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Introduction and Summary

THIS STUDY examines the loan experience and quality grading systems of two of the lending institutions serving farmers: the Production Credit Associations, which extend short- and intermediate-term credit, and the Federal Land Banks, which make longer-term mortgage loans. Although they are not the largest lenders in agriculture, the Federal Land Banks and Production Credit Associations are in some degree representative of the real estate and non-real-estate credit fields, respectively, and the loan data they provide are relatively complete and reliable.

The analysis centers upon the relationship between the loan grades and subsequent loan experience. In the case of Production Credit Association loans, the loans outstanding on the autumn examination date are graded with respect to quality. For Federal Land Bank loans, the quality of the loan collateral is graded prior to the loan closing. The relationships found between these two types of grades and subsequent loan experience allow inferences on the quality of credit based upon observed changes in the composition of the loan portfolios of these two lenders.[1]

The findings, noted in more detail later in this chapter, may be briefly summarized here as follows:

[1] The quality of credit refers to the likelihood that debtors will meet their obligations according to terms agreed upon at the time the loan was closed, with an assumption, usually not spelled out, that the effects of future economic events operative until the loan is disposed of will be "normal" thus permitting the marginal effects of the several loan characteristics to be approximately the same from one time period to the next. Loan experience, as observed, is a function of not only loan quality but of the general and specific economic conditions that unfold during the period of the loan. Depending upon these conditions at the time the loan is closed as well as future conditions, it may or may not make sense to increase lending activity even though lower quality loans are involved. However, we are not trying to answer this latter question in this study.

1. There is a close relationship between the credit ratings placed on loans by the Production Credit Associations and the ultimate disposition of those loans. This may indicate that the PCA personnel are skillful in appraising agricultural credit, but it also reflects the fact that the ratings are altered as the farmer's financial performance varies over the life of the loan and as new information is taken into account.

2. In the case of Federal Land Bank loans (where it is the quality of the loan collateral rather than the loan itself that is graded), little connection was found between loan collateral groups and loan experience. This indicates that the marginal lending decisions among collateral groups were nearly optimal. However, within loan collateral groups, a close relationship was found between the final disposition of loans and the loan/present value ratio. This would be expected since the same factor that determines present value also determines the borrower's debt servicing capacity, namely the expected future flow of net cash returns. The greater the loan relative to this expected flow, the poorer the expected loan performance.

3. The quality of credit at both the Land Bank and the PCA appears to have been declining since 1933. This might indicate that the less profitable farms are being forced increasingly into the credit markets to obtain the capital inputs needed to survive, that the commercial credit institutions are becoming more selective in accepting agricultural loans and are leaving the lower quality loans to the cooperative credit system, that the long-term profit squeeze in agriculture is causing cash flow problems for an increasing proportion of farmers, or that general economic conditions have improved so that sound loans can be made in spite of declining credit quality.

The Federal Land Banks and Production Credit Associations are well-established lenders in agriculture. The Federal Land Bank system has been in operation since before World War 1, and the Production Credit Association system was established in the 1930's during the depression. Both were originally underwritten by the federal government and, although now largely self-supporting, are still under the supervision of a government agency, the Farm Credit Administration.[2]

[2] See D. Gale Johnson, "The Credit Programs Supervised by the Farm Credit Administration," in *Federal Credit Agencies,* Commission on Money and Credit, Research Study Four, Englewood Cliffs, N.J., 1963, pp. 259–313 for a more complete summary of the organization and operation of these two lenders.

Since the two lenders operate as cooperatives, ownership of the lending mechanism is in the hands of the borrowing farmers. Funds are obtained through the sale of bonds rather than from deposits, and the lenders thus have access to the national financial markets to finance creditworthy farmers throughout the country. The bonds are sold in much the same way and in the same markets as the bonds of the Federal Home Loan Banks, Treasury securities, or corporate bonds.

The Production Credit Association System

Composed of many local associations, the system was organized as an extension of the Federal Intermediate Credit Banks and was designed to provide additional short-term credit to agriculture. More recently, intermediate-term production credit has also been extended by the Production Credit Associations. Although the associations received a small amount of federal aid in the form of interest-free capital, they are now largely self-supporting.

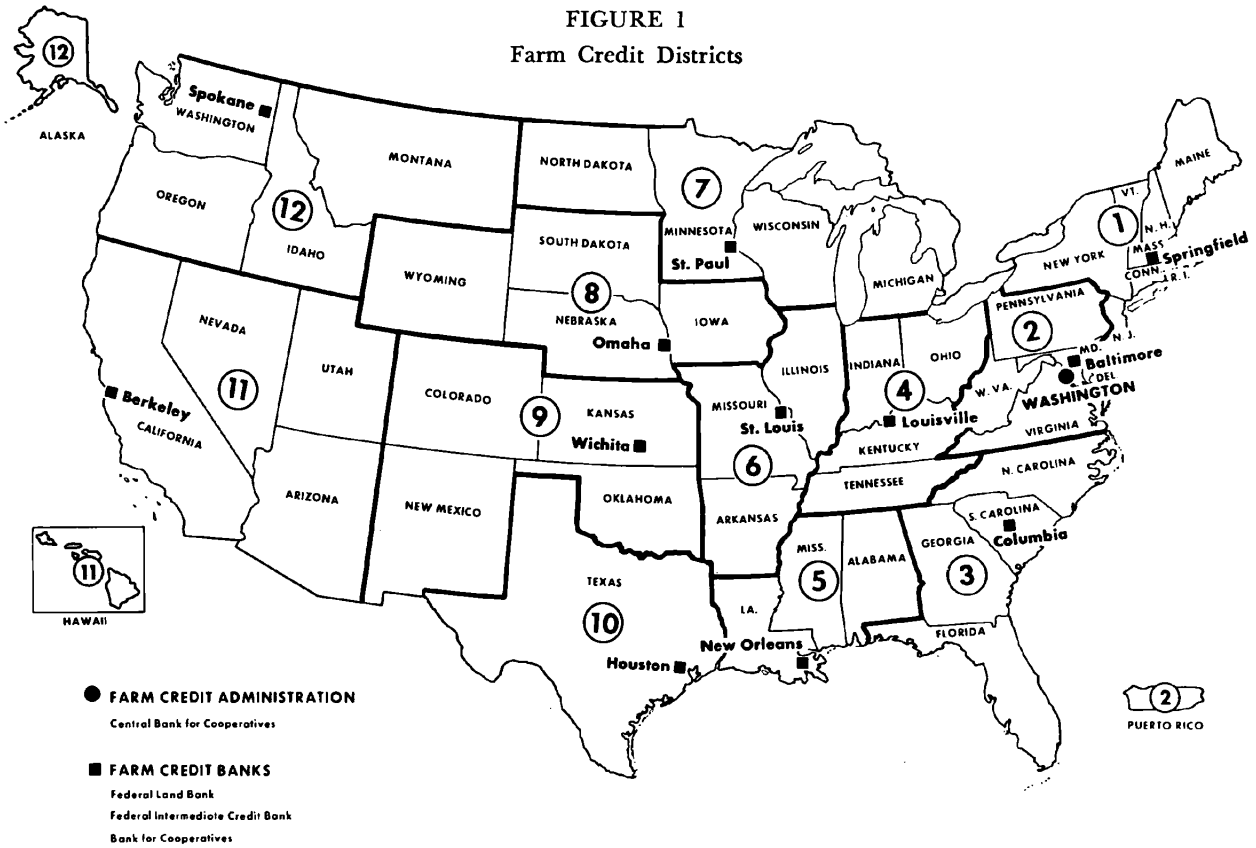
Competition between Production Credit Associations and commercial banks is relatively keen, but the services each can offer differ significantly. The sources of funds are also different since the Production Credit Associations can sell debentures in the national money markets. However, as in the case of commercial banks, they have no way of spreading risk or of making loans marketable, as can be done under some of the federal credit programs that provide loan insurance.

Production Credit Associations operate in the twelve Farm Credit Administration districts delineated in Figure 1. Observations for these districts provided the basic data used in analysis of the Production Credit Association loan experience.

While the share of the non-real-estate credit market served by the Production Credit Associations has increased steadily over the whole United States, the share for individual districts has varied widely, as illustrated in Tables 1 and 2. The dollar volume of loans outstanding from Production Credit Associations in 1966 was over eleven times the amount outstanding in 1945. Production Credit Association loans accounted for 23 per cent of total U.S. loans made to farmers for non-real estate by lending institutions in 1966, compared to only

FIGURE 1

Farm Credit Districts



Source: Production Credit Association, *30th Annual Summary of Operations,* 1963.

TABLE 1

Non-Real-Estate Loans to Farmers, Total Amount Outstanding Reported by Principal Lending Institutions and Percentage of Total for Each, United States, January 1, 1920–66

Year	*Total Amount ($ million)*	*All Operating Banks*	*Production Credit Associations*	*Federal Intermediate Credit Banks*	*Farmers Home Administration*
1920	3,455	100.0	—	—	—
1925	2,677	99.9	—	—	.1
1930	2,499	99.7	—	—	.3
1935	947	66.3	6.4	5.8	21.5
1940	1,504	59.9	10.2	2.1	27.8
1945	1,620	58.6	11.6	1.8	27.9
1946	1,668	62.0	11.7	1.6	24.8
1947	1,951	66.1	11.8	1.6	20.5
1948	2,290	69.5	12.6	1.7	16.2
1949	2,710	71.8	13.5	2.1	12.6
1950	2,834	72.3	13.7	1.8	12.2
1951	3,366	75.0	13.4	1.8	9.8
1952	4,063	76.8	13.8	1.9	7.5
1953	4,215	75.8	14.2	2.0	8.0
1954	3,744	73.8	14.5	1.7	10.0
1955	3,986	73.6	14.5	1.5	10.5
1956	4,420	74.8	14.6	1.4	9.2
1957	4,470	73.4	15.6	1.3	9.6
1958	4,994	72.2	17.7	1.3	8.7
1959	5,765	72.2	19.3	1.5	7.0
1960	6,668	72.3	20.4	1.3	6.0
1961	6,979	71.5	21.2	1.3	6.0
1962	7,551	70.4	21.7	1.3	6.6
1963	8,484	70.5	21.7	1.3	6.6
1964	9,477	70.2	22.2	1.3	6.3
1965	10,036	69.6	22.7	1.3	6.4
1966	11,112	69.1	23.2	1.3	6.4

Note: Excludes Commodity Credit Corporation loans. Data for forty-eight states through 1959. Thereafter Hawaii and Alaska are included.

Source: *Agricultural Finance Review*, February 1966.

TABLE 2

Non-Real-Estate Loans to Farmers, Total Amount Outstanding Reported by Principal Lending Institutions and Percentage of Total for Each, by Farm Credit Districts, January 1, 1964

District	*Total Amount ($ million)*	*All Operating Banks*	*Production Credit Associations*	*Federal Intermediate Credit Banks*	*Farmers Home Administration*
Springfield	358	60.2	27.5	.5	11.8
Baltimore	340	69.2	23.1	.0	7.7
Columbia	452	41.5	49.7	.2	8.6
Louisville	839	57.4	38.3	.4	3.9
New Orleans	282	51.2	32.8	2.9	13.1
St. Louis	1,057	71.7	23.4	.5	4.4
St. Paul	1,061	66.8	24.3	1.1	7.8
Omaha	1,602	82.6	11.1	1.4	4.9
Wichita	1,102	76.7	17.0	1.6	4.7
Houston	743	66.1	20.2	3.5	10.2
Berkeley	1,043	83.3	12.1	2.5	2.1
Spokane	598	65.4	24.4	.6	9.6
United States	9,477	70.2	22.2	1.3	6.3

Note: Excludes Commodity Credit Corporation loans.
Source: *Agricultural Finance Review,* December 1964.

12 per cent in 1945. The summary below, which includes debt held by other than institutional lenders, shows that of all non-real-estate debt, Production Credit Associations held 13 per cent as of January 1, 1965.

Non-Real-Estate Debt [a]	*Billion Dollars*	*Per Cent*
All operating banks	7.0	41
Production Credit Associations	2.3	13
Federal Intermediate Credit Banks	.1	1
Farmers Home Administration	.6	4
Nonreporting creditors	7.1	42
Total	17.1	100

[a] *Balance Sheet of Agriculture 1965,* p. 19. Excludes Commodity Credit Corporation loans.

The Federal Land Bank System

The Federal Land Banks were chartered and began operation in the farm real estate field in 1917. Like Production Credit Associations, initial capitalization was achieved primarily with government funds. Since 1947, when the government investment had been repaid, Federal Land Banks have been owned by the Federal Land Bank Associations, which are in turn owned by the borrowing farmers.

Twelve Federal Land Banks serve the same farm credit districts as the Production Credit Associations (see Figure 1) with loans made through local Federal Land Bank Associations. The Federal Land Bank loan data analyzed in this study are for the lending activities in New York State of the Springfield, Massachusetts, district.

The share of the farm real estate mortgage market of lending institutions served by the Federal Land Banks during the 1917–66 period is given in Table 3; in Table 4, the district shares of this market are provided. Sources of all outstanding real estate loans to agriculture on January 1, 1965, are indicated below.

Real Estate Debt[a]	*Billion Dollars*	*Per Cent*
Federal Land Banks	3.7	20
Farmers Home Administration	.6	3
Life insurance companies	4.3	23
All operating banks	2.7	14
Other farm mortgage debt	7.6	40
Total	18.9	100

[a] *Balance Sheet of Agriculture 1965*, p. 23.

Summary of Findings

The investigation found that, in general, the Production Credit Associations and the Federal Land Bank of Springfield, Massachusetts, employed grading systems for loans and loan collateral, respectively, which can be used to gain insight into the changing quality of credit and lending experience over time.

TABLE 3

Farm Mortgage Loans to Farmers, Total Amount Outstanding Reported by Principal Lending Institutions and Percentage of Total for Each, United States, January 1, 1920–66

Year	Total Amount ($ million)	Federal Land Banks	Federal Farm Mortgage Corporation	Joint Stock Land Banks	Farmers Home Administration	Life Insurance Companies	Commercial and Savings Banks	Other Farm Mortgage Debt
1920	8,449	3.5	–	.7	–	11.5	14.3	70.0
1930	9,631	12.5	–	6.6	–	22.0	10.4	48.5
1935	7,584	25.6	8.1	3.7	–	17.2	6.6	38.8
1940	6,586	30.5	10.8	1.4	.5	15.0	8.1	33.7
1941	6,494	30.1	10.6	1.1	1.0	15.7	8.4	33.1
1942	6,376	29.5	10.0	.9	1.8	16.7	8.4	32.7
1943	5,956	28.9	9.1	.6	2.7	17.5	8.0	33.2
1944	5,396	26.9	8.0	.2	3.2	18.3	8.3	35.1
1945	4,941	24.5	7.0	.1	4.0	19.0	9.1	36.3
1946	4,760	22.7	5.0	.1	3.9	18.7	10.6	39.0
1947	4,897	19.9	3.0	.0	3.9	18.2	14.0	41.0
1948	5,064	17.6	2.1	.0	3.9	18.9	16.6	40.9
1949	5,288	16.4	1.5	.0	3.7	19.6	17.0	41.8
1950	5,579	16.2	1.1	.0	3.5	21.0	16.8	41.4

1951	6,112	15.5	.7	—	3.6	22.1	16.5	41.6
1952	6,662	14.9	.5	—	3.6	23.2	15.7	42.1
1953	7,241	14.8	.3	—	3.7	23.7	15.3	42.2
1954	7,740	15.1	.2	—	3.7	24.5	14.6	41.9
1955	8,245	15.4	.2	—	3.5	24.8	14.7	41.4
1956	9,012	16.4	—	—	3.1	25.2	15.0	40.3
1957	9,822	17.5	—	—	3.0	25.2	14.1	40.2
1958	10,382	18.3	—	—	3.3	24.8	13.6	40.0
1959	11,091	18.6	—	—	3.5	24.0	13.6	40.3
1960	12,082	19.3	—	—	3.7	23.3	13.5	40.2
1961	12,820	19.8	—	—	3.8	23.2	13.2	40.0
1962	13,899	20.2	—	—	4.1	22.7	12.9	40.1
1963	15,168	19.9	—	—	3.9	22.4	13.6	40.2
1964	16,804	19.5	—	—	3.6	22.5	14.1	40.3
1965	18,894	19.5	—	—	3.3	22.7	14.1	40.4
1966	21,187	20.0	—	—	3.0	22.7	13.9	40.5

Note: Data for forty-eight states through 1959. Thereafter Hawaii and Alaska are included.

Source: *Agricultural Finance Review,* June 1967.

TABLE 4

Farm Mortgage Loans to Farmers, Total Amount Outstanding Reported by Principal Lending Institutions and Percentage of Total for Each, by Farm Credit Districts, January 1, 1964

District	*Total Amount ($ million)*	*Federal Land Bank*	*Farmers Home Administration*	*Life Insurance Companies*	*All Operating Banks*	*Other Farm Mortgage Debt*
Springfield	592	20.5	3.2	4.7	24.6	47.0
Baltimore	738	12.7	3.5	7.3	35.1	41.4
Columbia	1,223	19.7	7.4	19.3	15.3	38.3
Louisville	1,724	19.2	3.5	20.3	23.8	33.2
New Orleans	742	23.8	11.9	24.3	18.8	21.2
St. Louis	1,689	18.6	3.3	33.7	16.3	28.1
St. Paul	2,086	20.8	2.9	12.6	14.9	48.8
Omaha	1,843	25.5	2.5	35.2	6.9	29.9
Wichita	1,289	20.2	3.4	31.4	8.8	36.2
Houston	1,237	23.5	2.6	31.8	7.8	34.3
Berkeley	2,236	11.7	1.3	16.5	10.2	60.3
Spokane	1,405	20.7	4.1	20.0	4.6	50.6
United States	16,804	19.5	3.6	22.5	14.1	40.3

Source: *Agricultural Finance Review,* December 1964.

Grading Systems

Production Credit Loans. Under the loan inspection procedure used by the Production Credit Associations, loans are classified into quality groups that generate, over time, different loan disposition rates for different groups. The grading system includes three classifications: AB, C, and D loans, in order of credit quality. All loans are considered AB at the time of closing, but are re-evaluated at annual inspection dates.

For AB and C loans, loss rates were zero in the year immediately following closing, because any loan on which a loss was taken had been classified as D at a prior date. Only about 0.25 per cent of AB loans were classified as D loans on the next annual inspection date. Loans in the C group that were classified as D in the following year averaged about 2.2 per cent, a rate nearly ten times as high a rate as that for AB loans. Loans graded D which remained in the D

group on the next inspection date amounted to about 40 per cent, or more than eighteen times as high as for C loans.

The annual charge-off rate for D loans was about 23 per cent by number, about 9 per cent by amount. Approximately 21 per cent of the number and 10 per cent of the amount of D loans were paid in full each year. Since many D loans in any one year are continued in that category the following year, about 40 per cent of all D loans are ultimately charged off.[3]

These findings suggest that the Production Credit Association loan grading system is useful for assessing the quality of loans outstanding from this lender.

Federal Land Bank Loans. The Federal Land Banks grade loan collateral rather than the loan itself. Both the farm and the farm area are included in the judgment on collateral; numbers from 1 to 4 represent grades of farm area and letters from A to D represent the grade of farm. The four collateral groups used in this study range from 12AB farms, which are the best farms in the best areas, to 34CD farms, which are the worst farms in the worst areas.

The following observations were made concerning Federal Land Bank loans grouped by loan collateral (farm and farm area): (1) the characteristics of the loans in each grade group were markedly different; (2) these loan characteristics were closely correlated with type of disposition, and yet (3) the disposition rates for each loan collateral group were very similar.

Certain loan characteristics, rather than loan collateral grades, were found to be closely correlated with type of disposition. These characteristics were size of loan, normal agricultural value of the farm, present market value, size of farm in acres, and the ratios of loan to acres, loan to normal agricultural value, and loan to present value of farm.

The connection between loan collateral groups and loan experience was not close. In other words, knowledge of the collateral grade for a specific loan is of limited use in predicting type of disposition, the indication being that the groups of loans in each collateral grade

[3] Estimates of ultimate D loan dispositions probably slightly overestimate payments in full and underestimate loans charged off, since D loans on the books for more than one year had a tendency to show slightly higher annual charge-off rates than did those on the books less than one year.

were of nearly equal quality. Loans on the worst farms in the worst farming areas were slightly worse in terms of loan experience.

These three sets of relationships indicate that the Bank, in deciding which loans to close and how much to loan, was able to generate for each loan collateral group approximately equal actuarial worths, as indicated by similarities in disposition rates for each of the four collateral groups of loans. The likelihood that this result could have been generated by chance is so small that the chance hypothesis was rejected.

Loan Experience and Loan Quality Over Time

Production Credit Association Loans. The magnitude of the Production Credit Associations' lending activities has generally increased during the period since 1945, both in number of loans and in amount.

The composition of the Production Credit Associations' portfolio also changed during the 1945–65 period. There was a relative increase in C loans as a proportion of all loans, with a concurrent decline in the proportion of AB loans. The steady decline in the proportion of AB loans began in the early 1950's and continued through 1965. There is no clear-cut trend in the proportion of D loans, which ranged between .52 and 1.82 per cent of total loans.

Although the decline in the proportion of AB loans indicates a deterioration in the quality of loans in the portfolio, loan experience was good over the entire period. Losses on loans have quite naturally increased in absolute terms, but loss rates have been relatively low and have not exhibited any definite trend. The proportion of D loans paid in full has declined slightly, but the proportion charged off (annually) has also been reduced since 1945. The proportion of D loans that have remained D loans in recent years has increased, suggesting a decline in loan quality.

Federal Land Bank Loans. As in the case of the Production Credit Associations, the total amounts loaned by the Federal Land Bank have been increasing over time.

Concurrent with the increase in lending activities, the composition of the Land Bank portfolio of loans has changed in the period since 1933. The proportion of 34CD loans among loans closed in the portfolio has increased both in number and amount. The shift in propor-

tions indicated by this rise in 34CD loans may represent a change in the types of farms on which loans were sought.

Loan experience, in terms of losses and foreclosures, has varied widely throughout Land Bank history. During the entire 1917–33 period, there were high loss rates. The number of foreclosures peaked in 1933, representing a turning point in the experience of loans made by the Bank. Many low-quality loans had been made in the early 1920's, but this had been largely corrected by 1925.

After 1933, profits were realized on foreclosed loans, accompanying the secular increase in land values after the depression. Loss rates are therefore not useful for judging the loan experience among loan collateral grades for this period. The rate of foreclosures, a more meaningful measure, was not as high from 1933 to 1957 as it had been in the early days of the Bank. It seems reasonable to conclude that the quality of loans made by the Federal Land Bank in the 1933–57 period has improved in comparison with the quality of loans in the early days of the Bank's operation.

However, during the 1933–57 period itself, there was a rather marked shift in the composition of the Bank's portfolio. Relatively more of the loans were on the poorer farms in the poorer areas than previously. When this fact is coupled with the relationship between loan experience and loan characteristics, it appears to signal a deterioration in loan quality.