Evaluating FSA loan program's ability to serve credit-constrained agricultural producers

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INTRODUCTION

USDA's Farm Service Agency (FSA) lending programs provide loans to qualifying family farms that otherwise would be unable to access commercial loans at reasonable rates and terms. Evaluation of these programs is key in ensuring that they are serving farmers and ranchers. As outlined in the Foundations for Evidence-Based Policymaking Act of 2018, this task is complicated by data quality, data availability and external factors including large datasets spread across multiple systems, lack of data collected for certain key measurements or collected sporadically, lack of access to data on the farm population as a whole, and the need to account for external factors impacting the agricultural industry and credit markets (Congress, 2019).

This paper presents the initial findings of an ongoing project to evaluate the effectiveness of FSA loan programs in achieving the goal of serving family farms otherwise unable to obtain credit. A unique approach is used to evaluate FSA loan programs given the constraints noted above. By utilizing administrative data from FSA Farm Loan Programs (FLP), along with statistical data from other USDA data sources (ARMS survey data from the Economic Research Service and National Agricultural Statistics Service), we can evaluate the degree to which FLP guaranteed and direct loan programs are meeting the needs of U.S. small farms, credit constrained farms, beginning farmers, and Socially Disadvantaged (SDFR) farmers and ranchers. In addition, we broaden this analysis to include populations highly likely to be underserved in the traditional agricultural credit market.

The evaluation compares the number of FSA borrowers to the population of U.S. indebted farm operators falling within specific categories, as well as additional categories where FLP would be expected to have a greater presence. Specifically, we calculate a measure of market penetration defined as the ratio of the number of FLP borrowers to the total number of indebted U.S. farms. Initial results indicate that FSA direct borrowers had the greatest presence among small family and mid-sized farms, single operator beginning farmers, those with greater financial stress, and racial-ethnic minority producers. FLP direct borrowers were also a greater share of farms with principal operators under 34 years old and those located in regions of persistent poverty. Guaranteed borrowers had the greatest market penetration among mid-sized and large family farms, large single operator beginning farmers and multigenerational beginning farming operations, and those with moderate financial stress. Also, a greater share of farms with principal operators less than 34 years old and between 35-44 years old were found to be guaranteed borrowers.

These initial results will be used to drill down further to examine trends in FSA participation by time, loan type, region, borrower type, and other categories as well as interactions across categories. Differences in financial measures among FSA borrowers between programs will also be examined and quantified. Such research will shed light on the similarities and differences between FSA borrowers and the overall indebted farm population as well as the impact that changes and outside forces have on each. The goal is to provide insights that will be useful to Congress and USDA in designing and modifying farm loan programs.

FSA LOAN PROGRAMS

Government intervention in agricultural lending has been justified due to credit barriers stemming from issues such as asymmetric information between borrowers and lenders, lack of competition in rural areas, insufficient lending resources, and the desire to target lending towards disadvantaged groups (CRS, 2022; Dodson and Ahrendsen(A), 2016). Without intervention, certain producers may experience barriers to obtaining the essential capital they need to enter farming, maintain annual operations, weather downturns, and to modify, update, or expand operations. Those adversely impacted most often are beginning or young farmers without credit histories or collateral, small- and mid-sized family farms without sufficient household income to meet both family and farming expenses, racial and ethnic minorities, and other groups (Dodson and Ahrendsen, 2016; Dodson and Ahrendsen(A), 2016; Ahearn, 2011).

FSA's FLP helps assure that creditworthy family farms have access to loans at reasonable rates and terms. In addition to being a creditworthy family-size farm, a qualified applicant must demonstrate the necessary skills and knowledge to effectively manage a farming operation, have good credit and no previous debt forgiveness on any federal debt, and demonstrate a feasible business plan among other things (Dodson and Ahrendsen, 2016).

FSA's FLP is administered through two distinct delivery mechanisms: a direct and a guaranteed program. Direct loans are made and serviced by FSA. Interest rates are set periodically according to government borrowing costs. Guaranteed loans are made and serviced by lending institutions and guaranteed by FSA, typically between 90-95 percent of the loss of principal, interest, and qualifying fees in the case of borrower default. Interest rates are set by the lender but are subject to a maximum cap established by USDA. Lenders must apply for and comply with USDA's guaranteed lending rules to participate.

The guaranteed and direct programs are split between real estate and nonreal estate types. Real estate loans are administered through the farm ownership (FO) program and nonreal estate through the operating loan (OL) program, each with different loan limits, term lengths, and allowable uses. FO loans terms vary but never exceed 40 years. They may be used to purchase or enlarge a farm or ranch, erect, or improve buildings, implement soil and water conservation measures, pay closing costs, and refinance allowable debt. OL terms range from between 1-7 years and may be used to purchase livestock, poultry, farm equipment, feed, seed, fuel, fertilizer, chemicals, insurance, other operating costs; for borrower training costs; and to organize and refinance allowable debt. The maximum loan limits vary by program and purpose, with direct loans having lower limits than guaranteed and OLs having lower limits than FO loans.

Guaranteed and direct loans serve different roles. The guaranteed program primarily addresses credit market failures arising from informational asymmetries between lenders and borrowers (Dodson and Ahrendsen, 2016). As a result, guaranteed loan programs are expected to have greater presence in regions with greater farm financial stress, lower per capita incomes, fewer agricultural lenders, and greater presence of young and beginning farmers. Direct loan programs address concerns arising from barriers to entry, which may result in difficulties in entering farming or expanding operations (Dodson and Ahrendsen (A), 2016). As a result, the FSA direct program has a relatively stronger presence (compared to guaranteed and other types of loans) for new or beginning farmers, racial-ethnic minorities, women, and veterans. A portion of loan funds are reserved for beginning farmers and ranchers at the start of the fiscal year until April 1st. In FY2022, 50 percent of direct operating, 75 percent of direct farm ownership and 40 percent of guaranteed loans (both operating and farm ownership) were reserved for beginning farmers and ranchers (Monke, 2022). Targets are also established for socially disadvantaged farmers and ranchers (SDFR) based on the local demographic information (Monke, 2022).

While the dollar value of direct and guaranteed farm debt represents only 3 percent and 4 percent, respectively, of all outstanding farm credit in the U.S., FSA credit programs serve as an important credit source for small and midsized family farms who are unable to obtain credit elsewhere (Monke, 2022)[1].

[1] These estimates are based on Congressional Research Service calculations using the FSA FY2021 loan volume estimates, $14.8 billion direct loan portfolio and $17.6 billion guaranteed loan portfolio, and $441 billion market in farm debt estimate. The figures we calculate later are based on number of borrowers (not loan volumes), are an average over the 2013-2021 time period (not a single year) and use ARMS survey data as their source. Both are correct but measure different things. This is the most recent published estimate of loan volume market share.

FSA is often referred to as *a lender of last resort* for many family-sized small farms, due to its unique role in both providing credit to farmers and ranchers when they are unable to obtain credit elsewhere or without an FSA guarantee. Due to the statutory requirement that certain levels of funding be targeted to certain categories of farmers and ranchers, direct loan programs serve as a *unique mode of entry* and *lender of first opportunity* into agricultural credit for beginning farmers and ranchers, SDA producers, and others (Monke, 2022; Fiechter et al, 2023; Farnsworth, 2017; USDA FSA, 2022). As an illustration of the importance of direct loans to certain groups, 60 percent of direct borrowers and 45 percent of guaranteed borrowers in 2022 identified as SDA farmers and ranchers (Monke, 2022). These direct and guaranteed loans are intended as a pathway for credit-constrained growers to graduate to commercial credit (Farnsworth, 2017). Through monitoring, education, and loans, borrowers are assisted in moving out of direct/guaranteed loans and into commercial lending. Through this mechanism, FSA direct and guaranteed loan programs serve as a *unique mode of entry* into commercial credit.

EVALUATION OF IMPORTANCE AND ROLE OF FSA LOAN PROGRAMS

The first step in evaluating the performance of FSA loan programs is to identify the population they serve and their characteristics. Various studies have done this, including Dodson and Koenig (2001), Dodson and Koenig (2003), and Nwoha et al. (2007).

Any solid analysis evaluates how the population of borrowers aligns with the population which the programs are intended to serve. Dodson and Koenig (2001) employed a regional-level analysis to do this. Using a probit regression on 1997 Census of Agriculture data and matched FSA borrower identifiers, they examined the share of FSA direct operating and farm ownership loans by county relative to the share of targeted borrowers in each county. They found no statistically significant correlation between the presence of high levels of beginning farmers or women producers in a county and FSA direct loan levels. However, their analysis covered a period before programs were heavily targeted to beginning and SDFR groups. They did find a strong correlation, though, between FSA loan demand and counties with higher-than-average levels of racial and ethnic minorities, fewer guaranteed FSA borrowers, greater share of farms with debt, and highly farming dependent counties.

Quantifying the degree to which the intended and served population match is also a key part of effective program evaluation. One approach is to measure the share of program participants as a percentage of a given total population. Two methods commonly used to do this are market penetration and market share. Market penetration measures the number of program participants divided by the size of the total

population. Market share measures the dollar value of program participants in a given category divided by the dollar value of the total category or program[2].

Using the first approach, Nwoha et al. (2007) calculated the level of market penetration for direct loans among the targeted populations of small farms, beginning farmers and SDFRs between 2000-2003. To calculate market penetration among all eligible borrowers, data on new FSA loans issued by year and 2002 Census of Agriculture data were employed. To calculate market penetration among all farms with debt, data for all borrowers with an outstanding direct FSA loan by year and annual ARMS survey data between 2000-2003 was employed. They found that market penetration was much larger when looking at existing share of farm debt compared to new loans among eligible borrowers. Their results indicated that FSA market penetration was greater in regions with a larger share of SDFR borrowers, though the results varied widely among regions.

Other studies focused on single segments of targeted populations. Using ARMS data merged with USDA-FSA data on direct and guaranteed loans outstanding as of 2014, Dodson and Ahrendsen (2016) examined the share of small farms served by FSA loans in 1997, 2004, and 2014. They found that between 1997 and 2014, direct loan programs have serviced more small family-sized-farms (less than $100,000 in production) while guaranteed lending has shifted more towards large family-sized farms (over $500,000 in production). This is in part due to the differences in targeting levels set, loan limits, and credit threshold differences among the two programs.

Using a similar dataset, Dodson and Ahrendsen (2016) analyzed the share of beginning farms served by FSA loan programs across different categories compared to the share of total indebted beginning farms within these classifications. They found that while providing a small share of total debt in the aggregate (< 6 percent), FSA served 14 percent of all beginning farms through direct and guaranteed loans. Smaller (less than $100,000 in value of farm production) beginning farmers had a greater presence in direct loan programs while more than one in four large ($1 million or more in farm production) beginning farmers had a direct or guaranteed loan.

[2] The units used to determine market penetration differ between the numerator and denominator. The numerator represents FSA program borrowers while the denominator is NASS farms. A farm may include multiple borrowers and a borrower may be involved in several farms. Likewise, it is possible some new entrants that receive FSA loans may not yet meet the NASS farm definition. Thus, the ratio is not limited by 0 and 1. Market share is the share of total farm debt outstanding held by FSA and cannot exceed 100 percent.

Most recently, Ahrendsen et al. (2021) measured FSA market penetration for beginning farmers and SDFR groups. Using ARMS data and merged FSA data, as well as Census of Agriculture data from 2012 and 2017, they evaluated the changes in both market penetration as well as in the characteristics of these groups in 2012 compared to 2017. They found that beginning farmers and ranchers were more likely to use credit in general, and FSA programs in particular, compared to SDFR groups. They also found that among SDFR borrowers, FSA programs had a significant presence.

Most of these studies cover a limited number of years and exclude more recent years. Many focus on either a specific loan program or targeted borrower category. Our study attempts to update these results to recent years and cover additional categories or indicators of targeted and credit-constrained population usage of both direct and guaranteed loan programs. Future work should consider time trend properties, interaction between categories, and differences in measures of financial health between FSA borrowers and all indebted farms. We hope to examine both changes in patterns (as well as lack of change in patterns) and how these changes correspond with changes in overall U.S. farm economic conditions. This future work will be discussed later.

DATA

Data for this study are primarily from the Farm Business and Farm Household Information data component of the Agricultural Resource Management Survey (ARMS). ARMS is an annual survey of farm operators regarding cropping practices, farm businesses metrics (including income, expenses, assets, debts, structure, location), and household descriptive information. It provides USDA's primary source of information on the financial condition, production practices, and resource use of America's farm businesses and the well-being of America's farm households (ARMS Data User Guide).

The survey is a multiphase, multi-frame, stratified, probability-weighted annual survey of farm operators within 48 U.S. states. Phase III is a nationally representative sample of farmers which obtains information on the cost and returns during the given survey year (from January 1st to December 31st of the given year or as of December 31st of the given year). Data are collected at the whole farm level.

To first identify FSA borrowers, we generated a list of identifiers for both existing and new FSA direct and guaranteed borrowers by year between 2013-2021 using the FSA administrative loan data. This list was provided to NASS, who matched the unique USDA customer identifiers of these borrowers with those who participated in the ARMS survey. Within the secure government data access sharing portal

(referred to as the Administrative Data Research Facility (ADRF)), the list of FSA borrowers and their unique USDA customer identifier and ARMs survey identifier was provided, along with the ARMS survey data for 2013-2021. The ARMS data were then merged by survey year with the list of FSA borrowers with an outstanding balance on any FSA loan as of December of the same survey year. This included any outstanding direct or guaranteed loan. If the borrower received a direct loan or had an outstanding direct loan balance during the year, they were counted as a direct borrower during that calendar year. Each borrower with an outstanding direct loan was only counted once regardless of the number of outstanding direct loans they possessed. The same procedure was used for guaranteed borrowers. Borrowers having both direct and guaranteed loans were counted once in each category if they had either type of outstanding loan balance and once in the category "both" referring to those borrowers with both outstanding direct and guaranteed loan balances. Additionally, borrowers with only direct or only guaranteed loans were identified. The total number of weighted observations by year and debt status are provided in Table 1.

Table 1: Number of Representative Farms in Sample by Year and FSA Loan Type[3]

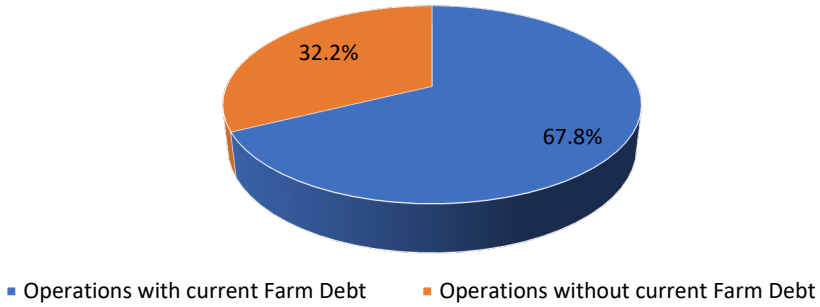
Year	Indebted farms	Direct loan only	Guaranteed loan only	Both direct and guaranteed loan
2013	682,126	61,120	43,731	12,369
2014	688,366	51,447	44,998	13,990
2015	689,936	64,311	49,419	13,732
2016	689,126	61,648	45,853	12,414
2017	694,520	61,836	52,290	16,611
2018	674,108	54,337	39,541	10,542
2019	629,788	60,813	40,107	11,815
2020	603,664	54,337	37,966	10,963
2021	571,048	51,513	39,300	11,573

Source: ARMS survey data for years 2013-2021 and matched FSA-ARMS unique identifiers. ARMS expansion weights applied.

[3] The methodology applied to estimate FSA borrowers in Table 1 uses the subsample of FSA borrowers by loan program type in the ARMS survey each year times the ARMS farm expansion weights. The resulting total number of borrowers listed here may not necessarily add to the totals reported in USDA FSA administrative data, and in particular for direct loan program participants. There are multiple possible reasons for this discrepancy. One is that ARMS weights, which are based on production and farm numbers, may not align directly with debt usage numbers. Another reason is that the ARMS survey may be missing some populations of the smaller farms in the FSA cohorts, resulting in the underestimation of FSA direct borrowers. Guaranteed estimates generated in Table 1, which tend to cover on average larger farms with higher overall debt levels, appear to align more closely with the overall FSA administrative data totals.

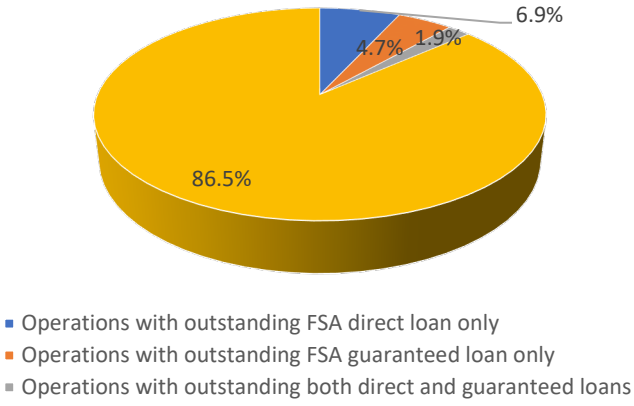
According to the ARMS data, on average between 2013 and 2021, 32 percent of farms had some level of outstanding farm debt as of December 31st of the given survey year (Figure 1). Of farms with outstanding farm debt, 14 percent had some type of FSA direct or guaranteed loan, with 7 percent having only a direct loan, 5 percent a guaranteed loan, and 2 percent having both a direct and guaranteed loan (Figure 2).

Figure 1. Percent of U.S. Farm Operations with Current Farm Debt at Year End, 2013-2021.



This is the percentage of U.S. farms with outstanding farm debt as of December 31st of the given survey year. Average over the 2013-2021 time period.

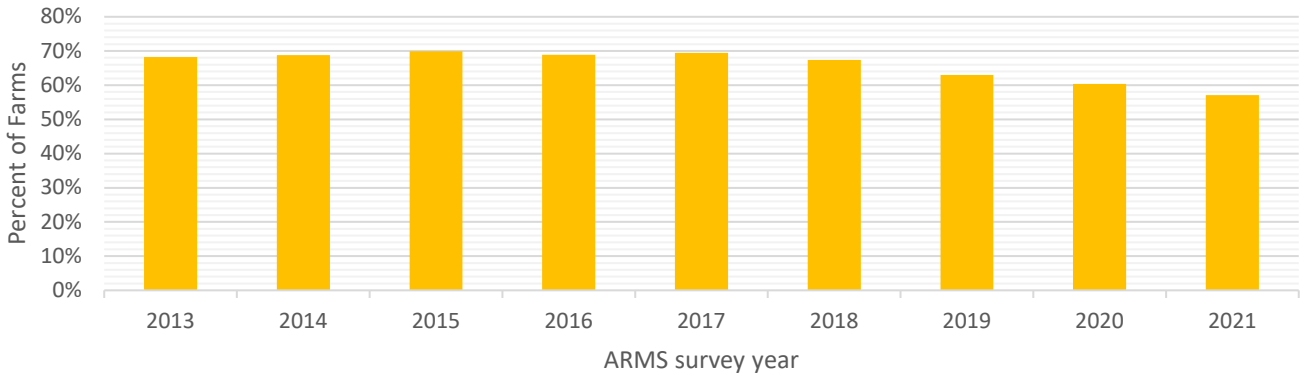
Figure 2. What percent of indebted farms had an outstanding FSA loan between 2013-2021?



This figure shows of the 32.2% of farm operations with current farm debt at yearend, what percent had an outstanding FSA loan (by type of loan) and those that had outstanding debt but no outstanding FSA farm loan. Operations were counted once if they had at least one outstanding direct or guaranteed loan, regardless of the number or balance of other loans.
Source: Source: ARMS survey data years 2013-2021 and FSA-USDA Identifiers. Farm expansion weights used.

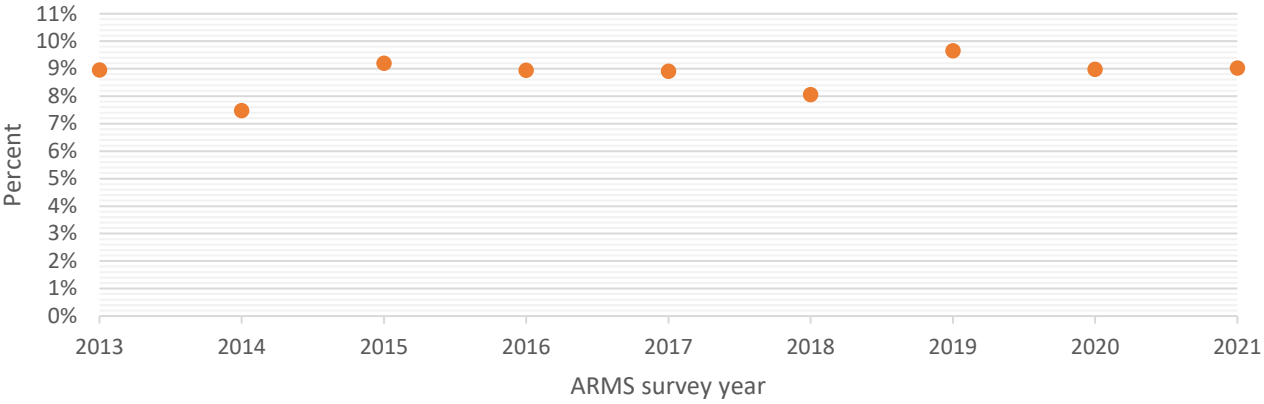
Using the ARMS survey data (sampled farms times farm expansion weights), results in a noticeable decrease in the number and share of farms with debt after 2018 (Table 1 and Figure 3). The number of FSA borrowers surveyed in the sample (matched respondents times farm expansion weights) also decreased over the same time period across both direct and guaranteed loans. The number of primary operators with an outstanding FSA direct or guaranteed loan, as a percent of total indebted U.S. farms, held relatively steady (Figures 4 and 5). It appears that the number of primary operators with a direct loan, as a percent of all indebted U.S. farms, had a slight uptick right after 2018, while the number of primary operators with a guaranteed loan as a percent of all indebted U.S. farms has decreased slightly right after 2018. These results are tentative and further research will examine these trends in greater detail.

Figure 3. Percent of All U.S. Farms with Outstanding Farm Debt at Yearend, 2013-2021



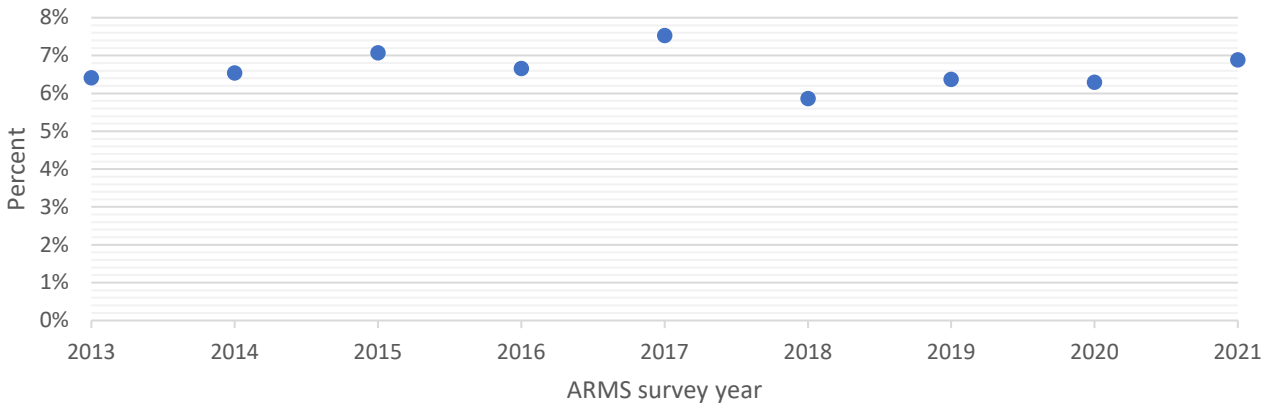
This figure shows The percent of U.S. farms with outstanding farm debt as of December 31st of each survey year.
Source: Source: ARMS survey data years 2013-2021. Farm expansion weights used.

Figure 4. FSA Direct Borrowers as a Share of Indebted Farm Operators, 2013-2021



This figure shows the number of primary operators surveyed in the ARMS with an outstanding FSA direct loan in December of each survey year as a percent of all indebted U.S. farms that survey year.
Source: Source: ARMS survey data years 2013-2021 and USDA-FSA Identifiers. Farm expansion weights used.

Figure 5. FSA Guaranteed Borrowers as a Share of Indebted Farm Operators, 2013-2021



This figure shows the number of primary operators surveyed in the ARMS with an outstanding FSA guaranteed loan in December of each survey year as a percent of all indebted U.S. farms that survey year.
Source: Source: ARMS survey data years 2013-2021 and USDA-FSA Identifiers. Farm expansion weights used.

METHODOLOGY

This study compares specific metrics for FSA borrowers to all U.S. farm operations with farm debt between 2013-2021. We choose to focus only on farms in this study that reported some level of debt on the ARMS survey. As explained in Dodson and Ahrendsen (A) (2016), excluding farm operations without farm debt allows for comparisons of FSA borrowers to that of the subset of all farm operators with farm credit.

Using ARMS responses as well as NASS variables and classifications, a set of farm classifications were chosen to proxy the distribution of farmers within given FSA targeted populations, including beginning farmers, socially disadvantaged farm operators, and small-sized family farms. Additional classifications were also employed based on those that either the literature or past studies have shown to be linked with FSA targeted populations. Finally, categories potentially linked to farm or operator characteristics that might indicate difficulty in obtaining farm credit were also included.

The resulting classifications are farm size, beginning farmer status, FSA credit rating, SDRF status, crop vs. livestock farm, age, limited resource farm, and regional classifiers including being in a persistent poverty county, in a county with a large Native American, Black or Hispanic population, and counties in which farming is the primary occupation. These classifications are further defined and explained below.

Farm Size

Farm size classifications are constructed using the ERS farm typologies. The ERS defines a farm as *any place that, during a given year, produced and sold—or normally would have produced and sold—at least $1,000 of agricultural products* (Whitt et al., 2023). The updated farm typology focuses on family farms, defined as *a farm in which the majority of the business is owned by an operator and/or any individual related by blood, marriage, or adoption including relatives not living in the operator's household* (Whitt et al., 2023). Within this framework, farms are classified based on ownership of the farm, annual gross cash farm income, and primary occupation of the principal operator.

Starting with the ERS farm typologies, farms are grouped first based on the primary occupation of the primary operator. If the primary operator's occupation is not farming (retired or other occupation), they were classified as part-time farms. The remaining farms were then split by family farm vs. nonfamily farms. Those that do not fit the family farm operation were classified as non-family farms. Finally, family farms were split based upon income level into small farms (less than $150,000 in annual cash farm income (GCFI)), midsized family farms (between $150,000-$350,000 GCFI), and large family farms (more than $350,000 GCFI). Farm size classifications are summarized in Table 3.

Table 2. Farm Size Classifications

Classification	Farming primary occupation?	Annual Gross Cash Farm Income	Ownership
Part-Time farms	No	----------	----------
Small family farm	Yes	<$150,000	Family farm
Mid-sized family farm	Yes	$150,000 -350,000	Family farm
Large family farm	Yes	>$350,000	Family farm
Non-family farm	----------	----------	Nonfamily farm

Beginning Farmer Status

USDA defines a beginning farmer or rancher (BFR) as *an individual who has not operated a farm or ranch for more than 10 years* (CRS, 2023). The ARMS survey identifies a single primary operator[4] (producer) and collects additional information on up to three additional operators. For this study, a farm was considered a beginning farmer operation if any of the operators (including spouses) were a beginning farmer. Using this definition, beginning farms were categorized as single operators (not including spouses) and multiple operators (those with more than one operator listed on the arms survey). Next,

[4] This differs from the Census, which allows for more than 1 primary operator.

single beginning farm operations were divided based on income level into small single operators (less than $100,000 GCFI) and large single operators (greater or equal to $100,000 GCFI). Finally, multiple operators were split into multigenerational and non-multigenerational categories. This allows us to proxy farms in which the operation was passed between generations since familial relationships are not indicated in the ARMS. Multigenerational farms are those where at least one of the operators was a generation older or younger than the other operators and are defined as farms where the spread in age between at least one of the operators was equal to or greater than 20 years. Beginning farmer categories are summarized in Table 3.

Table 3. Beginning Farmer Classification Categories

Classification	Years farming	Number of operators	Annual Gross Cash Farm Income	Largest age span between all operators
Small single operator	<= 10 years	1	<$100,000	
Large single operator	<= 10 years	1	>= $100,000	
Multigenerational multiple operators	<= 10 years	>1		>20 years
Non-Multigenerational multiple operators	<= 10 years	>1		<= 20 years

FSA Credit Classification Ratings

For loan decision making, monitoring, and graduation to commercial credit, FSA uses multiple measures and tools. One tool is the FSA credit classification rating.[5] This rating evaluates the borrower based on four financial measures commonly used by commercial banks: asset-to-debt ratio, return-on-assets ratio, current ratio, and term debt coverage ratio. Each of these metrics is given an individual rating from 1-4 based on their level (or 1-5 for term debt coverage ratio). The rounded average of these individual ratings is used to calculate an overall farm-level FSA credit classification rating. Using this rating, farms are grouped into four ordinal categories: marginal (4), acceptable (3), standard (2) and commercial (1). Farms are more creditworthy according to typical bank criteria as they move down in value from marginal (4) to commercial (1).

[5] THIS IS NOT AN OFFICIAL FICO CREDIT SCORE, rather a means to monitor the financial health of borrowers and the FSA loan portfolio. It is used as a tool to assist loan officers best serve and ensure the success of borrowers. See paragraph 251 of the FSA Handbook: https://www.fsa.usda.gov/Internet/FSA_File/1-flp_r01_a260.pdf

The ARMS survey data either provide these ratios or the data to calculate them. To determine the FSA credit classification rating for each farm, financial ratios were first calculated. These financial ratios were subsequently used to estimate the overall FSA classification rating. Finally, the overall FSA classification ratings were grouped into four categories to evaluate farms based on commercial credit qualification ability (Table 4). Commercial farms (FSA credit classification rating <2.0) are those that either currently or will shortly be likely to qualify for commercial credit. Acceptable/Marginal farms (FSA credit classification rating >3.0) are those whose financial characteristics would suggest less ability to qualify for commercial credit relative to other classification ratings. Farms between these two measures were split into a High Standard (FSA credit classification rating between 2.0 and 2.49) and a Low Standard (FSA credit classification rating between 2.5 and 2.99) category. Farms classified as such would exhibit some credit shortcomings which would reduce their ability qualify for commercial credit.

Table 4. FSA Credit Classification Rating Categories

Account Classification	FSA credit classification rating	Ability to obtain commercial credit
Commercial	<2.0	High
High Standard	2.0-2.49	Medium
Low Standard	2.5-2.99	Medium
Marginal/Acceptable	>=3.0	Low

4.0 is the upper bound. A score of 5.0 is used for loans that are not classified, such as Youth or Non-Program loans. Due to sample size limitations, the acceptable and marginal categories were combined.

SDFR status

An SDFR is defined as a farmer or rancher *whose members have been subjected to racial or ethnic prejudice because of their identity as members of a group without regard to their individual qualities* (CRS, 2023). Within FSA loan programs, this category includes operations where at least one operator is either part of a non-white racial or ethnic group and/or a woman. The ARMS collects information on the race, ethnicity, and gender of the primary operator and up to three additional operators. Race is collected across five categories: white, black or African American, American Indian or Native American, Asian, Native Hawaiian or other Pacific Islander. Ethnicity is collected for Hispanic vs. Non-Hispanic. Gender is classified as either male or female.

SDA status was defined using both the race and ethnicity classifications of all four operators and the gender classification of the primary operator. The first step was to identify SDFR based on race and/or Hispanic status (SDFR race or Hispanic). If any of the operators identified a race other than white or unknown, or Hispanic ethnicity, they were classified as SDFR race or Hispanic. The next step was to

identify SDFR based on gender (SDFR gender). Farms were classified as SDFR gender if the primary operator reported female as the gender. SDA was any operation who identified as either SDFR race or Hispanic or SDFR gender. SDFR farms included any farm that fell under the SDFR ethnic or SDFR gender classification. Measures are provided across SDFR race or Hispanic, SDFR ethnic, and SDFR. This is because, given the significant share of U.S. farm operators who are female, comparing only SDFR status without looking at the racial and gender components could mask significant differences within these individual categories. [6] The SDFR classification categories are provided in Table 5.

Table 5. SDA Classification Categories

	Race or ethnicity	Gender of primary operator	Either nonwhite, Hispanic or female?
SDA race or Hispanic	Nonwhite for any single operator	----------	
SDA gender	----------	Female	
SDA	----------	----------	Yes
Non-SDA	White for all operators	Male	No

Commodity Type

The ARMS data provide the value of annual gross cash farm sales in the given survey calendar year broken into crop sales, livestock sales, and total sale, which were used to split farms into livestock or crop farms. Farms are classified as crop farms if 50 percent or more of their value of production is derived from crop sales in that given calendar year and livestock farms if 50 percent or more of their value of production was derived from livestock sales. To determine this breakdown, the farm's value of annual crop gross cash farm sales to total gross farm sales was calculated. The same was done for the farm's ratio of livestock annual cash farm sales to total gross farm sales. Farms with ratios of greater or equal to 50 percent in crop sales to total sales are classified as crop farms and similarly for livestock farms.

Age

[6]When women, regardless of race and ethnicity, were included in the calculation, a Government Accountability Office analysis estimated that SDRF's accounted for 30 percent of all U.S. farm operators in 2017. When non-Hispanic white women were excluded, that estimate dropped to 9 percent of all U.S. farms according to USDA data (CRS, 2023).

The ARMS data contains an age classification variable that groups farms based on the age of the primary operator. The age categories are farms with primary operators less than 34 years old, between 34 and 43 years old, between 44 and 53 years old, between 54 and 64 years old, and 65 years or older.

Limited Resource Farms

The ARMS data indicate if the farm is classified as a limited resource farm household. Limited resource farm households are farm households which *tend to be smaller-sized, operated by older or retired persons, or have lost money farming* (CRS, 2023).[7] This variable was employed and used to proxy farms in which credit access may be an issue.

Persistent Poverty County

ARMS data provide an indicator of whether the farming operation was located in a county defined as a persistent poverty county. These are counties in *which poverty rates of 20 percent or higher have persisted for 30 years or more* (USDA (A)). Similar to the limited resource classification, this variable was employed and used to proxy farms in which credit access may be an issue.

Counties with large racial minority populations

The ARMS data indicate whether the farming operation is located in a county with 25 percent or more of the population identify as Native American, Black or Hispanic. These indicators were used in this study to proxy FSA targeted racial measures and areas in which obtaining credit may be an issue due to either lower average farm incomes or the availability of fewer credit institutions. Past studies have found that, especially among Native American and Black farms, farm incomes tend to be lower and/or fewer credit institutions may be available (White et al., 2023).

Farming Dependent County

The ARMS data also indicate if the farming operation is located in a farming dependent county. Farming dependent counties are defined as counties where an annual average of 25 percent or more of the total county's earnings are from farming-related activities or where farm employment accounts for 16 percent or more percent of the county's total employment (USDA ERS).

[7] Also see the USDA NRCS Limited Resource Farmer Rancher Self Determination Tool: https://lrftool.sc.egov.usda.gov/LRP_Definition.aspx

To quantify the share of FSA borrowers compared to all U.S. farms with debt, market penetration is calculated using a formula similar to that of Nwoha, et al. (2007). For annual totals, market penetration is defined as:

$$market\ penetration_{f,c,t} = \frac{\sum_{t=1}^{T} number\ of\ unique\ borrowers\ with\ an\ outstanding\ FSA\ loan\ in\ category\ c\ loan\ type\ f\ and\ year\ t}{\sum_{t=1}^{T} total\ number\ of\ indebted\ farms\ in\ category\ c\ \ and\ year\ t}$$

Where f=FSA direct, guaranteed, or both; c=category, t=year

RESULTS

The results presented here are averages over the 2013-2021 time period. Two types of comparisons are made. The first compares the market penetration rate for FLP loan programs within category levels compared to total FSA loan program market penetration rates. Loan program breakdowns are: those with at least one outstanding FSA direct loan but no outstanding guaranteed loans ("direct loan only"), at least one outstanding FSA guaranteed loan but no outstanding direct loans ("guaranteed loan only"), at least one outstanding FSA direct and at least one outstanding guaranteed loan ("both direct and guaranteed loans"), and for all farm operators having at least one outstanding FSA loan of any type ("any FSA loan"). These results are presented in tables with loan program breakdowns (rows) for each category level (columns). The final column of the table ("all Indebted farms") provides the market penetration rate of FSA farm loans by program type and serves as a comparison value. Results are discussed only for the first two categories; results for "both" are not discussed unless there is a significant difference compared to borrowers with a direct or guaranteed loan only.

The second set of results compares the percent of U.S. farms within each category level (pie charts) to the total FSA loan market penetration within each category level (number of all farms within that category level having an outstanding balance on any FSA loan as a percent of all farms in that category level) (bar charts). The data in the bar charts corresponds to the last row of the tables ("Any FSA loan").

Farm Size

Farms with FSA direct loans comprise a notable portion of indebted small and mid-sized farms. While the market penetration for farms with direct loans was 6.9 percent, it was 7.1 percent and 9.8 percent for small and mid-sized family farms (Table 6). Farms with FSA guaranteed loans comprise a relatively higher portion of mid-sized and large family farms. While the market penetration for farms with

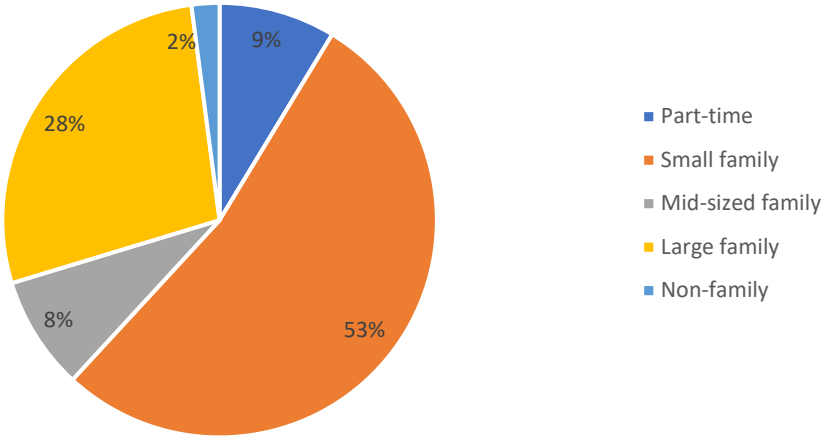
guaranteed loans was 4.7 percent, it was 6.3 percent and 10.5 percent for mid-sized and large family farms respectively (Table 6).

Table 6. Market penetration of FSA loan programs, by FSA Loan Program Type and Farm Size, 2013-2021

	Part-time	Small family	Mid-sized family	Large family	Non-family	All Indebted farms
% of Indebted Farms with..						
FSA direct loan only	6.5	7.1	9.8	5.9	3.0	6.9
FSA guaranteed loan only	1.9	1.9	6.3	10.5	4.7	4.7
Both direct and guaranteed loans	0.8	1.0	3.2	3.8	0.7	1.9
Any FSA loan	9.2	10.0	19.3	20.2	8.5	13.5

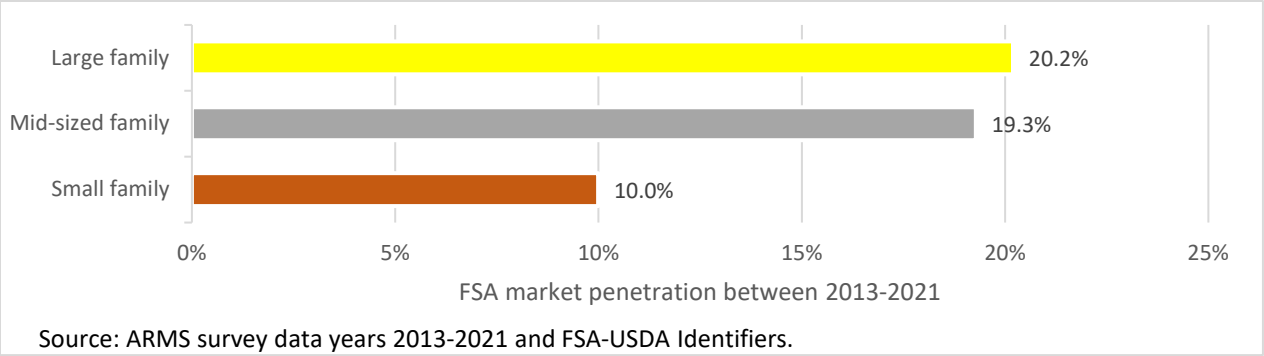
Overall, a little less than one-tenth of the 53 percent of indebted small family farms, one-fifth of the 8 percent of indebted mid-sized family farms, and one-fifth of the 28 percent of indebted large family farms had an outstanding FSA loan (Figures 6 and 7).

Figure 6. The majority of indebted U.S. Farms are Family Farms.



Percent of indebted farms by farm size between 2013-2021. Source: ARMS survey data years 2013-2021.

Figure 7: FSA loans have a relatively large market penetration among family farms.



Source: ARMS survey data years 2013-2021 and FSA-USDA Identifiers.

Beginning Farmer Status

FSA loans appear to provide a significant portion of debt to beginning farmers. Direct loans appear to be more important to single operator beginning farms relative to multiple operator beginning farms and guaranteed loans more important for multiple operator beginning farms. While the market penetration for farms with direct loans was 6.9 percent, it was 9.8 percent and 16.1 percent of small and large single operator beginning farms respectively (Table 7). For farms with guaranteed loans, it was 8.9 percent and 6.6 percent of all large single operator beginning farms and multigenerational beginning farms (Table 7). Large single operator beginning farms were relatively more reliant on both direct and guaranteed loans.

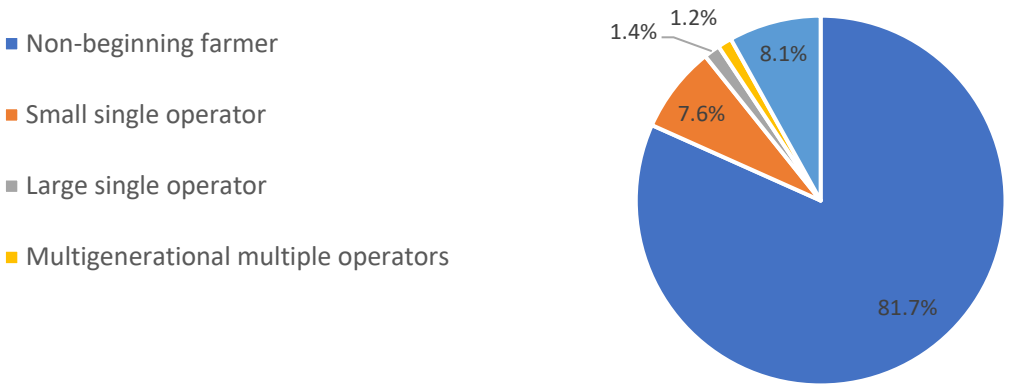
Table 7. Market Penetration of FSA loan programs by Beginning Farmer Categorization, 2013-2021

	Single Operator		Multiple Operator		All beginning farms	All Indebted farms
	Small	Large	Multi-generational	Non multi-generational		
% of Indebted Farms with..						
FSA direct only	9.8	16.1	4.2	6.4	8.4	6.9
FSA guaranteed only	2.8	8.9	6.6	4.2	4.2	4.7
Both direct and guaranteed	1.9	11.1	1.1	2.9	3.0	1.9
Any FSA loan	14.5	36.1	11.9	13.5	15.5	13.5

While the market penetration based on any FSA loan was 13.5 percent of all indebted farms, 14.5 percent of small single operator and 36.1 percent of indebted large single operator beginning farms reported having any outstanding FSA loan (Table 7). Overall, of the 1.4 percent of indebted large single

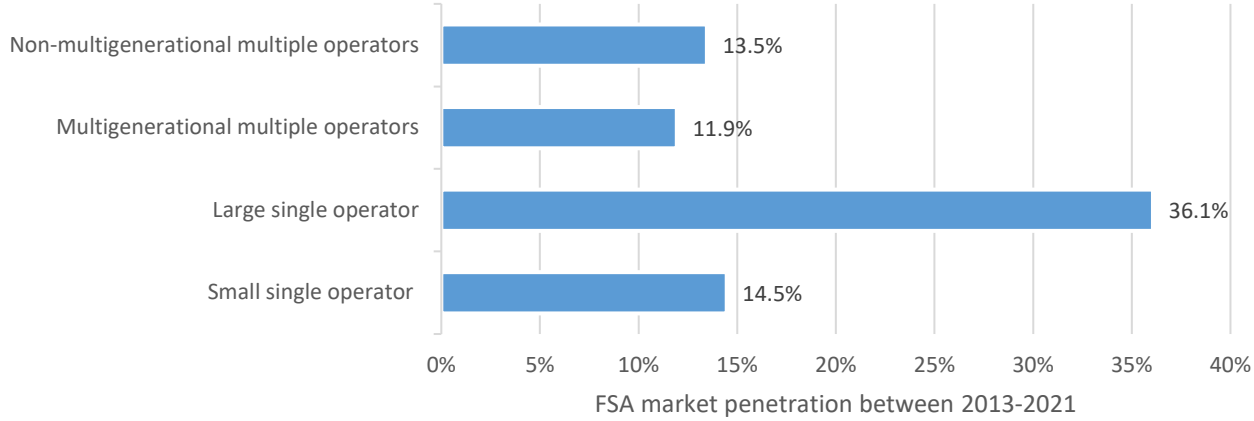
operator beginning farms, more than one-third of these have an outstanding FSA loan (Figures 8 and 9). FSA loan market penetration is between 11.9 percent and 14.5 percent of all other beginning farm categories (Figure 9).

Figure 8. Less than 20 percent of indebted U.S. farms had at least one beginning farmer operator.



Percent of indebted farms by beginning farm classification between 2013-2021
Source: ARMS survey data years 2013-2021.

Figure 9: FSA loans have a relatively large market penetration among beginning farms.



Source: ARMS survey data years 2013-2021 and FSA-USDA Identifiers.

FSA Credit Classification Ratings

FSA guaranteed loans appear to be an important source of credit among borrowers with higher (more creditworthy) credit classifications. While FSA guaranteed loan participants had a market penetration of

4.7 percent of all indebted farms, their market penetration was 11.1 percent among indebted farms with a High Standard classification and 5.0 percent of farms in the Commercial category (Table 8). The market penetration of guaranteed loans was relatively less among farms in the Marginal/Loss category at 3.3 percent (compared to their overall 4.7 percent market penetration) (Table 8).

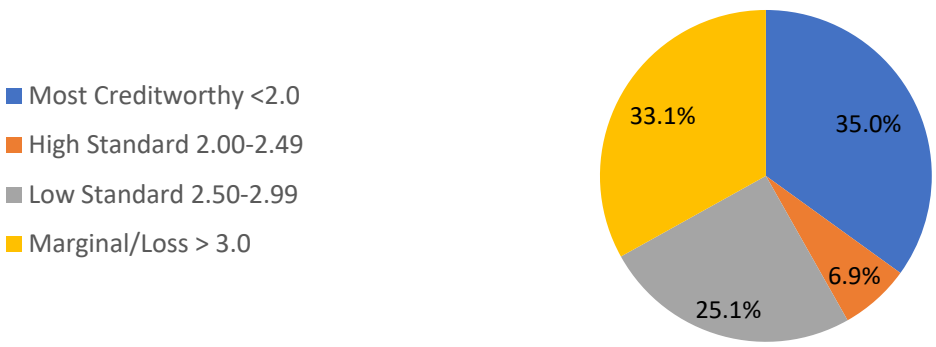
Direct loan participants had slightly lower (less credit-worthy) overall credit classification ratings. This is not surprising given that this program focuses on farms who have greater difficulty obtaining commercial credit compared to guaranteed borrowers. Their market penetration was relatively larger for the farms in the Low-Standard classification categories, as well as the Marginal/Loss category, compared to guaranteed loan borrowers (Table 8).

Table 8. Market Penetration of FSA Loan Programs by FSA Borrower Classification Rating, 2013-2021

	Most creditworthy <2.0	High standard 2.0-2.49	Low Standard 2.50-2.99	Marginal/Loss >3.0	All indebted farms
% of Indebted Farms with..					
FSA direct only	5.5	11.6	8.2	6.4	6.9
FSA guaranteed only	5.0	11.1	4.4	3.3	4.7
Both direct and guaranteed	1.8	5.3	1.6	1.6	1.9
Any FSA loan	12.2	27.9	14.2	11.3	13.5

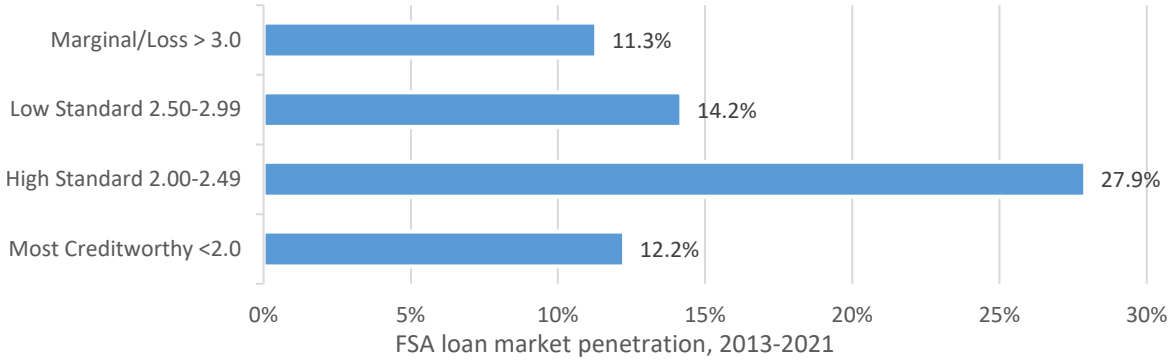
These results are a strong indication that FSA programs are fulfilling their mission—targeting creditworthy farms that might have a difficult time obtaining commercial credit. While 6.9 percent of indebted U.S. farms fell in the High Standard range, just below that which would be considered commercial creditworthy, 27.9 percent of indebted farms in this category had an outstanding FSA loan (Figures 10 and 11). Hence, FSA appears to serve a vital role in providing credit to the small but vital share of farms that are just below the cut-off for being considered credit worthy on their own by commercial lending standards.

Figure 10: Majority of indebted U.S. farms fall within upper and lower tails of the FSA Credit Classification Ratings



Percent of indebted farms by FSA credit classification between 2013-2021
Source: ARMS survey data years 2013-2021.

Figure 11: FSA loans have a relatively high market penetration among High Standard (just barely failing to meet commercial credit-worthy criteria).



Source: ARMS survey data years 2013-2021 and FSA-USDA Identifiers.

SDFR status

Farms with FSA direct loans appear to have a significant presence among racial and ethnic minorities, indicated by their high concentration within the SDFR race/ethnic classification. While market penetration among farms with direct loans was 6.9 percent, it was 18.3 percent among indebted farms with a race/ethnic minority operator (Table 9).

Table 9. Market Penetration of FSA Loan Programs by SDFR Status, 2013-2021

	All SDA	SDA race/ethnic	SDA gender	All Indebted farms
% of Indebted Farms with..				
FSA direct only	6.8	18.3	5.0	6.9
FSA guaranteed only	2.4	5.0	2.0	4.7
Both direct and guaranteed	0.5	0.9	2.0	1.9
Any FSA loan	9.8	24.2	9.0	13.5

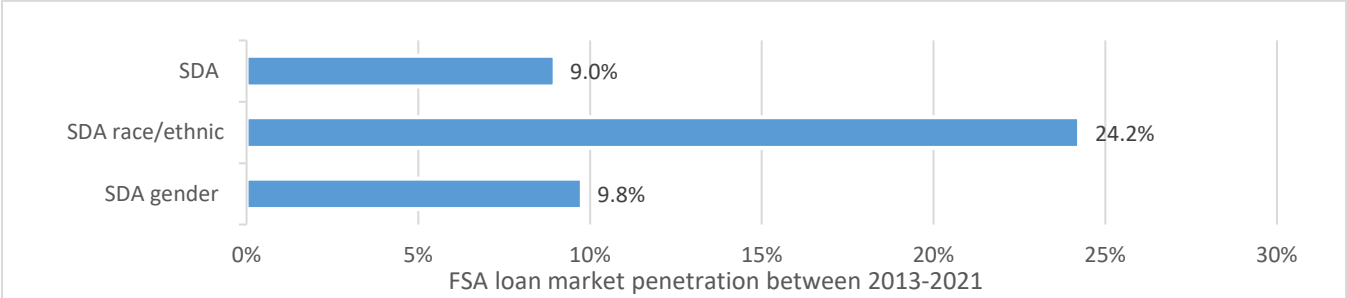
Note: "All SDA" includes all farms falling in either one or both of the SDA race/ethnic and SDA gender categories. Hence "All SDA" may be less than the sum of SDA race/ethnic and SDA gender.

Overall, while farms with any producer reporting a non-white ethnicity were only 1.5 percent of all indebted farms, FSA market penetration was roughly one fourth of these farms (Figures 12 and 13). The market penetration for FSA direct and guaranteed loans in the SDA gender subcategory was lower[8], resulting in FSA loans having a 9.0 percent SDFR market penetration, which is slightly below that of their overall market penetration (Figure 13).

Figure 12. Less than two percent of indebted U.S. farms identified having a non-white racial/ethnic operator.

Percent of indebted farms by SDFR status between 2013-2021
Source: ARMS survey data years 2013-2021.

Figure 13: One quarter of U.S. farms with an outstanding FSA loan report having at least one operator of non-white race or ethnicity.



Source: ARMS survey data years 2013-2021 and FSA-USDA Identifiers.

[8] These results may be slightly underestimated for SDFR gender and total SDFR farms given our calculations do not account for farms with female operators other than the primary operator.

Commodity Type

FSA's presence among crop vs. livestock farms was also examined. This is because other studies have found that smaller farms belonging to racial minorities ethnicities tend to have a greater presence in livestock farming compared to larger, white-operated farms. Table 10 indicates that farms with FSA direct loans have a slightly larger market penetration in livestock farming (7.6 percent) compared to all indebted farms (6.9 percent). Farms with FSA guaranteed loans have a slightly larger market penetration in crops (5.0 percent compared to 4.7 percent) (Table 10). Crop farms tend to be larger, which is one of the factors contributing to this result.

Table 10. Market Penetration of FSA Loan Programs by commodity type, 2013-2021

	Crop farms	Livestock farms	All Indebted farms
% of Indebted Farms with..			
FSA direct only	6.1	7.6	6.9
FSA guaranteed only	5.0	4.5	4.7
Both direct and guaranteed	2.4	1.5	1.9
Any FSA loan	13.5	13.5	13.5

Age

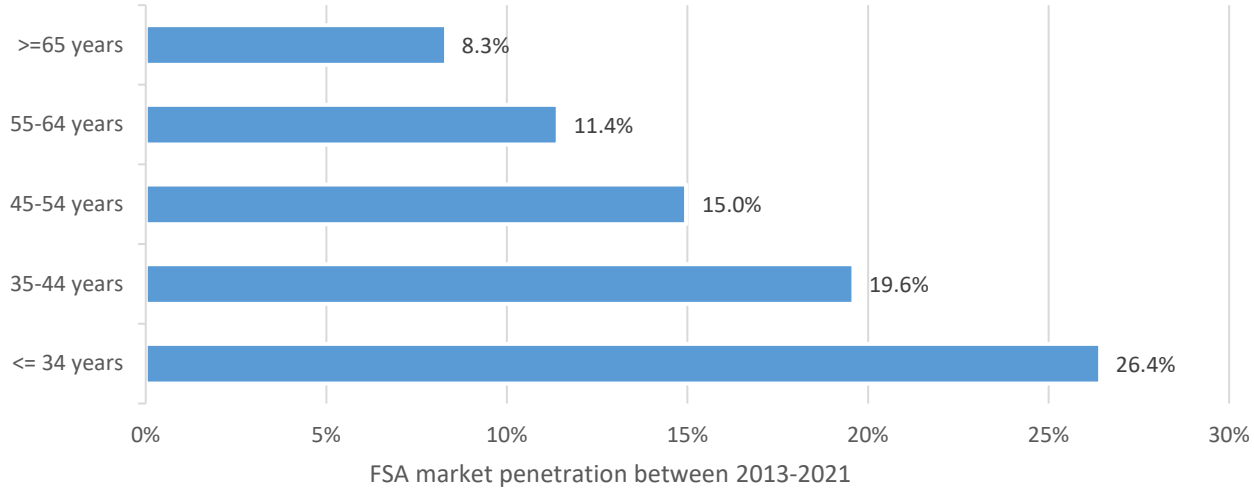
On average, farms with FSA loans appear more heavily clustered among farms with younger operators (54 years of age or younger) (Table 11). While the market penetration for farms with direct loans was 6.9 percent, it was 14.2 percent among operators under 35 years old (Table 12). Also, market penetration for FSA direct loans was 9.7 percent and 7.8 percent, respectively, among farms with primary operators between 35-34 and 45-54 years old (Table 11). In contrast, farms with guaranteed loans had relatively lower market penetration among the younger age categories, ranging between 5.4 percent and 5.9 percent for those less than 55 years (Table 11).

Table 11. Market Penetration of FSA Loan Programs by Age Categorization, 2013-2021

	<35 years	35-44 yeas	45-54 years	55-64 years	>64 years	All Indebted farms
% of Indebted Farms with..						
FSA direct only	14.2	9.7	7.8	5.4	4.6	6.9
FSA guaranteed only	5.8	5.9	5.4	4.8	3.0	4.7
Both direct and guaranteed	6.4	4.0	1.8	1.2	0.7	1.9
Any FSA loan	26.4	19.6	15.0	11.4	8.3	13.5

Overall, farms with FSA loans had a market penetration ratio of 26.4 percent among primary operators younger than 34 years old and 19.6 percent of farms with debt and primary operators between 35 and 44 years of age (Figure 14). This likely reflects the emphasis of FSA loan programs on serving young and beginning farmers. These young and beginning farmers, unless farming under an older established primary operator, are more likely to have weaker or less established credit history and lower collateral levels resulting in difficulties in obtaining commercial credit. This is another indication that FSA loan programs are serving their intended audience of beginning farmers.

Figure 14: FSA loan market penetration largest among the youngest primary operators.



Source: ARMS survey data years 2013-2021 and FSA-USDA Identifiers.

Limited Resource Farms

Farms with FSA direct loans have a large relative market penetration within the limited resource category. On average, the share of U.S. farms between 2013-2021 classified as limited resource was 5 percent of all farms with debt. The market penetration for FSA loans was 11.0 percent of all indebted limited resource farms (Table 12).

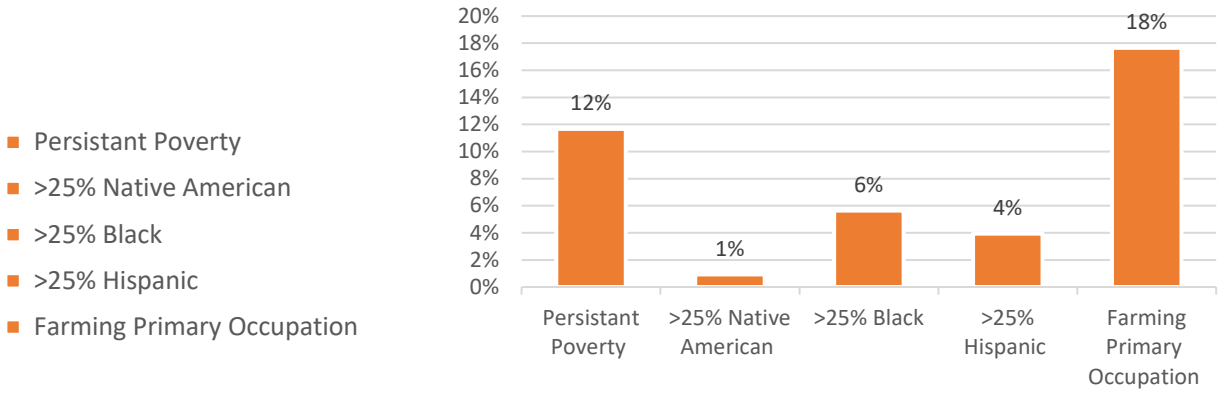
Table 12. Market Penetration of FSA Loan Programs by Limited Resource Categorization, 2013-2021

	Limited resource	Not Limited Resource	All Indebted farms
% of Indebted Farms with..			
FSA direct only	8.4	6.3	6.9
FSA guaranteed only	1.6	8.8	4.7
Both direct and guaranteed	0.9	3.0	1.9
Any FSA loan	11.0	18.0	13.5

Persistent Poverty, Black and Native American Counties, and Farming Dependent Counties

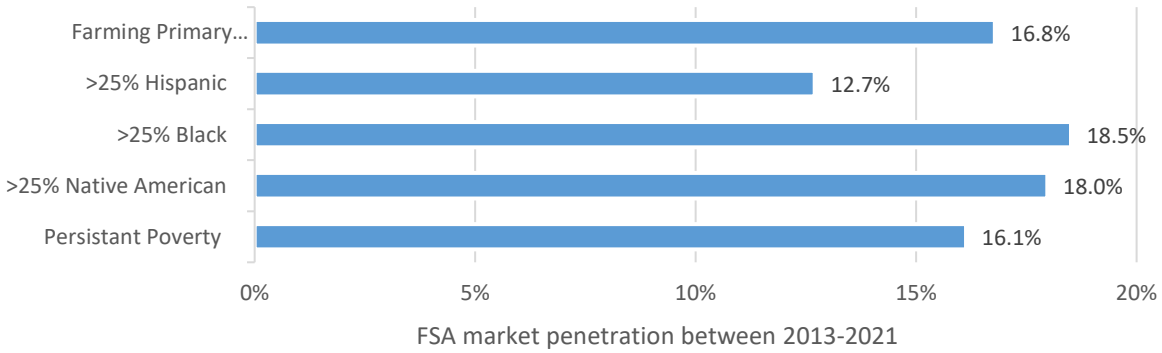
FSA market penetration for direct and guaranteed loans is also significant in counties with large shares of Native Americans and Blacks. While only 1 percent of U.S. farms between 2013-2021 were in counties with more than 25 percent of the population identifying as Native American ("Native American Counties") and 6 percent in counties with more than 25 percent of the population identifying as Black ("Black Counties"), the FSA loan market penetration was between 18.0 and 18.5 percent for Native American and Black counties (Figures 15 and 16).

Figure 15. Less than one tenth of indebted U.S. farms are located in counties with large Native American, Black or Hispanic populations.



Native American, Black and Hispanic classifications represent counties where more than 25 percent of the population identified as this race or ethnicity in the most recent Census.
Percent of indebted U.S. farms between 2013-2021. Source: ARMS survey data years 2013-2021.

Figure 16: FSA loans have a significant presence among counties that are impoverished, farming dependent, or have large high minority populations.



Source: ARMS survey data years 2013-2021 and FSA-USDA Identifiers.

FSA direct loans, in particular, are relatively important in counties that identify as persistent poverty, high minority populations, or are dependent on farming. As a result, while less than 18 percent of indebted U.S. farms were located in counties where farming was the primary occupation and only 12 percent in counties labeled as persistent poverty, of those farms roughly one-in-six had an outstanding FSA loan (Figures 15 and 16). Of the less than 10 percent of U.S. farms located in counties where more than 25 percent of the population was Black, Native American, or Hispanic, more than one-in-six had an outstanding FSA loan (Figures 15 and 16).

FURTHER RESEARCH

As discussed earlier, while the total share of farms with debt decreased significantly between 2018-2021, the share of FSA borrowers appears to have remained fairly constant (Figures 3-5). Analysis of the direction and magnitude of any trends within the share of FSA borrowers over time and across categories could shed further light on these relationships and any trends over time. Another area of interest may be to determine if there are differences among the composition of borrowers utilizing FSA loans during farm economic booms compared to times of economic stress. Both these avenues of research could provide valuable information to policy makers for planning and program administration purposes.

Future efforts could also explore interactions among different farm classifications and differences in results among loan types (operating vs. farm ownership loans). For example, what is the market penetration ratio of beginning farms with an FSA loan located in a region of persistent poverty and has this changed over time? Has the ratio of farms with FSA loans in the small family-sized farm category who have Marginal/Low FSA credit classification ratings increased or decreased over time? These results may pinpoint additional producer categories where FSA loan programs have been stepping up to play an increasing role in providing credit to vulnerable farms or in regions with fewer traditional lending resources—as well as identify the need for additional outreach and other resources for potential borrowers.

CONCLUSIONS

The results indicate that FSA direct loan programs have a significant market penetration among small and mid-sized family farms, single operator beginning farms, farms with an ethnic producer, and those

under principal operators under 34 years old. Farms with FSA direct loans also have a significant presence among counties with high shares of Native American, Black or Hispanic populations, persistent poverty counties, and limited resource farms. Farms with FSA guaranteed loans have significant market penetration among mid-sized and large family farms, large single operator beginning farms and multigenerational beginning farms, those that just barely would not qualify for commercial credit according to FSA credit classification ratings, and farms with principal operators younger than 54 years of age.

These results are strong indicators that FSA direct loans are meeting the needs of intended program participants—small and midsized family farms that are unable to obtain commercial credit—and that the beginning farmer and SDA program targets have resulted in a significant portion of FSA direct and guaranteed funding being used by farm operations meeting these qualifications. They also demonstrate that guaranteed loan programs serve a similar though slightly different population—larger mid-sized and large family farms—which are close to (but not quite) qualifying for credit without an FSA guarantee by commercial banks.

This research is the first step in filling in essential gaps in our knowledge of the characteristics of farms with FSA loans and how they compare to the general farm population. They provide indications of the level of effectiveness of FSA loan programs in meeting the credit needs of small and mid-sized family farms unable to obtain commercial credit or who cannot do so independently without an FSA guarantee. These results will be of interest to policy makers and FSA loan staff as for program evaluation and administration and provides an avenue and directions for further research and analysis using joined ARMS survey data and FLP loan administrative data.

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