



How Diverse is Farm Credit System (FCS) Leadership? A report on the ethnic and cultural representation of FCS

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Contents

Executive Summary:	3
List of Tables	5
List of figures	6
List of illustrations, symbols, abbreviations, or other	7
Introduction	8
Methods:	10
Discussion:	13
Conclusion:	19
Recommendations:	21
Appendix	22
References:	28

Executive Summary:

• **Introduction:** Statistical analyses continue to uncover loan denial inequalities between white and minority loan applicants (Tempkin et al., 1999). Discrimination in lending has also been analyzed in terms of the loan distribution of the Paycheck Protection Program (e.g. Atkins et al. 2021, Chernenko & Scharfstein, 2021) and within USDA loan programs (Escalante et al. 2006). Limited credit access can hinder investments and impact farm productivity which can hinder revenue generation and land tenure, characteristics needed to improve chances of a loan approval. Could increases diversity among board members improve credit access to socially disadvantaged farmers and ranchers? We investigate whether a larger diversity of governing boards and senior management has any linkages to lending to minority farmers and Socially Disadvantaged Farmers and Ranchers (SDFR).

• **Objective(s):** The objectives are three fold: 1) document and analyze demographic information on the Farm Credit (FC) board members and/or senior leadership staff; 2) analyze the correlation between lender diversity levels and SDFR lenders; 3) Use the PPP to understand loans given by FCS to socially disadvantaged farmers and ranchers.

• **Methods:** The following methods are used: 1) data on ethnic and cultural representation on Farm Credit (FC) Institutions' governing boards and leadership staff was collected from FC Institutions' websites; 2) diversity measures were calculated using the Herfindahl-Hirschman Index (HHI) as proposed in Hunt, Layton and Prince (2015); 3) descriptive statistical analysis, correlation tests were performed to understand the relationship between diversity on leadership staff at FC Institutions and lending to SDFRs.

• **Discussion:** Females make up ~27% among senior management (SM) and ~13.8% among board of directors (BOD). The lower share of diversity in terms of gender maybe de linked to the challenges faced by women to become leaders. In academia, Hilsenroth et al. (2022)

name lack of mentoring and gender bias in evaluations among others as barriers. White race accounts for ~96% of SM and 97% of BOD members. These shares resemble that of farmers of non-white races in the 2017 Agricultural Census (1.7% American Indian only, 0.6% Asian only, 1.3% African American only, 0.1% Pacific Islander only (Key and Todd 2022)). HHI for gender ranges between 0.67 for SM and 0.76 for BOD, while that for race is 0.96 for SM and 0.97 for BOD. When both gender and race are considered, the HHI for SM becomes 0.65 and 0.76 for BOD is 0.76. FC Institutions had the lowest share of PPP loans given to SDFR. As the percentage of minority and female farmers increases the BOD becomes more diverse (a -0.18 correlation is observed).

- **Conclusion:** On average SM is more diverse, in terms of gender, race and ethnicity than BOD members. Share of male members dominate those of female members. White individuals dominate in both BOD and SM. Many SDFRs were approved for PPP through non-traditional lenders and a smaller amount through FC Institutions (15%). Correlation results indicate that the demographic composition of the BOD and SM is associated with that of the farmers in the county where the farm credit is located. As the share of minority farmers (race and ethnicity) and that of female farmers in a county increase so does the level of diversity of the FC leadership.

- **Recommendations:** Main issues identified in this study were: 1) Lack of transparency in how BOD, SM and staff identify themselves in terms of race, gender and ethnicity; 2) Lack of diversification among BOD and SM. Given these issues it is recommended that BOD and SM should try to mirror the demographics of the farmers in the county they serve. Farm Credit lenders could consider adopting affirmative action efforts. Call reports from lenders and websites would provide more information about how their leadership members and staff identify in terms of race, gender and ethnicity. Aggregate information could be provided.

List of Tables

Table 1: Summary statistics of race, gender and ethnicity of Farm Credit leadership and farmers.....	15
Table 2: Distribution of PPP loans to SDFR and Non-SDFR by lender type.....	16
Table 3: Summary statistics of PPP loans for 2020, 2021 and both years by farmer race and gender.	17
Table 4: Diversity and the Paycheck Protection Program (PPP): Amount awarded through a Farm Credit Institution and diversity.	18
Table 5: Correlations between SDFR, minority and female farmers and the level of diversity in Farm Credit leadership.	19

List of figures

Figure 1: The distribution of SDFR in the U.S. in 2017.....	16
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List of illustrations, symbols, abbreviations, or other

FC: Farm Credit

FCA: Farm Credit Administration

FCS: Farm Credit System

HHI: Hirschman Herfindahl Index

MFI: Microfinance Institution

PPP: Paycheck Protection Program

SDFR: Socially Disadvantaged Farmers and Ranchers

Introduction

Despite having fair lending laws, many statistical analyses continue to uncover loan denial inequalities between white and minority loan applicants (Tempkin et al., 1999). Past events have shed light on the existence of a different treatment from lenders to borrowers of different race and ethnicity (Escalante et al 2017): e.g. lawsuits to companies such as Countrywide Financial, Wells Fargo and Honda for charging higher fees, rates or interests to minority borrowers (Savage 2011, 2012, Isidore, 2013; Meyers, 2015). Ghimire et al., (2020) concluded that minority borrowers are given smaller loans, face higher interest rates, and shorter repayment terms than White American borrowers. In agriculture, Escalante et al (2017) finds that lenders charge minority borrowers higher interest rates than non-minority borrowers. Discrimination in lending has also been analyzed in terms of the loan distribution of the Paycheck Protection Program (e.g. Atkins et al. 2021, Demko and Sant'Anna 2021, Chernenko & Scharfstein, 2021), within USDA loan programs (Escalante et al. 2006) and, in farmer use of non-traditional lenders (McDonald et al. 2022). Limited credit access can hinder the investments and impact farm productivity which in turn can hinder revenue generation, yields, farmer welfare and land tenure (Feder et al., 1990; Houensou et al., 2021), characteristics needed to improve chances of approval on a loan. So how can we improve credit access to Socially Disadvantaged Farmers and Ranchers? Could increased diversity among board members improve credit access to socially disadvantaged farmers and ranchers? SDFR farms have lower output value and less operators. They earn less in government payments, have fewer total assets, higher current ratios, and lower debt-to-asset ratios, compared to non-SDFRs (McDonald et al., 2021). All these factors may make credit access challenging. We investigate whether a larger diversity of governing boards and senior management has any linkages to lending to minority farmers and Socially Disadvantaged Farmers and Ranchers (SDFR). SDFR are farmers or ranchers who face discrimination due to

their race, ethnicity, or gender (Socially Disadvantaged, Beginning, Limited Resource, and Female Farmers and Ranchers | USDA/ERS, 2022). We contribute to the literature by providing insights into how diversity among governing boards and leadership staff relates to credit usage by SDFR (Socially Disadvantaged Farmers and Ranchers).

Hartarska, Nadolnyak and Mersland (2014) report that microfinance institutions (MFI) lead by women CEO's face lower default rates from borrowers and are more technically efficient in reaching poor communities. Authors argue that reasons for their findings could be that believe that females have a better understanding of their clients and are more risk adverse. A diversified board can have advantages and disadvantages. The more diversified it is the greater the number of different and unique perspectives allowing for better decision making (Adams et al 2015). An increase in different perspectives can, however lead to conflicts and higher decision making costs (Adams et al 2015). In general, what is observed is a more homogeneous makeup of boards (Adams et al. 2015) leading to the emergence of policies such as the NASDAQ Board Diversity Rule¹, which requires companies listed by them have at least two diverse members as board of directors or explain why they do not. Within the realm of agricultural lending, little is known about the role of a diversified leadership. Gunderson, Gloy and Rogers (2009) studied how board size and compensation affected profitability and operating efficiency measures in Farm Credit Associations. Authors find that that these increases in board characteristics of size and member compensation had diminishing returns on profitability and operating efficiency measures.

Greater diversity in board of directors and senior management of lending institutions

¹ See Notice of Filing of Proposed Rule Change to Adopt Listing Rule IM-5900-9 to Offer Certain Listed Companies Access to a Complimentary Board Recruiting Solution to Help Advance Diversity on Company Boards, Exchange Act Release No. 34-90571, 85 Fed. Reg. 80,472 (Dec. 4, 2020) [hereinafter, "Nasdaq Proposal"], <https://www.govinfo.gov/content/pkg/FR-2020-12-11/pdf/2020-27091.pdf>.

could facilitate borrower-lender relationships of SDFRs. Previous literature has found that smaller differences in terms of gender and race between borrowers and lenders can have benefits. These are: 1) improving credit access to minority borrowers (Jiang et al., 2021); 2) improving loan acceptance² rates (Squire and Kim 1995); 3) greater favorable acceptance in loan denials among borrowers³ (Kulik and Holbrook 2000); 4) greater likelihood of returning for a second loan (Beck et al., 2018)⁴. Increase similarities between borrower and lender race and sex can facilitate borrower-lender relationships, which, in turn, plays an important role in credit access. Relationship lending can provide benefits to the borrower in terms of loan rates and conditions (Elyasiani and Goldberg 2004). Demko and Sant'Anna (2021) find evidence that having a relationship with the lender facilitated the application process for the Paycheck Protection Program. This may be especially true for Farm Credit System where each lending association is local and privately owned. In Farm Credit institutions, lender-borrower relationships appear to be more significant in terms of increasing credit availability and approval (Behr et al., 2011). Which promotes the question of whether the demographic composition of governing boards and leadership staff can foster credit access to minority borrowers.

Methods:

The objective of this study is three fold: 1) document and analyze demographic information on the farm credit board members and/or senior leadership staff; 2) analyze the correlation between lender diversity levels and SDFR lenders; 3) Use the PPP to shed light on the loans

² A study by Squires et. al. (1995) finds that the likelihood of successful African American loan applications increases as the number of African American loan officers increases.

³ Kulik and Holbrook (2000) find that loan applicants respond favorable to undesired outcomes when they came from loan officers of similar races.

⁴ Beck et. al. (2018) conclude that first time borrowers have a lesser chance of applying for a second loan if the lending officer is of the opposite sex. Also, first time borrowers applying with loan officers of the opposite sex tend to face higher interest rates, receive smaller loans with shorter maturity.

given by FCS to socially disadvantaged farmers and ranchers. In order to achieve these objectives, we: 1) collect secondary data as well as data on the ethnic and cultural representation on FCS governing boards and leadership staff; 2) used statistical methods to analyze the data and quantify the correlations of diversity in FCS leadership and credit access to SDFRs; 3) provide an example of a breakdown of loans given to SDFRs by using data from the PPP. The project is divided into five milestones: milestones one and two involve data collection and analysis, milestone 3 and 4 involve the application of statistical methods to arrive at preliminary and final results, the final milestone involves providing a final report.

We analyze demographic information on farm credit board members and senior leadership staff using data collected from Farm Credit Institutions regulated by the Farm Credit Administration. Data on the members of the board of directors and top senior management was collected by visiting the websites of each institutions and downloading the pages with information on the board of directors and senior management. This information included at minimum names, though at times it also included a short biography, when the person took on the position and a photo. We used this information associated, when necessary, with information collected from social sites (e.g. Facebook, Twitter, LinkedIn) to categorize the individuals in terms of race, gender and ethnicity. Gender identification was split into female and male while that of race was split into Asian, African American, and into ethnicity. Races that we could not identify were placed into a non-white category.

Data on farmer characteristics and county level information comes from Agricultural Census and from the Paycheck Protection Program (PPP), available through the Small Businesses Administration website. We use data on primary producers collected from the 2017 Agricultural Census to estimate the shares of SDFRs per county. In order to do so, we calculate the total number of primary producers in each county to create the denominator and then sum the primary producers that with SDFR characteristics to create the numerator. In order to

identify who is considered a SDFR we use the following definition: SDFR is a farmer or rancher who belongs to a group of people who have been discriminated against because of their race, ethnicity, or gender. These group includes African Americans, American Indians, Alaskan Natives, Asians, Hispanics, Pacific Islanders, women farmers, and ranchers (United States Department of Agriculture Economic Research Service, 2021). Using data from PPP loans we also create an SDFR indicator variable which includes PPP small business owners in production agriculture which have self-identified as either female, non-white or Hispanic. We compliment the unanswered information on small business owners' race, ethnicity and gender by: 1) searching on the Mergent Intellect company database for a minority or women owned business certification or; 2) searching the web for the race, gender or ethnicity of the business owner or president.

Following Hunt, Layton and Prince (2015) we adapt the Herfindahl-Hirschman Index (HHI) to measure the levels of diversity among the Farm Credit lending association leadership staff. Here HHI measures the concentration of race and ethnicity within the leadership staff of a Farm Credit lending association:

$$HHI_i = \sum_{i=1}^N s_i^2 \quad (1)$$

where i represents each Farm Credit lending association up to N lending associations and s_i is the share of minority members on the board. HHI varies from 0 to 1. When HHI equals 1, the entire board is composed of members of the same race or gender. The smaller HHI is the more diverse the board members are.

We use HHI information to map their locations and analyze their linkages to the characteristics of their locations. The expectation being that lower HHI will be linked to counties with a larger share of SDFRs. In order to facilitate this analysis, we perform

correlations between the presence as well as the characteristics of SDFRs and HHI. The formula used to estimate the correlation ($\hat{\rho}$) is (Wooldridge 2013):

$$\hat{\rho} = \frac{\sum_{i=1}^n (x_i - \bar{x})(y_i - \bar{y})}{\sqrt{\sum_{i=1}^n (x_i - \bar{x})^2} \sqrt{\sum_{i=1}^n (y_i - \bar{y})^2}} \quad (2)$$

Where x and y are vectors of observations of HHI and SDFR shares for each county i , \bar{x} and \bar{y} indicate the means of vector x and y . We discuss the correlations and their statistical significance in the following section.

Discussion:

Our results shed light on the demographic composition of Farm Credit Institutions' board of directors and senior management. Table 1 presents the descriptive statistics of the information on gender, race and ethnicity collected from Farm Credit Institutions, as well as on the share of female and SDFR farmers at the county level. Table 1 splits the diversity information of Farm Credit Institution's leaders into Board of Directors (BOD) and Senior Management (SM). The Board of Directors has greater influence over policy designs and strategies of the company while the senior management is responsible for overseeing its implementation and execution. According to information collected on the Farm Credit Institutions' websites, the responsibilities of BOD's can be summarized as: 1) establishing policies; 2) providing strategic direction; 3) appointing the Chief Executive Officer and establishing a succession plan; 4) supervising management's work; 5) ensuring that information and disclosures to shareholders and investors are accurate, clear, and reliable. Note that these may not include all of their responsibilities. In turn, senior managers oversee various areas such as: lending and credit operations (including loan approvals), risk management and analytics, marketing, communications, human resources, customer experience, credit underwriting, legal issues and information technology. Therefore, BOD can have greater influence over new policies and

strategies of the institution to improve credit access to SDFR while SM oversees the execution of the policies and strategies.

On average the majority of Farm Credit leaders are white and are males. On average there is a larger share of women in senior management than as members in the board of directors. Females hold a share of ~27% among senior management and ~13.8% among board of directors. The lower share of diversity in terms of gender (in this case male and female) maybe de linked to the challenges faced by women to become leaders. In academia, Hilsenroth et al. (2022) name lack of mentoring, gender bias in evaluations and exclusion from social networks that promote information-sharing as a few of the barriers. In terms of race and ethnicity, the white race accounts for circa 96% of senior management and 97% of board of director members. These shares resemble that of farmers of non-white races in the 2017 Agricultural Census (1.7% American Indian or Alaska Native only, 0.6% Asian only, 1.3% African American only, 0.1% Pacific Islander only (Key and Todd 2022)). As such, the women on the senior management and board of directors are mostly white.

We measure the level of diversity by examining the Herfindahl-Hirschman Index (HHI). HHI summary statistics indicate lower levels of diversity among Farm Credit leadership. Table 1 shows that on average the HHI for gender is ranges between 0.67 for senior management and 0.76 for board of directors. In turn, HHI for race ranges between 0.96 for senior management and 0.97 for board of directors. The level of diversity increases when both gender and race are considered. The HHI for senior management becomes 0.65 while that of board of directors is 0.76, meaning that white females play an important role in increasing diversity in leadership. Note that Farm Credit Institutions in counties with large presence of minorities (e.g. Puerto Rico) also display less diversity on the leadership because then all members are of other race and/or ethnicity.

Table 1: Summary statistics of race, gender and ethnicity of Farm Credit leadership and farmers

Variables	# Observations	Mean	Standard Deviation	Minimum	Maximum
<i>Board of Directors</i>					
<u>GENDER:</u>					
Male (%)	75	86.25	8.41	66.67	100
Female (%)	75	13.75	8.41	0.00	33.00
HHI by gender	75	0.76	0.12	0.56	1.00
<u>RACE/ETHNICITY:</u>					
White (%)	75	97.27	11.94	0.00	100.00
Other race/ethnicity (%)	75	2.73	11.94	0.00	100.00
HHI by race and ethnicity	75	0.97	0.06	0.72	1.00
HHI by race/ethnicity and gender	75	0.76	0.14	0.50	1.00
<i>Senior Management:</i>					
<u>GENDER:</u>					
Male (%)	63	73.04	17.34	25.00	100.00
Female (%)	63	26.96	17.34	0.00	75.00
HHI by gender	63	0.67	0.16	0.50	1.00
<u>RACE/ETHNICITY:</u>					
White (%)	63	96.16	13.88	0.00	100.00
Other race/ethnicity (%)	63	3.84	13.88	0.00	100.00
HHI by race and ethnicity	63	0.96	0.10	0.50	1.00
HHI by race/ethnicity and gender	63	0.65	0.18	0.28	1.00
<i>Producers:</i>					
Share of Minority Farmer	3,072	0.30	0.07	0.10	1.00
Share Female Farmer	3,068	0.28	0.07	0.07	0.86

= Number, HHI is the Herfindahl-Hirschman Index. Minority considers race and ethnicity, not gender.

Notice the higher level of diversity among senior management than among board of directors. This may be due to the fact that individuals must be elected in order to be on the board of directors whereas the senior management probably is more linked to the individual's achievements and merits within the Farm Credit Institution. An additional factor is that the distribution of SDFR in the U.S. is not homogeneous (Figure 1). Higher shares of SDFR are concentrated on the borders of the country, as such, Farm Credit Institutions serving farmers in the corn belt region are likely to have a less diverse BOD and SM than others in regions with greater shares of SDFR.

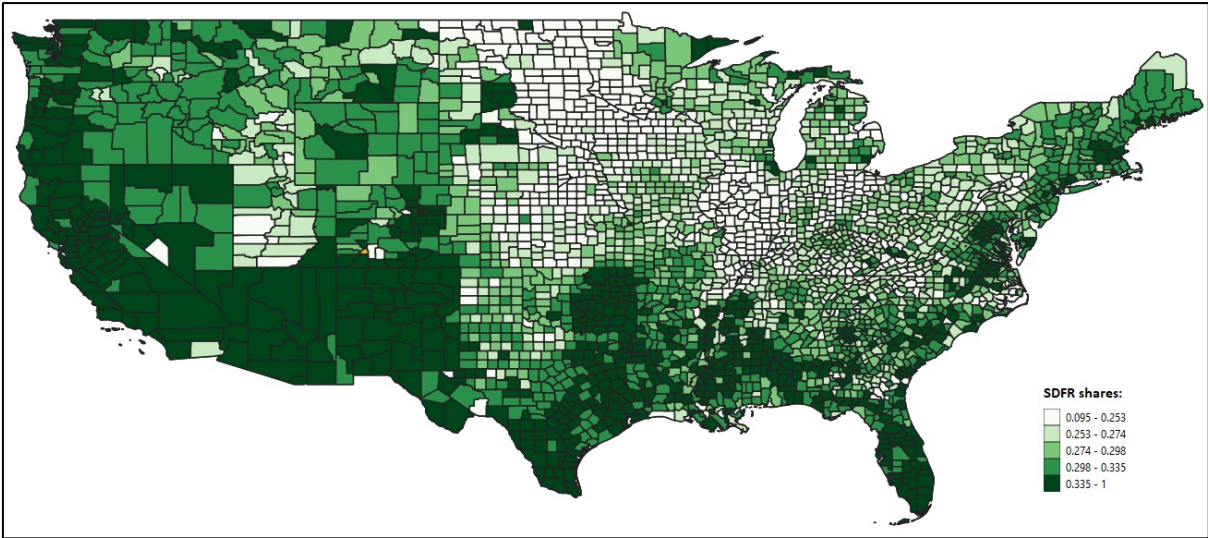


Figure 1: The distribution of SDFR in the U.S. in 2017.

Please see the method section for information on how the SDFR shares were calculated.

The Farm Credit System is an important lender to agriculture in terms of production and real estate loans. In 2020 the Farm Credit System (FCS) surpassed commercial banks in real estate loans and was the second largest lender in non-real estate loans (USDA/ERS, 2022). The Farm Credit System is made up of four banks, 67 associations and six service corporations (Farm Credit Administration, 2021). Farm Credit Institutions were one of the lenders that could be used to apply for PPP loans, however it had the lowest share of PPP loans given to SDFR (Table 2). This could be due to the fact that some Farm Credit lenders overwhelmed by PPP applications suggested applicants to use non-traditional lenders such as Kabbage. This could potentially explain the high shares of SDFR applications through non-traditional lenders (Table 2).

Table 2: Distribution of PPP loans to SDFR and Non-SDFR by lender type

Lender	Non-SDFR	SDFR	Unanswered	Total
Credit Union	2,527	785	8,716	12,028
Farm Credit Association	7,343	1,294	34,013	42,650
Commercial Bank	115,340	31,341	409,744	556,425
Non-traditional Lender	1,986	4,099	11,142	17,227

PPP loans awarded to SDFR can be further broken down by race and gender. Such a breakdown is important given that the definition of SDFR includes a number of different

racess, ethnicity and gender. A further breakdown allows for the contrast between white female farmers and non-white female farmers, for instance. Unfortunately given the number of PPP applicants who did not volunteer their gender, race or ethnicity we could only breakdown by race, white and non-white male and female. Table 3 summarizes the breakdown in PPP loans to farmers by race, gender and an interaction of both for 2020, 2021 and for both years. Notice that the average PPP loans is smaller in 2021 than in 2020, the same is true for the standard deviation, this is likely due to the changes in who could apply to the program. In 2021, the maximum size of small businesses eligible for the PPP dropped from 500 to 300 or less. Additionally, only companies that incurred a 25% reduction in gross revenues between 2019 and 2020 were eligible.

Table 3: Summary statistics of PPP loans for 2020, 2021 and both years by farmer race and gender.

Borrower	PPP loans 2020 and 2021			PPP loans 2020			PPP loans 2021		
	Average	Standard Deviation	# loans	Average	Standard Deviation	# loans	Average	Standard Deviation	# loans
All borrowers	\$27,603.10	\$104,270.90	625,157	\$57,910	\$203,249	135,292	\$19,233	\$46,286	489,865
Race									
American Indian	\$18,930.44	\$40,344.47	3563	\$37,812	\$72,525	399	\$16,549	\$33,474	3,164
Asian	\$37,486.66	\$115,105.40	1753	\$59,973	\$163,032	486	\$28,861	\$88,795	1,267
African American	\$20,726.47	\$70,237.58	4613	\$31,943	\$171,960	621	\$18,982	\$32,933	3,992
Other race	\$19,595.99	\$27,880.48	126	\$30,056	\$30,268	15	\$18,183	\$27,382	111
White	\$22,484.33	\$68,285.33	143423	\$39,404	\$130,676	27,659	\$18,442	\$40,155	115,764
Unanswered	\$29,257.74	\$113,447.20	471679	\$62,955	\$218,597	106,112	\$19,476	\$48,069	365,567
Gender									
Male White	\$21,976	\$63,846	126,194	\$37,935	\$125,177	23,206	\$18,380	\$37,335	102,988
Male Non-White	\$22,371	\$66,957	6,894	\$45,249	\$138,882	889	\$18,984	\$46,962	6,005
Female White	\$23,274	\$71,983	15,427	\$40,318	\$124,338	3,740	\$17,820	\$42,078	11,687
Female Non-white	\$22,171	\$45,368	2,638	\$30,729	\$45,416	463	\$20,349	\$45,159	2,175
Non-White but Gender Unknown	\$35,428	\$174,505	523	\$59,568	\$302,357	169	\$23,904	\$33,322	354
White but Gender Unknown	\$51,335	\$201,171	1,802	\$82,415	\$263,687	713	\$30,986	\$142,975	1,089
Male but Race Unknown	\$36,906	\$130,916	58,860	\$56,485	\$201,196	20,492	\$26,449	\$66,025	38,368
Female but Race Unknown	\$38,146	\$121,439	9,247	\$52,147	\$167,102	3,806	\$28,352	\$72,812	5,441
Race nor Gender Known	\$27,939	\$110,420	403,572	\$65,079	\$224,764	81,814	\$18,495	\$44,807	321,758

Obs: Unknown means that the applicant did not inform their race and/or gender

Asian farmers and white farmers received PPP loans higher than the overall average PPP loan. Atkins et al., (2022) also finds that while Asian small business lenders tended to receive more in PPP loans, business owners of other races and women business owners received less. In 2021, PPP lending appears to reach more SDFR farmers. Although there appears to be improvements in terms of the average amount of loans received by non-white

farmers in 2021, the number of PPP loans awarded is still considerably smaller than those to white farmers. This may be due to the lesser number of non-white farmers in comparison to white farmers. Among female farmers, white female farmers received higher PPP loans than non-white in 2020 but lower in 2021. All in all, the summary statistics point to increased credit access to SDFRs in 2021. This is similar to what Fairlie and Fossen (2022) find when analyzing the entire PPP dataset (i.e. including all industries).

Table 4 shows the average level of diversity according to the SDFRs that were awarded a PPP loan through a Farm Credit Institution. On average SDFRs received a larger PPP loan amount than non-SDFR. SDFR received an average of \$34,107.35 while non-SDFR \$23,885.49 (Table 4). The levels of diversity between the Farm Credit Institutions that awarded loans to SDFR versus those that awarded loans to non-SDFR are the same for senior management and very close for the board of directors. There are still a number of PPP applicants that did not answer their gender, race nor ethnicity, those are identified as unanswered.

Table 4: Diversity and the Paycheck Protection Program (PPP): Amount awarded through a Farm Credit Institution and diversity.

		SDFR PPP	Non-SDFR PPP	Unanswered
Awarded Loan	Mean	\$ 34,107.35	\$ 23,885.49	\$ 39,836.97
	Standard deviation	\$ 94,266.35	\$ 77,486.04	\$ 140,694.50
	# Observations	1294	7343	34013
HHI (SM)	Mean	0.70	0.70	0.73
	Standard deviation	0.14	0.14	0.18
	# Observations	1214	7314	33567
HHI (BOD)	Mean	0.73	0.75	0.70
	Standard deviation	0.12	0.12	0.13
	# Observations	1294	7370	34013

BOD=Board of Directors; SM=Senior Management; HHI= HHI is the Herfindahl-Hirschman Index

Lastly we estimate the correlations between the levels of diversity of leadership in Farm Credit Institutions and the shares of female and minority farmers. We also estimate the

correlations between SDFR PPP borrowers and the level of diversity among Farm Credit Institutions' leadership. Here a negative correlation means that counties with higher shares of minority and female farmers have higher levels of diversity in Farm Credit Institutions' leadership (or lower HHI) (Table 5). As the percentage of minority farmers increases the board of directors becomes more diverse, a -0.18 correlation is observed that is statistically significant at the 1% level of statistical significance. Senior management, however, becomes slightly less diverse, though is correlation may be too small to have any economically significant effect on diversity. As the percentage of women farmers in a county increases the board of directors of the Farm Credit institution in that county becomes more diverse.

Table 5: Correlations between SDFR, minority and female farmers and the level of diversity in Farm Credit leadership.

Variable	HHI by race, ethnicity and gender	
	Board of directors	Senior Management
SDFR_PPP	0.027 [1275]	0.008 [1361]
% Minority Farmer	-0.18 *** [1640]	0.04 * [1705]
% Female Farmer	-0.14 *** [1640]	-0.002 [1705]

[] = Number of observations. *, **, *** indicates 10%, 5% and 1% levels of statistical significance.
SDFR_PPP= SDFR that received PPP loans.

Conclusion:

This study involved the documenting of the levels of diversity among Farm Credit Institutions' board of directors and senior management. A measure for diversity was calculated using a modified version of the HHI. It was found that on average senior management is more diverse, in terms of gender, race and ethnicity than board of director members. The shares of females to males are almost the same size with the share of males dominating. In terms of race and ethnicity white individuals dominate in both board of

directors and senior management. We also find that many SDFRs used non-traditional lenders to apply for the PPP. About 15% of PPP applications made through Farm Credit Institutions, where the applicant volunteered information about their race, gender and/or ethnicity, were made to SDFRs. Correlation results point to the demographic composition of the governing board and senior management being associated with the demographic composition of the county where the farm credit is located. As the share of minority farmers (in terms of race and ethnicity) in a county increase so does the level of diversity of the Farm Credit leadership. The same findings were identified when only considering gender and the share of female farmers. This would indicate that Farm Credit institutions are attempting to have a leadership body that represents the community they serve. How diversity affects credit access still needs to be discussed. Findings from the econometric estimations should allow for further discussion on the topic.

It is important to state that we were unable to check our classifications conducted from the raw data gathered from the Farm Credit institutions' website because no Farm Credit Institutions volunteered to fill out the survey we designed. We contacted all institutions by email and phone requesting them to participate in a survey to gather data on the diversity at their leadership but also among their lending officers. This information would allow us to conduct a robustness check of our estimations with the HHI. We tried contacting key people at Farm Credit Institutions to try to get the survey answered, without avail. See in the appendix the survey sent and the documentation on communications with the Farm Credit Institutions. As a solution we have included a clarification as to the limitation of the data to our analysis.

Having a diversified board may be challenging since there may be biases and barriers that impede non-male and non-white individuals from becoming a member in a board of directors. In academia, for instance, lack of mentoring, student funding and access to

information sharing networks can hinder minorities from advancing in their career (Hilsenroth et al. 2022). Future research could investigate the reasons for a lack of diversity among agricultural lenders' leadership. A representative board of directors may have a greater impact on increasing credit access to SDFR than greater diversity among senior management. The reason being that BOD can influence the institution's policy and business strategies, for example they can design and promote strategies to increase diversity among lending officers. The voluntary practice of affirmative action by lenders is suggested by Squires and Kim (1995).

Recommendations:

The board of directors (BOD) and senior management (SM) at Farm Credit Institutions have little diversity in terms of race and ethnicity. It is recommended that farm credit institutions seek to attract more senior management and promote the election of more racially diverse members into their board of directors. The BODs should strive to mirror the diversity among Farm Credit Institution's borrowers. In order to improve diversity among BOD, other related actions to make the shares of SDFRs more homogenous among US county levels may be needed. This could mean target policies to improve credit access in counties with lower shares of SDFRs.

Another issue identified in this research stemmed from the limitations: Race, ethnicity and gender of the board members and senior management were not self-identified, as such our results could be underestimating the level of diversity in Farm Credit institutions. There is limited information on the race, ethnicity and gender identities of BOD and SM. A recommendation is to increase transparency about how BOD and SM members identify themselves. This could be added to the website information of the BOD and SM. It could in turn help attract more SDFRs to apply for a loan through the Farm Credit Institution.

Farm Credit call reports do not have information on whether the loans went to SDFRs. In this research we used information volunteered by PPP applicants. There is a large number of unanswered observations in the PPP loan dataset that could be distorting our results. Allowing Farm Credit Institutions to gather voluntary information on their loan applicants would help policy makers and researchers improve their understanding of lending and credit access to SDFR. Aggregate information could be added on to call report information, not only for Farm Credit lending institutions but also other lenders, such as Commercial banks.

Appendix

Does a Diverse Leadership Board at a Lending Institution Increase Credit Access to Minority Farmers?

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INTRODUCTION

- Despite of having far ending loans, many statistical analyses continue to show loan denial inequalities between white and minority loan applicants (Templin et al., 1989).
- A string of lawsuits especially after 1990s have been reported in both farm and non-farm sectors in which different cooperatives were found guilty of charging higher rates of interest and fees to minority and female borrowers (Feder & Cowen, 2012; Dupont et al., 2019).
- In Farm Credit institutions, lender-borrower relationships appear to be more significant in terms of increasing credit availability and approval (Dell, Behr et al.).
- The Farm Credit System is made up of four banks and 67 associations that provide credit to farmers, ranchers, rural cooperatives, and others who are eligible to borrow (About banks & associations | Farm Credit Administration, 2021)
- In 2020 the Farm Credit System (FCS) surpassed commercial banks in real estate loans and was the second largest lender in non-real estate loans (Farm Income and Wealth Statistics | USDAERS, 2022).
- For the reasons above, it's important to understand how the diversity of governing boards and leadership influences credit availability to SDPR (Socially Disadvantaged Farmers and Ranchers).
- SDPR is a farmer or rancher who belongs to a group of people who have been discriminated against because of their race, ethnicity, or gender which includes African Americans, American Indians, Alaskan Natives, Asians, Hawaiian, Pacific Islanders, women farmers, and ranchers (Socially Disadvantaged, Beginning, Limited Resources, and Female Farmers and Ranchers | USDAERS, 2022).
- We contribute to the literature by investigating the linkages between diversity among board members in the FCS lending associations and the shares of SDPRs in counties.

OBJECTIVE OF THE STUDY

- This first step of the study has as an objective to investigate the level of diversity among board of directors (BOD) and senior managers (SM) in Farm Credit lenders and if that statistics do of the farming production on average.

LITERATURE REVIEW

- In past studies, different team of researchers found that access to credit impacted the productivity, investment, yield and welfare of farmers (Feder et al., 1990; Hounsoo et al., 2021).
- Dennis and Sant'Anna (2021) identified different loan amounts through the Paycheck Protection Program being received by small business owners of different race and gender.
- Gilmore et al. (2020) also concluded that minority borrowers are given smaller loans, higher interest rates, and shorter repayment terms than White American borrowers.
- Another study also found out that SDPRs lower output value, less operators, earned less in government payments, lower total assets, higher current ratios, and lower debt-to-asset ratios, compared to non-SDPRs (McDonald et al., 2012). This may make credit access challenging.

METHODOLOGY

- We determined the race and gender of farm credit directors and top managers by collecting data directly from each farm credit agency website. We then marked their gender and race by analyzing the names and photos.
- Gender identification was split into female and male while that of race was split into Asian, African American, and into ethnicity. Races that we could not identify were placed into a non-white category.
- This study uses Herfindahl-Hirschman Index (HHI), following Hunt, Taylor, and Prince (2015) to quantify the levels of diversity among the senior staff of Farm Credit lending associations. Here, HHI measures the level of diversity within the leadership staff of a Farm Credit lending association.

$$HHI = \sum_{i=1}^n s_i^2$$

- where, s_i represents each Farm Credit lending association up to N lending associations, i is the share of minority members on the board.
- HHI scores from 0 to 1. Where HHI equal to 1 means that all members of the board are of the same race or gender. The smaller HHI is the more diverse the board members are.
- The proportion of SDPRs in a county was calculated by adding all the SDPRs and divided it by total producers (including white producers).
- We calculated summary statistics and correlations between SDPRs and HHI. Correlations were calculated using the Pearson Correlation Method in R Studio Software (Rodgers & Nicewander, 1988).

DATA SOURCES

- We built a county-level dataset using data from: the 2017 Census of Agriculture (Government payments, farm-related income, farm sales, Farm producers) and from Farm credit services (FCS) websites.

PRELIMINARY RESULTS

Table 1: Summary Statistics of the Main Variables

VARIABLES	N	MEAN	SD	MIN	MAX
DEMOGRAPHIC PROFILE					
BOARD OF DIRECTORS (BOD):					
GENDER:					
MALE	76	10.19	3.43	3.00	22.00
FEMALE	76	1.69	1.24	0.00	5.00
RACE/ETHNICITY:					
WHITE	76	11.48	4.17	0.00	23.00
ASIAN	76	1.25	0.50	0.00	2.00
BLACK/AFRICAN AMERICAN	76	1.16	0.41	0.00	2.00
HISPANIC, LATINO OR SPANISH	76	4.00	4.24	0.00	7.00
NON-WHITE	76	1.00	0.90	0.00	1.00
SENIOR MANAGEMENT:					
GENDER:					
MALE	74	4.69	2.52	0.00	13.00
FEMALE	74	1.79	1.42	0.00	7.00
RACE/ETHNICITY:					
WHITE	74	6.29	3.17	0.00	16.00
ASIAN	74	1.00	0.90	0.00	1.00
BLACK/AFRICAN AMERICAN	74	1.00	0.90	0.00	1.00
HISPANIC, LATINO OR SPANISH	74	1.16	0.41	0.00	2.00
PRODUCERS DATA:					
TOTAL PRODUCERS	21,822	475.27	478.97	2.00	8,190.00
WHITE	21,822	424.23	449.11	0.00	8,822.00
SDPRs	21,822	228.08	258.90	2.00	13,269.00
SDPR SHARES	21,822	0.39	0.21	0.09	1.00
SDPR 50% AND GREATER:					
FARM INCOME	715,057	24,572.24	16,746.13	0.00	144,261.00
GOVERNMENT PAYMENTS	715,057	9,124.20	6,996.13	0.00	47,462.00
FARM SALES	715,057	15,327.98	12,637.91	-30,620.00	178,611.00
SDPR LESS THAN 50%:					
FARM INCOME	1,831,745	24,568.93	16,753.47	0.00	514,518.00
GOVERNMENT PAYMENTS	1,631,745	9,130.56	6,809.94	0.00	109,596.00
FARM SALES	1,631,745	15,366.75	13,030.49	-55,150.00	1,041,275.00
HHI:					
BOD	76	0.97	0.06	0.72	1.00
SM	74	0.96	0.10	0.50	1.00

N = number of observations, BOD = Board of Directors, SM = Senior Management, $SDPRs$ = stress process information on the proportion of SDPRs in counties.

- Table 1 presents the descriptive statistics of the variables used in the study.
- Demographic profile includes the gender and race/ethnicity of farm credit leaders. We see that most Farm Credit leaders are white males. Women make up about 22% of BOD and 54% of the senior management, in terms of race and ethnicity, white is the dominant race followed by Hispanic.
- HHI shows the diversity level in the farm credit lending institutions.
- Farm characteristics data provides information on the government payments, farm sales and farm related income of the counties per diversity level of producers. For example, SDPR (greater than 50%) receive a larger proportion of SDPR.

PRELIMINARY RESULTS

- On average, the counties have less diverse producers with the SDPR proportion of 39%. The number of counties with a larger proportion of SDPRs is smaller than that with a lower proportion.
- Counties with over 50% SDPRs have a slightly lower average of farm sales and government payment.
- HHI summary statistics show lack of diversity among senior members of the Farm Credit Associations.
- Correlation = -0.186 shows that there is a negative correlation between HHI for board of directors and socially disadvantaged farmers and ranchers. As the HHI becomes larger (i.e. less diverse) the proportion of SDPRs reduces.
- Correlation = -0.093 shows that there is negative correlation between HHI senior managers and socially disadvantaged farmers and ranchers. As the HHI becomes larger (i.e. less diverse) the proportion of SDPRs reduces.
- Hence there are more diverse board of directors and senior managers in the counties with more SDPRs and vice versa. Preliminary findings point to an attempt from Farm Credit lending institutions to represent the producer demographic in terms of race, ethnicity and gender, in the counties they serve.
- A non-white BOD or SM could mean greater understanding of the challenges facing SDPRs and could imply greater credit access to them. We will investigate this in the next steps of the project.
- Current findings can guide agricultural lenders and policy makers by shedding light on the demographic composition of governing boards and leadership staffs and whether they relate to the diversity of producers in the county they serve.

LIMITATIONS OF THE STUDY

- Race and ethnicity of the board members were not self-identified in this study, it was determined by researchers.
- We limited correlation and summary statistics to the counties where the Farm Credit lender is present, in the next steps we will include all counties that the Farm Credit lender serves.

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O Programa de Pós-Graduação em
Administração (PPA/UEM) convida para a

Palestra

Credit access to minority
in the U.S. *



Prof^a. Dr^a. Ana Claudia Sant'Anna

(West Virginia University)

Abstract: We examine credit access to minority agricultural producers using publically available data on the Paycheck Protection Program, which occurred in 2020 and 2021. PPP was designed to inject emergency funds to small businesses which were impacted by Covid-19. These businesses were potentially facing bankruptcy. Among the small businesses were farmers, who were also eligible for the program. This talk will discuss the PPP program, the types of credit available to U.S. farmers and the characteristics of minority farmers at the county level. Under minority farmers we include farmers who are female, those of Hispanic ethnicity and non-white. Data comes from the Agricultural census, ERS-USDA, lender websites as well as call reports. We analyze the differences received by minority farmers in PPP lending in comparison to non-minority farmers. Additionally, we analyze whether diversity at the leadership level of major farm lending institutions plays a role in credit access to minority farmers. Preliminary results reveal that minority farmers in rural counties and in low to moderate income counties received lower amounts of PPP than those in urban and high income counties. Also, female farmers received less in PPP loans than male farmers. Higher levels of diversity among members in the leadership at Farm Credit lending institutions exist in counties with higher shares of minority farmers. Implications and further steps will be discussed.

Dr. Ana Claudia Sant'Anna is an Assistant Professor of Agribusiness and Agricultural Finance in the Division of Resource Economics and Management at West Virginia University. Her research interest focuses on strategic decision making within the fields of agricultural production, agribusiness and ag finance. She has experience in applying quantitative methods to analyze market structures, contract relationships and firm strategic decisions. Ana Claudia has publications in journals such as, Agribusiness, Journal of Agriculture and Applied Economics, Renewable Energy, Biomass & Bioenergy, International Food and Agribusiness Management and Applied Economics. She has also received a number of awards such as the Excellence in Review Award (2018) from Resources, Conservation & Recycling, the University Distinguished Professors Graduate Student Award from Kansas State University and, the CNPq Brazilian National Award for Outstanding Performance in Initiation into Scientific Research. Her recent projects have addressed willingness to adopt soil health practices, credit access and availability and biofuel expansion in South America.

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20/07/2022 | Quarta-feira | 14:00h | Local: Auditório do PPA

Documentation:

Ranjita emailed and/or called all the 67 Farm Credit Institutions. We sent them an email requesting their participation in the survey, highlighting the benefits to the institution from participation and with information on anonymity. However, the institutions either did not reply or they informed that they would not like to participate at the moment. Therefore, I started contacting people who I had met that I knew worked at Farm Credit Institutions to see if we could get in touch with the correct people that were willing to answer the survey. We were unsuccessful. Below I detail the extra steps taken.

Farm Credit Survey

Talked to Christopher Laughton (Farm Credit East) on 04/26/2022 via zoom 4-5pm to seek help with getting in touch with the best person to complete the survey.

What we talked about:

1. Only FCS members can join be elected to be on the board of directors. In some counties, the percentage of SDFRs is low (as can be seen by the Ag Census), which is reflected on the diversity of board of directors
2. A larger diversity can be seen in terms of male and female ratio.

Talked to Gary Matteson – SVP Beginning Farmer Programs and Outreach on 04/29/2022 at 10:30am

- Talked about how Farm Credit uses farm credit score card and how they cannot, due to FCA regulations, identify the race of the borrower.
- Did not mention who I should talk to regarding the survey being answered.

04/27/2022 - Emailed Rebecca Franz – Farm Credit of the Virginias

Rebecca Franz forwarded the survey to HR who did not reply.

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