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FSA Direct Farm Loan Program Graduation Rates and Reasons for Exiting

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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 used 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 9 years after loan origination.

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

JEL Classifications: G20, G28, Q12, Q14

The U.S. Department of Agriculture's 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.[2]

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[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.).

[2] Borrowers can be disqualified from guaranteed loans if no commercial lender is willing to lend even with a guarantee or for having received debt forgiveness from FSA on more than three occasions.

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 eligibility limits for FSA borrowers 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 website 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."[3]

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 uses data from a nationwide survey of borrower applications for direct loans originated in federal fiscal years (FY) 1994–1996. In late 2004, Farm Loan Managers (FLMs) at the field office level were surveyed to provide data on a sample of loans originated in their offices. One question asked the reason why a borrower no longer holding an active direct loan had exited the direct FLP.[4]

In increasing program effectiveness, which can be partially measured as increasing the proportion of borrowers who exit the direct FLP and continue farming (graduate), it is important to know the characteristics of borrowers at the time of loan origination. Borrower characteristics may be used as indicators of the likely disposition of the borrower in the future. Such analysis is provided here by using a multinomial logit model that estimates the probability of a given type of borrower outcome as a function of observable characteristics at the time of loan origination.

In what follows, background on the FSA direct FLP and various program features that would lead to differential reasons for exiting the direct FLP are presented. In particular, FSA is mandated to make loans to socially disadvantaged and beginning farmers.[5] It is important in assessing direct FLP success and effectiveness to determine whether farmers with socially disadvantaged, beginning farmer, and other loan types have differing 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 loan and exit outcomes. Then a multinomial logit model of loan status as of November 2004 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 1 or 7 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 conser-

[3] U.S. Department of Agriculture. *Farm Loan Programs.* Internet site: www.fsa.usda.gov/dafl/directloans.htm#More%20Information (Accessed June 30, 2005).

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

[5] Targeting socially disadvantaged farmers was part of the Agricultural Credit Act of 1987 (P.L. 100-233). Targeting beginning farmers was in the Agricultural Credit Improvement Act of 1992 (P.L. 102-554).

vation; 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 2 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 10 or less years of farming experience. For FO purposes, a BF is a farmer who meets the general criteria for an FO loan, has 3–10 years of farming experience and owns acreage that does not exceed 30% of the county average farm size.[6] 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.

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

Collection of Survey Data

To estimate graduation rates and reasons for exiting the FSA direct FLP, FSA FLMs were surveyed in November and December of 2004 to collect information on a sample of loans originated in FY 1994–1996 in the 48 contiguous states. Three years were chosen so that unique characteristics of any 1 year would not unduly influence the variables observed. These 3 years are representative of the 1990s in terms of net farm income.[7] Additionally, the Agricultural Credit Improvement Act of 1992 (P.L. 102-554) authorized the beginning farmer program. Starting sampling before FY 1994 would have resulted in a small sample of beginning farmers. Sampling later than FY 1996 would not have provided sufficient time to obtain a long-term view of borrower payback and exit behavior.

Sequential sampling was used. The sampling frame was ordered to provide proportionate loan type, gender, racial, geographical, and loan origination date representation. The predominant FSA borrower race and gender are white and male. Because white males were relatively so abundant, white males were sampled at a rate of 1 in 18 for OL and EM loans. All other gender and races as well as white males for FO loans were sampled at a rate of 1 in 9.[8] The FLMs responded to an online instrument over the secure FSA intranet, although some FLMs responded via fax because of difficulties saving the instrument electronically. Information on borrower demographics, assets, liabilities, and projected income at the time of the loan request, and loan status as of November 2004, were provided by the FLMs from the borrower

[7] For the 1990s, net U.S. farm income in 1996 was the highest, 1995 the lowest, and 1994 in between. U.S. Department of Agriculture. *Data Sets: Farm Income—Summary Totals for 50 States.* Internet site: www.ers.usda.gov/data/farmincome/50State/50stmenu.htm (Accessed May 19, 2005).

[8] Because of different sampling rates, all the statistical analyses are done using weights for the observations (Lohr). Because the two sampling rates were 1 in 18 and 1 in 9, the respective weights were two and one.

files, particularly the application and farm and home plan (forms FSA-410-1 and 431-2). Information on current FSA loan involvement and reasons for exiting the program (if the borrower had exited) were collected.

During FY 1994–1996, 34,026 OL, 3,083 FO, and 8,359 EM loans were originated. In the sampling frame, loans were grouped into one of five categories: (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). There were 2,715 usable responses after cleaning the data out of a sample of 3,004 for a 90% response rate.[9] There was good geographical, gender, loan type, and racial representation so that no particular cohort of interest was under- or overrepresented in the sample data. The survey instrument is available in Nwoha et al. (2005).

Borrower Demographics and Financial Characteristics

Basic borrower demographic data by loan assistance type are presented in Table 1. Operator age at loan origination is in the early to mid 40s 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 1.5 years. In the 1997 Census of Agriculture (USDA/NASS), the average farm operator age was 54.3, so FSA borrowers are distinctly younger than the overall farm population.

Mean years of farming experience range between 17 and 21 years for nonbeginning farmers. The 1997 Census of Agriculture (USDA/NASS) reports an average 23.9 years among all farmers for years on the present farm. As expected, beginning farmers have less farming experience than nonbeginning farmers do with means ranging between 5 and 6 years. Most borrowers are married, but the percentage of those who are married varies between 60% for non-SDA beginning farmers and 90% for EM borrowers.

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.

Borrower financial characteristics indicate that the surveyed farms, with average assets of $282,369 and average net worth $93,221, are weaker than the average U.S. farm ($441,000 in assets and $376,000 for net worth) for 1994–1996.[10] Moreover, the mean farm debt-to-asset ratio (0.71) for FLP participants is much higher than that for U.S. farmers (0.15) in general. These weak characteristics indicate the direct loans are going to financially stressed farmers as the program intends.[11]

Expected first-year gross receipts reflect operation size. The total-cash farm income (gross receipts) mean of $157,092 puts most of the sample farms in the National Commission on Small Farms' definition of small farms having less than $250,000 in gross receipts.[12]

[9] A response instrument was deemed usable even if it did not contain a response to every question asked.

[10] The U.S. farm data were obtained at U.S. Department of Agriculture. *Data Sets: Farm Balance Sheet—Data Files.* Internet site: www.ers.usda.gov/Data/farmbalancesheet/fbsdmu.htm (Accessed January 28, 2007).

[11] ARMS data for 2000–2003 show that FSA borrowers are generally financially weaker than other agricultural borrowers who meet general FSA eligibility criteria (Nwoha et al., 2007).

[12] 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. 17). See Internet site: www.csrees.usda.gov/nea/ag_systems/pdfs/time_to_act_1998.pdf. (Accessed January 28, 2007). Total cash farm income in the survey included other farm income, which we assume is included in the Commission's definition of receipts.

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

	OLREG[b]	OLBF	OLBFSDA	OLSDA	FOREG	FOBF	FOBFSDA	FOSDA	EM	Total
N (number of FY 1994–1996 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)[c]	1,218	318	102	287	73	169	33	28	487	2,715
Mean age (years)	44.24	29.20	35.39	45.50	41.08	29.37	34.03	41.42	45.80	41.66
Mean years in farming	20.42	5.22	6.40	19.12	17.36	5.32	5.03	16.89	20.97	17.32
Marital status (percent married)	87.10	60.10	74.00	79.00	80.90	59.70	87.90	83.30	90.00	82.10
Marital status (percent separated)	0.70	0.00	1.00	0.40	0.00	0.00	0.00	4.20	0.40	0.50
Marital status (percent unmarried)	12.10	39.90	25.00	20.60	19.10	40.30	21.10	12.50	9.60	17.40
Race (American Indian/Alaskan Native)[d]	0.21	0.32	14.95	11.84	0.00	0.00	21.20	17.90	0.24	1.60
Race (Asian/Pacific Islander)	0.00	0.00	5.61	3.29	0.00	0.00	3.00	10.70	0.12	0.50
Race (Black)	0.08	0.00	22.43	30.59	4.10	0.00	15.20	17.90	1.55	3.20
Race (Hispanic)	0.17	0.32	14.02	22.37	0.00	0.60	9.10	21.40	12.02	4.40
Race (White)	91.63	85.49	34.58	23.36	93.20	89.90	48.50	21.40	75.48	81.20
Race (other)	0.00	0.00	0.00	0.66	0.00	0.60	0.00	0.00	0.00	0.10
Race (unknown)	7.91	13.88	8.41	7.89	2.70	8.90	3.00	10.70	10.60	9.20
Gender (male)[e]	79.26	80.70	52.34	62.50	87.70	86.40	51.50	53.60	77.26	77.40
Gender (female)	0.92	1.12	39.25	26.32	4.10	0.60	42.40	25.00	2.38	4.30
Gender (family unit)	11.50	6.70	0.93	4.93	6.80	8.30	6.10	10.70	8.93	9.50
Gender (male owned organization)	2.29	1.28	0.93	0.66	0.00	0.60	0.00	0.00	2.98	2.00
Gender (female owned organization)	0.21	0.00	0.00	0.66	0.00	0.00	0.00	0.00	0.12	0.20
Gender (unknown)	5.83	9.89	6.54	4.93	1.40	3.60	0.00	10.70	8.33	6.60
Gender (public body)	0.00	0.32	0.00	0.00	0.00	0.60	0.00	0.00	0.00	0.10

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

[a] Number of loans (*N*) and number of observations (*n*) are unweighted. All other reported statistics are weighted.

[b] OLREG, OLBF, OLBFSDA, and OLSDA denote regular, beginning farmer, beginning farmer–socially disadvantaged, and socially disadvantaged operating loans, respectively; FOREG, FOBF, FOBFSDA, and FOSDA denote regular, beginning farmer, beginning farmer–socially disadvantaged, and socially disadvantaged farm ownership loans, respectively; and EM denotes emergency loans.

[c] Statistics in a given column may be based on fewer observations if there were missing values.

[d] Race is as reported on survey, and figures are the percentage for a given loan type.

[e] Gender is as reported on survey (as opposed to other FSA records), and figures are the percentage for a given loan type.

The surveyed borrowers rely on farm income because they have low levels of nonfarm income. For all borrowers, the mean nonfarm income is $14,156. However, the mean living expense is $19,141.

Termination Rates, Loan Duration, and Exit Types

Termination Rates

Loans can be terminated either by paying in full or defaulting. The percentage of loans terminated by November 30, 2004, was 80.1% (Table 2).[13] That 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—1 year and 7 years. Hence, all OL loan types in Table 2 are categorized by loan maturity length.

When the various OL and FO loans are combined, the aggregate termination rates are 84%, 51%, and 75% for OL, FO, and EM loans. The differences between these three rates are statistically significant for all three pairwise comparisons. It is clear FO loans had a lower termination rate than OL and EM loans, undoubtedly because of 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% because a loan in the sample could not have been originated after September 30, 1996. So all loans had at least 8 years to terminate and 16% of the OL loans did not. These loans have likely been restructured or consolidated.

Loan Duration

The median lengths of time to loan termination are also displayed in Table 2. As expected, OL loans have much shorter durations than FO loans. The median FO loan length will increase as more of these loans are paid back. A similar effect will occur with OL loans, but because 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 1-year loans are terminated, and 74% of 7-year loans are terminated. Given that all four OL 7-year loan types had medians less than 7 years, it is clear that many 7-year loans terminated early. The median lengths of OL 1-year loans are just about 1 year, indicating about half the loans were not repaid within the expected time.

Types of Exits

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.

The most frequent type of direct FLP exit by farmers (33.5%) was directly graduating to conventional credit without the transitional step of receiving assistance through the FSA guaranteed-loan program. Only 9.2% of those exiting the direct FLP used FSA guarantees. A larger percentage was expected because borrower creditworthiness likely improves gradually, direct loan borrowers should move to commercial credit as soon as they are able, and guaranteed loans can be viewed as a transitional step. 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 because these beginning farmers initially used the direct FLP and then graduated and continued farming with credit from conventional sources.

[13] The method of determining termination status almost surely underestimates the number of loans actually terminated because the loan may have been restructured as a new loan, and the original loan may not have been considered by the FLM to be paid in full or in default.

Table 2. Termination Percentage and Median Loan Length by Loan Type for FY 1994–1996 Sample

OLREG[a] 1 yr	OLREG 7 yr	OLBF 1 yr	OLBF 7 yr	OLBFSDA 1 yr	OLBFSDA 7 yr	OLSDA 1 yr	OLSDA 7 yr	FOREG	FOBF	FOBFSDA	FOSDA	EM	Total
n (number of observations)[b]													
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	45.21	53.57	51.52	46.43	74.76	80.12
(1.06)	(1.97)	(2.35)	(3.28)	(5.46)	(6.32)	(2.55)	(3.92)	(5.87)	(3.86)	(8.83)	(9.60)	(1.97)	(0.77)
Median time from FY 1994–1996 loan origination to loan termination (years)													
0.98	6.29	1.04	6.45	1.04	6.85	0.91	6.04	7.82	7.03	6.62	7.82	6.26	3.04
(0.01)[c]	(0.14)	(0.04)	(0.14)	(0.24)	(0.69)	(0.05)	(0.37)	(0.72)	(0.32)	(0.90)	(0.72)	(0.22)	(0.14)

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

[a] OLREG, OLBF, OLBFSDA, and OLSDA denote regular, beginning farmer, beginning farmer–socially disadvantaged, and socially disadvantaged operating loans, respectively; FOREG, FOBF, FOBFSDA, and FOSDA denote regular, beginning farmer, beginning farmer–socially disadvantaged, and socially disadvantaged farm ownership loans, respectively; and EM denotes emergency loans. The subtitles 1 yr and 7 yr denote loans with 1- and 7-yr maturities, respectively.

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

[c] Figures in parentheses are bootstrap standard errors.

Table 3. Type of Exit by Loan Type for FY 1994–1996 Borrowers Exiting the FSA Direct FLP by November 30, 2004

	OLREG[a]	OLBF	OLBFSDA	OLSDA	FOREG	FOBF	FOBFSDA	FOSDA	EM	Total
					Percent of loans[b]					
Continued farming and graduated to FSA-guaranteed credit	9.2	10.2	4.4	3.5	7.4	8.5	0	0	11.1	9.2
Continued farming and graduated to conventional non-FSA credit	33.3	33.4	22.2	29.2	40.7	62.0	33.3	11.1	31.6	33.5
Continued farming and no longer needed credit	7.6	6.8	2.2	13.3	11.1	11.3	8.3	22.2	16.2	9.6
Left farming voluntarily other than retirement	21.9	35.2	44.4	23.0	25.9	12.7	41.7	44.4	19.8	24.0
Retired from farming	8.9	2.0	0	14.2	7.4	0	0	11.1	6.9	7.2
Left farming involuntarily other than death	12.7	12.3	20.0	9.7	3.7	2.8	16.7	11.1	9.0	11.5
Left farming because of death	6.3	0	6.7	7.1	3.7	2.8	0	0	5.4	5.0
Total of exited borrowers[c]	536	148	43	104	27	71	12	9	217	1167

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

[a] OLREG, OLBF, OLBFSDA, and OLSDA denote regular, beginning farmer, beginning farmer–socially disadvantaged, and socially disadvantaged operating loans, respectively; FOREG, FOBF, FOBFSDA, and FOSDA denote regular, beginning farmer, beginning farmer–socially disadvantaged, and socially disadvantaged farm ownership loans, respectively; and EM denotes emergency loans.

[b] Figures are the percentage of borrowers exiting the direct FLP for a given reason by the loan type indicated in the column. All columns sum to 100% except for rounding error.

[c] 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.

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, 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. All together, 52.3% of exiting farmers graduated, i.e., continued farming without direct FLP assistance.

Borrowers left farming voluntarily for reasons other than retirement (24%) and for retirement (7.2%). Five percent of direct FLP exits were because of the farmer's death.

Only about 12% of exiting borrowers left involuntarily. The highest percentage of borrowers leaving involuntarily was for the OLBFSDA assistance type, but the percentage, 20%, has a large standard error, so the rate is no different from the others except for regular beginning FO farmers (FOBF). Rates of involuntary exit were higher for regular OL (OLREG) and OLBF than their FO counterparts but not significantly so. Rates for beginning farmers (OLBF and FOBF) were not statistically different from those for nonbeginning farmers within the OL (OLREG) and FO (FOREG) programs, respectively.

Table 3 provides percentages of exit outcome by loan type as of November 2004. Approximately 9 years since originating loans in FY 1994–1996 had elapsed by the time of the survey. Table 3 does not show the exit outcome 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 direct FLP by November 30, 2004. It is unlikely that exited borrowers who are currently in their fifties will become FSA borrowers again except for need of an emergency loan. Because 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 after 2004 will likely have fewer credit needs, fewer good nonfarm employment opportunities, and be more likely to retire than those who left before 2004.[14]

Overall, it is clear borrowers exited the direct FLP for a variety of reasons, and no one reason dominates. It is surprising that about 43% of borrowers 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., because of financial stress. The next section explores the impact of factors known at time of loan origination on the type of borrower outcome.

Logit Model Specification

A multinomial logit model is estimated to identify the relevant variables known at time of origination that are useful in explaining borrower 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.

The dependent variable is *STATUS* and identifies four borrower outcomes. *STATUS* = 1 identifies those borrowers who were still FSA debtors as of November 30, 2004. *STATUS* = 2 is assigned to borrowers who had exited the direct FLP and were still farming using guaranteed credit, conventional credit, or did not need credit. This category represents graduated borrowers—those who exited the direct FLP and were still farming. *STATUS* = 3 designates borrowers who had left farming voluntarily or retired. This grouping represents those who exited farming but not under duress. *STATUS* = 4 contains

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

those who left farming involuntarily for reasons other than death.[15] *STATUS* = 2 clearly denotes achieving FSA's graduation goal. whereas *STATUS* = 3 represents a distinctly different outcome. The reduction to four categories from eight (the seven borrower outcomes in Table 3 plus still being active in the direct FLP) reduces the number of parameters estimated and also provides four alternatives that satisfy the independence of irrelevant alternatives (IIA[16]), which more numerous categories might not.

The formula for multinomial models is well known (e.g., see Greene). 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.[17] Standard errors for these marginal probabilities are computed using the analytical framework for the continuous independent variables and a bootstrap method (Greene, pp. 924-25) for the binary independent variables.

The independent variables are those observed during the loan approval process. This is the only information FSA has when evaluating a potential borrower. Knowledge of events occurring subsequent to loan origination and before November 30, 2004, would provide more precise results for explaining current status. However, the available data are sufficient to address the purpose of identifying preorigination 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. Exact descriptions of the variables are 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 one if the loan has the particular characteristic. Also included is the number of weeks elapsed (*WEEKELAP*) since loan origination to 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 whether the borrower had been in receivership, received a bankruptcy discharge, or petitioned for bankruptcy reorganization before 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 is, therefore, 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 nonfarm debts and assets are included in the computation. It is expected that an increase in the *DA* increases

[15] Sixty-three loans had farmers who exited because of death out of the 2,705 loans whose exit status was reported. There was no natural category among the four created for deceased farmers so they were treated as missing observations. 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.

[16] The IIA implies none of the outcomes are close substitutes relative to the others. A more detailed discussion of IIA is given in Judge et al.

[17] 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 because 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. The exact formula for the probabilities is in Greene, p. 722. See Bentley and Wise for an application of marginal probabilities estimated from a logit model.

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 emergency 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	Nonfarm 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.

the likelihood of the farmer being financially stressed and continuing in the direct FLP longer. Net worth (*NETWORTH*) is computed as total assets less total liabilities in millions of dollars. The ratio of nonfarm 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.[18] 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.[19] Descriptive statistics of the logit model variables are provided in Appendix A.

[18] Diversification increases as *NFINTCFI* increases from its lower limit of zero.

[19] 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.

Table 5. Logit Model Marginal Probabilities of *STATUS* Selection

	Outcome			
Variable	*STATUS* = 1	*STATUS* = 2	*STATUS* = 3	*STATUS* = 4
Constant	0.7120**	−0.1760	−0.3897**	−0.1463**
AGE	−0.0036**	0.0001	0.0043**	−0.0008*
RACE	0.1626**	−0.1122**	−0.0721**	0.0218
FEMALE	0.0457	−0.0763*	0.0297	0.0009
FO	0.1371**	−0.0478	−0.0729**	−0.0163
OL	0.0184	−0.0301	−0.0013	0.0130
BF	−0.0824*	−0.0134	0.1068**	−0.0110
SDA	−0.0533	0.0179	0.0575	−0.0221*
FINDIS	−0.0878	0.0113	0.0336	0.0429*
WEEKELAP	−0.0009**	0.0005*	0.0002	0.0002**
NUMEM	0.0589**	−0.0265*	−0.0304**	−0.0020
NUMOL	0.0243**	−0.0338**	0.0070	0.0026
NUMFO	0.0716**	−0.0260	−0.0125	−0.0331**
DA	0.0697*	−0.1139**	0.0367*	0.0075
NETWORTH	0.0906	0.1852**	−0.1244	−0.1514**
NFINTCFI	0.0033	0.0146*	−0.0107	−0.0072
REPAY	0.0154	0.0075	−0.0175	−0.0053
TOTINC	−0.0583	0.0445	0.0033	0.0104
n	1,928			
χ^2	291			
p-value	0.00			

Source: computed.
*Significant at 0.05 level.
**Significant at 0.01 level.

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 using the Hausman test given in Greene. 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 58% of the observations are correctly classified, this is only one percentage point better than predicting that all of the observations are in the category of borrowers who still held active, direct loans. The problem is likely due to the disproportionate number of observations in this outcome category. 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 nondirect loan credit or no longer needed credit, 273 had voluntarily left farming, and 107 had involuntarily left farming.[20] 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

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

well-being of FSA borrowers as with any borrower involved in agricultural production. From 1994–2004, some years were generally good, and some were weaker—particularly those from 1998–2002—in terms of net farm income.

The statistically significant marginal probabilities generally have the anticipated signs. The category *STATUS* = 1 is of particular interest because 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 10-year difference would only alter the probability by 0.036. Nonwhite borrowers, as opposed to white borrowers, have a 0.16 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 because FO loans are longer term. Also, 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).[21] Interestingly, a majority of the FO borrowers are beginning farmers. However, independent of whether the loan was FO or OL, the probability of remaining in the program declines by 0.08 for a beginning farmer. Beginning farmers are likely younger farmers that may find that farming is not as attractive as other opportunities they could pursue.

Not surprisingly, the longer the time since loan origination (*WEEKELAP*), the less likely it is that a borrower is still in the program. This indicates that borrowers tend to leave the direct FLP with the passage of time. Nonetheless, some borrowers undoubtedly do stay for long periods. 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 direct FLP would be 0.12 higher than the probability of a borrower originating a new loan with no other active direct loans. 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 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 the 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 0.69. For an increase in *DA* from 0.3 to 0.6, the probability of staying in the direct FLP would increase by 0.02. Repayment ability is not significant as a reason for not exiting or for any of the exit types. This may be because all borrowers have to show ability to repay as a requirement for obtaining the loan.

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. Number of outstanding OL and EM loans at origination, *DA*, and *RACE* have a negative effect, and *WEEKELAP* has a positive effect, on graduation, which is consistent with findings on the probability of remaining in the direct FLP (*STATUS* = 1) because the signs are opposite. The significant negative signs on *NUMOL* and *NUMEM* indicate more direct loan involvement decreases the likelihood of graduating from the direct FLP. Increased relative solvency (lower *DA*) 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 nonfarm income to total cash farm income at loan origination (*NFINTCFI*), the

[21] Thirty-eight percent of the FO loans in the sample were FO down-payment loans. Although all FO down-payment loans go to beginning farmers, the majority of the beginning farmer loans were OL loans, which had higher interest rates than FO down-payment loans.

greater is the likelihood of graduating. So, relative solvency, equity, and nonfarm income are indicators of likely program success. *RACE* is a significant variable, and it is negative. The effect is substantial because the estimated probability, −0.1078, indicates that being a member of a nonwhite racial group means the probability of graduating declines by nearly 0.11. Being female indicates a lower probability of exiting and continuing farming. Finally, the longer the time from origination (*WEEKELAP*), 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 lucrative, lifetime job alternatives to farming might leave early. However, that 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. Both these differences are statistically significant at the 0.01 level. The probability of BF recipients exiting voluntarily is higher by 0.11 than for their non-BF counterparts.

Having more EM loans at loan origination is negatively associated with voluntarily leaving farming. Farmers already saddled with debt via 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 because such farmers were in weaker financial condition at the beginning of the loan and may subsequently decide 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. Number of FO loans at origination is negatively related to leaving 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 because of FSA policies.[22] 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 to other types of assets; therefore, farmers are more likely to do more to keep from losing their farmland. Thus, a borrower with multiple FO loans and, perhaps, more farmland equity because of increasing farmland prices over the period, is less likely to leave involuntarily. The coefficient on 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 amounts of farm versus nonfarm income as the non-SDA farmers. Perhaps because SDA farmers 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 before 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

[22] To qualify for an FO loan, the borrower must own (or purchase) their farm, which is not a requirement for OL or EM loans. Moreover, 70% of FO direct loan funds are allocated to beginning farmers, and one qualification for an FO beginning farmer loan borrower is 3 years of farming experience.

bankruptcy actions) indicates a 0.04 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 those loans had exited from the direct FLP and the reasons for exiting.

Of the sample loans that originated in FY 1994–1996, 80% were terminated (paid or otherwise settled) by November 30, 2004. Time to termination varied with the loan type. OL loans and EM loans were terminated earlier and at a higher 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.

A larger issue for FSA is whether borrowers simply pay back one loan and then originate another. For the majority of borrowers sampled, that was not the case. Fifty-five percent of the unique originators in the survey had exited by approximately 9 years after origination. Some borrowers likely stay with FSA for a long time, but that 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 the loans had borrowers who left the FSA direct FLP and continued farming (graduated), and only 18% of those used FSA-guaranteed credit as a transition to conventional credit. Increased effort by FSA to get direct loan borrowers to use guaranteed loans more frequently might increase graduation rates. Perhaps even more surprising is that 18% of the continuing farming group continued farming without any credit at all. Only 12% of the loans had borrowers who left farming involuntarily other than death. These results suggest that direct loans let people try farming with some subsequently voluntarily leaving farming and some going on to farm successfully without a direct FLP loan. But relatively few are forced out of farming.

The estimated logit model suggests that borrowers with larger numbers of active FSA direct loans at loan origination are less likely to exit the direct FLP. Those with fewer FSA direct loans are more likely to exit and continue farming or to leave farming voluntarily. Number of FSA loans outstanding at origination likely indicates a weakened financial state and the need to use FSA as a lender of last resort. Scrutiny of loan applications for borrowers who already have a large number of direct loans may increase graduation rates.

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 and increased the likelihood of leaving farming voluntarily. Higher net worth at origination made graduation more likely and leaving farming involuntarily less likely. Financial difficulties before loan origination increased the likelihood of exiting involuntarily. These results suggest stronger credit standards related to loan applicants' prior and current financial information may be developed to improve graduation and involuntary exit rates.

Nonwhite borrowers were less likely to graduate or to leave farming voluntarily. These borrowers may have fewer alternative credit sources or career opportunities, indicating a potential market failure, which public

programs such as FSA are designed to address (Ahrendsen et al.). Borrowers of BF loans were more likely to exit farming voluntarily. A borrower with a socially disadvantaged loan was less likely to exit involuntarily, and females were less likely to exit the FLP and continue farming. This suggests SDA loans are less risky than other loans. FO borrowers were less likely to exit the direct FLP or to leave farming voluntarily, and low interest rates may abet such behavior. Also, the higher experience and land ownership requirements for FO borrowers suggest that similar requirements for OL and EM borrowers might be worth considering in an effort to decrease the likelihood of loan recipients leaving farming.

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, which is 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 that change must be balanced against excluding those who are the intended beneficiaries of the FSA direct FLP.

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Appendix. Descriptive Statistics of Logit Variables (Weighted)

Variable	Mean	SD	Min	Max
STATUS = 1	0.56	0.50	0	1
STATUS = 2	0.24	0.43	0	1
STATUS = 3	0.15	0.35	0	1
STATUS = 4	0.06	0.23	0	1
AGE	41.18	12.43	17	85
RACE	0.09	0.29	0	1
FEMALE	0.05	0.21	0	1
FO	0.08	0.26	0	1
OL	0.75	0.43	0	1
BF	0.20	0.40	0	1
SDA	0.07	0.25	0	1
FINDIS	0.06	0.23	0	1
WEEKELAP	505.60	46.49	425.14	579.71
NUMEM	0.44	1.02	0	11
NUMOL	1.50	1.74	0	15
NUMFO	0.47	0.83	0	8
DA	0.69	0.50	0.00	10.03
NETWORTH	0.11	0.19	−0.67	3.02
NFINTCFI	0.40	1.55	0.00	40.89
REPAY	1.15	1.28	0.12	65.85
TOTINC	0.05	0.16	−0.14	8.86