FSA Direct Farm Loan Program Graduation Rates and Reasons for Exiting

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ABSTRACT

Farm Service Agency (FSA) direct loans are intended to provide transitory credit to creditworthy borrowers unable to obtain conventional credit at reasonable terms. Farm loan program (FLP) effectiveness is measured in part by how readily direct loan borrowers graduate to conventional credit. A survey of FSA borrowers originating direct loans during fiscal years 1994-1996 is utilized to estimate graduation rates. A majority of 1994-1996 loan originators did exit the direct FLP by November 2004. A multinomial logit model indicates financial strength at origination resulted in greater likelihood of farming without direct loans approximately nine years after loan origination.

Key words: Farm Service Agency, direct loans, graduation, multinomial logit

JEL Classifications: G20, G28, Q12 Q14

FSA Direct Farm Loan Program Graduation Rates and Reasons for Exiting

The Farm Service Agency (FSA) administers direct and guaranteed farm loan programs (FLPs) designed to provide credit to family-sized farms "unable to obtain credit from conventional sources at reasonable rates and terms" despite having sufficient cash flow to repay and an ability to provide security for the loan (Dodson and Koenig, p.1). Under the Food Security Act of 1985 (P.L. 99-198), the FSA (then the Farmers Home Administration) was mandated to emphasize guaranteed lending over direct lending.[1] This was done for budgetary reasons as well as the belief that private sector lenders could administer loans more efficiently. Even though guaranteed loans are preferred by policy makers relative to direct loans, the direct FLP continues to serve farmers whose creditworthiness status disqualifies them from guaranteed loans.

The emphasis on guaranteed loans with the continued existence of direct loans indicates that direct loans should only be a transitory step for borrowers. The goal of moving borrowers out of direct loans is reflected in the Food, Agriculture, Conservation, and Trade Act of 1990 (P.L. 101-624) which established a placement program for those borrowers eligible to graduate from direct loans to guaranteed loans. To improve graduation rates, lifetime limits for FSA borrowers to receive assistance were established for operating (OL) loans. Borrowers became ineligible for direct OL assistance after receiving OL loans for 10 years, and ineligible for guaranteed assistance after 15 years (USDA/ERS, 1993). The Farm Security and Rural Investment Act of 2002 (2002 Farm Act, P.L. 107-171) enacted changes in the FSA direct FLP to make borrowing easier. The eligibility time limits for direct OL loans have been waived to provide longer access to FSA funded farm programs (USDA/FSA, 2005a). But the goal of borrowers moving

from direct loans to commercial loans persists. The FSA information web-site on direct loans states, "FSA provides temporary credit to its direct loan borrowers; therefore, all borrowers are required to refinance their loans with a private, commercial lender when they are financially able to do so."[2]

To evaluate the efficacy of the FSA direct FLP, it is necessary to analyze actual borrower graduation rates and individuals' reasons for exiting the direct FLP. The analysis presented in this study utilizes data from a nationwide survey of borrower applications for direct loans originated in fiscal years (FY) 1994-1996. In this survey farm loan managers (FLMs) at the field office level were asked to indicate the reason borrowers no longer holding active direct loans exited the direct FLP.[3]

In increasing program effectiveness, which can be partially measured as increasing the proportion of borrowers who exit the direct FLP, it is important to know the characteristics of borrowers at the time of loan origination that are indicators of the likely disposition of the borrower a number of years into the future. Such analysis is provided here by using a multinomial logit model that predicts the probability of a given type of outcome as a function of observable characteristics at the time of loan origination.

In what follows, background on the FSA direct FLP is presented to describe the program and various features of the program that would lead to differential reasons for exiting the direct FLP. In particular, FSA is mandated to make loans to beginning farmers and socially disadvantaged farmers. It is important in assessing the success and effectiveness of these two programs to determine if these programs have different exit probabilities and how they differ in the particular types of exits chosen. Next, the data collection process is described and basic descriptive statistics are presented for borrowers

and their outcomes. Then a multinomial logit model predicting exit status is estimated and the results are interpreted. Conclusions and implications for FSA policy are then presented.

FSA Direct FLP Loans

There are three main types of FSA direct loans: (1) OL loans are for one or seven years and may be used to purchase equipment and livestock, pay operating and family living expenses, and refinance debts under certain conditions; (2) farm ownership (FO) loans may be used to purchase land, construct buildings, and promote soil and water conservation; and (3) emergency (EM) loans may be used to replace essential property, pay operating and family living expenses, and refinance certain debts following a natural disaster. Program limits are $200,000 each for OL and FO loans and $500,000 for EM loans. Unlike guaranteed loans, the upper limits on direct loan indebtedness are not tied to an inflation index and are changed infrequently. The limits on OL and FO loans have not been changed for at least two decades and the limit on EM loans has been tightened so that $500,000 is the maximum limit of indebtedness regardless of the number of disasters.

The targeting of FSA loans to specific borrower subgroups of socially disadvantaged and beginning farmers is mandated by law. FSA defines a socially disadvantaged farmer or rancher as "one of a group whose members have been subjected to racial, ethnic, or gender prejudice because of their identity as members of the group without regard to their individual qualities. For purposes of FSA programs, socially disadvantaged (SDA) groups are women, African Americans, American Indians, Alaskan Natives, Hispanics, and Asian Americans and Pacific Islanders." (USDA/FSA, 2005b).

Escalante et al. investigate FSA lending practices as a function of borrower race and find targeting has likely been important in application evaluation. The definition of a beginning farmer (BF) varies by loan type. For OL purposes, a BF is a farmer who meets the general eligibility criteria for an OL loan and has ten or less years of farming experience. For FO purposes, a BF is a farmer who meets the general criteria for an FO loan, has three to ten years of farming experience, and owns acreage which does not exceed 30% of the county average farm size.[4] If the applicant is an entity, all members must be related by blood or marriage, and all stockholders in a corporation must be eligible beginning farmers (USDA/FSA, 2005c). The FSA youth loan program loans are not included in this analysis because of their relatively low volume.

The FY 1994-1996 Sample Data

To estimate graduation rates and reasons for exiting the FSA direct FLP, FSA FLMs were surveyed in 2004 to collect information on a sample of loans originated in FY 1994–1996. Three years were chosen so that unique characteristics of any one year would not unduly influence the variables observed. These three years are representative of the 1990s in terms of net farm income.[5] Additionally the Agricultural Credit Improvement Act of 1992 (P.L. 102-554) authorized the beginning farmer program. Starting sampling before 1994 would have resulted in a small sample of beginning farmers. Sampling later than 1996 would not have given sufficient time to obtain a long-run view of borrower payback and exit behavior.

During those three years, 34,026 OL, 3,083 FO, and 8,359 EM loans were originated. Financial information and demographic data were obtained by the FLMs from the Request for Direct Loan Assistance (FSA-410-1) and the Farm and Home Plan

(FmHA 431-2) that borrowers complete as part of the application process. The sampling method insured proportionate representation across five loan program types: (1) FO loans for non-BF borrowers (FONONBF), (2) FO loans for BF borrowers (FOBF), (3) OL loans for non-BF borrowers (OLNONBF), (4) OL loans for BF borrowers (OLBF), and (5) EM loans (EM). The sample was chosen to have gender, racial, geographical, and time representation as described in Nwoha et al. The predominant FSA borrower race and gender are white and males. Because white males were relatively so abundant, white males were sampled at a rate of one in eighteen whereas all other gender and races were sampled at a rate of one in nine.[6] There were 2,715 usable responses after cleaning the data out of a sample of 3,004 for a 90% response rate. There was good geographical, gender, loan type, and racial representation so that no one particular cohort of interest was under- or over-represented in the sample data. A copy of the survey instrument and further description of the sampling procedure are included in Nwoha et al.

Basic borrower demographic data by loan assistance type are presented in Table 1. The results are consistent with a priori beliefs. Operator age at loan origination is in the early to mid-forties for non-BF and non-SDA farmers. Beginning farmers have mean age of 29 except for the relatively older beginning SDA farmers who average 34 or 35 years of age. When the beginning farmer designation is removed, SDA and non-SDA farmers average about the same age. The group with the highest average age is composed of farmers receiving EM loans although the difference between them and regular OL borrowers is only about one and a half years. In the 1997 Census of Agriculture (USDA/NASS, 1999) the average farm operator age is 54.3 so that the FSA borrowers are distinctly younger than the overall farm population.

Mean years farming experience ranges between 17 and 21 years for non-beginning farmers. The 1997 Census of Agriculture (USDA/NASS, 1999) reports an average 23.9 years among all farmers for years on the present farm. Thus the surveyed farmers are less experienced than the average for U.S. farms. As to be expected, beginning farmers have less farming experience than non-beginning farmers with means ranging between five and six years. Mean number of family members is between three and four for all programs except the two beginning, non-SDA farmer programs who have about 2.6 to 2.7 members which is reflective of their younger ages. A similar pattern arises with respect to marital status. Most borrowers are married but the range varies between 60% for non-SDA beginning farmers and 90% for EM borrowers. Eighty-seven percent of regular OL borrowers are married.

The predominant minorities are Hispanic and African American/Black, although American Indian/Alaskan Natives are active in the SDA programs. Note that women and minorities also obtain loans in the regular loan categories although most of their loans are from the SDA loan categories.

As reported in Nwoha et al., average farm acreage for the sample was 664 acres with OL borrowers having larger farms than those borrowers obtaining FO loans and EM borrowers having the largest acreage at 779 acres. Roughly two-thirds of the acres were in crops although EM loans had 77% of their acres in crops.

Borrower financial characteristics indicate that the surveyed farms are, on average, not as large in terms of assets and net worth as the average U.S. farm as discussed in Nwoha et al. Moreover, mean debt-to-asset ratios for FLP participants are

much higher than those for U.S. farmers in general. These weak characteristics indicate the direct loans are going to financially stressed farmers as the program intends.

Expected first year cash flows reflect the average scale of operation. The total cash farm income mean of $153 thousand puts most of these farms in the National Commission on Small Farms' definition of small farms having less than $250,000 in gross receipts.[7] The surveyed borrowers rely on agricultural income because of low levels of non-farm income. For all borrowers the mean non-farm income is $14,405. However, the mean living expense is $19,056.

Table 2 displays the percentage of loans terminated by November 30, 2004.[8] The overall termination rate is 77.7%. This statistic is very much influenced by the preponderance of OL loans in the sample. OL loans come in two types based on length of maturity—one year and seven years. Hence all OL loan types in Table 2 are categorized by loan maturity length.

When the various OL and various FO loans are combined, the aggregate termination rates are 84%, 52%, and 75% for OL, FO, and EM loans. The differences between these three rates are statistically significant for all three pair-wise comparisons. It is clear FO loans had a lower termination rate than OL and EM loans; undoubtedly due to the long-term nature of FO loans. Nonetheless, approximately half of the FO loans had terminated. The high OL termination rate of 84% is expected and ideally should be 100% since a loan in the sample could not have been originated after September 30, 1996. So all loans had at least eight years to terminate and 16% of the OL loans did not. These loans have likely been restructured or consolidated.

The mean lengths of time to loan termination are also displayed in Table 2. As expected, OL loans have much shorter durations than FO loans. The mean FO loan length will increase as more of these loans are paid back. A similar effect will occur with OL loans but since the proportion of OL loans still active is so much smaller than for FO loans, the increase in OL loan length will likely be less than for FO loans. One-year loans make up about half of the OL loans in each OL category in Table 2. Ninety-one percent of the one-year loans are terminated and 74% of seven-year loans are also terminated. Given the short durations of the mean loan length times, it is clear that many seven-year loans terminated early. The mean lengths of OL one-year loans exceed the maturity and this is surprising. Since these are typically annual operating loans, it would be expected they would be paid back on time. As shown in Nwoha et al., the mean length of OL loans paid in full is less than when paid in full loans are combined with loans terminated in other ways. The means for all loan lengths are affected by problem loans. Nwoha et al. estimate that 89% of the terminated loans were paid-in-full.

Table 3 gives the percentages of loans whose borrowers had exited the direct FLP by November 30, 2004, for seven different reasons as indicated by the FLM. The FLMs could also report unknown. The percentages for the two FO SDA loan types—FOBFSDA and FOSDA—should be interpreted cautiously because they are based on small samples.

Several facts stand out in Table 3. First, the most frequent type of exit was graduation to conventional credit, i.e., *not* a transitional step through FSA guaranteed loan programs. Only 9.1% of those exiting the direct FLP used FSA guarantees. This result is surprising since we expected a larger proportion. Overall, fewer than half the exiting borrowers continued farming with credit (with and without FSA loan guarantees).

An exception to this behavior is FOBF where 62% of the exiting borrowers used conventional credit and another 8.5% had conventional credit with FSA guarantees. This indicates program success since these beginning farmers used the direct FLP early on and then graduated and continued farming with credit from conventional sources.

About 10% of those exiting continued farming and no longer needed credit. This could imply any number of things such as scaling back the operation, finally paying off all loans, or obtaining alternative sources of income to support the farm operation. It could also involve leasing some or most land or sale of some farming assets. The reasons were not collected in the survey. Overall, 53.4% of the loans had exiting farmers who graduated, i.e., continued farming without direct FLP assistance.

Borrowers left farming voluntarily for reasons other than retirement (23.7% of all exited loans) and for retirement (6.9%). Five percent of the loans were terminated due to the farmer's death.

Only about 11% of loans had borrowers who left involuntarily. The highest proportion of borrowers leaving involuntarily was for the OLBFSDA assistance type but the proportion, 20%, has a large standard error so that the rate is no different from the others listed except for regular FO (FOREG) and FOBF. Rates of involuntary exit were higher for regular OL (OLREG) and OLBF than their FO counterparts. Rates for beginning farmers were not statistically different from those for non-beginning farmers within the OL and FO programs, respectively.

Table 3 gives a snapshot in time of loan status. Approximately nine years since originating loans in FY 1994–1996 had elapsed by the time of the survey. Table 3 does not show the exit status for all loans, only those loans for which reasons were given.

There were 2,606 unique borrowers in the sample and 55% of these borrowers had exited the FLPs by November 30, 2004, and most of them surely left permanently. It is unlikely that exited borrowers who are currently in their fifties will become FSA borrowers again except for need of an emergency loan. Since the mean age of those who exited is only a year greater than those who remained FSA debtors, future exits for those still in the program are likely to be shaded more toward retirement and death than the rates in Table 3 would indicate. A reasonable conjecture is that those exiting post 2004 will likely have fewer credit needs, fewer good non-farm employment opportunities, and be more likely to retire than those who left before 2004.[9]

Overall, it is clear borrowers exited FLPs for a variety of reasons and no one reason dominates. It is surprising that about 42% of terminated loans had borrowers who left farming for some other occupation or lifestyle. This suggests FSA direct loans make it possible for some people to try farming and then seek alternative uses of their time. Also, for the majority of participants, FSA direct loans do not appear to lead to a lifetime of using FSA direct loans. FSA borrowers transitioned to conventional sources of credit. Moreover, a small proportion of farmers ended up having to leave farming involuntarily, e.g., due to financial stress. The next section explores the impact of factors known at time of loan origination on the type of outcome.

Logit Model Specification

A multinomial logit model is estimated to identify the relevant variables known at time of origination that are useful in predicting outcome type. The analysis below identifies indicators of whether a borrower is likely to: remain a longer term client, exit

and continue farming, leave voluntarily for some other occupation or retire, or involuntarily leave farming.

In the multinomial model there are four outcomes. Although there are eight possibilities—the seven in Table 3 plus still being active in the direct FLP—the multinomial model estimated below combines the outcomes (STATUS) into four categories. STATUS = 1 consists of those borrowers who were still FSA debtors as of November 30, 2004. STATUS = 2 combines borrowers who had exited the FLP and were still farming using guaranteed credit, conventional credit, or did not need credit. This category represents graduated borrowers—those who exited FLPs still were farming. STATUS = 3 contains those who had left farming voluntarily or retired. This grouping represents those who exited farming but not under duress. STATUS = 4 contains those who left farming involuntarily other than death.[10] The reduction to four categories from eight reduces the number of parameters estimated and also provides four alternatives that satisfy the independence of irrelevant alternatives (IIA) which more numerous categories might not.[11]

The formula for multinomial models is well known, see Greene for example. In lieu of presenting the estimated logit parameters directly, which do not have an intuitive interpretation, the estimated marginal probabilities for each variable and category are presented. The marginal probability of an outcome is the change in the probability of the particular outcome for a one-unit change in an independent variable.[12] Standard errors for these marginal probabilities are computed using the analytical framework for the continuous variables and a bootstrap method for the binary independent variables.

The empirical model was specified with the goal of including those explanatory variables most likely to predict which borrowers exited the program and how they exited. The explanatory variables are those observed during the loan approval process. This is the only information FSA has when evaluating a potential borrower. While knowledge of the events that occurred subsequent to loan origination and before November 30, 2004, would provide more precise results for explaining current status, the available data are sufficient to address the purpose of identifying pre-origination predictive variables.

The independent variables are grouped into four categories: (1) borrower demographics, (2) characteristics of the current loan, (3) prior financial distress and involvement with FSA direct loans, and (4) borrower financial characteristics. An exact description of the variables is given in Table 4. The demographic variables are age (AGE), race (RACE) and gender (FEMALE). The characteristics of the current loan include whether the loan is FO, OL, BF, and/or SDA. These four variables are binary and take on the value of 1 if the loan has the particular characteristic. Also included is the number of weeks elapsed (WEEKELAP) since origination of the loan and November 22, 2004, the beginning day of the survey. As time elapses, it would be expected the borrower would be more likely to leave the direct FLP.

The binary variable FINDIS indicates if the borrower had been in receivership, received a bankruptcy discharge, or petitioned for bankruptcy reorganization prior to the loan application. This is included as a measure of prior financial distress. Also included are the number of active FO loans at time of application (NUMFO) and similar measures for number of OL loans (NUMOL) and number of EM loans (NUMEM). These are included to account for current reliance and past experience with FSA. It is expected that

increasing reliance is an indicator of need for FSA direct financing and therefore to be inversely related to exiting direct FLPs.

The financial variables are measured at the time of loan application. The debt-to-asset ratio (DA) is defined as total debts divided by total assets. Both farm and non-farm debts and assets are included in the computation. It is expected that an increase in the DA increases the likelihood of the farmer being financially stressed and/or continuing in the program longer. Net worth (NETWORTH) is computed as total assets less total liabilities in millions of dollars.[13] The ratio of non-farm income to total cash farm income sources (NFINTCFI) measures income diversification as well as the ability to generate income to offset financial shortfalls from farming.[14] Repayment ability is measured as the balance available for debt service divided by total debt service due that year (REPAY). The final variable (TOTINC) is total annual household net cash income in millions of dollars. Borrowers with higher net worth, income diversification, repayment ability, and income should graduate from the direct FLP earlier than borrowers at lower levels of these variables.[15]

The Estimated Logit Model

The estimated model yields a number of statistically significant marginal probabilities as displayed in Table 5. The sample had 1,928 observations. This is fewer than the 2,715 survey responders but an observation was included only if it had valid entries for all variables in the logit model for a given loan. The overall fit of the model can be appraised in three dimensions. First, the IIA assumption cannot be rejected. Second, the likelihood ratio statistic measuring the overall significance of the coefficients firmly rejects the hypothesis that the coefficients of all the variables simultaneously equal

zero. The third dimension of model fit considers the predictive accuracy of the estimated model. Although 57% of the observations are correctly predicted, this is not much better than simply predicting all of the observations as being in the category of borrowers who still held active, direct loans. The problem is likely due to the disproportionate number of observations in the outcome categories. In the sample used to estimate the logit model 1,092 observations were from borrowers who still had active FSA direct loans. Of the remaining observations, 456 had graduated to non-direct loan credit or no longer needed credit, 273 had voluntarily left farming, and 107 had involuntarily left farming.[16] Thus the estimated model tends to classify each observation as being in the category with the most observations—not exiting the program in this case.

The lack of predictive power underscores the point that events subsequent to origination undoubtedly play a major role in the financial well-being of FSA borrowers as with any borrower involved in agricultural production. From 1994 to 2004 some years were generally good and some were weaker—particularly those from 1998 to 2002 in terms of net farm income.

The statistically significant marginal probabilities generally have the anticipated signs. The category STATUS = 1 is of particular interest since it indicates borrowers are still holding one or more direct loans. The older the borrower at time of origination, the less likely they are to still be in the direct FLP. A ten-year difference would only alter the probability by 0.03. Non-white borrowers, as opposed to white borrowers, have a 0.15 higher probability of still having an FSA loan. Receiving an FO loan indicates a 0.14 higher probability of still being in the program. This is expected since FO loans are longer term. Furthermore, a majority of the FO borrowers are beginning farmers; and the

interest rate for the beginning farmer down payment FO loans was 4.0% during FY 1994–1996, which was lower than market rates at the time (USDA/ERS, 1998). Thirty-eight percent of the FO loans in the sample were down payment loans.[17] Independently of whether the loan was FO or OL, beginning farmers are less likely to remain in the programs. These may be younger farmers that find farming is not as attractive as other opportunities they could pursue.

Not surprisingly, the longer the time since loan origination, the less likely a borrower is still to be in the program. This indicates that borrowers tend to leave the FSA FLP with the passage of time. Nonetheless, some borrowers undoubtedly do stay for long periods of time. All three variables representing the number of FO, OL, and EM loans outstanding at time of loan origination have the expected positive signs and are significant. This effect is important. For a borrower with two OL loans and one FO loan at origination, the probability of still being active in the FSA direct FLP than a borrower originating a new loan with no other active direct loans would be 0.11 higher. Even though there are limits on the total FSA debt a borrower can hold at any point in time, numerous loans may proxy overall financial weakness. That borrowers with multiple loans are less likely to exit is not surprising. But this fact does raise the important policy issue of whether there should be a limit to the number of loans—particularly FO and OL loans—any one borrower can have at a given time.

The final significant variable for not exiting direct FLP is the debt-to-asset ratio, DA. It has an expected positive sign indicating that weaker solvency at origination increases the likelihood of remaining in the direct FLP but the effect is not large. In the

estimation sample, DA has a mean of 0.67. For a shift from 0.3 to 0.6, the probability of staying in the FLP would increase by 0.02.

The significant marginal probabilities of continuing farming with or without conventional credit (STATUS = 2) share some variables in common with the likelihood of remaining in the program. Numbers of outstanding OL and EM loans at origination have a negative effect on graduation as does DA. The significant signs on NUMOL and NUMEM, which are negative, are consistent with the findings for the probability of remaining in the direct FLP. Increased solvency at loan origination makes it more likely the borrower will graduate from the direct FLP. A further confirmation of this financial characteristic effect is the significant positive sign on NETWORTH. The larger the ratio of non-farm income to total cash farm income at loan origination, the greater the likelihood of graduating. So solvency, equity, and non-farm income are indicators of likely success. RACE is a significant variable, and it is negative. The effect is substantial because the estimated coefficient, -0.1076, indicates that being a member of a non-white racial group means the probability of graduating declines by nearly .11. Finally, the longer the time from origination, the more likely the borrower is to graduate.

Significant variables influencing the probability of leaving farming voluntarily or retiring (STATUS = 3) include demographic and loan type variables. Age is highly significant but its coefficient is small. The fact that "retired" is included in this category is probably a deciding factor in making the coefficient positive. It could alternatively be argued that younger farmers who perceive they have alternative lucrative, life-time job opportunities to farming might leave early. However, this argument is inconsistent with the positive age coefficient. The FO coefficient implies a 0.07 decline in the probability

of voluntarily leaving farming or retiring compared with originators of EM or OL loans. The probability of BF recipients of exiting voluntarily is higher by 0.09 than their non-BF counterparts.

Increasing numbers of EM loans at loan origination are also negatively associated with voluntarily leaving farming. Farmers already saddled with debt via the EM loans appear less likely to become free of additional debt. Finally, lower initial solvency as evidenced by a greater debt-to-asset ratio at time of borrowing indicates an increased likelihood of leaving farming voluntarily. This is expected since such farmers were in weaker financial condition at the beginning of the loan and may have decided the likelihood of achieving success via farming was too small and chose to leave farming.

Those leaving farming involuntarily other than death (STATUS = 4) are affected by an interesting set of factors. Somewhat surprisingly, age is negatively related suggesting that experience may be a factor in being financially successful. Borrowers who received FO loans were less likely to have left involuntarily. Farmers receiving FO loans, which are relatively longer-term loans, may be required to be in a relatively stronger financial position and have more knowledge than farmers qualifying for other FSA direct loans as is implied by some of FSA's policies. Also, farmers with FO loans own real estate. It is generally considered that farmers are more personally attached to real estate, particularly if it has been in the family for a while, than non-real estate assets. Therefore, farmers are more likely to do more to keep from losing their farmland. This finding for FO is consistent with the number of FO loans at time of origination being negatively related to leaving involuntarily. Thus a borrower with multiple FO loans and, perhaps, more farmland equity as a result of increasing farmland prices over the period, is

less likely to leave involuntarily. The coefficient of time since origination (WEEKELAP) is positive implying that being in the program longer can be an indication of distress.

Borrowers originating SDA loans have lower probabilities of leaving involuntarily. SDA farmers in the sample have lower mean farm assets and essentially equal farm and non-farm income as non-SDA farmers. Perhaps because they have less invested in farming and equivalent income prospects, such farmers might be more likely to overcome financial difficulties and not involuntarily leave farming.

Two other variables, FINDIS and NETWORTH, are significant in the probability to leave involuntarily. The binary variable FINDIS indicates that prior to origination, the borrower had experienced financial hardship by virtue of having been in receivership, discharged in bankruptcy, or petitioned for reorganization under bankruptcy. This history of past financial difficulties (having past bankruptcy actions) indicates a .04 greater probability of involuntarily leaving farming. In addition, increasing net worth at loan origination implies that financially stronger borrowers are less likely to leave the direct FLP involuntarily.

Summary and Conclusions

The Farm Service Agency provides direct loans to creditworthy borrowers unable to obtain credit at reasonable rates. Such credit is provided with the goal of helping the borrower graduate to conventional credit sources so that clients are helped through a transitory phase and do not become permanent FSA borrowers. Data from a sample of 2,715 loans originated from October 1, 1993, through September 30, 1996, were used to

examine how many borrowers with these loans had exited from the direct FLP and the reasons for exiting.

Seventy-eight percent of the loans originated in FY 1994-1996 were terminated by November 30, 2004. Time to termination varied with the loan type. OL loans and EM loans were terminated at a faster rate than FO loans as expected. Nonetheless, more than half the FO loans had been terminated by November 30, 2004, indicating that a majority of FO borrowers did not exploit the long-term nature of FO loans.

But the larger issue is whether FSA borrowers simply pay back one loan and then originate another. For the majority of borrowers sampled, this is not the case. Fifty-five percent of the unique originators in the survey had exited by approximately nine years after origination. Some borrowers likely stay with FSA for long periods of time, but this aspect was not addressed in the survey.

Borrowers exited the FSA direct FLP for a variety of reasons. A surprisingly high proportion of farmers left the direct FLP voluntarily and did not continue farming. About 24% of the loans initiated in FY 1994–1996 and terminated by November 30, 2004, had borrowers who left farming voluntarily for reasons other than retirement. Only slightly more than half of the borrowers who left the FSA direct FLP stayed in farming (graduated) and only 17% of these used FSA guaranteed credit as a transition to conventional credit. Perhaps even more surprising is that 18% of the continuing farming group continued farming without any credit at all. Only 11% of the borrowers left farming involuntarily other than death. These results suggest that direct loans let some people try farming with some subsequently exiting and some going on to farm successfully without a direct FLP loan. But relatively few are forced out of farming.

The estimated logit model infers that borrowers with larger numbers of active FSA direct loans at time of loan origination were less likely to exit. Those with less FSA direct loan involvement were more likely to exit and continue farming or to leave farming voluntarily. Financial strength as measured by the debt-to-asset ratio or net worth at origination was important. Higher debt-to-asset ratios decreased the likelihood of graduating or increased the likelihood of leaving farming voluntarily. Higher net worth at origination made graduation more likely and leaving involuntarily less likely. Financial difficulties prior to loan origination increased the likelihood of exiting involuntarily. Non-white borrowers were less likely to remain in farming or to leave farming voluntarily. Borrowers of BF loans were less likely to remain in the program and more likely to exit farming voluntarily.

The survey results indicate the FSA direct FLP is providing transitional credit to financially stressed farmers. FSA borrowers were, for the most part, not becoming permanent FSA clients, consistent with FSA goals. FSA would also like to minimize those farmers who encounter financial hardship and leave farming as a result. Our results suggest that strengthening financial requirements at time of origination might help, but this must be balanced against excluding those who are the intended beneficiaries of the FSA direct FLP.

Endnotes

[1] Direct loans are funded through FSA and are serviced by local FSA staff, whereas guaranteed loans are funded and serviced by conventional lenders, but guaranteed (typically at a rate of 90%, but as high as 95% for certain loans) by FSA against default (Ahrendsen et al., 2005).

[2] Online at http://www.fsa.usda.gov/dafl/directloans.htm#More%20Information (accessed June 30, 2005).

[3] Reasons for exiting as well as detailed financial information on borrowers who originated loans in 1994-1996 were not available from any central electronic data source.

[4] Prior to 2004, the acreage limit was 25% of the county average farm size (U.S. 7 CFR 1943.4).

[5] For the 1990s, U.S. net farm income in 1996 was the highest, 1995 the lowest, and 1994 in between. Online at http://www.ers.usda.gov/data/farmincome/50State/50stmenu.htm (accessed May 19, 2005).

[6] Because of the different sampling rates, all the statistical analyses are done using weights for the observations. Since the two sampling rates were one in eighteen and one in nine, the respective weights were two and one.

[7] The National Commission on Small Farms defines a small farm as, "…farms with less than $250,000 gross receipts annually on which day-to-day labor and management are provided by the farmer and/or the farm family that owns the production or owns, or leases, the productive assets." (p. 18). (See: http://www.csrees.usda.gov/nea/ag_systems/pdfs/time_to_act_1998.pdf. Accessed June

1, 2005). Total cash farm income in the survey included other farm income which we assume is included in the Commission's definition of receipts.

[8] As discussed in Nwoha et al., the method of determining termination status almost surely underestimates the number of loans actually terminated.

[9] Older farmers tend to be less indebted (Gale, 2003) so likely have lower credit needs.

[10] Sixty-three farmers exited because of death out of the 2,705 farmers whose exit status was reported. There was no natural category among the four created for deceased farmers. The deceased farmers could have been put into a category of their own but then the specification of the economic and demographic variables (except for age) would not have made much sense.

[11] The IIA implies none of the outcomes are close substitutes, see Greene.

[12] To evaluate the probabilities, it is necessary to set the values of the independent variables at some level. In this study the continuous independent variables were set at their sample means. For binary variables the marginal probabilities cannot be interpreted as marginal changes since the variable can only change from zero to one. The estimated probability resulting from a change in a binary variable reported here is the estimated probability of a particular outcome with the binary variable set to one less the estimated probability with the binary variable set to zero.

13 Millions are used to facilitate convergence in maximizing the likelihood function and to keep the coefficients from becoming comparatively minute.

14 Diversification increases NFINTCFI increases from its lower limit of 0.

15 An alternative specification approach would be to use a credit scoring index. Such an index is the weighted value of various variables measuring borrower characteristics.

Splett et al. use measures of liquidity, solvency, profitability, repayment capacity and financial efficiency. Two of the variables in the estimated model, DA and REPAY, could be included in a credit score. Additional variables to measure liquidity, profitability and financial efficiency were tried in preliminary estimation but their estimated parameters were not significant.

16 In particular, missing observations were a problem for those exiting the program. If the FLM did not know the reason for exit, they could mark "unknown".

17 While all FO down payment loans go to beginning farmers, the majority of the beginning farmer loans were OL loans.

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Table 1. Basic Demographic Description of Sampled Borrowers Originating Loans from FY 1994–1996 by Loan Assistance Type

	OLREG*	OLBF	OLBFSDA	OLSDA	FOREG	FOBF	FOBFSDA	FOSDA	EM	Total
N (number of FY 1994–96 loans by assistance code)	23,557	6,351	1,139	2,979	660	1,728	339	356	8,359	45,468
n (number of observations)**	1,218	318	102	287	73	169	33	28	487	2,715
Mean Age (years)	44.24	29.20	35.39	45.50	40.79	29.33	34.03	41.35	45.80	41.46
Mean Years in Farming	20.42	5.22	6.40	19.12	17.28	5.34	4.79	16.50	20.97	16.77
Mean Total Household Members	3.29	2.64	3.69	3.20	3.58	2.66	3.56	3.27	3.45	3.21
Marital Status (percent married)	87.10	60.10	74.00	79.00	81.80	59.60	89.50	84.60	90.00	81.00
Marital Status (percent separated)	0.70	0.00	1.00	0.40	0.00	0.00	0.00	3.80	0.40	0.50
Marital Status (percent unmarried)	12.10	39.90	25.00	20.60	18.20	40.40	10.50	11.50	9.60	18.00
Race (American Indian/Alaskan Native)***	0.21	0.32	14.95	11.84	0.00	0.00	18.42	16.67	0.24	2.58
Race (Asian/Pacific Islander)	0.00	0.00	5.61	3.29	0.00	0.00	2.63	10.00	0.12	0.77
Race (Black)	0.08	0.00	22.43	30.59	2.82	0.00	13.16	16.67	1.55	5.27
Race (Hispanic)	0.17	0.32	14.02	22.37	0.00	0.30	7.89	20.00	12.02	7.34
Race (White)	91.63	85.49	34.58	23.36	94.37	90.21	52.63	26.67	75.48	74.97
Race (Other)	0.00	0.00	0.00	0.66	0.00	0.59	0.00	0.00	0.00	0.11
Race (Unknown)	7.91	13.88	8.41	7.89	2.82	8.90	5.26	10.00	10.60	8.96
Gender (Male)****	79.26	80.70	52.34	62.50	88.73	86.35	50.00	50.00	77.26	76.41
Gender (Female)	0.92	1.12	39.25	26.32	2.82	0.59	44.74	30.00	2.38	6.12
Gender (Family Unit)	11.50	6.70	0.93	4.93	7.04	0.31	5.26	10.00	8.93	8.99
Gender (Male Owned Organization)	2.29	1.28	0.93	0.66	0.00	0.59	0.00	0.00	2.98	1.81
Gender (Female Owned Organization)	0.21	0.00	0.00	0.66	0.00	0.00	0.00	0.00	0.12	0.22
Gender (Unknown)	5.83	9.89	6.54	4.93	1.41	3.56	0.00	10.00	8.33	6.38
Gender (Public Body)	0.00	0.32	0.00	0.00	0.00	0.59	0.00	0.00	0.00	0.07

Source: Computed from 2004 Survey of FY 1994–1996 New Loans

* OL denotes operating loan, FO denotes farm ownership loan, SDA denotes a socially disadvantaged assistance type, BF denotes beginning farmer assistance type, REG signifies a non-SDA and non-BF assistance type.

** Statistics in a given column may be based on fewer observations if there are missing values.

*** Race as reported on survey and figures are percent for a given loan type.

**** Gender as reported on survey (as opposed to other FSA records) and figures are percent for a given loan type.

Table 2. Termination Percentages and Mean Loan Length by Loan Type for FY 1994–1996 Sample

	OLREG* 1yr	OLREG 7yr	OLBF 1yr	OLBF 7yr	OLBFSDA 1yr	OLBFSDA 7yr	OLSDA 1yr	OLSDA 7yr	FOREG	FOBF	FOBFSDA	FOSDA	EM	Total
n (number of observations)**	695	523	163	155	45	57	145	142	73	169	33	28	487	2,715
Percent of loans terminated by November 30, 2004														
	91.39	71.88	90.06	79.02	84.44	66.13	89.54	68.21	45.77	53.41	55.26	43.33	74.76	77.70
	(1.06)	(1.97)	(2.35)	(3.28)	(5.46)	(6.32)	(2.55)	(3.92)	(5.87)	(3.85)	(8.79)	(9.54)	(1.97)	(0.80)
Mean time from FY 1994–1996 loan origination to loan termination (years)														
	1.62	5.63	1.54	5.60	1.98	5.92	1.60	5.21	7.27	6.48	6.69	7.41	5.38	3.75
	(0.09)	(0.13)	(0.15)	(0.21)	(0.42)	(0.41)	(0.17)	(0.28)	(0.42)	(0.27)	(0.68)	(0.88)	(0.15)	(0.07)

Source: Computed from 2004 Survey of FY 1994–1996 Originated Loans
*See table 1 for a definition of loan type abbreviations. 1yr denotes an OL loan with a one year term. 7yr denotes an OL loan with a seven year term.
**Statistics in a given column may be based on fewer observations if there are missing values. Figures in parentheses are standard errors.

Table 3. Type of Exit by Loan Type for FY 1994-96 Borrowers Exiting the FSA Direct FLP by November 30, 2004

	OLREG	OLBF	OLBFSDA	OLSDA	FOREG	FOBF	FOBFSDA	FOSDA	EM	Total
					Percent of loans*					
Continued farming and graduated to FSA guaranteed credit	9.2	10.2	4.4	3.5	7.5	8.5	0	0	11.1	9.1
Continued farming and graduated to conventional non-FSA credit	33.3	33.4	22.2	29.2	41.5	62.0	28.6	11.1	31.6	34.6
Continued farming and no longer needed credit	7.6	6.8	2.2	13.3	11.3	11.3	7.1	22.2	16.2	9.7
Left farming voluntarily other than retirement	21.9	35.2	44.4	23.0	26.4	12.7	50.0	44.4	19.8	23.7
Retired from farming	8.9	2.0	0	14.2	5.7	0	0	11.1	6.9	6.9
Left farming involuntarily other than death	12.7	12.3	20.0	9.7	3.8	2.8	14.3	11.1	9.0	11.1
Left farming due to death	6.3	0	6.7	7.1	3.8	2.8	0	0	5.4	5.0
Number of exited borrowers**	536	148	43	104	27	71	12	9	217	1167

* Figures are the percentage of borrowers exiting for a given reason from the loan program indicated in the column. All columns sum to 100 percent except for rounding error.

**Note: This row gives the number of loans whose originators left the direct FLP by November 30, 2004, and for whom the FLM gave a reason for exiting. An additional 330 loans had borrowers out of the system but no reason for exiting was given by the FLMs.

Source: Computed from 2004 Survey of FY1994-1996 Originated Loans.

Table 4. Logit Model Variable Definitions

Dependent Variable is STATUS	
	STATUS = 1 if borrower has active direct OL, FO or EM loans as of November 30, 2004, STATUS = 2 if borrower has no active direct OL, FO or EM loans and is still farming using conventional sources of credit or no credit at all, STATUS = 3 if borrower has no active direct OL, FO or EM loans and left farming voluntarily or retired, STATUS = 4 if borrower has no active direct OL, FO or EM loans and left farming involuntarily (other than death).
Independent Variables	
AGE	Age in years of the operator at time of loan application,
RACE	Binary variable taking on a value of 1 if borrower not white, 0 otherwise,
FEMALE	Binary variable with value of 1 if borrower female, 0 otherwise,
FO	Binary variable with value of 1 if loan FO, 0 otherwise,
OL	Binary variable with value of 1 if loan OL, 0 otherwise,
BF	Binary variable with value of 1 if loan has a beginning farmer assistance code, 0 otherwise,
SDA	Binary variable with value of 1 if loan has a socially disadvantaged assistance code, 0 otherwise,
FINDIS	Binary variable with value of 1 if borrower has ever been in receivership, discharged in bankruptcy or petitioned for reorganization under bankruptcy,
WEEKELAP	Number of weeks since loan origination date to November 22, 2004,
NUMEM	Number of active EM loans at time of loan application,
NUMOL	Number of active OL loans at time of loan application,
NUMFO	Number of active FO loans at time of loan application,
DA	Total liabilities divided by total assets,
NETWORTH	Net worth in millions of dollars,
NFINTCFI	Non-farm income divided by total (gross) cash farm income,
REPAY	Balance available for debt service divided by total debt service due that year,
TOTINC	Total annual household net cash income in millions of dollars.

Table 5. Logit Model Marginal Probabilities of Status Selection[1]

Outcome Variable	**Status = 1**	**Status = 2**	**Status = 3**	**Status = 4**
Constant	0.6692**	-0.1676	-0.3779**	-0.1237**
AGE	-0.0034**	0.0002	0.004**	-0.0007*
RACE	0.1537**	-0.1076**	-0.0679**	0.0219
FEMALE	0.0292	-0.0703	0.0385	0.0026
FO	0.1382**	-0.0429	-0.0749**	-0.0204**
OL	0.0177	-0.032	0.0017	0.0125
BF	-0.0768**	-0.0072	0.0948*	-0.0108
SDA	-0.0348	0.0086	0.0479	-0.0218*
FINDIS	-0.0778	0.0015	0.0343	0.042*
WEEKELAP	-0.0008**	0.0004*	0.0002	0.0002**
NUMEM	0.0545**	-0.0273*	-0.0252*	-0.002
NUMOL	0.0247**	-0.0336**	0.0063	0.0026
NUMFO	0.0698**	-0.0261	-0.0135	-0.0303**
DA	0.0720*	-0.1157**	0.0367*	0.007
NETWORTH	0.0824	0.1749**	-0.1143	-0.143**
NFINTCFI	-0.0018	0.0160**	-0.0083	-0.0059
REPAY	0.0157	0.0084	-0.0198	-0.0043
TOTINC	-0.0945	0.0743	0.0082	0.012
n	1928			
$\chi 2$	288			
p-value	0.00			

Source: computed.

[1]One asterisk (*) denotes significant at 0.05 and two asterisks (**) denotes significant at 0.01.