THE EFFECTS OF FmHA GUARANTEED FARM LOANS ON RURAL CREDIT MARKETS

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Credit markets allocate a limited supply of loanable funds among alternative uses. In the process, some firms and investments are judged too risky and are excluded from receiving "affordably priced" credit. Other firms may experience credit rationing because of market imperfections. Over the years, a number of Federally sponsored loan programs have evolved to address perceived problems with the credit delivery system (Bosworth, et al., 1987; Wolf, 1988). Several Federal programs are targeted at rural firms, in particular, because of their dependence on fairly small, geographically segmented capital markets. This paper examines the use of one Federal program in an attempt to determine how the delivery mechanism influences credit availability within rural communities.

The Farmers Home Administration (FmHA), an agency of the U.S. Department of Agriculture, provides credit to farmers and other rural businesses, homeowners, and communities through direct loans and by guaranteeing privately originated loans. The underlying principle guiding FmHA is that the assisted entity must not be able to obtain credit from usual commercial sources at reasonable rates and terms, but is judged economically viable or capable of becoming so in the future.

This paper examines FmHA's farmer loan guarantee program operations during fiscal 1988 in an attempt to determine the characteristics of participating lenders and how lender behavior affects the guaranteed loan programs' impact on local credit markets. While the paper deals exclusively with farmer programs, many of our conclusions may also apply to Federal and State loan guarantee programs for nonfarm borrowers as well.

Local Capital Markets and Federal Loan Guarantees

Rural firms (both farm and nonfarm) typically have access to privately originated credit from only a small number of financial institutions. The market served by

rural banks is often geographically limited, with bankers expressing considerable reluctance to lend outside of their local area (Rogers, et al., 1988). The cost of acquiring information about new or different financial markets, borrowers, and products is one major reason for regionally segmented financial markets (Moore and Hill, 1982; Harrigan and McGregor, 1987). The existence of market imperfections, when coupled with the importance of financial markets in fostering economic development (Roberts and Fishkind, 1979; Barkley and HeJander, 1985), has been used to justify government credit programs and financial market intervention.

For many years, government assistance was delivered primarily through direct lending programs operated by governmental agencies, such as the Small Business Administration and FmHA. But over time, Federal credit agencies have shifted their activity away from direct loans in favor of guaranteed loan programs. Not only do guarantees remain off-budget until the government has to make good on defaulted loans, but guarantees are perceived to cost less than direct loans.[1]

Tight budgets and the perception that loan guarantee programs provide economic incentives at relatively low costs have led to the development of a number of State-sponsored guarantee programs as well (Drabenstott and Morris, 1989). However, as origination of guaranteed loans is dependent upon private lenders, the ultimate impact of a guarantee program depends on lender behavior. Previous research has shown that small rural banks often do not make guaranteed loans (Taff, et al., 1984). And while geographic deregulation has increased the number of large bank organizations with offices serving rural markets, the majority of rural counties continue to be served exclusively by small- to medium-sized banks (Milkove and Sullivan, 1989). Thus, the move to provide governmental credit assistance to rural firms through loan guarantees rather than through direct loans could cause disruptions in credit delivery within some communities.

The Importance of Bank Behavior

An important role of Government credit programs is to increase the availability of credit and/or reduce its cost, thereby encouraging investment and economic growth. Direct loan programs tend to increase the local supply of

loanable funds since they use nonlocal funds to meet the credit needs of program participants. The impact of a guaranteed loan program on regional credit markets, however, may range from insignificant to highly beneficial depending upon lender participation and how lenders use the program.

To obtain the benefits of a loan guarantee, the lender must incur costs of making and servicing the loan, securing the guarantee, and paying an origination fee. Based on an assessment of these costs and the potential benefits from program participation, not all lenders or local credit markets will make use of Federal guarantee programs. Should local lenders decline to participate, the Federal Government's shift from direct to guaranteed loan programs could reduce credit availability within the area.

But even if lenders participate in the guarantee program, the effect on regional credit supplies may be small. If lenders simply obtain guarantees on their existing weak loans, credit supplies aren't increased although credit use may be maintained at higher levels than would occur in the programs' absence. Some positive impact on regional credit markets may occur from this procedure if it reduces lenders' losses and improves the quality of their existing loan portfolios. If this is the case, some lenders might be persuaded to allocate a higher proportion of their assets to loans than they would in the absence of the programs.

The guarantee programs can result in a larger net expansion in the local supply of loanable funds if lenders use the guaranteed portion of their loan portfolio as a substitute for holding Federal securities, freeing funds for additional local uses. The proportion of the lender's assets in government-backed securities could remain unchanged, but instead of investing local funds outside the community, funds could be invested locally. This could represent a net addition to local credit supplies above that which would occur in the absence of the program. Evidence of this strategy might be a reduction in a lender's holdings of government securities as its participation in the guarantee programs increases.

Finally, if a lender sells the Federal guarantee to outside investors and uses the proceeds to make additional loans, then the guarantee programs can have a positive and pronounced impact on local credit supplies. Indeed, if used intensively, the secondary market for Federal guarantees can have a multiplier effect on the local supply of loanable funds. Used in this way, a lender who commits an added $100,000 of funds can theoretically achieve up to a $1 million expansion in local lending. The maximum expansion occurs by retaining the unguaranteed portion (typically 10 percent) of the guaranteed loan and selling all of the guaranteed portion of the loan. Using the proceeds

from this sale, up to $90,000 can be used to provide funds for a second guaranteed loan of which 10 percent is retained and 90 percent sold. By repeating the process, the maximum expansion could be reached. Though this expansion would greatly increase the riskiness of the lender's portfolio, and is therefore unlikely to occur, the strategy does have the potential to expand credit supplies in a local area.[2]

FmHA-Guaranteed Loan Program Participation, 1988

FmHA's loan guarantees enable private lenders to recoup up to 90 percent of any loss of principal and interest should a participating borrower default. The partial guarantee encourages lenders to use prudent credit standards and procedures in the approval, servicing, and, if necessary, liquidation of guaranteed loans. The Federal guarantee is meant to entice private lenders to extend credit to family-sized farmers unable to meet normal credit standards by reducing the risk associated with the loans and increasing the lender's liquidity. Liquidity increases because the guarantee converts the loan of a small, unknown firm into a primary asset which can be marketed.

The 8,247 FmHA-guaranteed farmer loans obligated and closed during fiscal 1988 were originated by 2,274 lenders (table 1). The vast majority of these were commercial banks, but Farm Credit System (FCS) institutions—production credit associations and Federal Land Banks or their associations—also originated a large number of FmHA-guaranteed loans. While unimportant on a national scale, savings and loan associations, credit unions, and farm finance corporations may have played significant roles in a few local markets.

A geographic dimension regarding the program's impact on farm credit markets is shown by the location of recipients of FmHA guaranteed loans during FY-88.[3] Though nearly all rural counties contain farmers potentially eligible for FmHA-type financing, over two-fifths of all rural counties had no guaranteed farm loan borrowers during 1988 (table 2). Program participation is greatest in counties most dependent upon farming. But even among highly agricultural counties (those in which farming accounts for 20 percent or more of total earned income within the county) 27 percent had no guaranteed loans, and by extension no participating lenders, during FY-88. Within this group of 320 agricultural counties, only 44 percent were served by 2 or more participating lenders, raising concerns that FmHA-eligible borrowers in some rural areas may have a limited selection of lenders willing to service their unique credit needs.

Table 1

Loan Characteristics by Type of Lender Participating
in FmHA's Guarantee Program, FY-88

Loan Characteristics and Program Type	Type of Lender		
	Commercial Banks	FCS	Other[1]
	Number		
Participating Firms[2]	2,054	186	34
Guaranteed Loans	6,612	1,492	143
	Dollars		
Average Loan Size	96,456	95,893	127,351
	Percent		
Proportion of Loans Guaranteed at 90%	86.3	94.4	96.5

[1]Other lenders include savings and loan associations, credit unions, farm finance corporations, and the Federal Deposit Insurance Corporation.
[2]Lender counts are based on the number of firms making one or more guaranteed farm ownership or operating loans; within any one firm, numerous branch offices may actually be the loan originators.

Source: Calculated from information in the Farmers Home Administration's loan guarantee master file as of September 30, 1988.

Table 2

Geographic Participation in FmHA's Guarantee Program

Extent of Program Participation	All Rural Counties	Counties in Which the Ratio of Farm to Total Earned Income is:		
		Under 5%	5.0-19.9%	20% and Up
Number of rural counties	2,383	1,191	872	320
Distribution of counties with:	Percent			
No participating lenders	44	55	35	27
1 participating lender	25	23	25	29
2 participating lenders	13	10	16	18
3 participating lenders	9	6	11	13
4 participating lenders	5	2	7	8
5 or more participating lenders	4	4	6	5

Note: County-coverage is determined by the presence of one or more participating borrowers residing in the county. "Rural" counties are those outside metropolitan statistical areas.
Source: Calculated from information in the Farmers Home Administration's loan guarantee master file as of September 30, 1988. Farm and total personal income data were from the Local Area Income tapes, Bureau of Economic Analysis, 1986.

Bank Behavior and Local Credit Market Impacts

We have argued that the impact on regional farm credit supplies of Federal guaranteed loan programs depends not only upon lender participation but how lenders use the programs. In this section, we present preliminary analyses of our hypotheses regarding the determinants of commercial bank participation in FmHA's loan guarantee program and the impact on local credit markets.

We concentrate on commercial banks for two reasons. First, commercial banks were the dominant lender group participating in FmHA's guarantee program in fiscal 1988, comprising 90 percent of the lenders and originating over 80 percent of the guaranteed loans. And second, as the primary supplier of credit to the rural economy, commercial bank behavior is expected to have a greater impact on rural credit markets than would be the case for the more specialized lenders.

Identification of Potential Participating Banks

Given our interest in rural credit markets, our analysis focuses only on banks headquartered in nonmetropolitan counties. We also assumed that only banks with experience in farm lending would be potential users of the guarantee program, restricting our analysis to banks which reported farm loans outstanding in December 1987 and 1988. Using these selection criteria, 6,791 banks were identified as potential rural participants in FmHA's guaranteed farm loan program in 1988. The unit of observation was the bank firm. All offices of a branch system were treated as a single bank, but banks belonging to a multibank holding company were treated as independent banks. Though 2,054 commercial banks made one or more guaranteed loans during FY-88 (table 1), only 1,655 were headquartered in nonmetropolitan areas. On this basis, about one-fourth of all banks we considered potential rural users of the guaranteed farm loan program actually participated during FY-88.

Determinants of Bank Participation

Commercial bank participation in FmHA's guaranteed farm loan program is likely a function of both lender characteristics and local market characteristics, but our empirical analysis relies almost exclusively on lender attributes due to data constraints. In general, one might expect experienced agricultural lenders to be the primary participants in the guarantee program since the program is structured to take advantage of existing lender expertise. Since costs are incurred in learning the regulations pertaining to FmHA guarantees, completing the necessary paperwork, and purchasing the guarantee, it was felt that larger banks, branching organizations, and those affiliated with multibank holding companies (MBHC's) might gain more from participation and would therefore comprise a significant segment of the participating banks (Taff, et al., 1984; Barkley et al., 1984; Markley, 1987).

In addition, banks with a ready supply of FmHA-eligible borrowers should find it easier and more profitable to participate in the program. A study by the USDA's Inspector General indicates that virtually all of the guaranteed farm loans made between late 1985 and mid-1987 represent lenders guaranteeing the loans of their existing customers (USDA, 1988). Therefore, banks with sizeable portfolios of problem farm loans may be more inclined to take advantage of the guarantee program. Not only do high-risk loans make the benefits of risk-reduction immediately obvious, but having a sizeable "captured" market provides an additional incentive for the lender to develop expertise in guaranteed loans.

Other lender-specific characteristics that might influence participation include the lender's loan-to-deposit ratio, its earnings, and its capital-to-asset ratio. Banks with high loan-to-deposit ratios could find resale of the FmHA guarantee an effective way of meeting demand for loans while maintaining liquidity. Banks with inadequate earnings or capital levels would find the risk-reduction and marketability aspects of guaranteed loans appealing because they generate income to offset losses on the bank's nonperforming loans while limiting the added risks typically associated with new loans.

Finally, participation is likely a function of the characteristics of the local markets served by the bank. Making guaranteed loans is likely to be more profitable as the pool of FmHA-eligible borrowers within a bank's service area increases, and as the number of other local participating lenders declines. Having easy access to an FmHA county or district office could also encourage participation. Not only would this facilitate the application process, but an aggressive FmHA staff may bring potential borrowers to the attention of local lenders.

These relationships can be expressed as:

$$PL = f(BS1ZE, AGTOTTL, BSTR, BPER, \quad (1)$$
$$RSELL, NEED, MARKET)$$

where PL is a dummy variable equal to 1 when the bank has originated one or more guaranteed loans and equal to 0 otherwise. BS1ZE is the bank size as measured by the value of its assets. AGTOTTL is the ratio of agricultural loans to total loans, expressed as a percent. BSTR is a series of bank structure variables, indicating the number of offices operated by the bank (NOFF) and the number of banks affiliated with a bank's organization (for independent banks or those affiliated with a one-bank

holding company NAFFIL equals 1; otherwise NAFFIL equals the total number of banks affiliated with the multibank holding company).

BPER is a series of performance ratios designed to capture the quality of the bank's farm loan portfolio and its financial position. Performance measures include: PROB, the ratio of problem (delinquent or restructured) farm loans to outstanding farm loans; LOS, the ratio of farm loan charge-offs to outstanding farm loans; LD, the loan-to-deposit ratio; BCAP, the capital-to-asset ratio; ROE, the rate of return on equity capital; and PFAIL, the probability that the bank will fail during calendar 1989.[4]

RSELL indicates the bank's sales of all kinds of loans (farm, nonfarm, guaranteed, and unguaranteed) during the year relative to its loan balance at the beginning of the year. NEED indicates the area's need for FmHA-type credit. We use the inverse of average income of the county's farm proprietors during 1986 relative to the U.S. average (AFPI) and the ratio of farm personal income to total earned income during 1986 (RFITEI) within the bank's headquarters county as our measures of need. The latter ratio is a measure of the importance of the farm sector in the bank's headquarters-county.

MARKET is a series of variables indicating other local market characteristics that could affect the profitability of participating in the guarantee programs. While we do not include any market variables in this analysis, this remains an obvious area for refinement in future research. These could include a dummy variable indicating the presence of an FmHA county or district office within the bank's headquarters county, a count of other lenders (participants and nonparticipants) operating within the local market, and variables describing the structure of the local financial market.

These same variables could also explain variation in the intensity of program use among participating lenders. That is:

$$\text{RGLBAL} = f(\text{BSIZE, AGTOTTL, BSTR,} \atop \text{BPER, RSELL, NEED, MARKET}) \quad (1a)$$

where RGLBAL is the ratio of the dollar volume of guaranteed loans originated during the year relative to the value of the bank's year-end farm loan portfolio. All other variables are as defined above, but only participating banks are included in the statistical analysis.

Table 3 presents the results of two multivariate analyses. The first two columns represent the results of a logit analysis of equation 1, reporting the parameters of factors hypothesized to be associated with program participation. The final two columns represent the results of a regression analysis of equation 1a, reporting the parameters of our model of intensity of program use among participating banks.

Bank asset size relative to the rural average is positively related with participation and intensity of use. As expected, participating banks tend to have higher proportions of their loan portfolios in agricultural loans. However, intensity of use is negatively related with the farm-to-total loan ratio. Given the higher risks associated with undiversified loan portfolios, this negative relationship is surprising. Perhaps banks with the highest concentrations of farm loans were making few additional loans, attempting to reduce their exposure to sectoral downturns, while the more diversified banks were aggressively *seeking new* loan business during 1988.

Contrary to expectations, the number of bank offices and affiliation with a multibank holding company do not seem to be associated with program participation. Furthermore, both of these variables are negatively related to intensity of use among participating banks. These results may indicate that guarantee program "expertise" is not easily transferred among branches or affiliates or that the cost of obtaining expertise is relatively unimportant. They may also reflect the greater appeal Federal guarantees have as a risk management technique to single-office banks with their less geographically diversified asset bases.

Of the characteristics that might indicate lender interest in the guarantee program, the bank's loan-to-deposit ratio and rate of return on equity are positively associated with participation, while it's capital-to-asset ratio is negatively related with participation, as expected. In addition, previous farm loan problems are positively related with bank participation and intensity of use, as expected. Thus, aggressive banks and those experiencing financial stress appear to be taking the closest look at the guaranteed loan program.

The probability of failure was statistically insignificant in the multivariate analysis. Since probability of failure is itself a function of many of the other bank variables included in our model, it is possible that the relevant relationships between financial stress and program use are captured in the other parameters and PFAIL added little to the explanatory power of the equations. The negative coefficient for need indicates that program participation tends to be more likely as the county's average farm proprietor incomes increase relative to the U.S. average. While this may seem surprising, it agrees with the view that recent financial stress also took a toll among larger commercial-sized farms. For both models, the coefficient of determination was low indicating that other factors determined bank participation and use of the guaranteed farm loan program.

In order to illustrate the magnitude of the characteristics associated with participating and nonparticipating commercial banks, averages for the bank variables are shown for the two groups of banks in table 4. The table also includes characteristics of banks issuing 9 or more guaranteed loans during 1988.[5] This group of banks, termed "major issuers," accounts for roughly 6 percent of the partici-

Table 3

Parameters for Equations 1 and 1a Based on a Logit Analysis of Guarantee Program Participation
and a Regression Analysis of Intensity of Use Among Participating Banks, FY-88.

Variables	Logit Analysis: Program Participation		Regression Analysis: Intensity of Use	
	Beta	t-value[1]	Beta	t-value
Intercept	-1.992	10.10	2.13	0.27
Relative Asset Size (BSIZE)	0.164	3.96	6.40	4.33
Farm-to-Total Loan Ratio (AGTOTTL)	0.027	14.86	-0.27	3.81
Number of Bank Offices (NOFF)	—	0.00	-2.64	4.40
Number of Affiliated Banks (NAFFIL)	—	0.00	-0.37	2.44
Percent of Farm Loan Volume:				
Delinquent or Restructured (PROB)	0.024	5.36	-0.30	1.73
Charged-Off (LOS)	0.015	2.14	1.76	19.33
Loan-to-Deposit Ratio (LD)	0.012	5.11	0.21	2.20
Capital-to-Asset Ratio (BCAP)	-0.082	6.54	0.70	1.40
Rate of Return on Equity (ROE)	0.002	2.17	-0.01	0.43
Probability of Failure (PFAIL)	-0.112	0.14	5.33	0.23
Loan Sales Ratio (RSELL)	-0.002	1.11	0.03	0.43
Relative Farm Income (AFPI)	-0.007	4.14	-0.04	0.77
Farm Dependency Ratio (RFITEI)	0.003	0.65	-0.04	0.29
Pseudo-R^2		.08		—
Chi-Square		566.72		—
R^2		—		.23
F-ratio		—		37.48
Mean of Dependent Variable[2]		0.25		10.21
Number of Banks[3]		6,725		1,650

— Indicates a parameter smaller than 0.0005.

[1]Asymptotic t-value.

[2]For the logit analysis, the dependent variable (PL) is a 0-1 dummy variable equal to one for banks that originated one or more guaranteed farm loans during FY-88, and 0 otherwise. The dependent variable in the regression analysis (RGLBAL) is the volume of guaranteed loans originated during the fiscal year as a percentage of year-end farm loans outstanding.

[3]The number of banks differs slightly from that reported in table 4 because observations with missing data were dropped from the analysis.

Source: Derived from the December 1987 through December 1988 Report of Condition and Report of Income, Board of Governors of the Federal Reserve System. County farm income data is from the Local Area Income and Employment tapes, Bureau of Economic Analysis, 1986. PFAIL is from Gajewski (1989).

pating rural banks and was responsible for approximately one-third of both the loans and dollar volume of guaranteed loans issued by rural-headquartered banks during the year.

Credit Market Effects of FmHA Guarantees

It was hypothesized that the impact on an area's farm credit supply of a local lender's participation in a guaranteed loan program could range from neutral to positive depending upon the way banks used the program. Some notion of how participating banks used FmHA's guarantee program in fiscal 1988 can be gained by estimating:

$$\Delta FL = f(GLR, \Delta GSEC, \Delta DEP, LD, RSELL) \quad (2)$$

where ΔFL is the percentage change in a bank's farm loans outstanding during 1988, GLR is a bank's ratio of FmHA-guaranteed loans made during the year to farm loans outstanding at the beginning of the year, $\Delta GSEC$ is the percentage change in the bank's holdings of government securities during 1988 and ΔDEP is the percentage change in the bank's deposit base. LD is a bank's loan-to-deposit

The Review of Regional Studies

Table 4

Characteristics of Selected Rural-Headquartered Commercial Banks,
by Guarantee Program Participation Status, FY-88.[1]

Bank Characteristics	Nonparticipating Banks	Participating Banks[2]	
		Total	Major Issuers
Number of Banks	5,136	1,655	97
Average:		$ Thousands	
Asset Size	45,384	55,653	136,817
Farm Loan Portfolio	3,122	6,270	10,107
Amount of FmHA Guaranteed Loans			
Originated, FY-88	0	298	1,653
		Percent	
Average Farm-to-Total Loan Ratio[3]	23.4	35.4	34.3
Guaranteed Loans as a Percent of			
Farm Loans Outstanding, 1988	0	10.2	29.2
		Number	
Average Number of Offices[4]	2.1	2.6	6.9
Average Number of Affiliations	3.4	3.2	2.6
		Percent	
Proportion Which Are:			
Single-Office Independent Firms	44.2	42.3	34.0
Branching Independent Firms	31.0	34.7	44.3
Multibank Holding Co. Affiliates	24.8	23.0	21.6
Average Percent of Farm Loan Volume			
Which Is:			
Delinquent	1.7	3.0	3.1
Restructured	0.9	1.7	1.9
Charged-Off During Previous Year	0.9	1.6	1.4
Average Loan-to-Deposit Ratio	48.3	49.0	52.1
Average Capital-to-Asset Ratio	10.0	9.5	9.2
Average Rate of Return on Equity	5.3	5.3	1.1
Average Loans Sold as a Percent of			
Loans Outstanding, 1988	3.6	4.7	4.6
Proportion Vulnerable to Failure	7.7	14.8	24.7

[1]All averages are unweighted.

[2]Participating banks issued one or more FmHA guaranteed farm loans during 1988. Major issuers are those that made 9 or more guaranteed loans.

[3]Unless otherwise noted, all financial ratios are expressed as percentages and are based on year-end 1987 data.

[4]Office counts and MBHC affiliation are as of June 30, 1988. Independent banks are assigned a value of 1 for the count of holding company affiliates.

Source: Derived from the December 1987 through December 1988 Reports of Condition and Reports of Income, Board of Governors of the Federal Reserve System. Vulnerable bank count is from Gajewski (1989).

ratio at the beginning of the year and RSELL is the total volume of all loans sold by the bank during the year relative to beginning loan balances.

A zero or negative coefficient on GLR indicates that banks have primarily used the program to replace regular farm loans with guaranteed loans. A positive coefficient is consistent with the view that the program increases the area's supply of farm credit. Further support for this view would be a negative coefficient for ΔGSEC and a positive coefficient for RSELL. LD is an indication of portfolio risk and a negative relationship is hypothesized.

Table 5 reports the results of regressing the change in farm loans outstanding during the 1988 calendar year against these explanatory variables. As expected, this

cross-sectional analysis shows that growth in a bank's deposit base is positively related with farm lending activity, while its loan-to-deposit ratio is negatively related. The regression results also suggest that the FmHA's guaranteed loan program had an expansionary effect on the supply of farm credit from participating banks. However, the coefficient for ΔGSEC was not significantly different from 0, meaning that banks do not appear to be substituting FmHA guarantees for other U.S. Government securities.[6]

In addition, loan sales were not statistically related to ΔFL. In the vast majority of cases, loan sales by rural banks probably involve home mortgages rather than farm loans. The lack of a statistical relationship between loan sales and farm loan growth means that banks didn't systematically sell loans to generate the liquidity needed to make more farm loans during 1988. Because the expansionary effect of guaranteed lending on outstanding farm loans was not found to be related with portfolio adjustments in government securities or in selling loans, the observed positive association must be due to other causes. One possibility is that bank management desired to expand its farm lending and loan guarantees represented one tool to achieve the expansion.

The failure (if it is one) of participating banks to take full advantage of their Federal guarantees by adjusting their holdings of government securities or selling the guarantees could slow economic development, especially

during tight-credit periods. Our analysis does not adjust for variations in the demand for loanable funds, so we don't know why banks behaved the way they did in 1988. In general, it appears that ample credit was available during the year, even in rural areas, to meet the needs of viable business investment opportunities (Dennis and Dunkelberg, 1988; Stam, 1989). So banks may have held their guaranteed loans because they had no reason to make further portfolio adjustments. But would rural banks have behaved differently had this not been the case?

Taff, et al. (1984) found that a high percentage of the rural banks they sampled did not sell loans because of difficulties they encountered negotiating the sale. Thus, in the absence of a viable secondary market for guarantees, it seems likely that many participating banks might not take full advantage of their guarantees, even during tight-credit periods. While a secondary market in FmHA guarantees does exist, it relies on individual placements and lacks provisions for pooling loans.[7] Thus, small banks may find it difficult to sell their guarantees, discouraging them from viewing guarantees as liquid assets.

Conclusions

FmHA has played a significant role in financing the farm sector. Until the mid-1980's most of its lending was made through its direct loan programs. Because these

Table 5

Parameters for Equation 2 Based on a Regression Analysis of the
Change in Farm Loans Outstanding During Calendar 1988.

Variables	Beta	t-value
Intercept	16.59	3.94
Guaranteed Loans as a Percent of Farm Loan Balance, 1987 (GLR)	0.65	98.57
Percentage Change in Government Securities Holdings (ΔGSEC)	—	0.04
Percentage Change in Deposits (ΔDEP)	0.62	9.60
Loan-to-Deposit Ratio (LD)	-0.28	3.36
Loan Sales Ratio (RSELL)	0.07	0.89
R^2		0.857
F-ratio		1975.6
Mean of dependent variable[1]		15.837
Number of banks		1,648

— Indicates a parameter smaller than 0.005.

[1]The dependent variable (ΔFL) is the percentage change in farm loans outstanding between December 31, 1987 and December 31, 1988.

Source: Derived from the December 1987 through December 1988 Report of Condition and Report of Income, Board of Governors of the Federal Reserve System.

funds came from outside the area, they provided a net increment to local credit supplies and contributed to increased regional economic activity. The shift to guaranteed lending uses lenders and credit supplies indigenous to the area. While this credit delivery mode has the potential of reducing the Government's program costs, it increases the competition for locally supplied credit and may reduce credit availability to the farm (and possibly nonfarm) sector, thereby having an adverse affect on rural areas. The impact of the shift to guaranteed lending on the farm sector and rural areas depends, to a large extent, on lender participation and how lenders use the loan guarantee programs. This study focused on these two issues.

With regards to the first issue, the study found that participation in FmHA's guarantee programs was fairly broad among agricultural commercial banks and FCS institutions. Within rural markets, one of every four commercial banks that had farm loans outstanding at the end of 1987 participated in the guarantee programs, and approximately half of the FCS' banks and associations originated at least one FmHA-guaranteed farm loan during the year. Nonetheless, only 55 percent of rural counties were served by the guarantee programs during 1988. While slack demand for farm credit during the year undoubtedly explains the lack of participation in some areas, lack of lender interest in the program may leave eligible borrowers in some parts of the country under-served.

Based on our analysis of rural-headquartered commercial banks, it appears that larger agricultural banks, particularly those which have had recent problems with their farm loan portfolios, are most likely to participate in the loan guarantee program. This is consistent with previous research by Taff, et al. (1984), but also indicates that smaller-sized banks can be enticed to participate in loan guarantee programs if the benefits of participation are obvious. Nonetheless, low coefficients of determination indicate that much remains to be done in order to adequately account for bank participation in, and use of, the FmHA guarantee program.

This study also examined how lenders used the FmHA guarantee program. An intriguing result of our analysis was the positive estimated coefficient between use of guaranteed loans and growth in outstanding farm loans. This implies that the guarantee program had an expansionary effect on the supply of farm credit in 1988. However, because we could find no statistical evidence that banks substituted the guarantees for U.S. Government securities or that selling loans bolstered farm lending, an alternative explanation is proposed. We conclude that the observed farm loan expansion associated with the use of loan guarantees occurs either because guarantees strengthen the lender's portfolio and thereby encourage larger loan

holdings, or because bank policy was to expand farm lending and loan guarantees were one useful tool to accomplish this objective.

The study shows that guaranteed lending can increase credit availability above the amount which would have existed in the absence of any government credit programs. However, when the previous government credit program was in the form of direct lending, the shift to loan guarantees may reduce credit availability to the farm sector and rural areas.[8] Support for this view is the lack of participation in FmHA's guaranteed farm loan programs by many banks located in rural areas and by the lack of evidence that participating banks were using the programs in ways which increase local credit supplies. Whether the impending implementation of a formal secondary market for FmHA guarantees will encourage participating banks to further adjust their portfolios as the liquidity of FmHA guarantees increases remains to be seen.

While our analysis is primarily concerned with how FmHA's loan guarantee program affects the availability of agricultural credit, our findings have implications for the broader rural credit market as well. As Federal farm credit assistance shifts from direct lending programs (which supplement local credit supplies) towards loan guarantees (which rely on local lenders), credit availability in areas previously served by Federal direct loan programs is likely to decline. If local lenders don't participate in the guarantee program, tighter credit markets will be felt primarily by high-risk farm borrowers. But if lenders participate in the program without altering their securities portfolios or selling more loans, then the nonfarm sector may find local credit markets tightening as well. When lenders fail to take steps to supplement the local supply of credit, such as selling loans or reducing their holdings of Government securities, then guarantee programs merely change the distribution of local credit supplies, helping eligible borrowers and hurting ineligible borrowers. To some extent, a vibrant secondary market in guaranteed loans should help overcome these drawbacks by increasing the liquidity of guaranteed loans and making it easier for participating lenders to tap nonlocal funds to supplement local credit supplies.

Notes

[1]Costs are believed to be lower because private lenders apply their expertise in selecting and servicing guaranteed loans, loan terms and standards more closely mirror market conditions than do direct Federal loans, and in the case of default, government losses are limited to the guaranteed portion of the loan (Milkove and Sullivan, 1988).

[2]For the economy as a whole, budget allocations to FmHA's

guaranteed loan program—and its potential impact on the overall supply of loanable funds—are fixed.

[3] Determination of whether a county was served or not is based on the geographic location of borrowers rather than on the presence of a financial institution within the county. This was done for two reasons. First, lender markets often cross county boundaries, so the physical presence of a lender is not necessarily needed to provide service to an area. And second, information on the county-location of each participating lender's offices was not universally available.

[4] The probability of failure was estimated using financial data from June 1988. See Gajewski (1989) for a discussion of the model and the specific variables used to estimate probability of failure.

[5] The cutoff represents one standard deviation above the mean of 3 guaranteed loans originated by participating rural banks during 1988.

[6] Neither the simple nor partial correlation coefficient between GLR and ΔGSEC was significantly different from 0, indicating that use of the guarantee programs did not cause banks to systematically alter their holdings of Government securities.

[7] USDA is currently developing regulations needed to implement a new secondary market which will overcome these restrictions, as mandated by the Agricultural Credit Act of 1987.

[8] Guaranteed loan programs are not likely to be viewed as perfect substitutes for direct loan programs by borrowers either. Guaranteed loan borrowers tend to pay higher interest rates, are required to meet tighter credit standards, and face a greater likelihood of foreclosure if they default than do direct loan borrowers (GAO, 1989).

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