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Examining the Relationship Between Women, Minority Farmers, and Diversity in the Leadership of Farm Credit Institutions

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Abstract

In lending, diversity in company's leadership could increase credit access to minority and women borrowers. We estimate diversity among governing board of directors (BOD) and senior management (SM) at a major US agricultural lending institution and investigate its linkages to minority farmers and women farmers. Main objectives: 1) measure the level of diversity among the leadership; 2) identify correlations between lender diversity leadership levels and minority farmers. Data is collected from Farm Credit (FC) Intuitions' websites. Diversity is measured using the Herfindahl-Hirschman Index (HHI) and correlation tests are performed. Results show that females make up ~27% among SM and ~13.8% among BOD. White individuals dominate in BOD and SM. 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. As the percentage of minority and female farmers increases the BOD becomes more diverse (a negative correlation is observed). 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.

Keywords minority farmers, women farmers, credit access

JEL code Q14, J15

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Introduction

In lending, diversity in company's leadership can provide a number of benefits, among those greater credit access to minority and women borrowers. Despite changes to legislation, inequality in lending still exists. Tempkin et al., (1999) identified loan denial inequalities between white and minority loan applicants. Past events have shed light on the existence of a different treatment from lenders to borrowers of different race and ethnicity (Escalante et al 2018): 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; 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 (2018) 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, Sant'Anna et al. 2023), within USDA loan programs (Escalante et al. 2006) and, in farmer use of non-traditional lenders (McDonald et al. 2021).

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 minority and women farmers? Could greater diversity among board members improve credit access to minority and women farmers? In this study we first estimate the level of diversity of a major U.S. agricultural lender to then estimate correlations between lender diversity leadership levels with the race and gender composition of the counties which they serve.

It is undeniable that the composition of the board of directors has an impact on the

business. The more diversified a board of directors 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). Nevertheless, what is generally observed is a more homogeneous makeup of boards (Adams et al. 2015). Recent attempts have been made to increase diversity within business' board of directors. An example is the NASDAQ Board Diversity Rule[1], which requires companies listed by them have at least two diverse members as board of directors or explain why they do not. Yet, specifically within the realm of agricultural lending, little is known about the role of a diversified leadership and its connections to their customer base. Hartarska et al. (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 believe that females have a better understanding of their clients and are more risk adverse. Gunderson, Gloy and Rogers (2009) studied how board size and compensation affected profitability and operating efficiency measures in Farm Credit Associations. Authors find that increases in board size and member compensation had diminishing returns on profitability and operating efficiency measures.

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 acceptance[2] rates (Squire and Kim 1995); 3)

[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.

[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.

greater favorable acceptance in loan denials among borrowers[3] (Kulik and Holbrook 2000); 4) greater likelihood of returning for a second loan (Beck et al., 2018)[4]. Based on these findings, we believe that a diverse leadership, especially one that reflects the makeup of their customer base, can increase credit access through borrower-lender relationships. Lending relationships 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 the 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.

The Farm Credit System (FCS) is an important US agricultural lender. In 2021, the FCS together with commercial banks were the source of 80% of the farm sector debt (includes real estate and nonreal estate loans) (USDA/ERS 2023). In 2021, the FCS held ~48% of the US agricultural real estate loan debt, occupying first place, and ~38% of the non-real estate loan debt (USDA/ERS 2023). We contribute to that need by estimating diversity among governing board of directors (BOD) and senior management (SM) at the FCS and investigate linkages between diversity in FCS leadership and minority farmers and women farmers. Using data collected from Farm Credit (FC) Intuitions' websites we measure diversity using the Herfindahl-Hirschman Index

[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.

(HHI). Results show greater diversity in terms of sex but little diversity in terms of race. Results also indicate that in general the demographic composition of the BOD and SM is associated with that of the farmers in the county which the farm credit lending association serves.

Measuring Diversity and correlations to farmer demographics

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, sex 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/ethnicity or sex. The smaller HHI is the more diverse the board of directors is.

In order to examine the linkages between diversity among Farm Credit lending Associations and the composition of their potential customers we estimate the correlations between HHI and shares of women and minority farmers in a county. As such we match HHI to the shares of women and minority farmers in the counties they serve. In counties serviced by more than one Farm Credit lending institution a weighted average of the HHI was estimated, according to the market shares of the institutions in terms of loans. Market shares are calculated using the total loans provided at the headquarter. 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*, *x* and *y* bar indicate the means of vector *x* and *y*. The expectation is that lower HHI, i.e. more diverse leadership, will be linked to counties with a larger share of female and minority farmers. Diversity levels of leadership and their linkages to the characteristics of farmers in the counties they serve is discussed in results section.

Data collection

Between October 2021 and May 2022 data on farm credit board members and senior leadership staff was collected from Farm Credit lending Associations by two researchers. All data was updated and verified at the end of May 2022. Data on Board of Directors was collected from 75 institutions and Senior Management from 63. The Farm Credit System is made up of 4 banks, 67 associations and six service corporations (Farm Credit Administration, 2021). 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 least names, though at times it also included a short biography, the date the person took on the position and a photo. When needed, further information on the leadership was collected from social sites (e.g. Facebook, Twitter, Linkedin) was collected by a third researcher to help categorize individuals in terms of race, sex and ethnicity. Sex identification was split into female and male while that of race was split into White, Asian, African American, Indian, non-white and, ethnicity into Hispanic or non-Hispanic.

County level data on farmers' sex and race comes from the 2017 Agricultural Census data on primary producers. We use data on primary producers collected from the 2017 Agricultural

Census to estimate the shares of women and minority farmers per county. We consider as minority farmers non-white male and female farmers (primary producers). Women farmers include all farmers who have identified themselves as female regardless of race and ethnicity. The composition or share of women and minority farmers is calculated by dividing the total number of primary producers in each county by the sum the primary producers that are non-white (minority) and that are female. Only the US continental was considered for the data from the 2017 Agricultural Census.

Table 1 summarizes data collected from the Farm Credit lending institutions' websites and from the 2017 Agricultural Census. Table 1 presents the shares of males and females in the Board of Directors (BOD) and Senior Management (SM) and of white versus other races and ethnicities. Senior management leadership appears to be slightly more diverse than the board of directors. In considering the shares of males and females, the BOD has 14% of females as members while the SM has 27%. Less diversity is observed in terms of race and ethnicity, BOD has 3% of members that are of another race and ethnicity while the SM has 4%. On average counties have circa 28% of its primary producers identifying as female and 6.8% as a race and ethnicity other than white.

Results

Our results shed light on the demographic composition of Farm Credit Institutions' board of directors and senior management. Leadership is split into Board of Directors (BOD) and Senior Management (SM). On average the majority of Farm Credit leaders are white and males. On average there is a larger share of women in senior management than as members in the board of directors. On average shares of female leaders in SM resemble those of female producers in counties. 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 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. Given that senior management oversee areas such as lending and credit operations (including loan approvals), risk management and analytics, a greater female presence could lead to a better understanding of the needs from the farmers in the county they serve. In terms of race and ethnicity, the white race accounts for circa 96% of senior management and 97% of board of director members. As such, the women on the senior management and board of directors are mostly white. These shares are a little smaller than the average shares of non-white primary producers in US counties.

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 2 shows that on average the HHI for sex ranges between 0.68 for senior management and 0.78 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 0.66 while that of board of directors is 0.76, suggesting that white females play an important role in increasing diversity in leadership. Standard deviations in diversity levels for race and ethnicity are small indicating little variation in the indices, that is diversity in terms of race and ethnicity does not vary much between the lending institutions. In turn, diversification in terms of sex has a slightly larger variation in diversity levels from one lending institution to the other.

Thus far we have considered diversity within each farm credit institution. Yet our argument is that increased levels of diversity may lead to increased credit access to female and

minority farmers. At times, farmers in a county can choose between two or more farm credit lending associations to apply for a loan. As such, we estimate the level of diversity of the leadership of the farm credit institutions that the farmer can lend from. HHI are assigned to the counties the farm credit serves, when a county is served by more than one farm credit lender a weighted average is used according to the share of total loans awarded as explained afore. Table 3 brings information on HHI levels at the county level. This step is conducted in order to then analyze the correlations between the shares of female farmers and minority farmers with the level of diversity at Farm Credit lending institutions. When analyzed at the county level, diversity in terms of sex and race is increased among senior management. Variation is also larger given that standard deviations range from 0.28 to 0.39. Little change is observed in terms of diversity among the Board of Directors.

Table 4 displays the correlations between levels of diversity in leadership in Farm Credit lending institutions and the share of female and that of minority farmers in a county. Results show a week yet statistically significant inverse relationship between shares of minority farmers in a county and HHI. As the size of the share of minority farmers increases within a county the greater the diversity among the leadership. This indicates that lending institutions are attempting to have a leadership that reflects their potential customers. Since board members have to be part of the Farm Credit Association it also indicates that non-white members are making it into leadership positions. In terms of female farmers, a stronger inverse and statistically significant effect is observed. As the shares of females in a county increases so does the level of diversity, in terms of sex, within the leadership of the lending institution.

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 than board of director members. In terms of sex (i.e. male and female), females made up almost a third of the leadership body while non-whites make up less than 5%. The females seem to be represented on average at similar rates than the shares of female primary farmers. In terms of race and ethnicity white individuals dominate in both board of directors and senior management. Although the shares of minority farmers are low in counties (~6-7% on average) their representation within the leadership of the Farm Credit Institution lending association is even smaller. As such, women in leadership roles are predominantly white.

Correlation results point to the demographic composition of the governing board and senior management being associated with the demographic composition of the county which the farm credit serves. We find a weak but statistically significant inverse relationship indicating that as the share of minority farmers (in terms of race and ethnicity) in a county increases so does the level of diversity of the Farm Credit leadership (i.e. HHI decreases). The same inverse relationship was found when only considering gender and the share of female farmers, yet at higher numbers (i.e. a stronger inverse relationship). These results indicate that Farm Credit institutions are attempting to have a leadership body that represents the community they serve. It also indicates that female and non-white members in Farm Credit Institutions are being elected as board of directors. The lower levels of diversity among board of directors with respect to senior manager may be since individuals must be elected in order to be on the board of directors (BOD) 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 minority farmers in the U.S. is not homogeneous. As such, Farm Credit Institutions serving predominantly counties with white farmers are likely to have a less diverse BOD than others in regions. One-way Farm Credit lending institutions could increase diversity among their board of directors is through the external member. Assigning a women or non-white individual as an external member can increase diversity in the board of directors even when there is little diversity among Farm Credit members running for election. We do not have information on which members are external for all the Farm Credit lenders in our sample. Other limitations from this study are: 1) categorization of race, gender and ethnicity of the Farm Credit Lenders' leadership was not self-identified which could lead to underestimation of the level of diversity of leadership; 2) weighted average HHI assumes that shares of loans at the Farm Credit association headquarters is than those at the county level they serve.

Board of Directors have greater influence over policy designs and strategies of the company while senior management is responsible for overseeing the implementation and execution of strategies. 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 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 minority and female farmers while SM oversees the execution of the policies and strategies.

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).

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Tables

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

Variables	# Observations	Mean	Standard Deviation	Minimum	Maximum
		Board of Directors			
GENDER:					
Male (%)	75	86.00	8.41	66.67	100
Female (%)	75	14.00	8.41	0.00	33.00
RACE/ETHNICITY:					
White (%)	75	97.00	11.94	0.00	100.00
Other race/ethnicity (%)	75	3.00	11.94	0.00	100.00
		Senior Management:			
GENDER:					
Male (%)	63	73.04	17.34	25.00	100.00
Female (%)	63	26.96	17.34	0.00	75.00
RACE/ETHNICITY:					
White (%)	63	96.16	13.88	0.00	100.00
Other race/ethnicity (%)	63	3.84	13.88	0.00	100.00
		Producers:			
Share of Minority (%)	3,073	6.78	8.84	0.00	100.00
Share Female Farmer (%)	3,068	28.44	6.91	6.87	85.71

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

Table 2: Herfindahl-Hirchman Index by sex, race and ethnicity for Farm Credit Institution leadership

Herfindahl-Hirschman Index	Board of Directors		Senior Management	
	Mean	Standard Deviation	Mean	Standard Deviation
Male/Female	0.78	0.12	0.68	0.16
Race and ethnicity	0.97	0.06	0.96	0.10
Race/ethnicity and male/female	0.76	0.14	0.66	0.18
Observations	74		68 (71 for M/F)	

Table 3: HHI measures by sex, race and ethnicity of Board of Directors and Senior Management members at the county level

Herfindahl-Hirschman Index	Board of Directors		Senior Management	
	Mean	Standard Deviation	Mean	Standard Deviation
Male/Female	0.78	0.08	0.52	0.28
Race and ethnicity	0.95	0.08	0.72	0.39
Race/ethnicity and male/female	0.75	0.10	0.50	0.28

Table 4: Correlations between Women and Non-White farmers and the level of diversity in Farm Credit leadership at the Board of Directors and Top Management Levels

	HHI by race, ethnicity and gender		HHI by gender		HHI by race and ethnicity	
	BOD	SM	BOD	SM	BOD	SM
% Minority Farmer	-0.24 ***	-0.11 *			-0.09 ***	-0.15 ***
	[3054]	[3054]			[3054]	[3054]
% Female Farmer	-0.37 ***	-0.33 ***	-0.30 ***	-0.33 ***		
	[3053]	[3053]	[3053]	[3053]		

[ ] = Number of counties. *, **, *** indicates 10%, 5% and 1% levels of statistical significance. Pairwise Pearson correlation is used.