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Introduction

Cooperatives have a significant footprint in the agricultural industry of the United States. Agricultural cooperatives dot the landscape across America and are a valuable component of the agricultural and food industries in the U.S. and beyond. According to the most recently published statistics, agricultural cooperatives collectively had a record net income in 2021 of \$9.3 billion from \$231.4 billion in total sales, employed over 138,000 full-time employees, and controlled a record \$111 billion in assets (Wadsworth, Coleman and Rivera 2022). As impressive as those numbers are, Novkovic (2008) makes the case that agricultural cooperatives have a greater presence in the market than most studies recognize.

This level of economic activity is built on a long history, one rooted in the story of the collective of producers (Pitman 2018; Fulton and Giannakas 2013). Part of the reason behind this success is the unique business structure that employs the user-owner, user-control, and user-benefit principles (Dunn 1988; Cobia 1989). These principles allow owner-members to reach the critical mass necessary to tap large, global markets and reach economies of scale (Kenkel and Park 2011; University of Wisconsin Center for Cooperatives 2012) while maintaining some level of agency.

Although American cooperatives rose in significance over the country's history, the numbers of enterprises and members have been declining. The total

number of cooperatives in the United States is down, a trend that has persisted well over three decades. The U.S. Department of Agriculture reports 1,699 agricultural cooperatives existed in 2021 (Wadsworth, Coleman and Rivera 2022). A decade earlier the number was 2,390 and in 1989 it was 4,799 (Ali, Penn and Eversull 2012; Richardson et al. 1994). A review of the historical numbers shows the speed of the annual decline in the number of ag cooperatives has slowed down. The number of voting members has a similar story. In 2021, there were 1.8 million voting members, down 1.3 percent from 2020 (Wadsworth, Coleman and Rivera 2022). There were 2.2 million and 4.1 million in 2009 and 1989, respectively (Ali, Penn and Eversull 2012; Richardson et al. 1994). Unlike the number of cooperatives, which have seen a decline in numbers year-over-year for over three decades, membership had five years of increased numbers scattered over the 30-year span.

There are many reasons for the decline in the number of agricultural cooperatives and voting-members of cooperatives. Consolidation in the agricultural input and crop marketing industries is well documented. MacDonald (2017) points to rapidly changing technology and the magnitude of research dollars needed to strategically position for future competitiveness as one cause of consolidation. It was also noted that as the input sector consolidated so did the crop marketing side of the industry. The producer sector also saw great consolidation resulting in fewer farms and producers (MacDonald, Hoppe and Newton 2018). In addition to the consolidation of input suppliers and marketers of outputs, the structure of those markets is changing with the rise of companies like Farmer's Business Network and other direct, mass marketers.

With the numbers showing fewer entities and fewer producers controlling record level revenues and assets, it is easy to make the case that the choice of an individual producer to join and consistently conduct business through

cooperatives is carrying more weight. Winning each producer to the cooperative is more critical to the success and future viability of agricultural cooperatives in this changing, more competitive market space. Therefore, agricultural cooperatives need to focus on retaining current and attracting new owner-members like never before to ensure their future. Key to that effort will be the producers' perspectives about cooperatives and the perception of the value proposition cooperatives have to offer. Understanding these factors will help retain current members and recruit new members.

This study considers what producers value with respect to cooperatives and identifies factors of cooperative leaders. The results paint a picture of how agricultural producers in Kansas perceive cooperatives and what motivates their decision to join and participate in agricultural producer cooperatives. In addition, the study identifies factors that could help in selecting the next generation of cooperative leaders who could be targeted early on for leadership development activities. The results will help the management team and board members of cooperatives develop strategies to retain current and attract new members and a leadership development strategy.

A brief review of related studies on the cooperative value theory and other studies on cooperatives as it pertains to the value proposition of agricultural cooperatives follows. The variables used and survey process are explained, and then methods of analysis are explained. The empirical results are presented and in the last section a summary and conclusions are made.

Literature Review

The cooperative business model has been widely adopted across the United States and around the world (World Cooperative Monitor 2020). Membership in cooperatives is paramount to their success. Members are the owners and patrons of the cooperative. They directly benefit from the

organization's services. Membership, in fact, is an essential key for a cooperative's profit and sustained success (Fulton and Adamowicz 1993). Part of what allows cooperatives to be profitable is that the collective of producers is able to reach critical mass needed to access global markets (Kenkel and Park 2011; University of Wisconsin Center for Cooperatives 2012). Wadsworth (2001) claims members are what keeps the cooperative spirit alive and kicking.

A major reason for this widespread adoption is the unique combination of benefits, control, and ownership offered by cooperatives to its members (Cobia 1989; Dunn 1988; Barton et al. 2011). In agriculture, farmers and ranchers who are members of their local cooperative are part owners of the larger entity. They have a voice in the operation of the cooperative in the form of voting rights, and it is usually one-member, one-vote. Therefore, large producers and small producers have the same level of input into what the organization does. Members enjoy direct benefits of being a cooperative member. The benefits can further be considered as price, quality, and relationship (Hallock 2015). Part of the price consideration is the patronage, or the returns of a portion of profits based on a member's level of business conducted with the cooperative (Barton 1998). Fulton and Adamowicz (1993) found the size of the patronage paid to Canadian wheat cooperative members may also be a factor that influences member commitment to cooperatives.

The importance of membership has driven many to consider the factors that are related to membership. Previous research has considered how demographics of producers relate to membership. One such demographic is the income level of the farm. Higher income levels increase the likelihood of producers joining cooperatives. Hallock (2015) found producers with more than \$100,000 income from agriculture are more likely to join cooperatives as these producers are large enough to run their own operations and would seek a

cooperative membership to boost profits, unlike producers who earn less than \$100,000 who most likely have other primary income sources. Also, these producers with a higher income from agriculture are interested in the kinds of services provided by cooperatives from marketing and value-added activities, to training on new innovative farming methods, and the input prices offered by cooperatives.

Akin to agricultural income, length of experience with agriculture potentially could influence the motivation to be a member of a cooperative. Hueth and Reynolds (2011) make an argument to consider longevity or experience in agriculture. They note that younger producers, those who did not have to worry about the competitive pressures that brought about their cooperative, do not see the pro-competitive effect it had. Generally, one could consider that experience and longevity through various market cycles and conditions would lead a producer to be more favorable to cooperative membership.

Age of the operator is another factor that has been considered. In some cooperatives, the equity redemption models are tied to a producer's age, often with equity redemption not triggered until the member reaches a pre-determined age (Eversull 2010). This form of equity redemption is losing ground to revolving fund models, where the oldest equity being redeemed first regardless of age of the producer (Barton et al. 2011). The effect of age is not a settled issue. Some studies have found age to be insignificant in the likelihood of joining a cooperative (Burt and Wirth 1990; Wadsworth 1991), citing that producers, whether young or old, are willing to join cooperatives.

Beyond membership, the participation of producers in the operation of their cooperative is also a concern. Gray and Kraenzle (1998) is a seminal and extensive work on this topic. They found that farm characteristics like size, producer demographics, attitudes toward cooperative principles, perception of

members making a difference, and general attitudes toward farming, among other things, impact the level of engagement or participation in cooperative leadership.

Several studies have found that various factors have different impacts on farmers' decisions to join cooperatives and participate when they become members. Factors such as age, farming experience, income level, education level, among others tend to influence the decision to join cooperatives and these socio-economic characteristics have been examined in literature regarding what kind of individuals could potentially be cooperative members.

Data and Methodology

The data used in this study was collected via an online survey administered in the fall of 2023. A copy of the Qualtrics survey is presented in Appendix 1. Responses were collected over a ten-week period, starting in August and ending in October. The study utilized a snowball technique where Kansas agricultural producers were targeted. Distribution efforts started with electronic invitations being sent to members of three Kansas agricultural organizations: AgManager.info, Kansas Farm Management Association, and the Kansas Specialty Crop Growers Association. The invitation requested the recipient take the survey and pass the invitation on to those they thought might be interested in participating. Each directory was supplied with a different link and thus responses were tracked by campaign.

The qualifying question on the survey was whether the respondent was directly involved in production agriculture. Those that answered "No" had their session terminated. Those that answered "Yes" were presented with a series of demographic questions about self, operation, knowledge of and attitudes toward cooperatives, cooperative involvement, and media preferences. The demographic variables collected include age, gender, highest level of education, time working

in agriculture, total income from agricultural activities in 2022, percent of agricultural income to household income, primary role of respondent in the agricultural operation, county of main operation, type of cooperative memberships, and whether business is done with an agricultural cooperative. In addition, attitudes and perceptions were collected about the importance of various factors when choosing to do business with a supplier as well as when deciding to join an agricultural cooperative. Respondents were also asked about their opinion and knowledge of agricultural cooperatives in addition to two questions to check their understanding of the cooperative business structure. The flowchart of the survey instrument can be found in Figure 1.

The responses to the survey were associated as follows: 553 responses from AgManager.info, 43 responses from Kansas Farm Management Association, and 15 responses from the Kansas Specialty Crop Growers Association. A total of 611 responses were collected. Of those that responded, 203 were deemed incomplete. An additional 40 responses were omitted for quick survey pace and trap questions. Ultimately, 368 responses were useable. Due to the nature of the snowball effect utilized in soliciting responses, it is infeasible to calculate a response rate that would have any meaning.

Summary Statistics

Table 1 presents selective summary statistics from the responses collected in the producer survey. These statistics are compared to Kansas statistics from the 2022 U.S. Census of Agriculture (USDA NASS 2024) to check deviations from the profile of agricultural producers across the state. Gender and age demographics vary slightly from state averages according to the most recent Census of Agriculture. The largest divergence from Census of Agriculture numbers is the oversampling of male producers by more than 17 percentage points. As for age groups, those aged between 25-35, 35-44, and 65-74 years old

are oversampled, whereas producers between the ages of 45-54, 55-64, and over 75 are under sampled. While the groups were not exact matches, no age group deviated by more than six percentage points, and most are within two. Education demographic variables were not collected in the 2022 Census of Agriculture. However, the sample of producers contains a skewed representation of the education profile of Kansas residents, specifically in the number of 4-year degree and advanced degree holders (U.S. Census Bureau 2022).

Table 2 presents summary statistics describing respondents' cooperative membership and experience. Approximately 82 percent report membership in at least one cooperative, while 18 percent are non-members. Among members, agricultural cooperatives (69.02 percent) and credit unions (64.95 percent) are most common, followed by farm credit institutions (33.42 percent), rural electric cooperatives (14.95 percent), and other cooperative types (14.13 percent). On five-point Likert scale measures, members report moderate cooperative knowledge (3.52), favorable opinions (3.68), moderate engagement (2.69), and moderate loyalty (3.04). Binary indicators show substantial interaction: 86 percent conduct business with a cooperative, 65 percent voted in a recent board election, 37 percent attended a recent annual meeting, and 32 percent report current or past board service. Additionally, 39 percent discuss cooperative governance with family members, and 84 percent report that either they or a family member works for a cooperative.

Methodology

Like many other studies regarding cooperatives (Hallock 2015; Griffing 2016; Drożdż Vitunskiene and Novickyte 2021), a binary logit regression model was employed to determine the probability of cooperative membership. The response to the question, "Are you a member of an agricultural cooperative?" was the dependent variable with 1 being "Yes" and 0 being "No". Various

demographic and profile variables such as age, farming experience, sex, role in farm operation, level of education, percentage of income from agriculture in 2022, farm revenue range in 2022, and number of current cooperative memberships were the explanatory variables. The linear expression of the model used to estimate the likelihood of cooperative membership is expressed as:

$$\begin{aligned} Membership_i = & \beta_0 + \beta_1 CoopKnowledge_i + \beta_2 CoopOpinion_i \\ & + \beta_3 CoopBusiness_i + \beta_4 Education_i + \beta_5 Male_i \\ & + \beta_6 AgExp_i + \beta_7 Revenue2022_i \\ & + \beta_8 AgPercentIncome2022_i + \beta_9 PrimaryRole_i \\ & + \beta_{10} Partners_i + \beta_{11} Age_i + \varepsilon_i \end{aligned} \quad (1)$$

where $Membership_i$ is the status of respondent i as a cooperative member, β are coefficients to be estimated and ε_i is an error term.

An ordered logit model was also employed to determine the factors related to higher levels of engagement by cooperative members. The answer to the question, “How would you rate your participation/involvement in your agricultural co-op(s)?” was the dependent variable. The responses ranged from 1, indicating low levels of involvement, and 5, indicating extreme levels of involvement. Explanatory variables included similar demographic variables mentioned above, as well as responses to questions about current and previous board of director leadership, recent participation in the board of directors’ vote, recent annual meeting attendance, and conversations with family members about governance and/or operations of agricultural co-op. The linear expression of the model used to estimate the likelihood of cooperative membership is expressed as:

$$\begin{aligned}
Engagement_i &= \alpha_1 BoardDirector_i + \alpha_2 BoardVote_i \\
&+ \alpha_3 MeetingAttendance_i + \alpha_4 FamilyConv_i \\
&+ \alpha_5 Age_i + \alpha_6 Male_i + \alpha_7 AgExp_i \\
&+ \alpha_8 Revenue2022_i + \alpha_9 AgPercentIncome2022_i \\
&+ \alpha_{10} CoopKnowledge_i + \alpha_{11} CoopOpinion_i \\
&+ \alpha_{12} PrimaryRole_i + \alpha_{13} Partners_i + \omega_i
\end{aligned} \tag{2}$$

where $Engagement_i$ is the self-reported involvement of respondent i , α are coefficients to be estimated and ω_i is an error term.

Finally, factor analysis, a common membership analysis tool (Entsminger 2017; Grashuis and Cook 2019), was conducted to identify underlying dimensions influencing cooperative attitudes among Kansas agricultural producers. The first analysis examined producers' considerations when deciding to join an agricultural cooperative. This included 11 Likert-scale items focused on trust, price competitiveness, ownership, control, and related attributes. The second analysis focused on producer sentiment toward agricultural cooperatives, analyzing six Likert-scale statements reflecting perceived constraints and usability. The factor models are expressed as:

$$X_i = \Lambda F_i + \tau_i \tag{3}$$

where X_i is the vector of observed variables of the Likert-scale questions, Λ is the matrix of factor loadings, F_i is the vector of latent factors, and τ_i is a vector of error terms.

All data analyses were carried out using Stata 16.1 (StataCorp 2023) and SAS 9.4 (SAS Institute 2023).

Results and Discussion

How various factors are related to cooperative membership is the focus of the first analysis. The binary logit model results of agricultural cooperative membership are displayed in **Table 3**. While the estimates from logit models are not directly interpretable without transforming the coefficients into log-odds, the signs can be useful in identifying relationships between dependent and independent variables (Greene 2018). Producers who do business with cooperatives and total revenue were positive and significant at the 1% level. Age of the respondents and the level of self-reported knowledge of cooperatives were also positive and significant at the 5% and 1% levels, respectively.

The non-significant estimates included the demographic variables education level, gender, years of agricultural experience, percent of household income from agriculture, and primary role of respondents. Additionally, the opinion of cooperatives by the respondents was also insignificant.

Education level was insignificant, yet self-reported knowledge of cooperatives is positively associated with membership. This may suggest that formal education and functional knowledge about cooperatives may operate through different processes in influencing membership decisions. In the sample data, education level and knowledge of cooperatives have a weak yet insignificant correlation ($\rho = 0.06$, $p\text{-value} = 0.28$).

The collective results of the logit analysis suggest that the value proposition sought by producers is centered on general business principles rather than cooperative principles alone. The strong, positive relationship of the level of cooperative business and total agriculture revenue with membership supports the idea that membership is often a function of transactional convenience or necessity. In addition, producers with greater self-reported knowledge of

cooperatives are more likely to be members, indicating that familiarity with cooperative structures may facilitate participation. As such, cooperatives may need to position themselves competitively alongside other input and service providers while communicating the principles of ownership and governance as added benefits.

Those making the decisions about strategic direction for the cooperative are the board members, and thus it is helpful to understand what factors relate to the membership engagement in the cooperative's operations. The ordered logit model results pertaining to respondents' involvement in an agricultural cooperative are displayed in **Table 4**. Current or past involvement as a member of the board of directors, recent voting in board of director election, attendance at recent annual meetings, conversations with family about co-op governance and operations, and higher levels of leadership in their operations, claim to be knowledgeable about cooperatives, and view agricultural cooperatives favorably are factors that have a positive and significant relationship on the level of engagement by producers in an agricultural cooperative. Producers who are males and farm employees are less likely to be involved in agricultural cooperatives.

The cooperative leadership engagement analysis suggests that certain experiences, such as serving on the board of directors, voting in board elections, and attending annual meetings, are associated with greater involvement in the cooperative. These findings indicate that governance participation may deepen engagement, reinforcing the idea that involvement begets more involvement. Producers who discuss cooperative governance with family members are more likely to report higher levels of engagement, suggesting that even informal dialogue plays a role in maintaining cooperative interest.

Producers with greater cooperative knowledge and more favorable views of cooperatives also report higher involvement levels. This highlights the value of

education and positive sentiment in fostering engagement. While knowledge and opinion were included in the membership model, their positive association with involvement here may reflect different underlying dynamics. Membership engagement builds as producers become more familiar with cooperative operations, values, and governance. This supports the idea that cooperatives should invest in relationship-building and ongoing education to help strengthen involvement over time.

Because the data are cross-sectional and based on self-reported responses, the logit and ordered logit models estimate associations rather than causal effects. Some explanatory variables, such as cooperative knowledge, perceptions, and governance participation, may develop alongside membership and involvement rather than strictly preceding them. For example, producers who are members of a cooperative may become more knowledgeable or more engaged over time. As a result, the direction of influence cannot be fully separated in this analysis. The results should therefore be interpreted as relationships observed within the sample rather than evidence of causation.

Finally, factor analysis, a common membership analysis tool (Entsminger 2017; Grashuis and Cook 2019), was conducted to identify underlying dimensions influencing cooperative attitudes among Kansas agricultural producers.

The logit results indicate how variables relate to cooperative membership and to cooperative leadership and give cooperatives characteristics to look for in potential members. To understand the different ways producers think about cooperatives, two different factor analyses were completed. The first factor analysis considered how respondents rated items when thinking of cooperative membership. Respondents were asked to rate the importance of factors when considering membership in a cooperative on a five-point Likert scale. The items included Pride/Loyalty, Access to Markets, Community Involvement, Ownership,

Control, Knowledge of Staff, Trust, Price Competitiveness, Quality Products/Services, Reputation of Cooperative, and Profit Sharing (see question 22 in appendix).

The results of this factor analysis are reported in **Table 5**. Among the 11 items evaluated, two factors emerge. The first factor captures elements central to a general business value proposition, with strong loadings on knowledge of staff (0.7533), trust (0.7505), price competitiveness (0.7173), quality of products and services (0.7656), and reputation (0.6801). Collectively, these items reflect criteria that would influence supplier choice regardless of organizational structure. The second factor centers on ownership and control dimensions, with higher loadings on ownership (0.7170), profit sharing (0.6488), pride or loyalty (0.6303), and control (0.6003). These items correspond closely with core cooperative principles such as user ownership, user control, and user benefit. Although business performance attributes appear more dominant overall, the emergence of a distinct ownership-oriented factor indicates that some producers evaluate cooperatives through governance and member-benefit considerations in addition to transactional performance.

The second factor analysis considered producer's sentiments toward cooperatives. Respondents were asked to note their level of agreement/disagreement of statements about cooperatives on a five-point Likert scale. The statements were: Loss of personal independence; Model is outdated; It prevents me from shopping price; It is easy to do business with; The commitment is too burdensome; and I believe I can contribute to the co-op's operation (see question 36 in the appendix).

When examining producers' sentiments toward agricultural cooperatives, two factors emerge (**Table 6**). The first factor loads positively on statements related to loss of personal independence (0.5731), prevention of shopping for

price (0.6373), burdensome commitment (0.6209), and the perception that the model is outdated (0.4994). These items collectively reflect concerns about autonomy and perceived constraints associated with cooperative membership. This factor appears to capture practical and structural frustrations, including limitations on pricing flexibility and dissatisfaction with organizational rigidity.

The second factor loads in the opposite direction on statements such as “easy to do business with” (-0.3930) and “I believe I can contribute to the co-op’s operation” (-0.4447). These loadings suggest a distinct dimension related to perceived accessibility and voice within the cooperative. Producers who feel the cooperative is difficult to work with or that their influence is limited may hold different sentiments than those who primarily view the model as restrictive or outdated. Together, these two factors provide a more nuanced view of negative sentiment, distinguishing between concerns over autonomy and frustrations related to usability and member influence.

Conclusions

This study examined the variables and characteristics toward membership and involvement in agricultural cooperatives among agricultural producers in the state of Kansas. Demographic variables such as cooperative knowledge, business with cooperatives, total revenue, and age were shown to be important variables positively related to membership in agricultural cooperatives. Producers with current or past involvement in cooperative governance (e.g., board members, election voters, annual meeting attendees, conversations with family members) are more likely to be actively involved with agricultural cooperatives. Additionally, producers who are more knowledgeable about cooperatives and view them favorably report higher levels of engagement. The factor analysis indicated that producers primarily focus on core business principles, and the cooperative principles are the focus of the second factor. The second factor

analysis indicates producers are concerned with the loss of autonomy and flexibility in doing business.

Collectively, the results indicate that producers need to be sought after as any other business (i.e. non-cooperative) would woo customers. The immediate business value must be there for producers. That is not to say the cooperative principles can be ignored as they still hold a positive influence, at least to some. When it comes to getting producers to engage with the cooperative, it seems to start with that reason to do business with the cooperative. It would be valuable for cooperatives to start engaging producers at any level possible and work angles to continue to advance that engagement as this study shows the more producers engage the more they are likely to engage further.

Our study presents some limitations. The sample of Kansas agricultural producers does fully reflect the demographic profile of agricultural producers in the state, with the greatest discrepancy being an overrepresentation of male respondents, but males also make up the majority of primary farm operators. The use of snowball sampling through agricultural producer directories likely introduced bias toward producers who are more digitally engaged, well-networked, and/or already involved in cooperatives. As a result, the findings may overstate knowledge levels and engagement with cooperatives, limiting the generalizability of the results to the broader producer population. Future research could generate a larger and more diverse sample of Kansas producers. The survey also did not include specific farm-level characteristics, such as acres, credit access, and livestock inventory, which could be significant predictors of cooperative membership. While total farm revenue was included as proxy for scale, it may not fully capture operational diversity or resource constraints. Also, social desirability and inaccurate recall biases may have been introduced with the data being self-reported.

Future research could explore agricultural cooperative membership across geographic regions and agricultural sectors across the United States and Kansas to enhance the generalization of the findings. Additional factors such as farm size, operation structure, and financial performance could provide a more robust understanding of the factors influencing cooperative membership and involvement.

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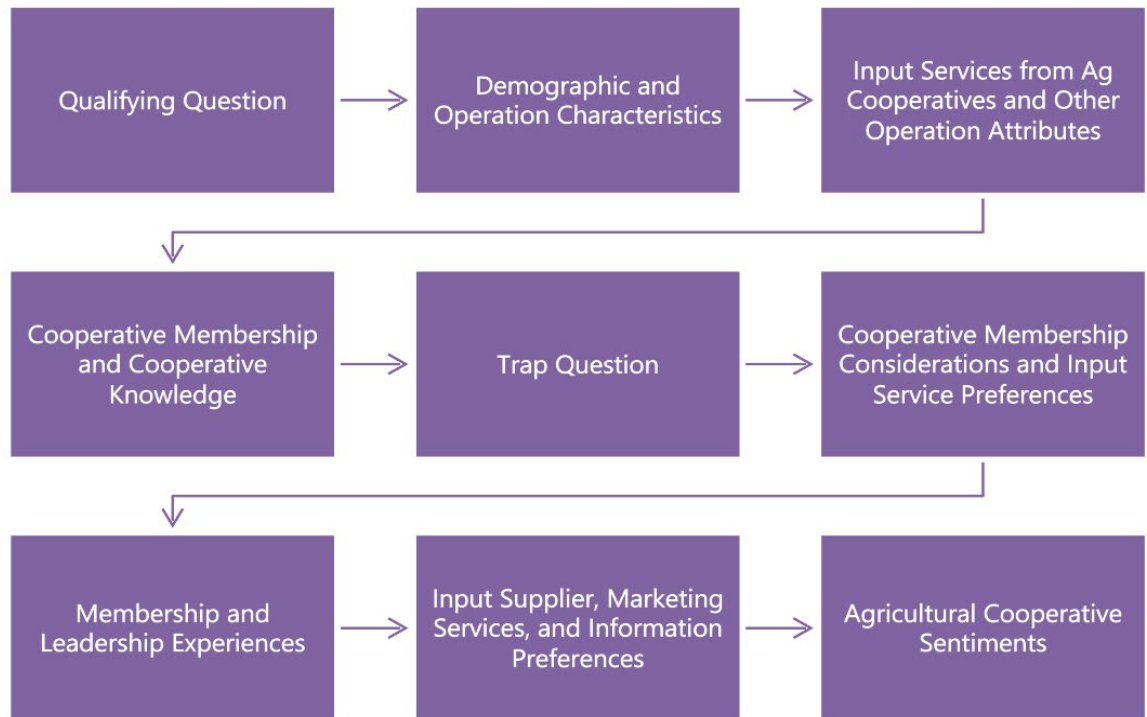


Figure 1. Flow of agricultural producer survey instrument.

Table 1. Summary statistics of Kansas agricultural producer variables (N-368)

	Sample	Census of Agriculture
Variable	Mean or Percentage	Mean or Percentage
Male (1)	83.11%	65.65%
Female (2)	16.89%	34.35%
High School/GED (1)	12.26%	
Associates/Tech/Trade Program (2)	14.17%	
Bachelor's/4-Year Degree (3)	50.14%	
Graduate/Professional Degree (4)	23.43%	
<i>Age</i>	56.52	58.20
<25 years	1.10%	1.71%
25-34 years	10.13%	7.92%
35-44	14.79%	12.24%
45-54	12.61%	14.39%
55-64	23.84%	24.01%
65-74	29.31%	25.82%
75+	8.22%	13.89%

Table 2. Summary statistics of cooperative variables

Variable	Mean or Percentage
Cooperative Members	82.02
Non-Members	17.98
<i>Types of Membership^a</i>	
Farm Credit	33.42
Credit Union	64.95
Rural Electric	14.95
Agricultural Coop	69.02
Other Coop	14.13
<i>Cooperative Experience and Perceptions of Members Only</i>	
<i>Five-Point Likert Scale Items^b</i>	
Cooperative Knowledge	3.52
Opinion of Cooperatives	3.68
Engagement with Cooperatives	2.69
Loyalty to Cooperatives	3.04
<i>Binary Scale Items^c</i>	
Business with Cooperatives	0.86
Current/Past Board Director	0.32
Vote for Recent Board of Directors	0.65
Recent Annual Meeting	0.37
Conversation with Family about Governance/Operations of Coop	0.39
Family Members Works for a Cooperative	.084

Notes: a – respondents could select multiple options. b – Likert scale items were from 1 = low levels to 5 = high levels. c – Items are scaled from 0 = No to 1 = Yes

Table 3. Results of logit model of agricultural cooperative membership with demographic variables

<i>Variable</i>	<i>Estimates</i>	<i>Standard Error</i>	<i>Wald χ^2</i>	<i>P-value</i>
Intercept	-5.268***	1.726	9.310	0.002
Cooperative Knowledge	0.485*	0.268	-1.810	0.071
Opinion of Cooperatives	0.372	0.257	-1.450	0.148
Business with Cooperatives	3.918***	0.542	7.230	<0.001
Education	-0.246	0.226	1.090	0.276
Male	-0.513	0.559	-0.920	0.359
Years Working in Agriculture	-0.324	0.316	1.020	0.306
2022 Total Revenue	0.526***	0.199	-2.640	0.008
2022 Agriculture Percent of Household Income	0.134	0.201	-0.660	0.506
Primary Role with Operation	-0.544	0.475	1.150	0.252
Number of Partners	0.003	0.063	-0.050	0.956
Age	0.039**	0.016	-2.430	0.015
Log Likelihood		-86.101		
Log Likelihood χ^2 Test Statistic		167.12		
P-value of χ^2 Test		<0.001		
Number of Respondents		351		

Notes: *, **, and *** denote statistical significance at the 10, 5, and 1 percent levels, respectively.

Table 4. Results of ordered logit model of agricultural cooperative involvement with demographic variables

<i>Variable</i>	<i>Estimates</i>	<i>Standard Error</i>	<i>Z-stat</i>	<i>P-value</i>
Current/Past Board Director	1.244***	0.298	17.69	<0.001
Vote for Recent Board of Directors	1.023***	0.291	12.38	<0.001
Recent Annual Meeting Attendance	1.229***	0.313	15.45	<0.001
Conversation with Family about Governance/Operations of Coop	0.981***	0.266	13.65	<0.001
Age	-0.002	0.010	0.05	0.816
Male	-0.614*	0.335	3.36	0.067
Years Working in Agriculture	-0.120	0.231	0.27	0.602
2022 Total Revenue	-0.077	0.105	0.53	0.466
2022 Agriculture Percent of Household Income	0.180	0.115	2.47	0.116
Cooperative Knowledge	0.374**	0.157	5.67	0.017
Opinion of Cooperatives	0.866***	0.143	36.63	<0.001
Primary Role with Operation	-0.596*	0.326	3.35	0.067
Number of Partners	0.055	0.062	0.78	0.375
Log Likelihood	-332.40			
Log Likelihood χ^2 Test Statistic	212.55			
P-value of χ^2 Test	<0.001			
Number of Respondents	288			

Notes: *, **, and *** denote statistical significance at the 10, 5, and 1 percent levels, respectively. Dependent variable includes response to categorical variable from 1 = not at involved to 5 = extremely involved.

Table 5. Factor analysis results of agricultural cooperative membership considerations

<i>Variable</i>	<i>Factor 1</i>	<i>Factor 2</i>
Pride/Loyalty	0.3714	0.6303
Access to Markets	0.5951	0.4405
Community Involvement	0.4366	0.5317
Ownership	0.3768	0.7170
Control	0.3436	0.6003
Knowledge of Staff	0.7533	0.3127
Trust	0.7505	0.3747
Price Competitiveness	0.7173	0.2545
Quality of Products/Services	0.7656	0.3364
Reputation of Cooperative	0.6801	0.3990
Profit Sharing	0.4000	0.6488
N	350	
Likelihood Ratio χ^2 Test Statistic	2,362.83	
P-value of χ^2 Test	<0.001	

Table 6. Factor analysis results of agricultural cooperative sentiments

<i>Statements</i>	<i>Factor 1</i>	<i>Factor 2</i>
Loss of personal independence.	0.5731	0.3881
Model is outdated.	0.4994	0.3814
It prevents me from shopping price.	0.6373	0.1246
The commitment is too burdensome.	0.6209	0.2065
It is easy to do business with.	-0.3135	-0.3930
I believe I can contribute to the co-op's operation.	-0.2147	-0.4447
N	340	
Likelihood Ratio χ^2 Test Statistic	443.12	
P-value of χ^2 Test	<0.001	

**Appendix I. Qualtrics Print Out of Ag Producer Survey
Survey Flow**

Standard: Introduction (1 Question) Standard: Block 1 (1 Question)
Branch: New Branch If If Are you directly involved in production agriculture? No Is Selected
EndSurvey: Advanced
Block: Block 2 (11 Questions) Standard: Block 3 (7 Questions) Standard: Block 4 (3 Questions) Standard: Block 5 (9 Questions) Standard: Block 6 (3 Questions) Standard: Block 7 (1 Question) Standard: Block 8 (1 Question) Standard: Block 9 (1 Question)

Q2 Are you directly involved in production agriculture?

- ☐ Yes (1)
- ☐ No (2)

Q3 What is the highest level of education you have completed?

- ☐ High School Diploma, Equivalent, or Less (1)
- ☐ Associates/Technical or Trade Program (2)
- ☐ Four-Year College Degree (3)
- ☐ Advanced Graduate Work (4)

Q4 What is your age (in years)?

Q5 What is your sex?

- ☐ Male (1)
- ☐ Female (2)

Q6 How many years have you been working in agriculture?

- ☐ Less than 5 Years (1)
- ☐ 5-9 Years (2)
- ☐ 10-19 Years (3)
- ☐ 20+ Years (4)

Q7 Approximately, what was your total revenue from agriculture in 2022?

- ☐ Less than \$50,000 (1)
- ☐ \$50,000-\$99,999 (2)
- ☐ \$100,000-\$499,999 (3)
- ☐ \$500,000-\$999,999 (4)
- ☐ \$1 Million-\$4.9 million (5)
- ☐ +\$5 million (6)

Q8 Approximately what percent of your agricultural operation's income is from the following categories (the sum of the percentages must equal 100)?

Crops: _____(1)

Cattle: _____(2)

Other Livestock: _____(3)

Other Agriculture: _____(4)

Total: _____

Q9 Approximately what percent of your 2022 total household income came from agriculture?

- ☐ 76-100% (1)
- ☐ 51-75% (2)
- ☐ 26-50% (3)
- ☐ 1-25% (4)

Q10 In a typical year, what percentage of inputs, by category, do you purchase from agricultural cooperatives?

For example, if you bought 80% of your crop inputs **from your cooperative**, you would select the high option for the corresponding row.

	None (1)	Low (2)	Medium (3)	High (4)	Don't Buy (5)
Animal Related Products (1)	☐	☐	☐	☐	☐
Crop Inputs (2)	☐	☐	☐	☐	☐
Agronomist or Application Services (3)	☐	☐	☐	☐	☐
Sell/Market Crops (4)	☐	☐	☐	☐	☐
Operating and Expense Financing (5)	☐	☐	☐	☐	☐
Precision Agriculture Services (6)	☐	☐	☐	☐	☐

Q11 What is your primary role in the agricultural operation?

- ☐ Owner (1)
- ☐ Manager (2)
- ☐ Employee (3)

Q12 Which Kansas county is your operation primarily located in? Please select from the drop-down list.

Q13 How many partners are actively involved with regular operations/decisions on the farm or ranch?

Q14 Are you a member of any of these types of cooperatives (check all that apply)?

- ☐ Farm Credit (1)
 - ☐ Rural Electric (2)
 - ☐ Credit Union (3)
 - ☐ Agricultural (4)
 - ☐ Other (please specify) (5)
-

- ☐ None (6)

Q15 How would you rate your knowledge of agricultural cooperatives?

- ☐ Not at all Knowledgeable (1)
- ☐ Slightly Knowledgeable (2)
- ☐ Moderately Knowledgeable (3)
- ☐ Very Knowledgeable (4)
- ☐ Extremely Knowledgeable (5)

Q16 What is your opinion of agricultural cooperatives?

- ☐ Very Unfavorable (1)
- ☐ Unfavorable (2)
- ☐ Neutral (3)
- ☐ Favorable (4)
- ☐ Very Favorable (5)

Q17 What determines the numbers of votes a member in a cooperative has?

- ☐ The number of shares a member holds. (1)
- ☐ One member receives one vote. (2)
- ☐ The amount of business conducted with the cooperative. (3)
- ☐ The number of years of membership. (4)

Q18 Which of the following is a way for an agricultural cooperative to distribute its profits to its members?

- ☐ Dividends (1)
- ☐ Patronage (2)
- ☐ Discounts (3)
- ☐ Rebates (4)

Q19 What determines the amount of profits distributed to a specific member?

- ☐ Shares held by the producer. (1)
- ☐ Seniority of the owner/president/manager. (2)
- ☐ Volume of business conducted with the cooperative. (3)
- ☐ Acreage under the operator's control. (4)

Q20 What month is it currently?

- ☐ June (1)
- ☐ August (2)
- ☐ October (3)
- ☐ February (4)
- ☐ September (5)

Q21 Do you do business with an agricultural cooperative(s)?

- ☐ Yes (1)
- ☐ No (2)

Q22 How important to you are the following when considering membership in an agricultural cooperative?

[illegible]

23 When considering your input suppliers, how important are the following items to you?

	Not Important (1)	Slightly Important (2)	Moderately Important (3)	Very Important (4)	Essential (5)
Ownership (i.e., equity position) (1)	☐	☐	☐	☐	☐
Control (i.e., voting rights) (2)	☐	☐	☐	☐	☐
Benefits (i.e., access to products/services, relationship) (3)	☐	☐	☐	☐	☐
Price (i.e., better pricing options) (4)	☐	☐	☐	☐	☐
Quality (i.e., access to desired products/services) (5)	☐	☐	☐	☐	☐
Relationship (i.e., trust built with employees) (6)	☐	☐	☐	☐	☐

Q24 Are you a member of an agricultural cooperative?

☐ Yes (1)

☐ No (2)

Skip To: End of Block If Q24 = No

Q25 How long have you been a member an agricultural co-op (in years)?

Q26 In general, how loyal are you to the agricultural co-op(s) you are a member of?

- ☐ Not at all Loyal (1)
- ☐ Somewhat Loyal (2)
- ☐ Moderately Loyal (3)
- ☐ Very Loyal (4)
- ☐ Extremely Loyal (5)

Q27 How would you rate your participation/involvement in your agricultural co-op(s)?

- ☐ Not at all Involved (1)
- ☐ Slightly Involved (2)
- ☐ Moderately Involved (3)
- ☐ Very Involved (4)
- ☐ Extremely Involved (5)

Q28 Have you ever or do you currently serve on a board of directors for at least one of the agricultural co-ops you are a member of?

- ☐ Yes (1)
- ☐ No (2)

Q29 Did you vote for the board of directors in the last election for at least one of the agricultural co-ops you are a member of?

- ☐ Yes (1)
- ☐ No (2)

Q30 Did you attend the last annual meeting for at least one of the agricultural co-ops you are a member of?

☐ Yes (1)

☐ No (2)

Q31 Have you and/or a family member ever been employed by an agricultural co-op (check all that apply)?

☐ Yes - Myself (1)

☐ Yes - Family Member (2)

☐ No (3)

Q32 Do you have regular conversations with family members about the governance and/or operations of your agricultural co-op?

☐ Yes (1)

☐ No (2)

Q33 How important are the following sources for receiving information about agricultural-related topics?

[illegible]

Q34 How important are the following when considering your input supplier or marketing services?

	Not Very Important (1)	Somewhat Important (2)	Moderately Important (3)	Important (4)	Extremely Important (5)	N/A (6)
Your Sense of Loyalty (1)	☐	☐	☐	☐	☐	☐
Pride Being Associated With (2)	☐	☐	☐	☐	☐	☐
Access to Markets (3)	☐	☐	☐	☐	☐	☐
Community Involvement (4)	☐	☐	☐	☐	☐	☐
Ownership (5)	☐	☐	☐	☐	☐	☐
Control (6)	☐	☐	☐	☐	☐	☐
Knowledge of Staff (7)	☐	☐	☐	☐	☐	☐
Trust (8)	☐	☐	☐	☐	☐	☐
Price Competitiveness (9)	☐	☐	☐	☐	☐	☐
Quality of Products/Services (10)	☐	☐	☐	☐	☐	☐
Reputation in the Market (11)	☐	☐	☐	☐	☐	☐
Profit Sharing (12)	☐	☐	☐	☐	☐	☐

Q35 Is there another factor that you consider carefully when choosing which input supplier to work with?

Q36 How much would you agree or disagree with the following statements about agricultural cooperatives?

	Strongly Disagree (1)	Somewhat Disagree (2)	Neither Disagree nor Agree (3)	Somewhat Agree (4)	Strongly Agree (5)
Loss of personal independence. (1)	☐	☐	☐	☐	☐
Model is outdated. (2)	☐	☐	☐	☐	☐
It prevents me from shopping price. (3)	☐	☐	☐	☐	☐
It is easy to do business with. (4)	☐	☐	☐	☐	☐
The commitment is too burdensome. (5)	☐	☐	☐	☐	☐
I believe I can contribute to the co-op's operation. (6)	☐	☐	☐	☐	☐