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Agricultural lending by commercial banks in the U.S. traditionally has responded to the short and intermediate term financing needs of agricultural producers. Longer term real estate lending was mostly left to Federal Land Banks, life insurance companies, and sellers of farm land because of the unattractive liquidity and risk characteristics of these types of loans for depository institutions. However, during the 1980s, the level and market share of farm real estate debt held by commercial banks increased substantially. The market share of farm real estate debt held by the Farm Credit System (FCS) increased from 19% in 1960 to over 44% in 1984. During this same time period, the market share for commercial banks fell from 13.5% to below 10%. As shown in figure 1, the total real estate volume increased rapidly from the 1960s to the early 1980s. In addition, total farm real estate debt peaked in 1983 at $114 billion. In 1984 the trend reversed and FCS began to decline in market share while commercial banks increased. Commercial banks increased from $8.392 billion in 1982 to $15.417 billion in 1988 and banks' market share increased from a low of 7.6% of total farm real estate debt in 1982 to 18.6% in 1988. At the same time, the levels and market shares of farm real estate debt held by Federal Land Banks and individuals declined considerably, the debt outstanding from life-insurance companies declined although their share remained relatively constant, and the debt levels and market shares of the Farmers Home Administration increased slightly. Table 1 shows the changes in farm real estate debt outstanding by lender from 1980 through 1989.

These recent changes in farm real estate lending likely are attributable to a combination of factors in agriculture and in financial markets and institutions. In agriculture, the severe financial stresses of the 1980s brought financial hardship to all lenders, especially Federal Land Banks due to their long term, specialized lending to agriculture. Institutional responses included more conservative lending practices, higher lending costs and interest rates, and downsizing of loan portfolios, all of which contributed to the restructuring of the farm real estate lending market. The profitability of agricultural banks came under substantial downward pressure, although compensating factors were the relatively high liquidity of agricultural banks following the downturn in high loan to deposit ratios of the 1970s, the slowdown in farm loan demand, and the shorter term nature of bank lending which allowed more rapid portfolio adjustments than for long term lenders. Thus, many agricultural banks were well positioned to selectively increase their farm lending as the stress times continued.

Financial deregulation and structural changes of depository institutions during the 1980s also increased competitiveness in banking markets, enhanced lending and risk bearing capacities, and heightened the interest among agricultural banks to offer a full range of short, intermediate and long term credit services to farm borrowers (American Bankers Association). Indeed, the banking industry played a major role in developing and promoting the concept of a secondary market for farm real estate loans, as reflected by the creation of Farmer Mac in the Agricultural Credit Act of 1987. All of these factors together with the observed changes in farm real estate debt suggest that long term changes in the structure of this lending market are occurring.

In light of these developments, a timely and comprehensive information base is needed about farm real estate lending by commercial banks. Accordingly, the purpose of this paper is to report and analyze the results of a mail survey of midwestern banks about their present and anticipated future

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involvement in farm real estate lending. The specific goals of the survey are to explain the growth in banks' loans secured by farm real estate, determine the purposes of these loans, identify the pricing, maturity and credit evaluation procedures, and assess the future goals of agricultural banks in farm real estate lending, including the anticipated use of the new secondary market. The survey responses also are evaluated according to bank size and legal structure, under the premise that larger, less specialized banks with more complex legal structures would have greater capacities to provide farm loans with more extensive pricing arrangements and evaluation procedures (Barry and Calvert).

Survey Development and Responses

The geographical scope of the survey contains the five state region of Arkansas, Illinois, Indiana, Iowa and Missouri. Agriculture is a major economic sector in each of the states and while the commodities produced are similar, the systems of production and levels of productivity exhibit considerable diversity. Moreover, the regional approach will provide a contrast between the financing of specialized grain farms and mixed grain-livestock operations and also allow a range of bank structures.

Farm real estate debt held by banks in this five-state region comprises 29% of all farm real estate debt held by commercial banks in the United States at year-end 1988. Within the region, the market share of farm real estate debt held by banks increased from 8.5% in 1982 to 23.6% in 1988 (USDA). Moreover, the volume of farm real estate debt held by banks increased 101% over this time period, while the real estate debt held by all lenders declined by 29%. The changes in both national and individual state data over this time period are indicated in Table 2.

The procedure was to survey all "agricultural banks" in the five state region. An agricultural bank was defined to have agricultural loans greater than $2.5 million or a ratio of agricultural loans to total loans that exceeded 0.25 as of year-end 1987[1]. The dual criteria of a loan concentration ratio and loan volume was used in order to include larger banks with a large volume of agricultural loans, but not necessarily a high concentration in agricultural lending. The 1,625 banks in the region that met these criteria held 92% of all agricultural loans from banks in the region and 89% of all loans secured by farm real estate at year-end 1987.

The survey questionnaire contains five parts: (1) introduction, (2) current farm real estate lending, (3) farm real estate lending in 1988, (4) future farm real estate lending, and (5) secondary market issues (a copy of the questionnaire is available upon request).[2] The introduction elicits descriptive information about the bank's legal structure, market size, and types of farming in its loan market, number of borrowers and farm real estate loans, and use of a written policy for farm real estate lending. Part 2 of the questionnaire addresses the bank's current practices and policies for farm real estate lending. Included is information about the following:

- General policies for fixed and variable rate loans,
- Frequency and limits of rate adjustments,
- The range of interest rates on fixed and variable rate loans,
- How the rates are determined,
- Maturity distributions of farm real estate loans and related interest rates,
- The evaluation of borrower risk and use of risk adjusted loan pricing,
- Down payment requirements,
- Purposes of loans secured by farm real estate,
- Estimates of farm real estate loans reported in Call Report categories other than **Loans secured by farm real estate**.

Questions in Part 3 focus on the characteristics of farm real estate lending in 1988 in order to identify whether any significant and recent changes are occurring in the terms and purposes of these loans relative to the previous 3 to 5 years. The remaining parts of the survey address the bank's future goals in farm real estate lending, activities of competing lenders, and anticipated use of the secondary loan market.

The surveys were mailed to the 1,625 banks on April 13, 1989, with a follow-up reminder on May 12, 1989. By June 15, 1989, 702 responses were received. Three responding banks indicated no involvement in farm real estate lending, 2 banks had recently merged, and 2 others expressed disinterest in the survey. Thus, the useable response to the survey contained 695 completed questionnaires, or a response rate of 43%. The responding banks hold 44% of all **Loans secured by farm real estate** held by all commercial banks in the 5 state region.

Survey Results

The results presented here include descriptive characteristics of the responding agricultural banks and a set of tables indicating the purposes of loans secured by farm real estate, pricing and credit terms on farm real estate loans, credit evaluation and pricing procedures, and future goals for farm real estate lending and secondary market activity. In each table, the results are differentiated by two categories of bank size -- less than and greater than $100 million in total assets -- and a later table indicates the bank holding company effects.

Descriptive Characteristics

The average bank responding to the survey held $ 81.6 million in assets, with bank size ranging from $5 million to $469 million. The average bank had $2.9 million of farm real estate debt outstanding, (ranging from $0 to 18 million) 136 farm borrowers, 50 farm real estate loans, and an average size of **Loan secured by farm real estate** of $78,411. The average agricultural loan ratio of responding banks was 0.35. The legal structure of the responding banks included 31% of the banks belonging to a multi-bank holding company, 45% affiliated with a single bank holding company, and 23% non-affiliate banks. Ninety three percent of the banks regarded their loan market as a local market with an average radius of 26 miles. Six percent of the responding banks operate in a regional market within a state and 1% have a statewide market. Cash grain farms were ranked as the most important type of farming for their farm borrowers by 83% of the banks, while swine farms were ranked second in importance by 57% of the banks. In general, then, survey responses were dominated by smaller, community oriented banks, that were heavily involved in farm lending.

Purposes of Farm Real Estate Loans

Commercial banks are required by the law to report income and balance sheet information on a quarterly basis. This procedure involves reporting different types of loans in separate categories. **Loans secured by farm real estate** is one of these categories. However, using the source of security as the basis for classification provides no information about the purposes of the loans. The loan proceeds could be used for a variety of purposes, including financing the purchase of farm real estate and related improvements, refinancing existing loans, and for non-real estate lending purposes. Because no recently published data are available about the purposes of farm real estate loans, the survey asked bankers to estimate the distribution of their farm real estate debt over the range of loan purposes shown in Table 3.

The averages for the banks responding to the survey indicate that 61% of banks' **Loans secured by farm real estate** were made for purposes of purchasing or improving farm land or buildings. About 34% of the **Loans secured by farm real estate** were used for various kinds of refinancing--11% for refinancing of loans by the respondent bank or other banks, 13% for refinancing of Farm Credit System loans, and 9% for refinancing of agricultural production loans. While some of the refinancing would involve loans originally used to finance the purchase of farm real estate, the existing loans would have been reported in prior years

by the original lender. Another approach to measuring the purposes of **Loans secured by farm real estate** is to weight the responses according to the amount of real estate debt outstanding from the respective banks. Using this calculation procedure, 59% of the banks' real estate loans were made for purposes of purchasing or improving land or buildings, while 35% of **Loans secured by farm real estate** were used for refinancing various types debt.

These loan purpose results provide some interesting contrasts to similar data attained in a 1981 survey of Illinois banks by Calvert and Barry. The 1981 survey of responses from 305 Illinois banks indicate that 72% of banks real estate **Loans secured by farm real estate** were for purposes of purchasing or improving farm land or buildings. About 16.4% of these loans were used for various kinds of refinancing, 7.8% of farm real estate loans were used for non-real estate purposes, and 3.7% were used for non-farm purposes. The higher incidence of refinancing in the 1989 results is consistent with the financial stresses experienced by farmers and lenders in the 1980s.[3]

The 1989 survey also asked bankers to indicate whether or not they held loans to finance the purchase of farm real estate that were not secured by farm real estate and thus not reported as **Loans secured by farm real estate**. Seventeen percent of the banks reported such loans which totaled about 4.1% of the sum of these loans reported elsewhere plus **Loans secured by farm real estate**. About 2/3 of these additional farm real estate loans were reported as non-real estate farm loans, while the rest were distributed over several Call Report categories. The results also indicated that the incidence of reporting farm real estate loans outside of **Loans secured by farm real estate** is slightly higher for larger banks and tends to show up in loans reported as construction and land development, commercial and industrial, and loans to individuals. However, the volume of these loans is low relative to the aggregate of farm real estate loans and relatively few banks are involved.

Pricing and Credit Terms on Farm Real Estate Loans

Survey results reported in Table 4 indicate the relative use of fixed and variable rate loans, interest rates, maturity distributions and down payment requirements on farm real estate loans. Sixty one percent of the banks offer fixed rate loans with an average maximum maturity of 7 years. The average minimum rate offered for fixed rate loans was 11.42% while the average maximum value was 12.38% or an average differential of 0.96%. This fixed rate differential between maximum and minimum rates for smaller banks was lower than the differential for larger banks. The incidence of offering fixed rate loans appears to be considerably higher at smaller banks (less than $100 million in assets) compared to larger banks.

Variable rate farm real estate loans are offered by 67% of the banks, with an estimated 63% of the farm real estate loans at the bank having variable rates. In contrast to fixed rate loans, the incidence of variable rate loans is considerably higher at larger banks. The range of interest rates on variable rate loans, an average minimum rate of 11.25% and maximum of 12.57%, is larger than the range for fixed rate loans and the frequency of rate adjustment is dominated by annual adjustments, with larger banks indicating more frequent reviews and significantly higher minimum and maximum interest rates on farm real estate loans. While not reported in the table, the base interest rate on existing farm real estate loans was changed an average of 3.11 times during 1988 for all banks, 3.58 times for the larger banks, and 3.01 times for the smaller banks. Thirty percent of the banks have a limit on the size of rate adjustment in one period, that averages 2.10%.

Both fixed rate and variable rate loans are offered by 31% of the banks. As indicated in table 4, the average level of minimum and maximum rates for fixed rate loans exceed these levels for variable rate loans by 0.2926% and 0.066%, respectively, for all banks.

On average, over 60% of each bank's farm real estate loan volume has a maturity of 5 years or less, with a balloon payment due at the end of the loan contract. Only 10% of the farm real estate loan volume has a 6 to 10 year maturity, while 26% has a maturity greater than 10 years. Larger banks indicate a slightly higher concentration of loan volume with longer maturities. Thus, in combination with the higher incidence

of fixed rate loans at smaller banks, it appears that banks are tending to build repricing opportunities into fixed rate lending by using relatively short maturities (i.e., 5 years or less) with loan renewals at the end of the loan contract. The bankers were not asked whether the repayment requirements for loan principal reflect an amortization period that exceeds the loan maturity, but this practice certainly is possible.

Variable rate loans should allow the banks to offer longer maturities while still passing the interest rate on to the borrowers. Accordingly, a correlation test between the proportion of variable rate loans in the portfolio and the maturity distribution was performed to test this possible relationship. Indications are that the higher is the proportion of variable rate farm real estate loans (VRP) the higher is the proportion of 11 to 20 year maturing loans(11-20YL) and the lower the is the proportion of 0 to 5 year balloon payment (0-5B) loans. The Spearman correlation coefficient between VRP and 11-20YL is 0.2903 (p value < 0.0001) and -0.3554 (p value < 0.0001) between VRP and 0-5B. The results when weighting the proportions by agricultural real estate volume are 0.3350 and -0.35694 respectively.

A minimum down payment criteria had been established for the purchase of farm real estate by 96% of the banks with an average minimum ratio of equity to appraised land value of 28%. The distribution of down payment over the past three years ranged from 11 to 25% of appraised value for 44% of the banks, and from 26 to 50% of appraised value for 50% of the banks. As shown in Table 4, larger banks on average are associated with higher down payment requirements.

Credit Evaluation and Pricing Procedures

The growing use of risk adjusted loan pricing, especially in larger banks, is shown by the survey results in which 80% of the larger banks and 62% of the smaller banks indicate that the interest rate charged to the borrower depends on the borrower's credit risk. Another 1981 national survey of agricultural banks by Barry and Calvert indicated that differential loan pricing among farm customers was practiced by 47% of the banks. Since the 1989 survey focused only on farm real estate loans, it is likely that the use of differential pricing is even higher than the 64% figure obtained from the survey, and the use of the practice clearly has increased during the 1980s.

The bankers also were asked to provide the approximate weights given to the following factors when determining a borrower's credit risk: solvency, profitability, debt servicing capacity, liquidity, repayment history, collateral and others. As the average weights reported in Table 5 show, collateral and debt servicing capacity receive the highest weight followed by profitability and then by repayment history, solvency and liquidity. The rankings stayed about the same when the banks were categorized by bank size, except that the large banks placed a greater weight on debt servicing capacity than on collateral. Thus, collateral clearly receives a high weighting in evaluating credit risk for farm real estate lending. Perhaps, however, this result should not be surprising in light of the high quality of collateral generated by farm land. Moreover, the high weight also given to debt servicing capacity shows a roughly balanced approach between asset security and repayment ability in credit evaluations by these banks.

The credit factors and weights can be used in a variety of approaches to credit evaluation ranging from highly subjective, informal methods to scoring techniques based on sophisticated statistical analyses of the borrower's financial data. However, little is known about the methods agricultural bankers employ in evaluating a farm borrower's credit worthiness. Accordingly, the survey questionnaire asked whether the responding bank uses a credit scoring work sheet or similar formal system to evaluate a borrower's credit risk on both farm real estate loans and production loans and other loans to farmers. In response, 27% of the banks indicated they employ a credit scoring or formal approach with farm real estate borrowers and 37% utilize such an approach on other types of farm loans. Since results reported above indicate that 64% of the banks use risk adjusted pricing, these incidences of credit scoring indicate that rather informal credit evaluation methods must be employed by a relatively high proportion of the banks.

Pricing, Credit Terms and Credit Evaluation by Legal Structure

The responses of the survey were also evaluated according to the legal structure of the responding banks. Table 6 reports specified items based on the bank's affiliation with a bank holding company (BHC), under the premise that banks affiliated with a multi-bank holding company have greater access to additional resources and thus, provide additional and more efficient credit services and arrangements. Similar to the previous tables, the responses are categorized into asset size categories and then subdivided into banks affiliated with a single bank holding company or have no bank holding company involvement (SBHC) and banks affiliated with a multi-bank holding company (MBHC).

Results for the larger banks exhibited negligible differences between MBHC and SBHC and will not be discussed. In the smaller size categories some interesting differences occurred between MBHC and SBHC. A higher proportion of MBHCs have a written policy regarding farm real estate lending. A significantly higher proportion of MBHCs offer variable rate farm real estate loans while a significantly higher proportion of SBHC offer fixed rate loans. As observed in the earlier section, this relationship correlates with the distribution of loans by maturity. MBHC affiliates tend to have a higher proportion of loans relative to SBHC in the 11-20 year maturity category and a lower proportion of loans in the 0 to 5 year loan category. A significantly higher proportion of MBHC affiliates in the smaller asset category price loans based on the borrowers' credit risk. Moreover, a higher proportion of MBHC affiliates use a formal evaluation procedure to measure the farmers' credit risk for real estate and non real estate farm loans.

Comparison of Farm Credit System Policies and Responses

An informal survey of the St. Louis, Louisville, Omaha, and Minneapolis Farm Credit Service (FCS) districts provide additional information about loan terms and pricing that were used by major farm real estate loan competitors during this same time period. Traditionally, the FCS have used primarily variable rate mortgages. Now however, each of these districts is also offering fixed and adjustable rate mortgages (ARMS) to meet the demands of farm borrowers and to offer a broader range of credit services. Along with the traditional variable rate mortgage loans, 1, 3, 5 year ARMs, and 5 year fixed rate loans were offered at each district. Three of the FCS districts also offered longer fixed rate loans.

The minimum interest rate charged farm borrowers on variable rate farm real estate loans averaged 10.9% while the average maximum rate charged on variable rate loans was 12.1%; these average rate levels are less than the comparable data for agricultural banks. Each district uses a tiered interest rate structure based on the borrower's credit risk. In one district, the only credit factors considered are the borrower's solvency position (ie. the equity to asset ratio) and the ratio of loan size to appraised value of the land pledged as security. Another uses weights based on capital debt repayment capacity or solvency and collateral positions. The other two districts have a scoring system based on solvency, liquidity, debt servicing capacity and collateral with slightly higher weights given to collateral and solvency.

The minimum loan to appraised value required for farm real estate loans was 25% with the average of the four districts between 30 and 35% loan to appraised value[4]. The variable rate at the districts changed an average of 3-4 times during 1988.

The average interest rates offered for 1, 3, and 5 year ARMs for the best customers were 11.05%, 11.3%, and 11.41%, respectively. In the case where 16-20 year fixed rate loans were offered, the average rate offered to the best customers was 12.2%. In many cases the longer term fixed rate loans were not offered to the higher risk borrowers.

Future Goals for Farm Real Estate Lending and Secondary Market Activity

Considerable uncertainty exists about the future levels of farm real estate lending and the relative position of various types of financial institutions in this market. In agriculture, profit prospects, investment opportunities and future changes in land values play an important role. In the financial markets, the

competitive position of the farm credit banks and life insurance companies is important, as are the activities of savings and loan associations and the efforts of commercial banks to offer full service financing to farm borrowers. The presence of Farmer Mac introduces additional uncertainties about the extent of use of the new secondary market and its financing implications for all types of lenders. As shown in Table 7, the bankers responding to this survey indicate a conservative, yet on balance, optimistic, set of goals for farm real estate lending over the next three years. Forty-one percent of the banks anticipate that their farm real estate loan volume will remain about the same over this period while 51% indicate a goal of increasing farm real estate lending by 10% to 30%, and 1% of the banks indicate a goal of decreasing farm lending by 10% to 30%. Moreover, 25% of the banks anticipate increasing the geographic market for farm real estate lending in the next 3 years.

When asked how the new secondary market for farm real estate loans would change their involvement in farm real estate lending over the next 3 years, 8% of the banks indicated a substantial increase, 30% indicated a slight increase, 53% indicated no change, and 9% were undecided. When considered by bank size, larger banks clearly anticipated greater involvement with the secondary market. Despite the mixed outlook for secondary market activity, 42% of the banks had purchased Farmer Mac stock at the time of the survey in order to qualify as an originator of loans qualified for sale in the market and about 43% of these banks had been contacted by a potentially certified pooler. Over 60% of the responding banks in Iowa indicated a purchase of Farmer Mac stock, which was significantly higher than the proportion of banks responding in other states. In looking to the future, 76% of the banks that purchased stock expected to service loans sold in the market at an estimated servicing fee that averaged 0.72% of the amount of the loans sold. The larger banks anticipate a significantly lower servicing fee than smaller banks. Moreover, these banks indicated, on average, that a fixed rate premium of up to 1.12 percentage points over the rate on a variable rate loans would allow the secondary loan sales to be competitive to their farm borrowers. Results from Leatham and Baker indicate that farmers would pay up to 1.5 percentage points of interest rate premium to use some fixed rate loans.

When asked their perceptions on the future market shares of other lenders, a large proportion indicated that FmHA and savings and loan associations will decrease market shares, while the Farm Credit System and commercial banks will likely show increases in volume over the next three years, but a relatively large proportion (24%) of banks also anticipated that the FCS would lose additional market share.

Concluding Comments

These survey results have provided a timely information base about the present and anticipated future involvement of midwestern agricultural banks in farm real estate lending. In general, the results indicate that the growth in bank loans secured by farm real estate represents a variety of loan purposes, although dominated by purchases of farm real estate, buildings or land improvements. Substantial refinancing of various types and sources of agricultural loans also occurred in response to the financial stresses of the early 1980s, although the pace of refinancing diminished in 1988. Moreover, the bankers responding to the survey clearly indicated no intentions to decrease their farm real estate lending in the next three years, with more than 50% anticipating growth of more than 10% over this period.

Despite the growth in farm real estate lending by agricultural banks, it remains unclear whether the credit terms involved are well suited to the financing needs of farm borrowers or to what extent the lending programs have been developed as a systematic part of asset/liability management, especially by smaller banks. The heavy reliance by all the responding banks, but especially smaller ones, on the fixed rate loans with relatively short maturities (5 years or less) and balloon payments may represent a trade-off between reduction in the banks' interest rate risk and increases in borrower credit risk. Short maturities with intended roll-overs or renewals create uncertainties for borrowers about credit availability and interest rates at loan maturity and about meeting potentially higher repayment obligations. To some extent these lending practices of the 1980s represent a return to bank lending of the 1880s when three to five year mortgage loans predominated, although a hundred years ago farmers worried as much about the survival of the bank as about the availability of credit. The relatively low incidence of banks offering both fixed and variable rate

loans also suggests a weak linkage between the lending programs and asset/liability management in many banks.

The high incidence of risk adjusted loan repricing represents considerable progress over time in agricultural bankers' use of price versus non-price responses to differences among borrowers in their credit risk. However, the lower incidence of credit scoring or formal methods of risk evaluation suggest that substantial opportunity exists for the adoption of more rigorous credit evaluation procedures. Consistent with findings of other studies (eg. Barry and Calvert), these survey results indicate that large banks with more extensive holding company involvement make greater use of more formal credit evaluation procedures, as well as other lending practices reported in the survey.

The new secondary market for farm real estate loans could have a significant effect on the farm real estate lending practices of agricultural banks. Longer maturities on fixed rate loans should be possible, and the underwriting standards should stimulate more widespread and more uniform practices in credit evaluation, loan documentation, and pricing for banks directly involved in secondary market transactions and for competing banks as well. Moreover, the bankers' observations about maximum interest rate differentials between fixed and variable rate loans suggest considerable flexibility for the secondary market to develop and function competitively, although the pricing situation of other types of lenders must be considered as well. Of course, these developments will be based on rather extensive participation in and use of the secondary markets by agricultural banks, and thus remain to be seen.

Future Research

One of the goals of this paper was to provide general results from our survey. The next step is to more rigorously test the linkages between some of the variables in the survey. Earlier the results were presented by size and subsequently subdivided by affiliation with a multi-bank holding company. Due to only two discrete classifications by size, the size effect is still likely affecting the results by holding company involvement within each size group. Other factors such as bank profitability, location, loan loss experience, bank liquidity, agricultural diversification in lending market, etc., may also influence lender's decisions on terms and pricing of agricultural real estate loans. A more sophisticated multivariate model will be used to estimate the effect of these parameters on terms and pricing of farm real estate loans.

Another related study is patterned after research in the housing market analyzing the institutional disparities in pricing of mortgage loans. (Hueson; Buser, Hendershott, and Sanders; Hendershott and Shilling). These studies have measured the interrelationships between adjustment parameters that are associated with ARMs and estimated basis points necessary to compensate for various loan parameters. Another area being explored is the characteristics of banks that increased their real estate loan portfolio since 1982, and the subsequent effects that this may have caused on bank profitability and/or liquidity. Finally, the mechanisms that agricultural lenders are using to measure credit risk will be investigated more thoroughly. Credit scoring models used by individual banks will be replicated and diagnosed using a multiperiod stochastic simulation model to determine the potential effects that these scoring models have on the farm borrower.

Footnotes

1. Agricultural loans are defined as Loans secured by farm real estate plus Loans to finance agricultural production and other loans to farmers.

2. An informal advisory panel consisting of representatives from the Illinois and American Bankers Associations, St. Louis Farm Credit Banks, Federal Reserve Bank of Chicago, Purdue and Texas A&M Universities along with 10 agricultural lenders assisted in the development and testing of the survey.

3. The respondents also were asked to report real estate lending in 1988. On average, 70% of the new loans completed were used for the purchase of farm real estate while 27% were used to refinance long term loans and previous operating losses. These results indicate a smaller proportion of new loans secured by farm real estate are being used for refinancing purposes.

4. In one case the 25% criteria could be lowered if the borrower secured a FmHA guarantee, chose a 15 year amortization, 20 year equal principal payment, or 25 year monthly payment loan. Other exceptions also occurred at other FCS districts.

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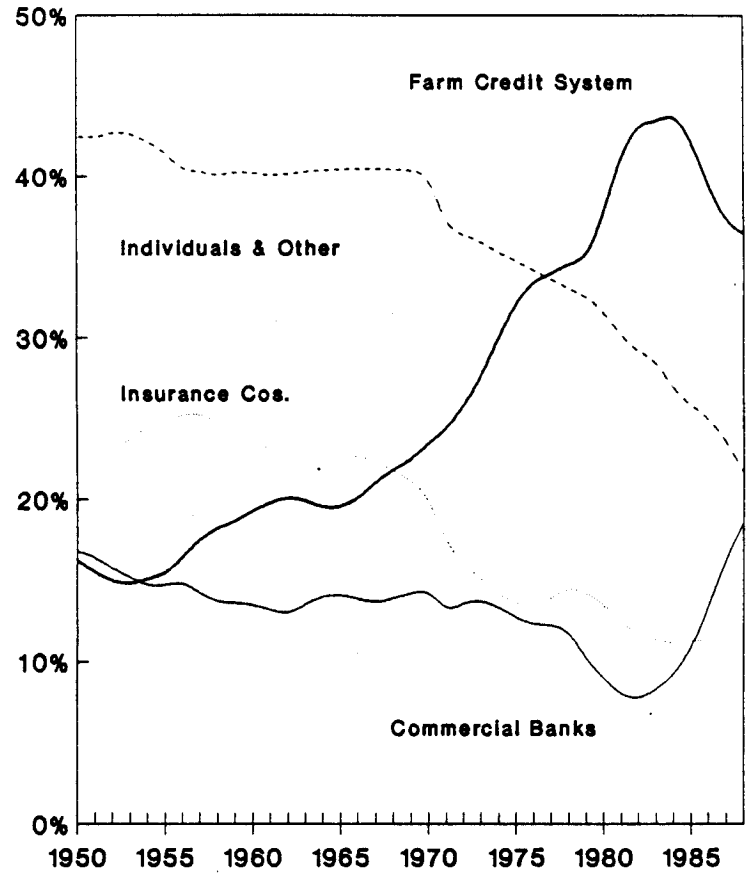
Figure 1.

Farm Real Estate Loans
Market Share



National Data

Figure 2. **Farm Real Estate Debt**
Amount Outstanding by Lender
1950 - 1988

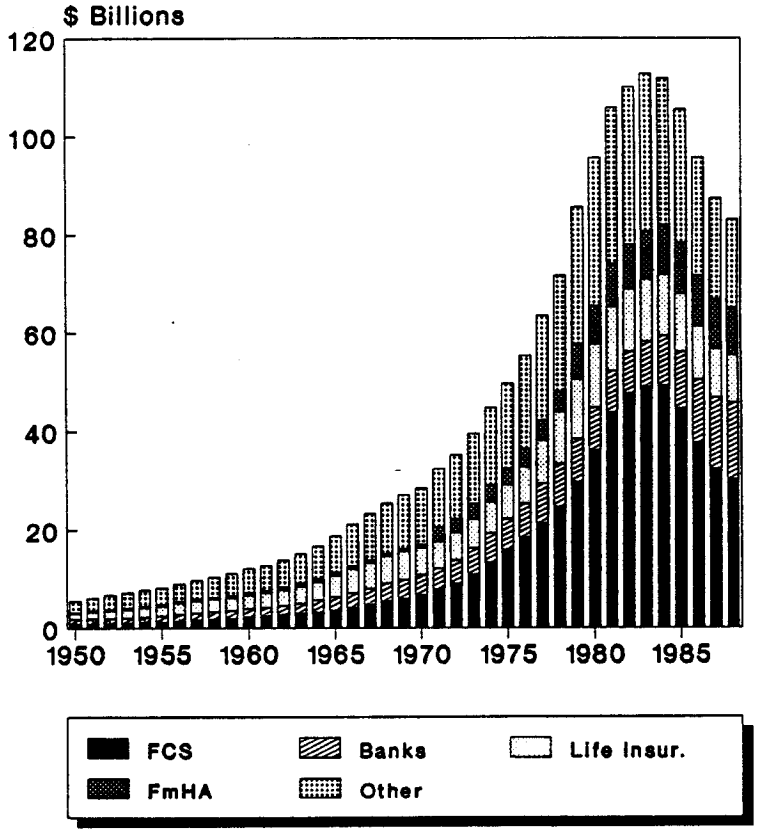


Table 1. Real Estate Farm Debt Outstanding (including operator households)
National
(million dollars)

	United States-Farm Credit System ---			--Farmers Home Admin.--			--Insurance Companies --			--- Commercial Banks ----			-Individuals and Others-			Total Farm RE Debt	Percent Change
	Debt Outs.	Annual % Change	Market Share	Debt Outs.	Annual % Change	Market Share	Debt Outs.	Annual % Change	Market Share	Debt Outs.	Annual % Change	Market Share	Debt Outs.	Annual % Change	Market Share		
1980	36,196		37.9%	7,715		8.1%	12,928		13.5%	8,563		9.0%	30,180		31.6%	95,582	
1981	43,825	21.1%	41.4%	8,744	13.3%	8.3%	13,074	1.1%	12.4%	8,342	-2.6%	7.9%	31,770	5.3%	30.0%	105,755	10.6%
1982	47,699	8.8%	43.4%	9,085	3.9%	8.3%	12,802	-2.1%	11.6%	8,392	0.6%	7.6%	32,000	0.7%	29.1%	109,978	4.0%
1983	48,929	2.6%	43.4%	9,550	5.1%	8.5%	12,718	-0.7%	11.3%	9,317	11.0%	8.3%	32,320	1.0%	28.6%	112,834	2.6%
1984	49,197	0.5%	44.0%	10,073	5.5%	9.0%	12,443	-2.2%	11.1%	10,186	9.3%	9.1%	29,900	-7.5%	26.7%	111,799	-0.9%
1985	44,695	-9.2%	42.3%	10,427	3.5%	9.9%	11,836	-4.9%	11.2%	11,385	11.8%	10.8%	27,200	-9.0%	25.8%	105,543	-5.6%
1986	37,660	-15.7%	39.4%	10,349	-0.7%	10.8%	10,940	-7.6%	11.4%	12,711	11.6%	13.3%	24,000	-11.8%	25.1%	95,660	-9.4%
1987	32,332	-14.1%	37.0%	10,083	-2.6%	11.5%	9,896	-9.5%	11.3%	14,455	13.7%	16.5%	20,600	-14.2%	23.6%	87,366	-8.7%
1988	30,327	-6.2%	36.5%	9,607	-4.7%	11.6%	9,700	-2.0%	11.7%	15,417	6.7%	18.6%	18,000	-12.6%	21.7%	83,050	-4.9%

Table 2. 1982 - 1988 Summary Five States - Farm Real Estate Lending

	---Commercial Bank--- Market Share		---- % Change from 1982 to 1988 ----	
	1982	1988	Farm RE Loans Commercial Banks	Farm RE Loans All Lenders
Arkansas	10.7%	23.4%	70%	-22%
Illinois	8.4%	26.6%	134%	-26%
Indiana	11.1%	23.5%	48%	-30%
Iowa	3.9%	18.5%	223%	-32%
Missouri	14.4%	29.8%	58%	-24%
Total- five states	8.5%	20.7%	101%	-29%
Total- United States	7.6%	16.5%	84%	-24%

	Assets[1] less than $100 million	Assets more than $100 million	Total
The dollar volume of loans reported as **Loans Secured by Farm Real Estate** is distributed among the following loan purposes:		%	
For the purchase and improvements of:			
Land	52	49	52
Buildings	8	10	9
Purchases of machinery, equipment and other farm items	5	5	5
Purchases of non farm items	1	0*	1
Refinancing of:			
Long term loans, this bank	7	5	7
Long term loans, other bank	4	4	4
Long term loans, Farm Credit System	12	17*	13
Agricultural production loans	9	9	9
Other loans	1	1	1
Banks reporting loans to finance farm real estate reported in other Call Report categories, %	17	17	17
Aggregate amount of loans to finance the purchase of farm real estate reported in other Call Report categories. ($000)	49,705	35,230	84,935
Aggregate amount of **Loans Secured by Farm Real Estate.** ($000)	1,432,752	566,906	1,999,658
Sum	1,482,457	602,136	2,084,593
Percent of loans to finance the purchase of farm real estate loans reported elsewhere as percent of the total estimated loans used for the purchase of farm estate and/or secured by farm real estate.	3.3%	5.8%	4.1%
Other Call Report categories used to report loans to finance the purchase of farm real estate. , % distribution			
Construction and land development	6	12	7
Loans to finance agr. prod & other loans to farmers	68	59	66
Loans secured by non-farm real estate	8	7	8
Commercial and Industrial loans	6	12	8
Loans to individuals	3	10	5
Other	9	0	6

* mean or conditional probability for banks with assets less than $100 million is significantly different from mean or conditional probability for banks with assets greater than $100 million at the 95% confidence level.

1 695 banks responded to the survey with 591 banks in the smaller size category. All banks did not respond to each question, therefore the weights for each size category as a percent of the total may vary by question.

Table 4. Pricing and Credit Terms on Farm Real Estate Loans

	Assets less than $100 million	Assets more than $100 million	Total
Fixed rate loans:			
Banks offering, %	64	46*	61
Interest rate offered:			
minimum, %	11.42	11.44	11.42
maximum, %	12.26	12.59	12.38
differential, %	0.84	1.17*	0.96
Maximum maturity, years	7	7	7
Variable rate loans:			
Banks offering, %	64	74*	67
Real estate loans volume, %	61	72*	63
Interest rate:			
minimum, %	11.21	11.42*	11.25
maximum, %	12.49	12.97*	12.57
differential, %	1.29	1.53	1.32
Rate adjustment frequency [1]			
weekly or shorter, %	11	17	13
monthly, %	9	8	9
quarterly, %	15	11	14
semi-annually, %	12	15	12
annually, %	60	57	58
Adjustment limit, % of banks	35	25*	30
Banks offering both fixed and variable rate loans:			
difference between:			
minimum variable and minimum fixed, %	0.318	0.158	0.2926
maximum variable and maximum fixed, %	0.076	0.012	0.0660
Maturity distribution by percent of farm real estate loan volume			
0 to 5 years (with balloon), %	61	53	61
0 to 5 years (without balloon), %	4	2	3
6 to 10 years (with balloon), %	6	5	6
6 to 10 years (without balloon), %	4	5	4
11 to 20 year, %	23	32*	24
greater than 20 years, %	2	1	2
Down payment requirement			
Banks requiring, %	96	94	96
Minimum requirement			
(equity to appraised value), %	28	28	28
Loan distribution pattern, % of loans			
0 to 10% down payment	2	3	2
11 to 25% down payment	44	39	44
26 to 50% down payment	49	54	50
greater than 50%	4	3	4

* mean for banks with assets less than $100 million is significantly different from mean for banks with assets greater than $100 million at the 95% confidence level.

[1] banks could respond to more than 1 frequency category.

Table 5. Credit Evaluation and Pricing Procedures on Farm Real Estate Loans

	Assets less than $100 million	Assets more than $100 million	Total
		%	
Banks where interest rate depends on borrower's credit risk, % banks	62	80*	64
Weights given to borrower's credit factors, %:			
Solvency	11	11	11
Profitability	17	19	17
Debt servicing capacity	23	26	23
Liquidity	9	9	9
Repayment history	12	12	12
Collateral	27	22*	26
Other	1	1	1
Use of a credit scoring work sheet or formal credit risk evaluation, % banks			
Farm real estate loans	25	33	27
Farm non real estate loans	37	37	37

* mean or conditional probability for banks with assets less than $100 million is significantly different from mean or conditional probability for banks with assets greater than $100 million at the 95% confidence level.

Table 6. Pricing, Credit, and Borrower Risk Terms on Farm Real Estate Loans Classified by Bank Size and Legal Structure

	Assets less than $100 million		Assets more than $100 million	
	SBHC	MBHC[1,2]	SBHC	MBHC
Written farm real estate loan policy established, % banks	69	79*	70	72
Fixed rate loans:				
Banks offering, %	68	54*	45	45
Interest rate offered:				
minimum, %	11.40	11.45	11.43	11.52
maximum, %	12.26	12.21	12.67	13.26
Maturity, years	7	6	8	6
Variable rate loans:				
Banks offering, %	61	76*	71	75
Real estate loans volume, %	59	65	75	71
Interest rate:				
minimum, %	11.17	11.32	11.47	11.42
maximum, %	12.46	12.52	12.67	13.26
Maturity distribution by percent of farm real estate loan volume				
0 to 5 years (with balloon), %	62	57	65	50
0 to 5 years (without balloon), %	4	4	1	3
6 to 10 years (with balloon), %	5	7	4	5
6 to 10 years (without balloon), %	4	5	7	3
11 to 20 years, %	23	24	21	38
greater than 20 years, %	1	3	1	2
Credit Evaluation				
Banks where interest rate depends on borrower's credit risk, % banks	61	68*	71	83
Use of a credit scoring work sheet or formal credit risk evaluation, % banks				
Farm real estate loans	24	29	28	36
Farm non real estate loans	34	45*	33	40

* mean or conditional probability for banks with assets less than $100 million is significantly different from mean or conditional probability for banks with assets greater than $100 million at the 95% confidence level.

1 SBHC = banks affiliated with a single bank holding company or no bank holding company involvement.
MBHC = banks affiliated with a multi-bank holding company.

2 Distribution of banks =

Assets less than $100 million	Assets greater than $100 million
SBHC = 440 MBHC=151	SBHC = 44 MBHC = 60

All banks did not complete each question so distribution of responding banks may vary by question

Table 7. Future Goals for Farm Real Estate Lending and Secondary Market Activity

	Assets less than $100 million	Assets more than $100 million	Total
		%	
Farm real estate loan goals for the next three years			
increase more than 30%	5	4	4
increase 10 to 30%	51	53	51
remain about the same	42	37	41
decrease 10 to 30%	1	1	1
decrease more than 30%	1	1	0
Anticipated expansion of geographic lending market, % banks	24	32	25
Effects of Farmer Mac on banks involvement in farm real estate lending, next three years			
increase substantially	7	17	8
increase slightly	29	32	30
no change	55	40	53
decrease	0	2	0
undecided	9	10	9
Banks purchasing Farmer Mac stock to qualify as loan originator, % banks	42	43	42
Responses by banks purchasing Farmer Mac stock:			
Banks contacted by potential certified pooler, %	40	60*	43
Banks expecting to service loans:			
yes, % banks	75	81	76
undecided, % banks	19	14	18
Estimated servicing fee, basis points	75	53*	72
Estimated fixed rate premium over variable rate to be acceptable by the market, yet allow secondary markets to be attractive to borrowers, %	1.12	1.09	1.12

Lender expectations of how market shares will change for other lenders over the next three years.

	% of responding banks				
	Increase Substant.	Increase Slightly	Remain the same	Decrease Slightly	Decrease Substant.
Farm credit system	11	40	24	20	4
Commercial banks	10	58	27	4	0
Savings and loan associations	1	7	59	22	11
Insurance companies	4	34	36	21	5
FmHA	2	13	29	36	21
Individuals	2	22	61	13	2
Others	1	8	81	8	2

* mean or conditional probability for banks with assets less than $100 million is significantly different from mean or conditional probability for banks with assets greater than $100 million at the 95% confidence level.