Explaining Regional Demand for USDA Direct Farm Loan Programs, 1995-99

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Abstract

Demand for federally subsidized credit provided by U.S. Department of Agriculture's Farm Service Agency (FSA) varies considerably across regions and counties. In some counties, a high percentage of farm borrowers receive FSA farm loans, while in other regions and counties little or no FSA lending occurs. This analysis uses Tobit estimation techniques applied to county data to analyze factors that might influence county-level variation in the use of FSA loan programs. New lending activity for direct loan programs is modeled for the period 1995 to 1999. Results suggest that counties with the highest level of demand for FSA loans are more likely to have higher concentrations of targeted populations, fewer alternative lenders, greater financial leverage among farmers, and lower per capita incomes.

Introduction

USDA's Farm Service Agency (FSA) provides subsidized farm loans to family-sized farmers unable to obtain credit from conventional sources at reasonable rates and terms. FSA operates direct lending programs and offers loan guarantees on farm loans made by private sector lenders. During fiscal 2001, FSA made $1 billion in direct farm loans and guaranteed another $2.4 billion in farm loans made by commercial lenders (USDA 2001). The direct and guaranteed farm loan programs each account for about 4 percent of the total outstanding farm debt.

While FSA's share of U.S. farm debt is relatively modest, there is considerable variation in farmer use of its farm loan programs across regions, within states, and between counties (USDA 2000). Mapping the share of total farm borrowers in a county with at least one FSA direct loan shows that counties tend to be regionally clustered according to the level of demand (figure 1). High demand for FSA loans is evident in the Mississippi Delta, Northern Plains, and Texas High Plains, while low-demand characterizes California, the Corn Belt, and Central Texas. In some counties of the Northeast and the Great Plains, as much as half of all farm borrowers have at least one FSA loan, while in the Corn Belt and along the Pacific relatively few indebted farm borrowers had a direct loan. While not the focus of this research, FSA's guaranteed farm loan programs show similar regional demand patterns.

Little analysis has appeared that might explain observed regional differences in FSA lending patterns, especially for the direct lending programs. Sullivan and Herr in 1990 developed three regression models to examine bank usage of FSA's guaranteed farm loan program using National data. Dixon et al. used county level data to model bank willingness to use FSA

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guarantees, but limited their study to the state of Arkansas. Settlage et al. (June 2001) modeled loan losses on FSA guaranteed loans for USDA regions and states using data from fiscal 1990-97, while Settlage et al. (August 2001) modeled guaranteed lending volume for states using the same data. Turvey and Weersink made empirical estimations of farm loan demand for Canada using cross-sectional and time-series data from the government owned Farm Credit Corporation.

This research attempts to explain observed regional variation in the use of FSA direct loan programs using county level data. Program use is defined as the share of all indebted farms within a county receiving at least one FSA direct loan. Explanatory factors that might influence demand for FSA direct farm loans include the availability of commercial credit, program targeting rules, and regional differences in the creditworthiness of farm borrowers. Estimations are made for the Nation as a whole and for Economic Research Service (ERS) production regions. The research reflects improvements to data and estimation techniques first reported by Dodson and Koenig (August 2001).

FSA direct and guaranteed credit programs are not perfect substitutes for each other. Dodson and Koenig (1999) have shown that guarantee program borrowers' tend to have larger farms and are more creditworthy than direct program borrowers. Also, the two programs have different delivery systems and eligibility standards that affect delivery. Therefore, the estimations were made only for direct loan programs.

Improving the understanding of factors that shape regional demand for FSA loan services helps to evaluate FSA's role in farm credit markets. For example, is there any evidence that FSA direct loan programs improve credit accessibility for farmers who are unable to obtain credit at favorable rates and terms despite being creditworthy? Creditworthy farmers can face credit constraints if private sector lenders avoid lending to certain identifiable groups because of perceived group differences in repayment risk. While some members of these groups are likely to be creditworthy, the cost of screening out non-creditworthy applicants may exceed benefits received from additional loans. Small family farms, women farmers, beginning farmers, and racial and ethnic minorities represent examples of such groups. Likewise, lenders may avoid lending to geographic regions characterized by weaker economic conditions or to farmers with greater financial risk profiles.

Results could also help forecast future program demand as well as help improve the delivery of program benefits. Many USDA county offices were consolidated into servicing centers in the 1990s and further office consolidation is possible. Understanding the factors that might influence local program usage could be important to policies that locate offices and staff.

Data Sources

The Tobit models are estimated with data compiled primarily from the 1997 Census of Agriculture, the Department of Commerce, and FSA's farm loan program databases. Data was selected to center around the 1997 Census of Agriculture. FSA loan obligation (new lending) data for the period of 1995 to 1999 was selected for the analysis to measure program demand. Many of the 3,017 counties had had little lending activity during a given year. To increase the

number of data points, the dependent variables were constructed as 5-year averages of new direct lending. Delivery and program eligibility policies changed little over this time period.

The number of FSA borrowers within each county was obtained from agency loan files and the total number of indebted farmers within each county was calculated from the 1997 Census of Agriculture. In both data sets, the county identified is where the home of the farm operator or base of farming operation is located.   Most explanatory variables were obtained or constructed from the Census of Agriculture or other USDA data sources. Personal and farm income data were obtained from the U.S. Department of Commerce. Data on commercial bank and the Farm Credit System (FCS) location were constructed from data from the Federal Deposit Insurance Corporation and Farm Credit Administration, respectively.

Model Specifications

Models are specified for the Nation as a whole and for the nine ERS land resource regions. Significant variations in demand are evident across regions, with FSA having higher market shares in the Northeast and the Southeast, and lower shares in parts of the Midwest. Regional models were specified because the diversity of agriculture was hypothesized to influence demand for FSA credit programs differently across the country.

Dependent Variables

Two models are estimated for each region, one for all direct loan programs and the other for direct loans excluding emergency loans. Two different models are estimated because the eligibility and targeting of operating loans (OL) and farm ownership (FO) loans are somewhat different than those of emergency loans (EM).[1] A separate model for EM loans could not be estimated because of a limited number of data points. EM loan volume has been relatively small during the study period.

The Census of Agriculture reports the number of farms with over $10,000 in annual sales having paid interest expense during 1997. This number is used as a proxy for the total number of indebted farms within a county. This number is likely to be greater than stock estimates of borrower numbers because it includes seasonal borrowings that are paid off at yearend. The total number of indebted farmers in a county would not be expected to vary greatly over short time periods. County-level demand or FSA market share is measured by calculating the ratio of unique farmers receiving an FSA direct loan within a county between 1995 and 1999 to the total number of indebted farms with at least $10,000 of farm sales (see table 1 for definitions of all model variables).

Very small farms, including retirement, lifestyle, and hobby typologies were excluded from the denominator in the ratio because they are less likely to meet FSA's family-farm criteria. Farms with under $10,000 in sales accounted for about 37 percent of all farms in 1997, but only 15 percent of all FSA borrowers (USDA 2000). Many in these borrowers are in the process of exiting farming. Likewise, only indebted farms were included in the analysis as they are most likely to need FSA assistance and hence better represent FSA's target market. Regardless of

definition employed, farmers who wanted loans during this period but did not receive them are not accounted for in the dependent variable.

Calculated county-level FSA market shares of total farm borrowers varied from 0 to over 100 percent. For those counties where FSA's share exceeded 100, the number was truncated at 100 percent. Market shares greater than 100 percent usually occurred in counties with few farmers. This may reflect the fact that FSA borrowers were counted over a 5-year period whereas Census counts are just for 1997 and so year-to-year changes in total farm numbers are not captured. It also may reflect changes in ownership and multiple borrowing entities associated with each individual farm counted by the Census. For example, a son or daughter may take out an FSA loan to purchase equipment, while the father has an outstanding FO loan. Therefore, FSA data counts two borrowers, while Census might only counted the senior operator.

Explanatory variables

Many variables are hypothesized to influence county level demand for FSA loans. These explanatory variables can be organized along the major missions of the loan programs: loan targeting, credit access, and farmer creditworthiness (table1).

Targeting

FSA loan programs are intended to serve family farms (Dodson and Koenig, 2000). Congress did not define family farm, leaving USDA with this task. FSA guidelines for designating eligibility require that borrowers are to be similar to other farming operations in the community and that only family members provide most day-to-day labor and management decisions of the farming operation. The programs are not intended to serve very large farms or lifestyle and hobby farmers. Recent research indicates that this is generally the case (USDA 2000). Caps on loan program indebtedness help ensure family-farms have primary access to FSA credit.[2]

To measure the influence of family farm targeting on county-level demand, the shares of total farms in 4 different sales classifications were included in the models. While annual farm sales is not a perfect measure of the family-size criteria, farms with farm sales between $100,000 and $500,000 in sales are considered to be most likely to meet FSA's family-size definition. According to the 1999 Agriculture Economics and Land Ownership Survey (AELOS) 55 percent of direct FSA borrowers had sales between $50,000 and $500,000, whereas only 31 percent of all indebted borrowers had sales in this range. It was hypothesized that demand for FSA credit should rise as the share of farms with annual farm sales within a $100,000 to $500,000 range rises within a county.

Counties with greater shares of their farmers fully employed on their farms are likely to have greater demand for FSA loan programs because more farmers are likely to meet FSA's family-farm eligibility criteria. The share of farmers fully employed by the farm business was defined as farmers who worked less than 50 days off the farm, as reported by the Census of Agriculture.

FSA loan programs are targeted to specific groups of individuals considered to be socially disadvantaged (SDA).[3] This definition includes racial and ethnic minorities and women. Targeting of loans is accomplished by setting aside a share of the annual loan funding for use by SDA applicants based on the proportion of SDA farmers or residents within the state. Koenig and Dodson show that FSA lending to racial and ethnic borrowers tends to be correlated with geographic concentration of these individuals and that a relatively high share of new lending goes to these groups.

The effect of SDA targeting on demand for FSA credit was measured by including variables for the share of total farms within a county that are operated by women and racial and ethnic minorities. Variables were included to represent Blacks, Hispanics, American Indians, and Asians. As the share of total farmers identified with one of these groups rises, demand for FSA direct loan programs is expected to rise.

FSA farm loans are also targeted to beginning farmers, with special loan terms and priority given to annual program funding for these applicants.[4] Generally, FSA defines a beginning farmer as anyone with less than 10 years of farming experience. This definition was found to include retirement age and lifestyle and hobby farmers, but neither group is the primary target for beginning farmer policies. Thus, to more accurately measure beginning farmers most likely to receive beginning farmer loans, a special tabulation was requested from the Census of Agriculture.[5] For this analysis, beginning farmers were defined as farmers under 45 years of age with less than 10 years experience operating a farm and reporting sales between $10,000 and $500,000. Higher ratios of farmers meeting this definition to the total number of farmers should increase overall FSA loan demand.

Credit Access

Access to competitively priced credit is another factor that is hypothesized to affect demand for FSA credit. In counties where fewer commercial lenders provide agricultural loans, a greater share of farmers should turn to FSA for at least some of their credit needs. This would be especially true for borrowers located in counties in or near metro regions or in non-farm dependent rural areas, where few banks may be active in farm lending.

Two variables measure credit market access, one for the location of a Farm Credit System (FCS) lender and the other for the presence of agricultural banks. These two lender groups supply over two-thirds of total credit to the farm sector and so their presence in local credit markets is expected to directly influence credit access. To measure the influence of the FCS, a county is assigned a value of one if a FCS branch office is located within the county or within 5 miles of its border. Bank presence within a county was measured by including the number of branches of agricultural banks located within the county.[6] Banks without significant exposure to agricultural loans were excluded because they are less likely to engage in specialized farm lending. Both variables are expected to negatively impact direct loan usage as a greater number of farm lenders imply greater access to private credit and hence less need for Federal credit.

Credit Risk and Creditworthiness

Counties with greater farm production risks should have greater demand for FSA assistance. We hypothesize that this would be especially true for the model that includes emergency loan program borrowers. To measure production risk and associated loan repayment risk, the ratio of crop loss pay outs to indemnity payments collected under the Federal Crop Insurance programs for 1995 through 1999 was included in the models. It was expected that counties with greater FCIC loss rates would also have higher demand for FSA loan programs.[7]

Because FSA loans are designed to serve farmers unable to get credit from conventional credit sources, the financial strength of farmers in a county should influence demand for FSA loan programs. Counties with greater financial leverage among farm borrowers would be expected to have a greater share of their farmers obtaining FSA loans because of the higher risk profile of its farm borrowers. To test for the influence of leverage, the ratio of total interest expense to total farm expense within the county was included in the model with a positive sign anticipated.

Higher personal incomes within a county indicate less need for federal credit assistance by county residents. High income reflects strong regional economic conditions that provide greater off-farm employment opportunities for the farmer or spouse. Also, lenders may be more willing to make loan investments in counties that are better off economically. Therefore, per capita county income was included in the model and was hypothesized to negatively impact demand for FSA credit.

Health of the farm economy should also influence demand for FSA credit. Counties where farm income is growing should have less demand for FSA credit assistance than counties where farm incomes are shrinking. To measure this, the level of net farm income relative to its 20-year trend (1977-1997) was included as a variable.

Many farm loans are secured with farm real estate, which represents about 80 percent of total farm assets. Thus, loan losses would be less likely in regions where farmland values are increasing. Because loan losses are less likely, commercial lenders should be more willing to lend to farmers in counties where farmland values are stable or rising. To test this hypothesis the average annual increase in land values from 1977 to 1997 was included in the models.

Estimation Results

National Models

Estimation results indicate FSA loan demand was greatest among counties with higher concentrations of family-sized farmers, minority farmers, greater levels of production risk, and more financial leverage (See tables 2 and 3). Results suggest that FSA direct FO and OL loan programs are in greater demand in counties with more farms reporting annual sales of between $100,000 to $500,000. These sizes are most consistent with the family-farm eligibility criteria. Counties with greater concentrations of farms with over $500,000 in sales exhibited less demand when EM loans were excluded. When EM loans were considered, the concentration of farms

with over $100,000 in annual sales had no significant impact on demand. Because EM loans are not as targeted and loan limits are larger, farm size should have less effect on FSA demand.

Regardless of whether EM loans were considered, the share of farmers within a county of African-American descent had a positive and significant influence on FSA loan demand. Though there are few Asian farmers, counties where they were located also reported higher demand. There was no apparent relationship between the concentration of Hispanic, American Indian, or women farmers and OL and FO loan demand. American Indians and women farmers were significant when EM loans were included, suggesting that these groups relied more heavily on EM loans. American Indian farmers are more common in the Southwest, which was affected by drought over the analysis period. The presence of beginning farmers had a positive and significant impact on the demand for direct OL and FO loans, but not when EM loans were included. This is consistent with program objectives, because unlike FO and OL loan programs, the EM program does not target beginning farmers.

There appears to be some relationship between FSA loan demand and credit accessibility as measured by the number of branches of agricultural banks within a county. As expected, the number of bank branches negatively influenced demand for FO and OL loans. This suggests that borrowers may turn to FSA for their credit needs where farm loan markets are less competitive. However, when EM loans were included, there was a positive relationship between the number of bank branches and FSA loan demand. A possible explanation for this is that there may be a symbiotic relationship between EM loan demand and agricultural banks. A primary use of EM loan funds is to refinance non-FSA operating note carryovers, with about 60 percent of all EM loan volume going for this purpose (Dodson).

A positive relationship between production risk within a county and the demand for FSA loan programs is evident when EM loans were included in the dependent variable. Regardless of whether EM loans were included, a positive and significant relationship was evident between the financial leverage of farmers within a county and FSA loan demand. Greater financial leverage, as measured by the ratio of interest expenses to total expenses, can be a consequence of past production losses.

County average personal income showed a negative and significant influence on FSA loan program demand in both models. Per capita income tends to be higher in more urban counties, while rural counties tend to have lower incomes. This result could suggest that commercial lenders may prefer farm lending in higher income counties or that farmers in these counties simply have less need for federal credit assistance. Variables for farm income and land values were insignificant in both models.

Results also indicate that demand for FSA loan programs is regional. Four of the regional dummy variables were significant in their effect on FSA loan demand. For estimation purposes, the Heartland region was excluded. Results indicate that demand is greater in the Northern Crescent, Prairie Gateway, Eastern Upland, and Mississippi Portal region relative to the Heartland. When EM loans were included, the Southern Seaboard was also significant. The strong significance of the regional variables suggests that federal farm credit programs may have become institutionalized in some counties. Demand may be greater in some regions simply

because FSA programs are more visible or more accepted by farmers. Because they are more commonly used, farmers are more familiar with them and, consequently, more likely to look to FSA for their credit needs. Also, regional demand may reflect differences in program delivery. State FSA leadership can have notable influences on how the programs are delivered.

Regional Models

Estimations completed for the nine ERS land resource regions show some differences in demand factors (table 4). Most notable were differences with respect to racial targeting. Regional results bear out the importance of racial minorities in certain regions of the country. Blacks are positive and significant in the Mississippi Portals, Southern Seaboard, and Fruitful Rim; regions where blacks represent more significant share of the total farming population. Asians were only significant for the Basin and Range, an area including California where there is a larger Asian farming population. American Indians were positive and significant in the Eastern Uplands (which includes eastern Oklahoma), Prairie Gateway, and Basin and Range, areas characterized by larger American Indian populations.

In the national model, the location of FCS branches appeared to have limited impact. But, the Northern Plains and the Heartland had positive and significant relationships between demand for FSA loan programs and proximity to a FCS branch office. This might be explained by regional differences in underwriting standards and business practices of FCS associations. In the absence of other commercial lenders, if FCS underwriting practices are more stringent in these locations, more farm borrowers may have turned to FSA for their credit needs.

Regional results also point out the importance of FSA loans in areas affected by natural disasters. FCIC loss rates were positive and significant in the Prairie Gateway and Northern Plains, which often experience weather related production losses. Two variables that more consistently affected FSA loan demand were per capita county income and the degree of financial leverage among farmers. The interest expense to total expense ratio was positive and significant in 4 regions, while per capita income was negative and significant in 5 regions. Interestingly, the rate of farmland value inflation was significant in the Heartland in both models, but had a positive relationship. This implies that higher appreciation in land prices actually increases the share of farmers using FSA loan programs. Higher rental costs and purchase prices associated with higher appreciation rates might explain the need for greater federal credit assistance.

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Summary

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While FSA credit programs are a relatively minor source of total U.S. farm credit, for some regions and counties borrowers are more dependent upon these programs. The level of dependence on FSA loan programs appears to follow regional patterns with high-use counties clustered in the Northeast, Great Plains, and Mississippi Delta. Low-use counties were clustered in the Corn Belt and Western States.

Factors that might influence county level demand for FSA loans were organized along the major FSA mission areas: loan targeting, credit access, and farmer creditworthiness. The results

indicate that mission related objectives of the programs appear to influence the usage of the programs during the 1995-99 period of the study. Results suggest that targeting requirements explain some of the differences in usage across regions and counties. In general, a higher presence of family-sized farmers, beginning farmers, and socially disadvantaged individuals within a county was found to increase demand for FSA credit. This was particularly true when only direct operating and farm ownership loans were considered. For regional models the importance of targeting varied, but showed somewhat similar patterns. For example, the presence of black farmers significantly influenced demand in regions where these farmers tend to reside.

Federal farm credit programs are intended to serve the least creditworthy segments of the borrowing population and estimation results indicate that creditworthiness and credit risk do influence county-level usage of FSA loans. Higher financial leverage positively influenced FSA credit demand, while greater county wealth (measured by per capita income) lowered demand for FSA credit. When emergency loans were included, higher levels of production risk increased demand for FSA assistance.

A greater presence of commercial banks in local credit markets lowered FSA credit demand, although for regional models variation was evident. The presence of FCS lenders actually increased demand for FSA credit in the Midwest. Estimations completed for all nine Economic Research Service production regions showed that factors influencing demand varied somewhat across regions. Some differences in demand across regions may result from institutional factors such as FSA State leadership or general familiarity with the FSA loan programs.

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Figure 1. Share of County Indebted Farms with an FSA Direct Loan

FSA Direct Program Market Penetration
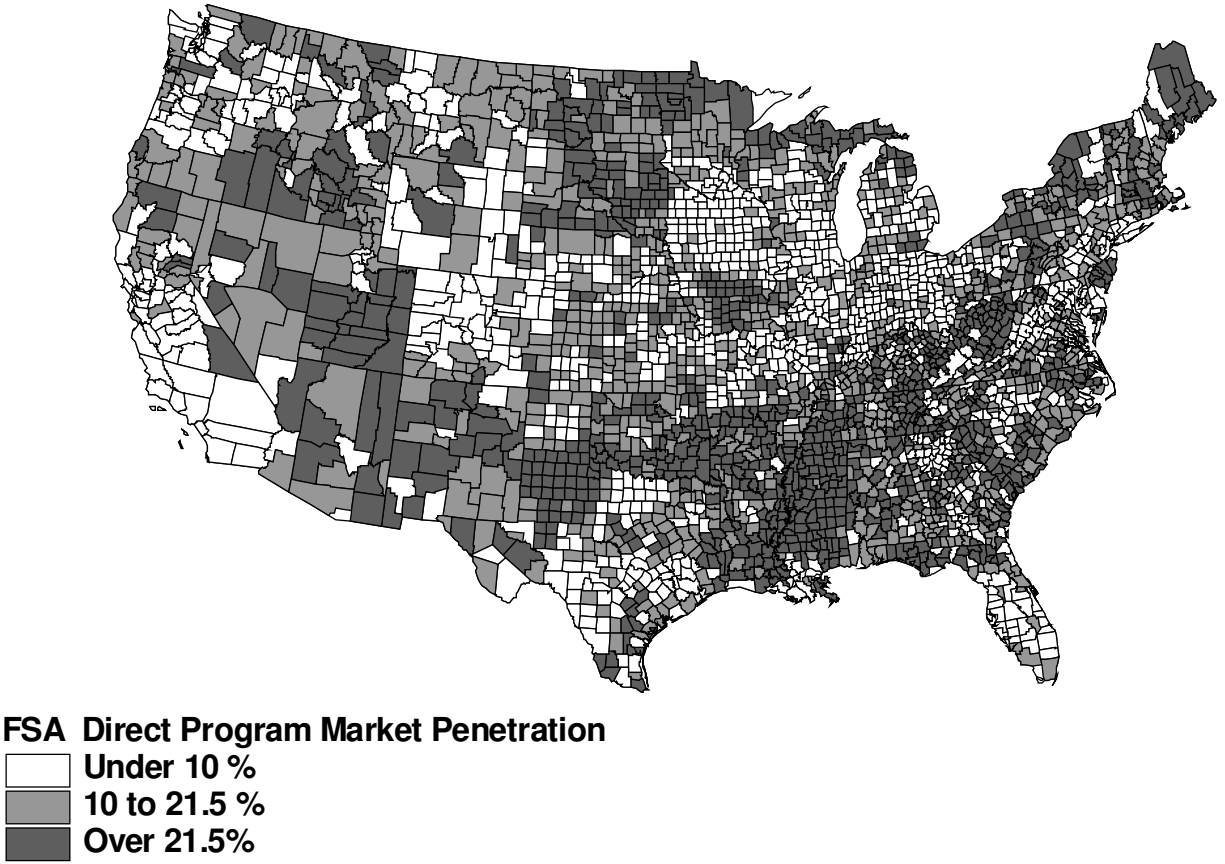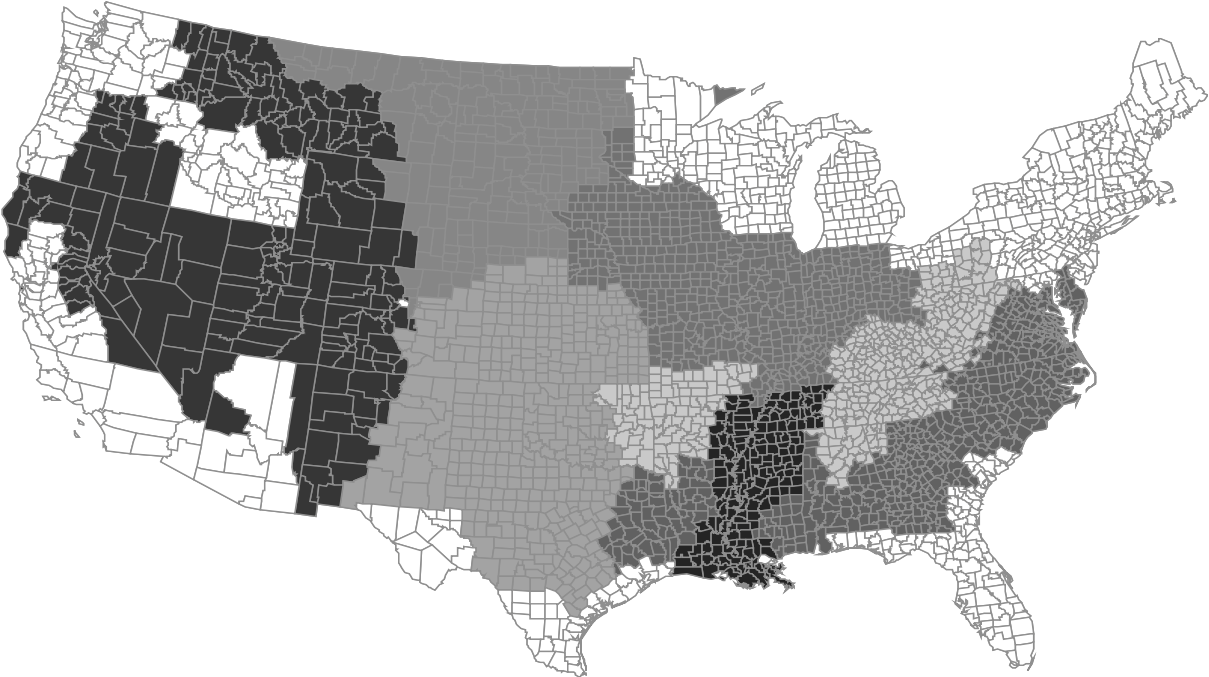☐ Under 10 %
▨ 10 to 21.5 %
■ Over 21.5%

Figure 2. ERS Land Resource Regions

ERS Land Resource Regions
- Heartland
- Northern Cresent
- Northern Plains
- Prairie Gateway
- Eastern Upland
- Southern Seaboard
- Fruitful rim
- Basin and Range
- Mississippi Portals

Table 1. Model Variables and Expected Relationships

Variable	Description	Expected Sign
	Dependent Variables	
OL & FO market Share	Share of FSA direct OL and FO borrowers to total farm borrowers with at least $10,000 in sales	
OL, FO, & EM market share	Share of FSA direct OL, FO, & EM borrowers to total farm borrowers with at least $10,000 in sales	
	Targeting	
Size of farms:	Share of farms (over $10,000 in sales) with:	
Small	Sales of $50,000 to $99,999	-
Medium	Sales of $100,000 to $249,999	+
Large	Sales of $250,000 to $499,999	+
Very large	Sales of $500,000 or more	-
Primary farms	Share of farm operators in county working less than 50 days off the farm	+
Am. Indians	Share of farmers within the county that are American Indians	+
Asians	Share of farmers within the county that are Asian	+
Hispanics	Share of farmers with the county that are Hispanic	+
Blacks	Share of farmers within the county that are black	+
Women	Ratio of farms operated by women to total farms with at least $10,000 in sales	+
Beginning farmers	Share of farmers with less than 10 years experience, 45 years old, and with $50,000 to $500,000 in sales	+
	Credit Access	
FCS branches	One if an FCS branch office is within the county or within 5 miles of the border	-
Ag. Banks	Number of branches of agricultural banks within the county	-
	Credit Risk and Creditworthiness	
Interest expense/ total expense	Ratio of interest expense to total farm expense, farms with > $10,000 sales	+
Farm income level	Net Farm income relative to its long term 20 year trend	-
FCIC loss rate	Ratio of FCIC indemnity payments made to premiums collected, 1995-99	+
Annual land inflation rate	Average annual increase in farmland values from 1977 to 1999	-
Per capita income	Average per capita income over the previous 10 years	-

Table 2. National Model Results, Excluding EM Borrowers

Variable	Parameter	Std. Error	P[|Z|>z]	Mean of Variables
Intercept	-2.8396	1.6688	0.0888	0.0000
Targeting:				
Beginning farmers	*0.2131*	0.1092	0.0510	4.2106
Blacks	*0.5069*	0.1019	0.0000	0.7003
Asians	*0.1743*	0.0757	0.0212	0.2300
Hispanics	0.0649	0.0465	0.1625	1.1439
American Indian	0.0565	0.0752	0.4522	0.4328
Women	0.0777	0.0516	0.1325	8.9015
Share of farms (over $10,000 in sales) with:				
Sales of $50,000 to $99,999	*-0.0325*	0.0394	0.4089	15.3202
Sales of $100,000 to $249,999	0.0487	0.0352	0.1672	17.0630
Sales of $250,000 to $499,999	*0.1269*	0.0502	0.0115	8.3119
Sales of $500,000 or more	*-0.1041*	0.0338	0.0021	7.1103
Operators working less than 50 days off farm	*0.0883*	0.0248	0.0004	60.1330
Credit access:				
Number of Ag bank branches	*-0.1210*	0.0372	0.0012	3.5676
Location of FCS branch	0.5600	0.3614	0.1213	0.4166
Credit risk and creditworthiness:				
Interest expense/total expense	*0.2131*	0.0623	0.0006	6.4674
Farm income level	-0.0002	0.0003	0.5486	109.0010
FCIC loss rate	0.5806	0.4116	0.1584	0.2883
Annual land inflation rate	0.0342	0.0397	0.3896	4.8771
Per capital income	*-0.0534*	0.0114	0.0000	77.0427
Regional:				
Northern Crescent	*3.5274*	0.6709	0.0000	0.1359
Northern Plains	1.1177	0.8744	0.2012	0.0593
Prairie Gateway	*1.4458*	0.6613	0.0288	0.1352
Eastern Upland	*6.0672*	0.7487	0.0000	0.1279
Southern Seaboard	0.0492	0.7806	0.9497	0.1521
Fruitful Rim	0.0060	0.8417	0.9943	0.0921
Basin and Range	-0.3448	0.8878	0.6977	0.0630
Mississippi Portal	*4.5982*	0.9462	0.0000	0.0547
Sigma	*9.0953*	0.1323	0.0000	0.0000
Mean of dependent variable	5.4281			
Standard deviation of dependent variable	8.3321			
Number of observations	3,017			
Log likelihood function	-9,476.33			

Note: Bold indicates significance at 5 percent

Table 3. National Model Results, Including EM Borrowers

Variable	Parameter	Std. Error	P[|Z|>z]	Mean of Variables
Intercept	*-11.5206*	2.6068	0.0000	0.0000
Targeting:				
Beginning farmers	0.1238	0.1689	0.4636	4.2106
Blacks	*0.6135*	0.1559	0.0001	0.7003
Asians	0.1297	0.1148	0.2587	0.2300
Hispanics	0.0208	0.0715	0.7712	1.1439
American Indian	*0.3266*	0.1141	0.0042	0.4328
Women	*0.2323*	0.0794	0.0034	8.9015
Share of farms (over $10,000 in sales) with:				
Sales of $50,000 to $99,999	*-0.2178*	0.0614	0.0004	15.3202
Sales of $100,000 to $249,999	-0.0318	0.0546	0.5605	17.0630
Sales of $250,000 to $499,999	0.1234	0.0772	0.1100	8.3119
Sales of $500,000 or more	-0.0384	0.0519	0.4589	7.1103
Operators working less than 50 days off farm	*0.1372*	0.0385	0.0004	60.1330
Credit access:				
Number of Ag bank branches	*0.8459*	0.0565	0.0000	3.5676
Location of FCS branch	-0.6237	0.5533	0.2597	0.4166
Credit risk and creditworthiness:				
Interest expense/total expense	*1.2363*	0.0957	0.0000	6.4674
Farm income level	-0.0003	0.0004	0.4242	109.0010
FCIC loss rate	*1.5206*	0.6236	0.0148	0.2883
Annual land inflation rate	0.0416	0.0608	0.4946	4.8771
Per capital income	*-0.0954*	0.0178	0.0000	77.0427
Regional:				
Northern Crescent	*8.5372*	1.0304	0.0000	0.1359
Northern Plains	2.5375	1.3401	0.0583	0.0593
Prairie Gateway	*3.9790*	1.0129	0.0001	0.1352
Eastern Upland	*8.4217*	1.1512	0.0000	0.1279
Southern Seaboard	*5.0032*	1.1938	0.0000	0.1521
Fruitful Rim	3.0618	1.2935	0.0179	0.0921
Basin and Range	0.9205	1.3654	0.5002	0.0630
Mississippi Portal	*8.6750*	1.4503	0.0000	0.0547
Sigma	*13.9009*	0.1982	0.0000	0.0000
Mean of dependent variable	7.0556			
Standard deviation of dependent variable	16.3252			
Number of observations	3,017			
Log likelihood function	-10,616.86			

*Note: **Bold** indicates significance at 5 percent.*

Table 4. Coefficient Signs for Regional Models, Excluding EM Loans

Variable	Heartland	Northern Crescent	N. Great Plains	Prairie Gateway	Eastern Uplands	Southern Seaboard	Fruitful Rim	Basin & Range	Miss. Portal
Intercept	Positive	Negative	Positive	Positive	Negative	Positive	Negative	Positive	Negative
Targeting:									
Beginning farmers	*Negative*	Positive	Negative	*Positive*	Positive	Positive	*Positive*	Positive	Positive
Blacks	Positive	Negative	Positive	Positive	Negative	*Positive*	*Positive*	----	*Positive*
Asians	Negative	Negative	Negative	Positive	Negative	Negative	*Positive*	Positive	Positive
Hispanics	Negative	Negative	Negative	Negative	Negative	Negative	Positive	Positive	Negative
American Indians	Negative	*Positive*	Positive	*Positive*	Negative	Negative	*Positive*	Negative	Positive
Women	Positive	*Positive*	Negative	*Positive*	Positive	Positive	Negative	*Negative*	Positive
Share of farms (over $10,000 in sales) with:									
Sales of $50,000 to $99,999	Positive	*Positive*	Negative	Negative	*Negative*	Positive	Negative	Negative	Positive
Sales of $100,000 to $249,999	Negative	Positive	Negative	*Positive*	Negative	Negative	Positive	Negative	*Positive*
Sales of $250,000 to $499,999	Negative	Negative	Negative	*Positive*	Positive	Positive	Positive	Positive	Positive
Sales of $500,000 or more	*Positive*	Positive	Positive	Negative	*Negative*	Negative	Negative	Positive	Negative
Operators working under 50 days off farm	*Positive*	Positive	Positive	Negative	*Positive*	*Positive*	Positive	Negative	Negative
Credit access:									
Number of Ag. Bank branches	Negative	Negative	Negative	Negative	Negative	Negative	Negative	Negative	Positive
Location of FCS branch	*Positive*	Positive	*Positive*	Positive	Negative	Positive	Positive	Negative	Negative
Credit risk and creditworthiness:									
Interest expense to total expense ratio	*Positive*	Negative	*Positive*	Positive	Positive	*Positive*	*Positive*	Positive	Positive
Farm income level	Negative	Positive	Positive	Positive	Positive	Negative	Positive	Negative	Negative
FCIC loss rate	Negative	Positive	*Positive*	Positive	Positive	Negative	Positive	Positive	Positive
Annual land inflation rate	*Positive*	Positive	Negative	Negative	*Negative*	Negative	Negative	Positive	Positive
Per capital income	*Negative*	Negative	*Negative*	*Negative*	Positive	*Negative*	Negative	Positive	Negative
Sigma	2.6039	10.3031	3.7545	5.5518	15.8332	7.9387	7.6030	7.7598	9.2300
Mean of the Dependent	2.6377	6.7846	5.3320	4.6304	8.6633	4.8124	4.5307	4.7578	9.4270
Standard Deviation of the Dependent	2.6693	9.5073	4.3997	5.8230	14.2942	6.7075	6.7868	6.6769	9.8944
Number of Observations	410.00	410.00	179.00	394.00	400.00	459.00	278.00	190.00	164.00
Log Likelihood Function	-1,365.00	-1,330.00	-478.30	-1,158.00	-1,553.96	-1,284.57	-764.08	-519.47	-525.00

Note: **Bold** Letters indicate significance at 5 percent.

Table 5. Coefficient Signs for Regional Models, Including EM Loans

Variable	Heartland	Northern Crescent	N. Great Plains	Prairie Gateway	Eastern Uplands	Southern Seaboard	Fruitful Rim	Basin & Range	Miss. Portal
Intercept	Positive	Negative	Positive	Positive	Positive	Positive	Negative	Positive	Negative
Targeting:									
Beginning farmers	Negative	Positive	Negative	Positive	Positive	Positive	***Positive***	Positive	Positive
Blacks	Positive	Negative	Positive	Positive	Negative	***Positive***	Positive	----	***Positive***
Asians	Negative	Negative	Negative	Positive	Positive	Negative	***Positive***	Positive	Positive
Hispanics	Negative	Positive	Negative	Negative	Negative	Negative	Positive	Positive	Negative
American Indians	Positive	***Positive***	Positive	***Positive***	Negative	Negative	***Positive***	Negative	Positive
Women	Negative	***Positive***	Negative	***Positive***	***Negative***	Positive	Positive	Negative	Positive
Share of farms (over $10,000 sales) with:									
Sales of $50,000 to $99,999	Positive	***Positive***	Negative	Negative	***Negative***	Positive	Negative	Negative	Positive
Sales of $100,000 to $249,999	Negative	Positive	Negative	***Positive***	Negative	Negative	Positive	Negative	***Positive***
Sales of $250,000 to $499,999	Negative	Negative	Positive	***Positive***	Negative	Positive	Positive	Positive	Positive
Sales of $500,000 or more	***Positive***	Positive	Positive	Negative	***Negative***	Negative	Negative	***Positive***	Positive
Operators working under 50 days off-farm	***Positive***	Positive	Positive	Negative	***Positive***	***Positive***	Positive	Negative	Negative
Credit access:									
Number of Ag. bank branches	Negative	Negative	Negative	Negative	***Positive***	Negative	Negative	Negative	Positive
Location of FCS branch	***Positive***	Positive	***Positive***	Positive	Negative	Negative	Positive	Negative	Negative
Credit risk and creditworthiness:									
Interest expense to total expense ratio	***Positive***	Negative	***Positive***	Positive	Positive	***Positive***	***Positive***	Positive	Positive
Farm income level	Negative	Positive	Positive	Positive	Positive	Negative	Positive	Negative	Negative
FCIC loss rate	Negative	Positive	***Positive***	***Positive***	Positive	Negative	Positive	Positive	Positive
Annual land inflation rate	***Positive***	Positive	Negative	Negative	Negative	Negative	Negative	Positive	Positive
Per capital income	***Negative***	Negative	***Negative***	***Negative***	Positive	***Negative***	***Negative***	Positive	Negative
Sigma	3.0420	11.0269	4.7347	6.1532	26.6713	8.8487	8.0929	8.2913	13.2205
Mean of the Dependent	2.9485	7.6295	6.4723	5.4440	15.0244	5.7641	5.2368	5.1557	13.1889
Standard Deviation of the Dependent	3.1164	10.2510	6.0990	6.5301	38.8653	7.7964	7.3438	7.1445	14.1711
Number of Observations	523.00	410.00	179.00	394.00	400.00	459.00	278.00	190.00	164.00
Log Likelihood Function	-1,286.12	-1,366.00	-518.57	-1,157.00	-1,617.97	-1,371.00	-788.00	-534.96	-577.00

Note: **Bold** Letters indicate significance at 5 percent.

Endnotes

[1] FO loans can be used to acquire, enlarge, or improve a farm or ranch; OL loans provide short- to intermediate-term production or chattel financing; EM loans cover production and physical losses or both in counties declared as disaster areas. EM loans do not have beginning farmer and Socially Disadvantaged targeting requirements and until 1996 did not have family farm targeting requirements.

[2] The cap on total program indebtedness for direct OL and FO loans is $200,000 each, while emergency program indebtedness is capped at $500,000.

[3] The Agricultural Credit Act of 1987 defined SDA individuals as those who may have been subject to discrimination because of their identity as members of a group, without regard to their individual qualities.

[4] A beginning farmer has no more than 10 years experience owning or operating a farm or ranch and must have at least 3 years to qualify for a direct FO loan. Seventy percent of direct FO annual funding and 35 percent of direct OL funding is reserved for use by beginning farmers until the last month of the fiscal year. Unused guaranteed OL authority can be transferred at year-end to satisfy unmet direct FO demand by beginning farmers. Funding is allocated to states based on Census of Agriculture shares of beginning farmers in the states.

[5] Copies of special tabulations obtained using Census data are available from NASS. For further information the reader is referred to the NASS web site: http://usda.gov/nass/nassinfo/datalab/data-lab-records.html.

[6] A bank and its branches are considered to be agricultural banks if a least 10 percent of the bank's total loans were classified as agricultural loans on July 1, 1997. Two common alternatives for measuring agricultural banks are the Federal Reserve's definition of an agricultural bank as having a greater than average share of farm loans to total loans and the FDIC's definition which states the bank must have at least 25 percent of its total loans to agriculture. These two definitions were thought to be too restrictive for many regions.

[7] The calculation excludes catastrophic policies (CAT) because of their relatively high pay out relative to premiums collected ($50 fee per crop).