The relationship between loan classifications and losses: The effects of a changing economy

Catharine Lemieux and Kenneth Spong

Catharine Lemieux and Kenneth Spong are economists in the Policy and Special Projects Department of the Division of Bank Supervision and Structure.

Both the agriculture and energy sectors of the Tenth Federal Reserve District were hard hit in the 1980s.[1] Real net farm income for Tenth District states in 1983 was about one-third the level earned in 1988. Farm real estate values fell 30 percent between 1982 and 1986. In the energy sector, crude oil prices fell nearly 60 percent between 1982 and 1985. At the same time the economy declined, District banks were forced to deal with many other changes, including deposit interest rate deregulation and competition from many nonbank sources.

A direct outcome of these events was a decline in bank asset quality, particularly for the farm banks that dominate the District. One measure of credit problems, gross loan losses as a percent of total assets, rose over sixfold at District farm banks—from less than 0.3 percent in 1980 to more than 1.7 percent in 1985. This compared to an average loss record of 0.2 percent over the 1970s. For other banks in the District, particularly those with some energy lending, loan performance also declined—a further sign of worsening economic conditions and emergence of serious banking problems within the District.

Although the District has recovered from many of these problems, the period of the 1980s provides a wealth of information on how banks and the supervisory process are affected by economic change. In this regard, perhaps the most detailed and consistently collected source of information is the loan classifications reported in bank examinations.

Examiners evaluated virtually all of the major credits banks granted in the 1980s and classified any loan that showed weaknesses into one of several categories. These classifications were then used by examiners to judge the risk exposure in a bank's loan portfolio, the potential for future losses, and the adequacy of a bank's capital and its reserves for loan losses. From today's perspective, however, these loan classifications provide an in-depth look at several other important topics. These include the overall decline in credit quality across banks, the subsequent performance of problem credits, and the manner in which bank loans react to changes in economic conditions.

This study takes a close look at examiner classifications and loan performance at 15 Tenth District state member banks between 1980 and 1989. The loan classification and loss information for these sample banks came from their state and Federal Reserve bank examinations and internal bank records. Overall, the study includes loan classifications from 141 bank examinations, 108 for Kansas banks and 33 for Oklahoma banks. In all, over 1,000 loans were reviewed, the majority (84 percent) of which were from Kansas banks.

In many ways, this study mirrors an earlier study by Spong and Hoenig, which analyzed loan classifications for 13 state member banks in the District between 1962 and 1975, a period of relative economic health for District agriculture.[2]

This study, as well as the Spong/Hoenig study, traces classified loans over time to determine their subsequent performance and the implications for a bank's risk exposure and overall condition. Both

[1] *The Tenth Federal Reserve District includes Kansas, Oklahoma, Nebraska, Wyoming, Colorado, and parts of New Mexico and Missouri.*

[2] *Kenneth Spong and Thomas Hoenig, "Bank Examination Classifications and Loan Risk." **Economic Review** (Federal Reserve Bank of Kansas City), June 1979, pp. 15-25.*

Box 1: Sample Selection

The 15 state member banks in the study were located in either Kansas or Oklahoma. To be included in the study a bank had to meet the following criteria:

- Each bank had to have remained a state member bank throughout the 1980s. This criteria helped ensure that sufficient loan information would be available for each bank and comparisons could be made across years.
- Each bank had to be located in Kansas or Oklahoma. The banking departments of these states, which typically examined these banks on an alternate year basis with the Federal Reserve, included detailed information on loan charge-offs and recoveries in their examination reports.

Overall, the 15 banks in the study represented nearly half the population of state member banks in Kansas and Oklahoma that were state member banks for the entire 1980s.

studies also analyze each bank's loan losses to determine the portion of losses that were previously identified as potential problems during the loan classification process.

Because of these similarities, the two studies provide comparable information on the bank examination process over a substantial number of years. This is of particular interest since these years encompass a wide variety of economic conditions and should show how loan performance and examiner evaluations respond to different circumstances. After a description of the sample banks and the regional economy, this paper examines the relationship between loan classifications and losses. The remainder of the paper discusses these relationships in light of varying economic conditions and in comparison with other studies.

The setting: Description of sample banks and the economic times

Banks were selected for this study according to the criteria listed in Box 1. These sample banks were located in rural counties in Kansas and Oklahoma with populations ranging from approximately 4,000 to 40,000 in 1980. These counties were heavily dependent on agriculture with oil providing an important secondary source of income. During the previous decade, prices in the energy sector had moved countercyclically to agriculture, providing an important cushion when farm income declined. This changed in the 1980s.

Table 1 presents a description of the sample banks at the beginning, near the middle (1986), and at the end of the decade. At the beginning of the study, all banks had a strong agricultural orientation, with more than 20 percent of their loan portfolio devoted to farm lending. Most of these banks received a composite examination rating of "one" or "strong" at the beginning of the study, indicating that these banks were considered sound institutions. As a group, they had strong capital and high returns on assets and equity.

During the early 1980s, farm income hit record lows (see Chart 1). It took several years for declining income expectations to be translated into lower farmland prices (Chart 2). A final blow to the economy in these counties came in 1986 with the abrupt decline in oil and other mining income (Chart 3). The year 1986 also represented a peak for loan classifications and charge-offs as a percent of total loans at

the sample banks (Chart 4). Charge-offs increased sixfold between 1980 and 1986. With the deterioration of the agricultural and energy sectors, half the banks fell to a composite examination rating of "three" (fair) or lower. Average asset growth and earnings also hit their lowest levels for the decade.

By the end of the decade, improvement in both the financial condition of the banks and the economy was evident. Bank returns on assets and equity had improved but were still not up to their 1980 levels. The same could be said for examination ratings. Charge-offs had declined from the 1986 levels, but were still higher than at the start of the decade. Interestingly, the percent of the loan portfolio devoted to farm lending also declined, possibly reflecting bankers' new wariness about agricultural loans and efforts by farmers to reduce their debt loads.

Table 1

Condition of banks: 1980, 1986, and 1989

(Total assets in millions of dollars and bank performance measures in percentage terms)

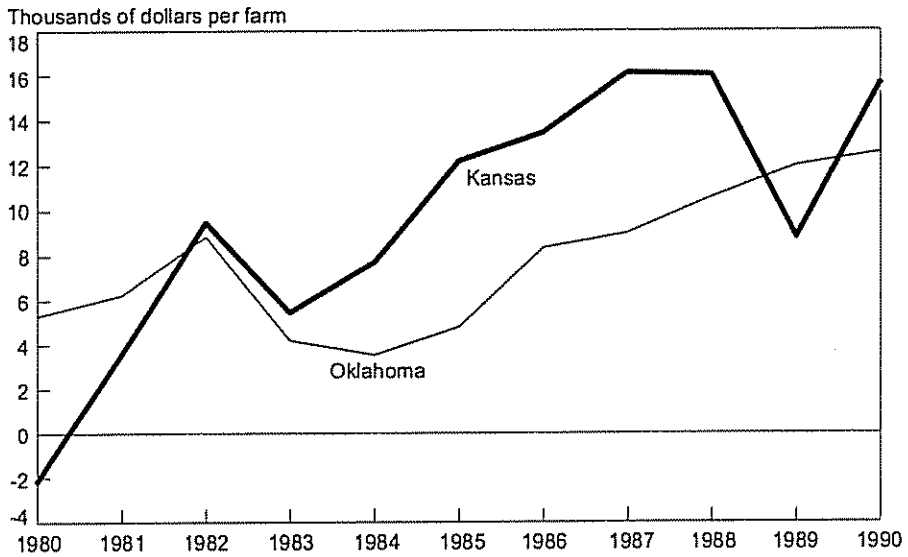
1980	Mean	St. Dev.	Minimum	Maximum
Total assets	26.0	21.0	4.1	76.5
Annual asset growth	8.3	8.7	5.6	25.8
Return on equity	14.2	5.2	6.1	26.7
Return on assets	1.5	0.6	0.6	2.9
Capital/assets	10.3	2.3	7.2	16.6
Ag loans/total loans	55.2	15.0	22.0	80.7
Charge offs/total loans	0.6	0.6	0.0	2.1
Composite rating	1.4	0.6	1.0	3.0
1986				
Total assets	37.0	27.8	8.1	100.8
Annual asset growth	2.1	5.6	(18.3)	10.6
Return on equity	4.8	9.6	(25.8)	15.3
Return on assets	0.6	0.9	(2.1)	2.1
Capital/assets	10.2	2.4	7.0	15.1
Ag loans/total loans	46.4	19.9	14.3	73.1
Charge offs/total loans	3.6	2.5	0.8	9.1
Composite rating	2.6	0.6	1.0	4.0
1989				
Total assets	39.8	30.8	7.7	116.0
Annual asset growth	1.7	5.4	(12.0)	11.3
Return on equity	9.5	4.2	2.1	17.6
Return on assets	0.9	0.4	0.2	1.7
Capital/assets	10.2	2.0	7.7	15.2
Ag loans/total loans	45.2	19.3	14.9	76.2
Charge offs/total loans	1.4	1.2	0.0	5.6
Composite rating	1.9	0.5	1.0	3.0

The results: Relationship between loan classifications and losses

To determine loan performance within this difficult and changing economic environment, this study reviews loan classifications and charge-offs at the sample banks during the 1980s. A general description of this loan classification process and its implications for loan charge-offs is included in Box 2. This study analyzes bank classifications from two perspectives: (1) following classified loans forward through time to determine the percent of each loan eventually charged off and (2) tracing loan charge-offs back through time to determine if the loans had been classified prior to charge-off and if so, their original classification. The first perspective—the subsequent performance of classified loans, indicates the relative likelihood that loans classified in

Chart 1

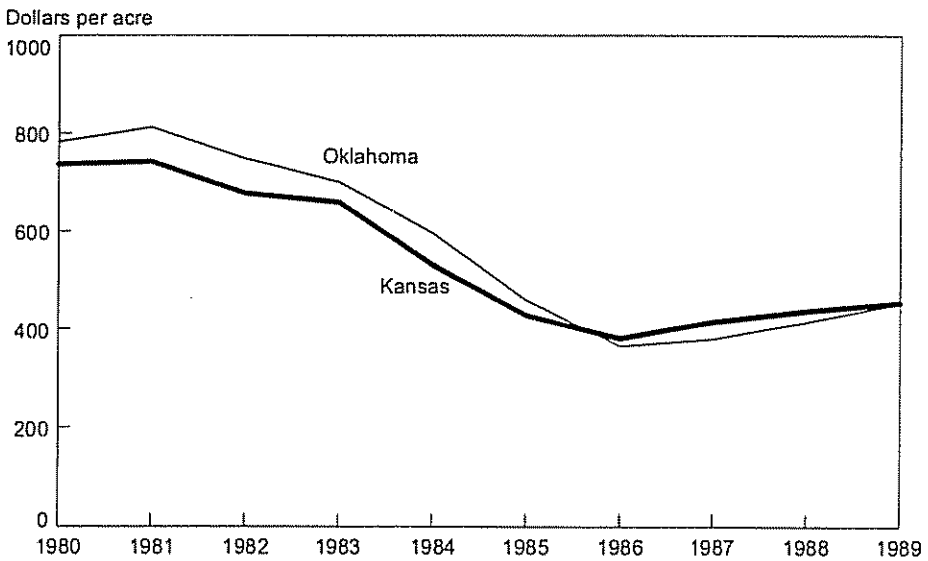
Real net farm income for Oklahoma and Kansas



Source: United States Department of Agriculture.

Chart 2

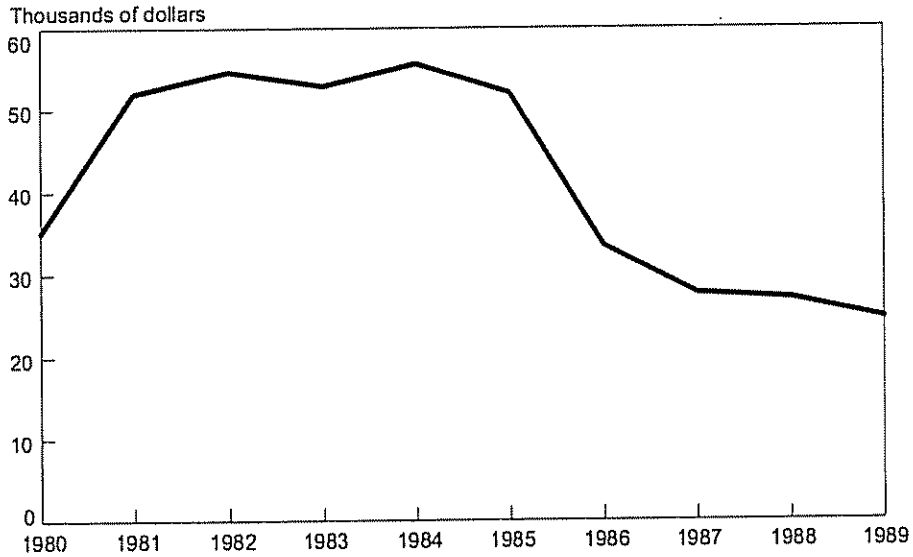
Farmland values in Oklahoma and Kansas



Source: Quarterly Agricultural Credit Survey. Federal Reserve Bank of Kansas City

Chart 3

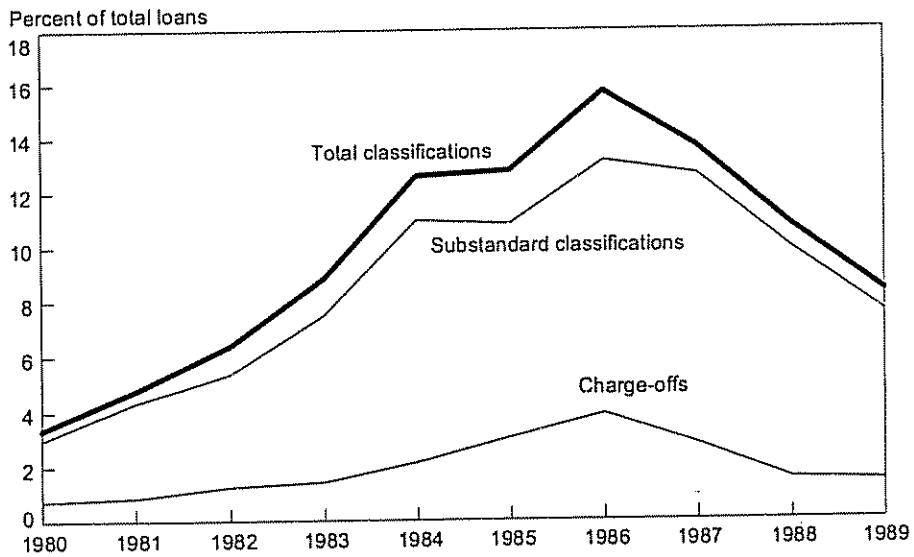
Mining income in sample counties



Note: Includes income from coal, oil, gas, metal, and non-metal mining.
Source: Bureau of Economic Analysis.

Chart 4

Classification and charge-off rates for sample banks



Source: Reports of Commercial Bank Examinations and Reports of Condition

Box 2: The Loan Classification Process

During a bank examination, examiners review all major loans in the bank as well as any smaller loans experiencing problems. In this review, the examiners assign quality ratings to bank loans based on their best judgment concerning the degree of risk in each credit, the financial condition and future prospects of the borrower, the likelihood of timely repayment, and the adequacy of any collateral behind a loan. Because of the time involved, a loan review focuses on the loans that could have a notable effect on the bank's condition. Therefore, examiners order loans by size and group together credits with the same source of repayment. A cutoff is then set which results in 60 to 70 percent of the dollar value of the bank's loan portfolio being reviewed.[1] Loans below the cutoff may be reviewed if they are past due or are experiencing other troubles.

The main objective of loan classification is to pinpoint which loans need strengthening and careful management to ensure their repayment. The four classification categories are special mention, substandard, doubtful, and loss. The *Commercial Bank Examination Manual* defines these classifications as follows:

> Special Mention - Assets with potential weaknesses which may, if not checked or corrected, weaken the asset or inadequately protect the bank's credit position at some *future date*.
>
> Substandard - Assets that are inadequately protected by the *current* sound worth and paying capacity of the obligor or of the collateral pledged, if any.
>
> Doubtful - Assets that have all the weaknesses of a substandard asset plus the added characteristic that the weaknesses make collection or liquidation in full, on the basis of existing facts, conditions, and values, *highly questionable or improbable*.
>
> Loss - Assets that are considered *uncollectible* and of such little value that their continuance as bankable assets is not warranted.

Because substandard assets demonstrate weaknesses that are not yet sufficient to immediately threaten their collectibility, they can be considered an *ex ante* measure or leading indicator of loan performance rather than a measure of actual loss. Doubtful assets may have similar types of weaknesses, but some loss on the loan is probable, although the amount is not fully ascertainable. Loss assets are those that have little or no current worth to the bank. These assets should be removed from the balance sheet and deducted from a bank's reserves for loan losses. This study focuses on these three categories and does not look at special mention credits because they have weaknesses that are often not well defined or are of a technical nature.

Examiners may split the classification of a credit among each of the categories, as appropriate, or may choose to classify only part of a loan if the borrower appears capable of making payment on the balance of the loan. An example of a split classification would be a loan in which a portion was uncollectible and deserving of a loss classification, with the remainder falling into one or more of the other categories.

Based on these definitions, examiners would expect to see bankers eventually charge off most of their doubtful and virtually all of their loss classifications. Because substandard credits have identified weaknesses and have a higher than average risk, examiners would expect a portion of them to eventually suffer losses. However, many of these credits would be expected to return to a sound status, particularly if the banker and borrower pursue corrective steps.

---

[1] This 60 to 70 percent coverage ratio represents the examination policy of the Federal Reserve.

different categories will eventually result in a loss. The second perspective—the classification of loans prior to charge-off, indicates the portion of loan losses which were initially identified through the examination process. Both perspectives thus provide important insights into the loan review process and its implications for a bank's condition.

Loss experience for classified loans. If examiners are able to identify the relative risk of problem loans, substandard classifications should have the lowest loss rate, while loss classifications would be expected to have the highest charge-off rate. Table 2 summarizes this loss experience for loans classified at the sample banks.[3]

As shown in the table, nearly 32 percent of the dollar volume of classified loans was eventually charged off. The loss rate on substandard classifications was 27 percent, while doubtful and loss classifications were charged off at the rate of 63 percent and 80 percent, respectively. These figures indicate that loans classified at the sample banks generally conformed to the expected risk patterns. Loss and doubtful classifications demonstrated very high probabilities of being charged off. Substandard classifications, while still showing well above average risk exposure, were much less likely to be charged off than more severely classified assets.

A significant portion of problem credits were still classified at the end of the 1980s. For example, nearly 23 percent of the loans classified substandard in the 1980s were still classified in 1990. If the credits still under classification are removed from the Table 2 totals, charge-off rates increase to 36 percent for substandard, 65 percent for doubtful, and 82 percent for loss credits.

The charge-off percentages for classified loans varied somewhat between Kansas and Oklahoma banks and between the individual banks in the study. As shown in Table 2, the Oklahoma banks as a group had higher charge-off rates than Kansas banks. This result can most likely be explained by the more severe downturn in the Oklahoma energy and farming sectors. Chart 1, for instance, shows Oklahoma per farm income adjusted for inflation was lower than the same measure for Kansas throughout most of the 1980s. On the individual bank level, two-thirds of the banks charged off between 20 and 40 percent of substandard loans, 46 and 86 percent of doubtful, and 70 to 100 percent of their loss classifications. Consequently, the individual bank results provide further evidence that charge-off rates increase with the severity of loan criticisms. Less than half of the charge-offs from substandard credits represented a complete charge-off of the amount classified. On the other hand, doubtful and loss credits were much more likely to be completely charged off, reflecting the severity of the problems identified.

Classification of loans prior to charge-off. A key measure of the ability of bank examinations to identify serious credit problems is the portion of total loan charge-offs that were previously classified by examiners. Provided most major charge-offs are identified by examiners at an early stage and few escape detection altogether, bank examinations could be viewed as successful in finding credit problems and giving insights into a bank's risk exposure and need for capital and reserves.

Table 3 examines the classification record of the loans that were charged off at sample banks during the 1980s. The entries in this table reflect the initial level of classification for a loan, or the point where examiners first recognized a loan's weaknesses. Also, for a charge-off to be attributed to a previously classified loan, the loan had to have been classified during the last examination prior to its charge-off.

[3] *Totals reported in Table 2 count a loan each time it is classified. Thus, loans classified in more than one examination will appear in Table 2 each time they are cited by the examiners. The charge-off figures in Table 2 reflect total or gross loan charge-offs. Recoveries against these charge-offs averaged about 10 percent over this period.*

Table 2

Loss experience of classified loans: 1980-89

(Thousands of dollars)

	Total		Substandard		Doubtful		Loss	
	Dollar Amount	Percent	Dollar Amount	Percent	Dollar Amount	Percent	Dollar Amount	Percent
All sample banks								
Classified	207,821.4	100.0	186,450.9	100.0	8,969.6	100.0	12,400.9	100.0
Charged off	66,036.6	31.8	50,396.9	27.0	5,660.9	63.1	9,978.8	80.5
Complete	29,715.4	14.3	17,836.8	9.6	3,324.0	37.1	8,554.6	69.0
Partial	36,320.6	17.5	32,560.1	17.5	2,336.2	26.0	1,424.3	11.5
Still classified	47,401.5	22.8	46,929.8	25.2	269.7	3.0	202.0	1.6
ORE*	7,364.7	3.5	6,591.5	3.5	242.3	2.7	608.3	4.9
Paid in full or no longer classified	87,018.6	41.9	82,532.7	44.3	2,796.7	31.2	1,611.8	13.0
Oklahoma banks								
Classified	13,575.4	100.0	12,047.1	100.0	648.8	100.0	879.5	100.0
Charged off	5,276.5	38.9	3,936.0	32.7	586.7	90.4	753.8	85.7
Complete	2,446.8	18.0	1,574.2	13.1	161.4	24.9	711.2	80.9
Partial	2,829.7	20.8	2,361.8	19.6	425.3	65.6	42.6	4.8
Still classified	1,563.2	11.5	1,563.2	13.0	0.0	0.0	0.0	0.0
ORE*	92.0	0.7	87.0	0.7	0.0	0.0	5.0	0.6
Paid in full or no longer classified	6,643.7	48.9	6,460.9	53.6	62.1	9.6	120.7	13.7
Kansas banks								
Classified	194,180.7	100.0	174,403.8	100.0	8,320.8	100.0	11,456.1	100.0
Charged off	60,695.7	31.3	46,460.9	26.6	5,074.2	61.0	9,160.6	80.0
Complete	27,204.2	14.0	16,262.6	9.3	3,162.7	38.0	7,778.9	67.9
Partial	33,026.8	17.0	29,734.2	17.0	1,910.9	23.0	1,381.7	12.1
Still classified	45,838.3	23.6	45,366.6	26.0	269.7	3.2	202.0	1.8
ORE*	7,272.7	3.7	6,504.5	3.7	242.3	2.9	569.0	5.0
Paid in full or no longer classified	80,374.0	41.4	76,071.8	43.6	2,734.6	32.9	1,524.5	13.3

* Other Real Estate Owned –This category represents bank collection of a loan through acquisition of any real estate held as collateral. Amounts recorded in this category represent the appraised value of the real estate and need not involve a loss to the bank. Moreover, any deficiency in the collateral would appear in the loan charge-off category in this table.

Nearly 73 percent of the dollar volume of loans charged off had been previously classified (Table 3). Losses from small loans that examiners would not have reviewed made up nearly 11 percent of the remaining charge-off total, while the final 17 percent of loan charge-offs came from large credits that examiners reviewed but did not classify. If only charge-offs from large loans are considered, approximately 19 percent, or less than one-fifth, of the charge-offs were not classified by examiners in the previous examination. Examiners, however, had classified nearly half of these loans at least once in prior examinations even though they were not classified in the examination immediately preceding charge-off.

Table 3

Loan charge-offs and their sources: 1980-89
(Dollars in thousands)

	All sample banks		Oklahoma banks		Kansas banks	
	Dollar Amount	Percent	Dollar Amount	Percent	Dollar Amount	Percent
Total charge-offs	44,793.4	100.0	7,039.3	100.0	37,754.1	100.0
Previously classified	32,498.2	72.6	2,623.3	37.3	29,874.8	79.1
Previously classified*						
Substandard (within a year)	3,990.7	8.9	298.7	4.2	3,692.0	9.8
Substandard (over a year)	21,748.2	48.6	1,629.0	23.1	20,119.1	53.3
Doubtful (within a year)	1,045.9	2.3	94.0	1.3	951.9	2.5
Doubtful (over a year)	2,114.2	4.7	129.5	1.8	1,984.7	5.3
Loss	3,599.2	8.0	472.1	6.7	3,127.1	8.3
Previously unclassified	12,295.2	27.4	4,416.0	62.7	7,879.3	20.9
Loans above examiners' cutoff	7,479.5	16.7	3,539.1	50.3	3,940.4	10.4
Loans below examiners' cutoff	4,815.7	10.8	876.9	12.5	3,938.9	10.4

* These classification categories reflect the level at which the loans were first classified. The time in parenthesis is the period between the initial classification of the loan and its charge-off.

Additionally, most problems (53.3 percent) were identified more than a year prior to charge-off and nearly 58 percent of the charge-offs were identified at the least severe level of criticism — the substandard classification category. Only seven percent of the loans charged off were first identified as doubtful and only eight percent were first identified as loss credits. These results suggest that examiners are identifying many problem loans at a point early enough to allow bankers and supervisors to take corrective steps and to plan and reserve for potential losses.

Significantly more of the problem credits were identified in Kansas banks than in Oklahoma banks. This difference could be due to several factors. First, a rapid and more severe downturn in Oklahoma's farm and energy economies undoubtedly contributed to a faster deterioration in the loan portfolios at Oklahoma banks. As a result, examiners probably had less opportunity to follow credit histories and observe the overall trends in a borrower's condition.

A second factor, which served to reinforce these effects, was less frequent examinations for most of the Oklahoma banks compared to the Kansas banks. Throughout most of the 1980s, the Oklahoma and Kansas banks were typically exam-

ined on an annual basis. However, for the four Oklahoma banks, there were seven exceptions to this annual schedule, but only two exceptions for the 11 Kansas banks. This longer period between examinations for Oklahoma banks, combined with a more severe economic downturn, would have given examiners less chance to identify problem credits early and increased the number of loan charge-offs avoiding examiner detection. Table 3 illustrates these effects, with fewer Oklahoma bank charge-offs detected at an early stage in the examination process and a majority coming from loans not previously classified.

Several other statistics provide further information on examiners' relative effectiveness and efficiency in identifying serious credit problems. For example, classifications averaged about nine percent of total loans at the sample banks during the 1980s. From this relatively small pool of loans came nearly 73 percent of the charge-offs against the loan portfolio. Thus, examiners would appear to be reasonably efficient in identifying the group of loans most likely to be of substantial risk in a bank. A final measure of examiner effectiveness is the relative risk of classified loans compared to unclassified loans. According to Table 2, nearly 32 percent of the dollar volume of classified loans was charged off at the sample banks. In comparison, the charge-off rate on unclassified loans, including small loans not reviewed by the examiners, was about 0.6 percent. These figures consequently indicate that examiners were generally successful in distinguishing high risk loans from normally sound credits.

Another perspective: Relationship between classifications, losses, and the economy

The collapse in oil, farmland, and agricultural prices in the 1980s came at the end of a credit boom in these sectors, leaving borrowers and lenders in a particularly vulnerable position. Since the banks in this study had strong lending commitments to the farming and oil industries, their loan classification and loss experience should have been significantly affected by these downturns. One might expect, for instance, that loans classified while economic conditions were deteriorating would have a worse loss record than loans classified when the economy was improving.

Table 4 presents the loss experience for substandard loans according to the year the loans were classified. This is a yearly breakdown of the substandard classification information contained in Table 2. The information in Table 4, however, does not include loans that are still classified at the end of the study.[4]

Loans classified substandard in 1983 experienced the highest charge-off rates compared to substandard classifications in any of the other years. The year 1983 represented a low point for real per farm income in Oklahoma and Kansas. Moreover, in the next several years when many of these charge-offs occurred, farmland prices experienced a substantial decline and the oil industry began to encounter problems. As income improved toward the end of the 1980s, the percent of substandard credits charged off declined. Loans classified substandard in 1987, 1988, or 1989 were charged off about half as often as loans classified in the early 1980s. Consequently, as one might expect, loans classified when economic conditions were deteriorating had a worse loss record than those classified when the economy was improving.

These charge-off trends were most typical of the Kansas banks. In Oklahoma, loans classified substandard during the second half of the decade had the highest charge-off rates. These state differences partly reflect the oil price decline in the mid 1980s and its effect on the Oklahoma economy. Other factors

[4] *Excluding loans still classified was a necessary step in constructing a meaningful comparison of loss rates over time. For examinations during the last few years of the study, many more of the classified loans have yet to be resolved compared to the earlier years. Table 4 attempts to adjust for this difference by only looking at loans for which an outcome is known. This is also equivalent to assuming that the loans still to be resolved perform much the same as the other classified loans.*

Table 4

Loss experience for substandard loans: 1980-89

(As a percent of the dollar volume of loans classified substandard in each year)

Year	Charged off	Complete	Partial	ORE	Paid off or no longer classified
All sample banks					
1980	42.1	22.0	20.1	6.5	51.4
1981	42.2	21.1	21.1	2.2	55.6
1982	44.2	23.7	20.4	5.0	50.8
1983	52.3	18.7	33.5	7.2	40.5
1984	47.3	10.1	37.2	4.2	48.5
1985	37.1	12.2	24.8	4.2	58.7
1986	27.2	8.4	18.7	4.1	68.7
1987	22.8	7.7	15.1	4.2	73.0
1988	24.4	12.1	12.3	4.5	71.1
1989	21.6	4.2	17.2	6.4	72.1
Oklahoma banks					
1980	18.0	18.0	0.0	0.0	82.0
1981	29.3	11.7	17.6	1.5	69.2
1982	32.2	16.7	15.5	0.0	67.8
1983	42.9	24.4	18.5	0.0	57.1
1984	33.4	0.0	33.4	4.9	61.7
1985	100.0	100.0	0.0	0.0	0.0
1986	24.9	11.3	13.6	1.1	74.1
1987	29.2	9.9	19.3	0.4	70.3
1988	56.0	28.0	28.1	0.0	44.0
1989	50.4	26.1	24.3	0.0	49.6
Kansas banks					
1980	42.7	22.1	20.5	6.6	50.7
1981	42.4	21.3	21.1	2.3	55.3
1982	44.4	23.8	20.5	5.1	50.4
1983	52.5	18.7	33.8	7.3	40.2
1984	47.9	10.5	37.4	4.1	48.0
1985	36.9	11.9	25.0	4.2	58.9
1986	27.4	8.0	19.6	4.6	68.0
1987	21.8	7.4	14.4	4.7	73.5
1988	18.7	9.3	9.3	5.2	76.1
1989	16.7	0.5	16.2	7.4	75.9

include the slower recovery in real per farm income in Oklahoma (Chart 1) and the small number of sample banks in Oklahoma. The smaller base of banks would allow individual bank characteristics to have more of an effect on the group averages.

These results indicate that economic conditions and individual bank characteristics, such as the lending decisions of bank management, are both likely to play important roles in the loan performance and loss experience of banks. For the banks in this study, a statistical analysis of the variation in charge-off rates across banks and over time showed that more than twice as much of the variation could be explained by changes over time (i.e., economic conditions and general banking trends) as by differences among banks. Although these results are undoubtedly influenced by the rapidly changing economic conditions in the 1980s and by the similarities in many of the sample banks, the economy would appear to be an important consideration in the loss experience of classified loans throughout the banking industry.

Other studies: A comparison of results

This study analyzes the performance of classified loans during a period when economic conditions experienced a substantial decline. In contrast, an earlier study by Spong and Hoenig traced classified loans over a period — 1962 to 1975 — when fluctuations in the Tenth District economy were less pronounced. Because of the similarities between the banks in these two studies, the comparative results should offer a longer-term perspective on the relationship between the economy and bank loan performance.[5] Also, with the substantial buildup in agricultural debt between the 1960s and the early 1980s, the two studies may provide further insight into the increasing vulnerability of both the borrowers in the farm sector and the banks making these loans.

One notable difference in the results of these studies — the performance of substandard classifications — appears consistent with economic and banking trends. As shown in Table 5, which reflects the loss experience based on the number of loans, over 47 percent of the substandard loans in this study had charge-offs recorded against them, while only 19 percent of such classifications in the Spong/Hoenig study involved losses.[6] Although many of the charge-offs in the 1980s represented only partial loan losses, a substantially higher loss rate on substandard loans is evident in comparison with the 1962-1975 period. These differences between the two periods consequently indicate that the severity of economic downturns is likely to be reflected in the performance of loans examiners judge to be abnormally risky. Also, the much higher loss rates in the 1980s provide some evidence that borrowers were more vulnerable due to their rising debt loads.

Other results of the Spong/Hoenig study also indicate the effects of a changing economic and banking environment. Like this study, the Spong/Hoenig study found that substandard loan charge-off rates tended to increase when economic conditions worsened, but then fall back to lower levels as the economy began to improve. In fact, the study found that charge-off rates for loans classified substandard just prior to a recession period averaged about one and one-half times the rate during economic expansions.

Additionally, such factors as the percent of loans classified at the sample banks and the charge-off rates on unclassified loans provide further evidence of a significant shift in bank lending conditions by the 1980s. Classifications represented only one to three percent of total loans at the sample banks in the Spong/Hoenig study, but in this study,

[5] *Nine of the thirteen banks in the Spong-Hoenig study had much the same rural, agricultural orientation as the banks in this study. Although the other four banks were located in metropolitan areas, they operated in a regional economy that was very similar to that faced by the nine rural banks.*

[6] *For consistency across all of the studies, Table 5 examines charge-offs from substandard classifications according to the number of loans that were classified and the percent of these with charge-offs. These percentages therefore are not directly comparable to those in Table 2, which relates the total dollar amount of charge-offs to the dollar volume of classifications. In particular, the numbers in Table 2 are influenced by the size of individual loans and whether a loan is completely charged off or is only a partial loss.*

classified loans averaged about nine percent of the loan portfolio. With regard to average charge-off rates on unclassified credits, the two studies indicate an increase from just over 0.1 percent in the 1960s and 1970s to about 0.6 percent in the 1980s. Thus, while both studies find the loan classification process to be effective in identifying problem credits, the implications for a bank's loss exposure appear closely tied to the prevailing economic conditions and banking environment.

Table 5

Comparison of results for different time periods

	Lemieux/Spong study	Spong/Hoenig study	Wu study	Wu study
Examination period	1980-89	1962-75	1964	1973
Percent of classified loans charged off				
Substandard	47.6	19.1	12.2	16.1
Complete charge-off	11.6	7.2	5.2	6.2
Partial charge-off	36.1	11.9	7.0	9.9
Doubtful	73.1	54.0	26.6	36.5
Complete charge-off	40.3	26.0	13.3	20.8
Partial charge-off	32.8	28.0	13.3	15.7
Loss	84.7	93.0		
Complete charge-off	69.4	83.7		
Partial charge-off	15.3	9.3		

* As indicated in footnote 6, the percentages in this table are based on the number of individual loans classified and charged off rather than the total dollar amounts in each category as reported in Table 2. This change allowed the different studies to be compared on an equivalent basis.

Using survey questionnaires, Wu did two similar studies on a larger sample of national banks.[7] He first investigated the disposition of loans classified in 1964 for a group of banks in New England. A second study, which analyzed loans classified in 1973, covered a sample of banks from several different parts of the country. As shown in Table 5, these studies produced results similar to the Spong/Hoenig study in terms of the percent of classified loans eventually charged off. The portion of large loan charge-offs identified through the examination process was also similar to this study and the Spong/Hoenig study, thus providing additional evidence on the ability of examiners to detect most major lending problems. In general, the Wu studies indicated that examination information from a larger sample of national banks supported many of the same conclusions reached in the Spong/Hoenig study for a group of Tenth District banks during the 1960s and 1970s.

The conclusions: Implications for bank supervision

These results demonstrate that the bank examination process is of value in assessing the risk exposure of individual banks. For a group of state member banks in the Tenth District, this study found that the classification ratings assigned by examiners provided a good picture of the relative risk in specific loans during the 1980s. Loans classified by examiners for identifiable weaknesses, for instance, had much higher loss rates than loans judged to be of normal risk. Also, the relative loss rates among classified loans corresponded closely to the severity of the classification. Another factor indicating the effectiveness of the examination process was the ability of

[7] *Hsiu-Kwang Wu, "Bank Examiner Criticisms, Bank Loan Defaults, and Bank Loan Quality," **Journal of Finance**, September 1969, pp. 697-705; and Hsiu-Kwang Wu, "Effectiveness of Bank Examiner Loan Criticisms: Some New Evidence," **The Journal of Commercial Bank Lending**, February 1978, pp. 57-69.*

examiners to identify in advance most of the loan losses experienced by the banks in the study.

An additional outcome of the study relates to the effect of economic conditions on classified credits and a bank's overall risk exposure. In particular, loans classified substandard during the early 1980s when the District economy was deteriorating had higher loss rates than loans classified later on as the economy was improving. This study, when compared to similar studies during the 1960s and 1970s, also shows that classified loan charge-off rates have fluctuated on a longer-term basis in line with changes in economic conditions and banking trends.

These results have a number of implications for how bank management and bank supervisors can use loan classifications to evaluate the riskiness of the loan portfolio. For many banks, examiner classifications represent the only comprehensive, independent review of their lending operations. Consequently, an examiner's assessment of credit exposure is important for both bankers and supervisors in determining the adequacy of a bank's capital and its loan loss reserves. A high level of classifications, for example, would suggest a need for a substantial level of reserves and could raise questions about the adequacy of a bank's capital. Moreover, this need for reserves and capital would likely be most critical when local economic conditions were worsening — a time when bank profits and the ability to retain earnings and build capital would be at their lowest points. As a result, this study implies that bankers and supervisors should take a long-run view in judging the adequacy of capital and loan loss reserves and plan in advance for periods of economic stress. Capital and reserves that are adequate to cover loan losses in good economic times or "rules of thumb" based on bank historical data during more stable situations may not provide sufficient protection during downturns similar to that in the 1980s.

Recent legislation is adding further emphasis to this need to maintain adequate capital and loan loss reserves. The Federal Deposit Insurance Corporation Improvement Act of 1991 establishes a system of progressive supervisory intervention for banks with enforcement actions that are tied closely to bank capital levels. In addition, a basic intent of this legislation is to make a bank's reported capital holdings more reflective of the interest rate and credit risks the bank incurs and the actual value of its assets in the marketplace.[8]

Loan classification information, by providing a guide to a bank's credit risk and future loan losses, will play a key role in this new supervisory framework. Such information, along with internal loan reviews by bankers, will help establish appropriate levels of loan loss reserves at banks. Also, examiner assessments will further give an indication of how a bank's capital holdings should be adjusted for risk. As this study shows, the real value of a bank's capital and its need for reserves may vary markedly with changing economic conditions. Under the new system of supervision, bankers may thus have to place an even greater emphasis on controlling their lending risks and building capital to a level sufficient to withstand problems in the general economy.

[8] *Related objectives and provisions of this legislation, for instance, include accounting standards which accurately reflect the capital of banks and other depository institutions, supplemental disclosure of the fair market value of bank assets and liabilities to the extent feasible, and revision of risk-based capital standards to take into account interest rate risks and credit concentrations. Also, if a bank has less than satisfactory asset quality, a banking agency may deem it to be engaged in an "unsafe and unsound practice" and for supervisory purposes, may treat it as if it belonged to a lower capital category.*