billions of dollars 1987:Q3)</u>
Total credit:	
Credit market debt owed by U.S. government	
+ Credit market debt owed by private domestic nonfinancial sectors	
	8,054.4
Private credit:	
Total credit	
- U.S. government borrowing	
	6,152.8
Intermediated credit:	
Mortgage credit	
+ Consumer credit	
+ Trade credit	
+ Security credit	
+ Bank and other credit	
	5,755.6

Source: Board of Governors of the Federal Reserve System

aggregate is best suited for policy. The empirical results can nonetheless suggest directions for future analysis.

The credit aggregates analyzed in this section are total credit, the private component of total credit, and intermediated credit. Detailed definitions of these aggregates, along with the summary of the relationships among them, are shown in Table 1. **Total credit, the aggregate currently monitored by the FOMC, includes all credit market funds raised by domestic nonfinancial sectors of the economy. Private credit excludes federal**

government debt from total credit.¹⁰ The private credit measure is included to provide evidence on whether the ultra-rationality hypothesis holds, or whether instead federal government debt is

¹⁰ The inclusion of state and local government borrowing in "private" borrowing can be justified on two grounds. First, data suggest that the borrowing and lending of state and local governments have been about equal in recent years, with the result that the net effect on credit markets has been small. Second, the production of industrial revenue bonds issued by state and local governments largely finances private economic activity.

perceived by households and businesses as being very different from their own debt. Intermediated credit, which is credit extended through financial intermediaries, is included to provide evidence on whether a distinction should be made between auction market credit and intermediated credit in evaluating the prospective impact of credit growth on the economy.

Improving forecasts with credit aggregates

A simple statistical model known as a vector autoregression is used to evaluate whether credit aggregates can be used to improve economic forecasts.¹¹ Alternative sets of financial variables are included in the model to determine what set of information variables may prove useful to the Federal Reserve in the conduct of monetary policy. A money stock measure, M2, is included because the Federal Reserve has for several years considered monetary growth a principal guide for monetary policy. An interest rate, the Aaa corporate bond yield, is included because interest rates are thought to influence spending on business investment, housing, and consumer durable goods. In the first version of the model, no credit aggregate is included. In the other versions of the model, however, alternative credit aggregates are included to determine whether monitoring some credit aggregate can be useful in supplementing information available from prior values of mone-

¹¹ The forecasts evaluated here are generated using the "Bayesian" variant of the vector autoregression (VAR) methodology. Bayesian VARs are those in which the estimated coefficients are constrained such that each equation approximates a random walk; the constraints force the coefficient on the own first lag to be approximately unity and the coefficients on other own lags as well as the coefficients on other variables to be approximately zero. For details, see Robert B. Litterman, "Forecasting with Bayesian Vector Autoregressions: Five Years of Experience," *Journal of Business and Economic Statistics*, January 1986.

Each equation in each model includes four lags of model variables, as well as a constant. All variables are used in growth rate form.

tary growth, interest rates, and GNP. The criterion for evaluating usefulness of credit aggregates is whether they would improve the ability to forecast GNP.

The forecasting methodology corresponds to the way economic forecasts are actually made. Only data that were available at the time of the forecast are used in estimating the models. In the initial forecasting experiment, each version of the model is estimated with data from the second quarter of 1960 through the second quarter of 1981. With allowances for lags, the starting point of this period corresponds to the availability of data on the M2 money stock. The ending point corresponds to the last cyclical peak in economic activity. The estimated models are used to forecast GNP four quarters into the future. The models are next estimated with data through the third quarter of 1981, and another forecast is made four quarters ahead, and so on to the end of the data set in the third quarter of 1987. Proceeding this way produces a series of 22 four-quarter forecasts that can be used in computing forecast error statistics, such as the root-mean-square error of the forecast. The second forecasting experiment is analogous to the first, except that the initial estimation period runs through the fourth quarter of 1982. For this experiment, there are 16 four-quarter forecasts. This endpoint of estimation was chosen so that the forecasting period would begin at the time the Federal Reserve began monitoring total credit.¹²

The forecasts generated in this way show that total credit has been of limited use in forecasting GNP. For the version of the model that does not include any credit aggregate, the root-mean-

¹² Strictly speaking, the forecasts include some information which would not have been available at the time the forecasts were made. Specifically, data revisions made through the end of 1987 are incorporated into the data set. These revisions, including revisions of seasonal adjustment factors, would not have been available to the hypothetical forecaster in our example.

TABLE 2
Using credit aggregates to improve economic forecasts

<u>Credit measure included in model</u>	<u>Forecast errors for GNP growth*</u> (percent, annual growth rate)	
	<u>1981:Q3-1987:Q3</u>	<u>1983:Q1-1987:Q3</u>
(1) —	3.2	3.1
(2) Total credit	3.2	2.9
(3) Intermediated credit	3.0	2.9
(4) Private credit	2.7	2.4

*The forecast errors for nominal GNP growth are measured by the root-mean-square error of the four-quarter-ahead forecast. The root-mean-square error is the square root of the average squared forecast error. Formal statistical tests for the significance of the reduction in forecast errors are not possible for models of the type considered here.

square error, which is a measure of the average size of the forecast errors, is shown in the first line of Table 2. Shown in the first column is the root-mean-square error from a model that includes only lags of monetary growth, interest rates, and GNP itself. The root-mean-square error indicates that the forecast errors would have averaged 3.2 percentage points when used to forecast over the upcoming four quarters. The forecast errors over the shorter horizon, which are shown in the second column of the table, are only slightly less, at 3.1 percentage points.

Adding total credit to the forecasting model does not substantially reduce the forecast errors. This can be seen by comparing the figures in the second row of the table with those in the first. The version of the model including total credit does not reduce forecasting errors at all over the long horizon, and reduces the forecast errors over the short horizon only to 2.9 percentage points. These results are consistent with the visual impression from Chart 1. The breakdown in the relationship between total credit and GNP evident in the chart implies that historical relationships based on total credit are unlikely to improve

the ability to forecast GNP in the 1980s.

The results are somewhat more encouraging for intermediated credit. As is apparent by comparing the figures in the third line of the table with the figures in the first line, monitoring the amount of credit channeled through financial intermediaries would improve the ability to forecast the future course of the economy. The forecast errors for GNP are lower when intermediated credit is included in the model than when no credit aggregate is included. The improvement is relatively small, however. In both the longer and the shorter forecast horizons, the reduction in forecast errors averages only 0.2 percentage points. Moreover, use of intermediated credit is not clearly preferable to use of total credit because the forecast errors are the same over the shorter forecast horizon. Only when the 1981-82 recession is included in the forecast horizon does use of intermediated credit improve the forecast over those using the model with total credit. These results suggest the possibility that monitoring the amount of credit available from financial intermediaries may be particularly important during periods of relatively high interest rates and of declining

economic activity. Perhaps such periods give rise to questions about the creditworthiness of some borrowers, leading financial intermediaries to be more cautious in their lending practices. If so, monitoring intermediated credit may be most useful when the lending attitudes of financial intermediaries are most likely to reduce the flow of credit to certain sectors of the economy. Even if this interpretation were accurate, the empirical results do not strongly support the implications of some recent theoretical models that credit channeled through financial intermediaries must be distinguished from auction market credit.

The private credit measure is clearly superior to the others. The forecast errors from the model including private credit, which are shown in the fourth row of the table, are lower than the errors from any of the other models for both the longer and the shorter forecast horizons. Compared with the model that excludes credit aggregates altogether, including private credit reduces forecast errors appreciably, by 0.5 percentage points (or 16 percent) for the longer horizon and by 0.7 percentage points (or 23 percent) for the shorter horizon. The superiority of the model with private credit is almost as large relative to the model that includes total credit, which tends to cast doubt on the validity of the ultra-rationality hypothesis. If households and businesses truly treated government debt as their own, as implied by the ultra-rationality hypothesis, combining private debt and federal government debt into a total credit measure should lead to improvement in the economic forecasts. Instead, including government debt reduces the information value of the credit aggregate that the Federal Reserve has been monitoring since 1983.¹³

¹³ The above results show that adding private credit and intermediated credit to an information set including interest rates and money lowers forecast errors of GNP. Conversely, it is also the

Identifying periods when private credit helps

An important specific instance can be identified in which the information from private credit could have influenced monetary policy decisions relative to those based solely on monetary growth. During such a period, private credit would fulfill the FOMC's stated goal of using a credit aggregate in "judging the responses to the monetary aggregates."

Using credit in this way is most likely to prove valuable when there is a substantial change in the relationship between monetary growth and credit growth, for it is during such periods that monitoring the credit aggregate could provide additional information about the economy. To identify periods in which the relationship between monetary growth and growth of private credit changed substantially, statistical measures are used to construct a typical range for the difference between monetary growth and credit growth. Specifically, the mean and the standard deviation of the difference between growth of private credit and the growth of M2 were calculated for each quarter using data from the previous five years. The results are plotted in Chart 2.¹⁴ The shaded area

case that adding money to an information set including interest rates and the proposed credit aggregates also lowers forecast errors of GNP. Thus, using money and either of the proposed credit aggregates together is superior to using only money or only credit for GNP forecasting.

It should also be noted that the interest rate plays at best a marginal role in the GNP forecasts. One possible reason is that the change in the nominal rate of interest, which is used here, inadequately captures changes in the real rate of interest, which is presumably the interest rate relevant for GNP determination. Further, the interest rate, however measured, may be more important for forecasts of inflation-adjusted GNP than for nominal GNP. Support for the importance of the interest rate when controlling for inflation is contained in James S. Fackler, "An Empirical Model of the Markets for Goods, Money, and Credit," *Journal of Money, Credit and Banking*, February 1985.

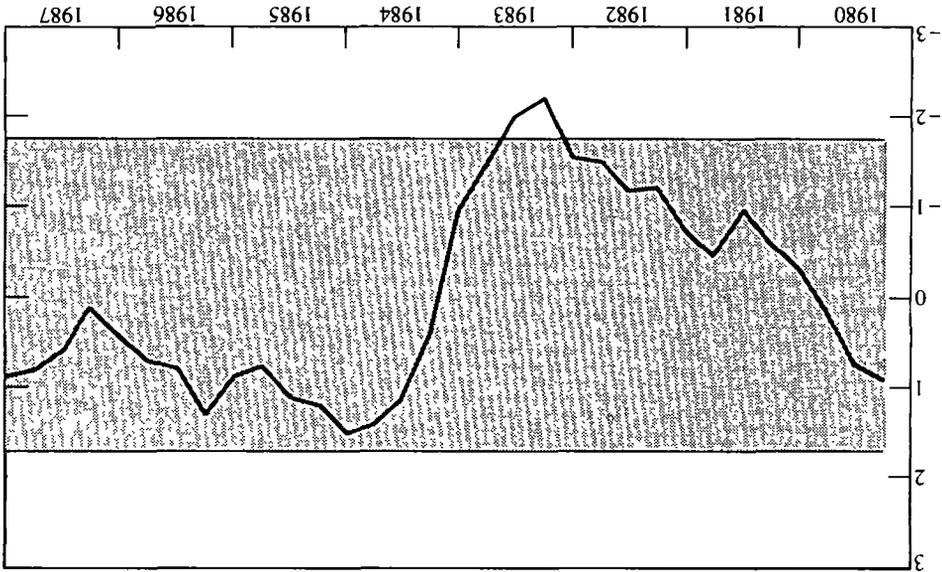
¹⁴ A five-year horizon is used in order to capture any gradually changing trends in the relationship between money and credit growth.

in the chart represents a range within which the growth of credit relative to money is within the normal bounds of recent historical experience. Only when the difference between monetary growth and growth of private credit falls outside this normal range is it likely that credit growth would provide significant information beyond that provided by money on the future course of the economy.

Using this approach, private credit provided important information to the Federal Reserve in the first half of 1983. The economy was just recovering from a recession that had in the fourth quarter of 1982. Growth of M2 was extraordinarily high in the first quarter of 1983 because of the inflow of funds into money market deposit accounts and Super NOW accounts authorized at the end of 1982. In view of the portfolio adjustments being made at the time, there was considerable uncertainty regarding the reliability of

M2 as a policy guide. As indicated in Chart 2, growth in private credit did not accelerate with growth in M2. As a result, the difference in the growth rates was outside the confidence bound by the beginning of 1983. Private credit signaled that the FOMC should not adopt a more restrictive policy stance in response to the very rapid growth of M2. This signal was important for at least one additional reason beyond the uncertainty associated with M2. Inflation fell substantially between 1981 and 1984. The corresponding lowering of inflation expectations led to a downward adjustment of nominal interest rates. Uncertainty about the speed of adjustment of perceptions of future inflation to actual inflation created uncertainty about the information content of nominal interest rates. For this reason, interest rates as well as money growth rates were unreliable as policy guides. Thus, the period including early 1983 provides an interesting example of circum-

CHART 2
Using private credit for monetary policy
 (Deviations of private credit growth from monetary growth, adjusted for mean and standard deviation)



stances in which private credit can serve as a policy guide.

The signals from private credit for the conduct of monetary policy are infrequent, though. As is clear in Chart 2, the difference between credit growth and monetary growth has seldom been significant enough to warrant a change in the stance of monetary policy. One possible reason is that in periods of moderate economic growth and low inflation, conditions that have characterized the U.S. economy since early 1985, credit growth may not have much incremental information for policymakers. The judicious use of such information variables as private credit may nonetheless improve the ability of the Federal Reserve to achieve its policy goals by helping to identify those instances in which the traditional methods of implementing monetary policy are unsatisfactory.

Conclusion

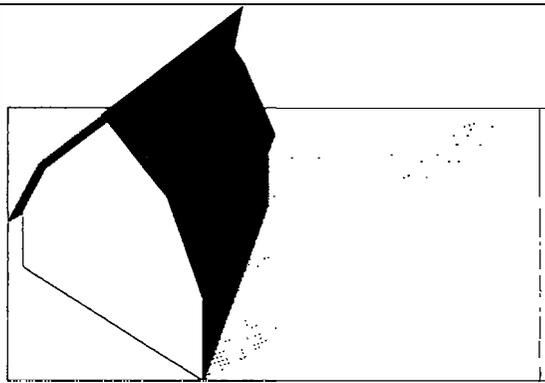
Both economic theory and empirical evidence suggest that there are still reasons for the Federal Reserve to monitor credit aggregates despite the

breakdown in the relationship between total credit and GNP. The first area of research, which showed the importance of the source of credit for economic activity, suggested intermediated credit as a promising information variable for monetary policy. The second area of research, which investigated the relationship between government and private debt, suggested the private component of total credit would be useful for policy purposes. The empirical evidence reported here shows that the private component of total credit contains important information on future movements in GNP. The evidence also shows that private credit contained important information for **policymakers** in the early 1980s when portfolio adjustments distorted the monetary aggregates. Private credit thus seems a promising candidate as the credit aggregate monitored by the Federal Reserve. The limited number of observations in the 1980s cannot, however, provide decisive evidence on which credit aggregate will be useful for policy in the future. Further research into the stability of the relationship between private credit and GNP would shed additional light on whether growth of private credit could be useful as a policy guide.

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