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Letter from the Editors:

The agricultural sector is complex due to the interactions of the biological, ecological, economic and institutional systems associated with it. WEF focuses on these issues with relevance and importance to the Western United States. To this end, the WEF provides a forum for economists and other thought leaders to participate in such discussions with articles related to food, farms, ranches, resources, institutions, communities and other related and applicable topic areas.

Guest editors are invited on an issue-by-issue basis. WEF is a semi-annual publication with each issue intended to address a specific topic area. Individuals and groups are encouraged to contact any member of the WEF editorial team with their ideas or proposals for an upcoming issue. If you know a group or want to become a guest editor, please call, email or visit with us at a meeting. We, the editors, are excited to work with you to help you be a guest editor, develop your topic and produce an issue. Topic areas must be relatable and relevant to the Western United States. This does not mean that the research, case study, or work occurred in the region, but that it has applicability and connectivity to Western US agricultural and natural resource issues. For instance, a series of papers about water might include the impact of various water policies throughout the world and how they relate to similar challenges in the Western US.

Individual papers may submitted and are referred to as guest submissions. These guest submissions are welcomed but subject to space availability and the editorial team’s approval. Individual submissions must be accompanied with at least two viable recommendations for potential referees including their contact information.

Authors should generally follow the formatting guidelines for the Journal of Resource and Agricultural Economics, http://www.waeaonline.org/publications/jare/submission-guidelines). Submissions must be in MS WORD with authorship only identified on a cover page. All submissions are subject to double-blind review. Reviewers may receive a PDF version, a cleaned MS WORD document or other format with authorship removed. Guest editors are responsible for making sure the papers authored by their group are peer reviewed.

Articles are normally expected to be approximately 2,500 words (maximum and minimum length is at the discretion of the editors). There is no fee for submissions or publication. Papers and topics may cover any issue related to agriculture and natural resources including but not limited to production, marketing, financial, business, institutional, food and specialty crops, regulatory issues etc. All works of the journal should be created to appeal to a wide audience of many different backgrounds, education and disciplines. As a professional forum, it is implicit that all works are original, professional and defendable based on current scientific standards.
The first two decades of the 21st century have seen a rapid realignment of the food and agriculture sectors with significant implications for cooperatives (co-ops). The pace of these changes are remarkable in terms of their breadth and depth. Consolidation has accelerated at each link in the value chain, from the producer all the way to the retailer; international markets have become the destination for an ever-growing share of U.S. agriculture; and consumer demands are driving change all the way down to the farm gate.

Co-ops have not been immune to any of these trends. As we look toward the 100th anniversary of the Capper-Volstead Act in 2022, co-ops are evolving as rapidly now as at any point in the past century. However, throughout this period, providing value to their producer-owners remains at the core of the co-op model. The essays in this volume put a spotlight on how co-ops are accomplishing this in the 21st century and form a valuable resource to help guide co-ops and their members going forward.
A Framework for Training and Assessment of the 21st Century Cooperative

John L. Park¹, Diane Friend², Greg McKee³ and Matthew T. Manley⁴

Abstract
The training of a board of directors for a cooperative business often focuses on the fiduciary duties and skills needed by the cooperative. However, this focus fails to recognize that high performing boards, which are comprised of individuals dedicated to self-improvement, strengthen the cooperative structure. This article presents a framework for cooperative governance, which is characterized by three levels: self, board, and cooperative. The authors suggest a more robust and holistic approach to director training.

JEL Classification: A290, D020, L310

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Introduction

Many say cooperatives exemplify the economic engine of rural America. They play an important role in the sustainability of their farmer members as well as the communities in which they reside. Governance of these businesses lies in the hands of a few farmers who serve as a board of directors for their organization. There are no qualifications for board membership other than membership in the cooperative and an election by their peers. Thus, we may ask, are board members equipped with necessary governance skills? In general, farmers are business-minded and likely run successful farming and ranching operations. However, are they truly prepared to govern an organization worth millions of dollars in assets that operates in an unfamiliar sector of the supply chain? Are they prepared to provide professional oversight, or make complex decisions and predict global trends? If not, what training is necessary to produce effective governing skills and abilities? Additionally, what governing competencies should be established and assessed to measure performance levels? These questions are the basis for this article, which provides a governance competency framework for cooperative board member assessment, training and development.

As a business model, the cooperative is often identified as having unique challenges to management and governance. These challenges generally stem from the inherent conflicts of interest that accompany customer ownership. A cooperative’s board of directors may understand and faithfully execute their fiduciary duties. However, board members are also owners and customers who are constantly responding to the influences of these competing identities. Further, a proper balance between company and customer may be difficult to achieve for a cooperative whose current members are removed from the initial motivations for formation. They have not experienced participation in a marketplace where the cooperative did not exist, and may not perceive the long-term value of the cooperative’s existence.

However, the challenges of cooperation are not limited to conflicts of interest. Several other subtle aspects of customer ownership exist which might present challenges (Park, 2018). Consider these:

1. Board members are elected from among the customers whose experience may be limited to production.
2. Board members are all successful managers of their own operations.
3. Members of the cooperative expect equal treatment and a strong culture of cooperation exists among cooperatives.
4. Board members may have little to no previous experience or training in interpersonal skills.

First, consider the implications from the board of directors being elected from among the membership. Since membership is limited to farmer users of the cooperative, board members tend to have similar types of experience. Therefore, the board may be limited in its breadth of collective skills compared to an independent firm. Some cooperatives try to overcome the lack of skills by changing their board structure to allow board appointments from outside the membership. Nonetheless, small, rural cooperatives may still be limited in their ability to appoint outside members.

Next, cooperative members, and therefore board members, are most familiar with managing farm production, which results in additional problems. Due to familiarity with the manager role, board members may be tempted to step outside their role as director and make managerial decisions.
Further, they may not fully comprehend the managerial decisions and financial considerations for a business focused on supply, processing, or marketing. Competitive considerations such as margins, pricing, or handling accounts receivable for a channel intermediary can be very different than those faced by a producer of farm commodities.

Finally, the culture among many cooperative businesses includes the expectation among members to be treated equally. Even when members are educated and accepting of equitable treatment as opposed to equal treatment, a sense of fairness persists that may limit a cooperative’s pursuit of certain customer segments. This extends as well to competition among other cooperatives. The traditional principle of cooperation among cooperatives may hinder a board trying to strategize on how to expand its business and customer base.

Evidence suggests negative consequences when directors do not have much experience or training in the skills to overcome these challenges. The inability to form and communicate a cohesive strategic plan can lead to buyouts of member equity (McKee and Jacobs 2018), diminished ability to participate in CEO succession transitions (Froelich et al 2011), and reduced strategic continuity during periods of CEO succession (McKee et al 2019) or during major innovations in policy (McKee and Kagan 2015).

**Board Training and Development**

An approach to board member training that also includes individual and team development may be an effective means of strengthening the ability of directors to perform functions associated with their fiduciary duties. Can the board accurately represent member preferences? Can the board facilitate development of a relevant strategic plan? Can the board credibly monitor business and managerial performance? If so, the board becomes a resource that delegates authority and preferences from the membership to the management team, while credibly monitoring performance. As individual board members increase their functional leadership, they can influence the governance capacity of the larger board, and ultimately the performance of the cooperative, thereby earning the trust of the membership.

Traditionally, the framework for training cooperative board members is built around fiduciary duties, namely the duty of care, the duty of loyalty, and the duty of obedience. Fiduciary duties imply that a board of directors will act in good faith, with all due diligence, and in the best interest of the cooperative. These implications must be carried out in a manner which supports the stated purpose of the organization and remain compliant with bylaws, statutes, and regulations. As a result, board members are trained to conduct meetings, set policies, review financial data, and become knowledgeable about legal considerations. These are critical topics for training individuals to fill the role of a director, yet they are insufficient for developing the capacity to excel in that role. Thus, topics for board member development could also devote explicit attention to monitoring how their individual capacities affect their personal ability to influence board discussion, culture and function, and to remain credible with the membership (Engelke and Park 2008).

**Governance Competencies**

Given such personal and interpersonal skills are desired, we suggest converting them into attainable competencies of governance. To become an effective cooperative director, certain skills must be employed with intention and motivation to reach the highest level of performance through behavior
and action (Northouse, 2017). By establishing baseline competencies, directors can rise to leadership levels by enhancing their overall capacity to grow and develop.

Governance competencies performed by individual board members are defined as certain acquired skills and abilities needed to perform governing roles. To be proficient, a director must exhibit a sufficient level of leadership efficacy. Collectively, proficient directors perform effective governance and act in the best interest of the organization. Identifying what is “effective governance” and measuring director competencies is the centerpiece for what we are suggesting as a multidimensional approach to governance. According to Peter Drucker (2008), making a corporate board effective requires “spelling out its work, setting specific objectives for its performance and regularly appraising performance against those objectives”.

Then, if the question is how to improve influence and credibility, board members need a mechanism by which they can assess the quality of their functional leadership. Board training and assessment should provide an opportunity for board members to reflect on the consequences of processes and structures of the board on its scope of influence.

We suggest that a more robust, effective, approach to board member training would be to expand the topics on roles and responsibilities, to include topics on personal, board, and organizational development. Further, we expect that boards, as a whole, may face certain challenges when specific skills are missing from the composition of directors. We offer a more holistic framework for board of director training and subsequent assessment.

**Theoretical Foundation**

The theoretical foundation for this article is found by drawing upon approaches, models and theories found in economic, business and leadership literature. However, it appears a significant gap exists in the literature specific to cooperative governance; how it is assessed and what training is needed for certain skills and competencies. Most of what we know about cooperatives is in the realm of operational process and financial and economic performance (Hueth & Reynolds, 2017; Hamstreet, 2006; Hogeland, 2008; Cook, 1995). One seminal study looked at commitment and loyalty in cooperatives as a “multidimensional construct with emotional or affective and behavioral components”, (Foreman & Whetten, 2002). This supports our contention that a complex set of skills and abilities are needed for boards of directors to lead the cooperative organization.

Widely recognized as one of the most applicable leadership approaches is *Situational Leadership Theory* developed by Hersey and Blanchard (1985). Defined by Levi (2017), Situational Leadership Theory links a leader’s behavior to characteristics of the team. This theory relies on the premise that different situations demand different kinds of leadership style, ability and skill. We can see its relevance in cooperative boards of directors, in which it prescribes developmental abilities and assumes the important goal of building capacity to develop the effectiveness of the whole team (Levi, 2017).

Another model recognized as an essential leadership concept is an *Emotional Competence Framework*. This framework includes two key dimensions of personal and social competence. According to Goleman (1998), using an emotional intelligence yardstick to measure how well we handle ourselves and influence others, is increasingly important to leading people. The great divide in competencies resides between the heart and the mind, or more technically between cognition and emotion (Goleman, 1998). By combining thoughts and feelings, cooperative directors may have the potential for learning the practical skills of self-awareness, motivation, self-regulation, empathy and
A Multidimensional Framework for Training and Assessment

If the training of directors should include the development of interpersonal skills, we suggest that governance of a cooperative is more than the actions and decisions of the board of directors in fulfillment of their duties. The actions and outcomes of governance are important, but do not fully describe the ability of an individual director to perform their duties. Consider that in the course of governance, a highly effective director is one who is able to properly influence themselves, the board, and ultimately the cooperative.

We refer to these levels of governance as simply, Level 1 (influence over self), Level 2 (influence over other individuals and the board), and Level 3 (influence over the cooperative organization). Beginning with Level 1 Governance, we recognize that an effective board member must be aware of their own perceptions, abilities, and biases as they interact with the world around them. Level 2 Governance is characterized by the ability to understand and build connections with others, leading to greater group effectiveness. Finally, Level 3 Governance represents the ability to develop the identity and sense of duty that allow the board member to unite others in a common cause. In short, Level 1 Governance is centered on the self, Level 2 Governance is centered on board relationships, and Level 3 Governance is centered on the cooperative organization.

Levels of governance are further defined by the beliefs formed from our individual abilities, experiences, and personality as well as the ways in which we act on those beliefs. As a result, we can describe levels of governance in terms of both belief and action.

Both belief and actions are expressed differently as we progress to higher levels of governance. As belief progresses from self to board to cooperative, it is expressed as consciousness, connectedness, and representation. As action progresses from self to board to cooperative, it is expressed as conduct, teamwork, and collaboration. Thus, our complete framework for governance is described by six key factors resulting from an expression of belief and action for each of the three levels of governance. They are namely, consciousness, conduct, connectedness, teamwork, representation, and collaboration (Table 1).

This framework provides an organized approach to board training and assessment. The framework also recognizes that the ability to influence successful outcomes of the cooperative starts with the individual board member. In other words, we suggest a cooperative is made financially stronger when governed by an informed, engaged board composed of individuals who can effectively work together. It is counterproductive to discuss and make plans to improve board governance without focusing on the individuals involved.

Table 2 summarizes Level 1 Governance. Level 1 recognizes that each board member has an opportunity to contribute to the culture and function of the board through their own preparation. Participation in training can instill the belief in the need for awareness of elementary knowledge about board function and operations. This belief can lead to actions that optimize the board member’s engagement in goals and learning. Outcomes of these actions include increased candor in board discussion and trust in personal contributions to board function. Board members should want to know, via self-evaluation, the current status of the critical skills associated with influence over self.

Table 3 summarizes Level 2 Governance. Level 2 Governance recognizes that individual directors may use training and evaluation to improve their skills for contributing to the function of
the board as a whole. Participation in training can reveal to new directors that they cannot act in the boardroom as single-issue directors. Training might also enhance their understanding of the complexities of business operations in the cooperative, or feelings of loyalty via participation in democratic decision-making. Actions resulting from these beliefs include greater engagement with other directors to consider key issues or to participate in board conversations motivated by a sense of accountability. Board members may choose to obtain information about board-wide influence skills on a periodic basis. Board members may also want to assess their influence skills for more targeted questions, such as the fulfillment of selected strategic objectives.

Level 3 Governance (summarized in Table 4) is associated with a board’s ability to develop a board culture of representative collaboration. The board must attest to the quality of managerial and business performance in reporting to the membership. Thus, through regular training, board members may come to realize that adherence to fiduciary duty satisfies the basic requirements of stewardship to the membership. Boards act on this belief by collaborating with the membership to determine which goods and services are to be provided by the firm and in what manner. Board members also collaborate with the membership and the management team by preserving boundaries between the board, membership, and employee roles. Each role is a center of power in the cooperative and the board performs a critical function by establishing a culture that promotes organizational trust and integrity.

**Board Assessment**

We want to be clear that we are not suggesting a system for board rating. This is not intended to provide a statement for comparing the effectiveness of one board to another or one director to another. It is a natural tendency to hear the word “assessment” or “evaluation” and equate this to some kind of statement on quality or worth. Rather, our philosophy is that each director brings a unique contribution. As such, a cooperative board should celebrate their strengths, identify their shortcomings, and make plans for improvement. Our vision for assessment is to provide a tool that will open the eyes of directors to overlooked or neglected skills and characteristics, and help prioritize training efforts.

The Multidimensional Governance Assessment (MGA) has been developed following the framework presented here. Currently, the MGA is being tested and refined among select agricultural cooperatives in Texas. The primary goal of the MGA is to promote a more holistic view of director competencies and subsequent training. A greater awareness of one’s ability to influence self, board, and cooperative can strengthen board interactions and ultimately firm performance. However, the MGA, like the framework upon which it rests, has the potential to provide benefits beyond self-improvement. We predict the MGA will prompt boardroom discussions to improve teamwork and accountability among board members. Also, as assessments are completed, we will collect data to provide industry benchmarks. Importantly, such data could help identify and prioritize topics for training by the Texas Agricultural Cooperative Council and other trade associations. An interesting potential for future research could be the identification of competency patterns within boards, and whether they are helpful or problematic to firm performance. We expect to see improved organizational effectiveness and a greater understanding of cooperative governance as a result of these efforts.


Table 1. Multi-Dimensional Framework of Cooperative Governance

<table>
<thead>
<tr>
<th>Level of Governance</th>
<th>Beliefs</th>
<th>Actions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Level 1 (Self)</td>
<td>Consciousness</td>
<td>Conduct</td>
</tr>
<tr>
<td>Level 2 (Board)</td>
<td>Connectedness</td>
<td>Teamwork</td>
</tr>
<tr>
<td>Level 3 (Cooperative)</td>
<td>Representation</td>
<td>Collaboration</td>
</tr>
</tbody>
</table>

Table 2. Level 1 Governance (Realm of Influence: Self)

<table>
<thead>
<tr>
<th>Belief: Consciousness</th>
<th>Competencies</th>
<th>Prospective Evaluation Statements</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>• Understanding of your personality and preferences for communication and work.</td>
<td>• I quickly realize when my thoughts are turning negative.</td>
</tr>
<tr>
<td></td>
<td>• Understanding how you respond to stress and conflict.</td>
<td>• I am open to feedback during discussions with other board member.</td>
</tr>
<tr>
<td></td>
<td>• I quickly realize when my thoughts are turning negative.</td>
<td>• I can articulate feelings and emotions appropriately during meetings.</td>
</tr>
<tr>
<td></td>
<td>• I am open to feedback during discussions with other board member.</td>
<td>• I am guided by my internal beliefs and value system rather than what others think and do.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Action: Conduct</th>
<th>Competencies</th>
<th>Prospective Evaluation Statements</th>
</tr>
</thead>
<tbody>
<tr>
<td>Goal setting.</td>
<td>• Goal setting.</td>
<td>• I can reflect and learn from my mistakes then move on.</td>
</tr>
<tr>
<td>Attitude of constant improvement.</td>
<td>• I will take a tough, principled stand even if it is unpopular.</td>
<td></td>
</tr>
<tr>
<td>Committed to learning.</td>
<td>• I will challenge unethical actions of the board when needed.</td>
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<tr>
<td></td>
<td>• I think clearly and stay focused under pressure when the board has to make tough decisions.</td>
<td></td>
</tr>
</tbody>
</table>
Table 3. Level 2 Governance (Realm of Influence: Board of Directors)

<table>
<thead>
<tr>
<th>Competencies</th>
<th>Prospective Evaluation Statements</th>
</tr>
</thead>
</table>
| **Belief: Connectedness**  
* A feeling of belonging to or having affinity with a particular person or group. | • I demonstrate empathy with others’ feelings.  
• I freely share my feelings and thoughts with others on the board.  
• I encourage open communication around me.  
• I will challenge bias and intolerance by speaking up when needed. |
| • Being aware of the feelings, body language, and preferences of others.  
• Exemplifies proper confidentiality, loyalty, dependability. | |
| **Action: Teamwork**  
* Work done by several associates with each doing a part but all subordinating personal prominence to the efficiency of the whole. | • I try to help others to develop their strengths.  
• I help others to see the best in themselves.  
• I actively seek ways to resolve conflicts in board meetings.  
• I am helpful, honest and courteous with other board members. |
| • Comes prepared for board meetings.  
• Accountability to board. | |
<table>
<thead>
<tr>
<th>Competencies</th>
<th>Prospective Evaluation Statements</th>
</tr>
</thead>
</table>
| **Belief:** Representation  
*The action or fact of one person standing for another so as to have the rights and obligations of the person represented.* | - Fiduciary duties (care, obedience, loyalty, good faith, disclosure). |
|               | • I am a loyal member of the cooperative in good standing. |
|               | • I strive to meet other members and learn about their needs. |
|               | • I try to raise the morale of others on the board and make them feel good about serving the cooperative members. |
|               | • I strive to adhere to the policies of the cooperative. |
| **Action:** Collaboration  
*The enabling of individuals to work together to achieve a defined and common business purpose.* | - Setting policy. |
|               | • Establishing strategy. |
|               | • Maintaining the division of roles between manager and directors. |
|               | • I am informed on the cooperative’s operations as well as its competitors. |
|               | • I strive to understand the financial status of the cooperative prior to board meeting. |
|               | • I understand the strategic plan of the cooperative and strive to fulfill it. |
|               | • I consider the needs of the cooperative above my own in boardroom decisions. |
The New Role of Agricultural Cooperatives in Pooling and Distributing Tax Deductions

Phil Kenkel1, Greg McKee2, Mike Boland3 and Keri Jacobs4

U.S. agricultural cooperatives create unique benefits for their producer members (USDA-RBCS, 1990). Cooperatives create economies of scale and scope in procuring inputs and marketing and processing commodities (Sexton 1990). Those scale economies also help to provide access to markets. Cooperatives provide an unseen and often unappreciated benefit in offsetting market power and maintaining the competitive environment. Agricultural cooperatives are unique in that they are an extension of the farm or ranch. Producer members can benefit at the farm level through prices and availability of services or at the cooperative level through patronage refunds. When many agricultural cooperatives first formed, they were able to pass along volume discounts for buying inputs at greater bargaining power or pass along volume premiums through greater negotiating ability. Over time, Congress passed various laws and the Internal Revenue Service codified cooperative taxation principles (Frederick 2013). Beginning in 2004, a new member benefit emerged from Congress, which was revised in the tax reform legislation of 2018 and again in 2019. Agricultural marketing cooperatives have been able to receive a federal income tax deduction and can retain that deduction at the cooperative level or pass some or all of the deduction on to their producer members.

In 2004, a wide range of firms, including agricultural cooperatives, were able to take advantage of Domestic Production Activities Deduction (DPAD), also known as Section 199. The Tax Cuts and Jobs Act of 2017 (TCJA) eliminated DPAD along with many other deductions and credits to help offset the reduction in the corporate tax rate. The TCJA created a new tax deduction (Section 199A) which was similar to DPAD and applied only to agricultural cooperatives. This highlights the role of agricultural cooperatives in pooling and distributing tax deductions and raises the possibility that these activities could become a permanent aspect of the value package for agricultural marketing cooperatives.5 For that reason, it is useful to discuss the specifics of these tax deductions and how they affect agricultural cooperatives and their farmer members.

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5 In July 2019, portions of the tax reform legislation including this provision are set to expire in 2025 unless Congress makes these a permanent part of the tax code.
Background
The American Jobs Creation Act (AJCA) of 2004 was created to compensate U.S. manufacturing companies for the loss of export tax relief and encourage domestic economic growth. The AJCA created a new deduction (DPAD) for businesses that produce goods inside the U.S. The deduction phased in over time but eventually became equal to the minimum of 9% of qualified production activities income (QPAI) or 50% of the W-2 wages that were allocable to the domestic production. Qualifying activities included cultivating soil, raising livestock, and fishing as well as the handling and processing of agricultural commodities. Agricultural producers and cooperatives were therefore considered manufacturers making them eligible for the DPAD (Harris and McEowen 2009).

A cooperative engaged in marketing agricultural and horticultural products may also be considered as having produced the commodities that it markets for the patrons. The DPAD for products sold by a cooperative can be calculated at the cooperative level. Additionally, the firm could elect to retain the deduction or pass all or part of it on to its members based on their patronage. The advantage to calculating the deduction at the cooperative level is that the W-2 wage limitation is based on the cooperative’s wages. Because many producers have little or no W-2 wages, the wage calculation is often the major limiting factor for taking the DPAD at the farm level. When the deduction is calculated at the cooperative and passed on to the member, the producer’s share is not limited by either their adjusted gross income or their W-2 wages (Harris and McEowen, 2009).

The cooperative board of directors make the decisions on whether to take the DPAD at the cooperative level and what portion, if any, to pass to the patrons. Such decisions are partially based on recommendations from auditors or other service providers. However, from a fiduciary standpoint, the decision lies with the board of directors. Some boards elect to ignore the tax deduction perhaps because of advice of their auditors or because they do not understand the deduction. In that case, the patrons were free to pursue the deduction at the farm level. Many marketing cooperatives take the deduction and the portion retained by the cooperative varies across firms.6

A major component of the Tax Cuts and Jobs Act of 2017 is a reduction in the corporate income tax rate from a maximum rate of 35% to a flat 21%. The revenue lost from the tax rate reduction was partially offset by the elimination of tax deductions and tax credits. The DPAD grew to be one of the largest corporate tax deductions with an estimated cost of $15 billion in 2016 and was an attractive choice for elimination (Institute on Taxation and Economic Policy 2017). The National Council of Farmers Cooperatives (NCFC) led an industry effort to preserve DPAD or a similar deduction for cooperative firms. The NCFC argued that because cooperatives passed through taxation to their farmer members, those firms and their members would not benefit from the corporate tax rate deduction. Many viewed NCFC’s strategy as ambitious since almost every category of manufacturing firm wanted a special exception.

The TJJA includes a new provision designated “Section 199A” that applies to “taxpayers other than a corporation” and included a “deduction for income attributed to domestic production activities of specified agricultural or horticulture cooperatives”. Gaining support for Section 199A was a notable accomplishment for the cooperative industry. A special tax deduction was created for

6 Land grant university faculty working with cooperatives conducted a great deal of education and research on this topic and dissemination through eXtension and other resources.
cooperative firms in the context of tax legislation that generally eliminated tax deductions and credits as an offset for reducing the corporate tax rate.  

The original language generated significant controversy because of a provision creating a tax credit for agricultural producers. The structure of the credit gave producers a significant incentive to market commodities through a cooperative. Many independent grain elevators and other non-cooperative entities were vocal in their opposition to the bill. The magnitude of the tax advantage from marketing through a cooperative clearly was not the intent of Congress and the drafting error became known as “the grain glitch” (Greenberg 2018). Industry groups including NCFC and NGFA (National Grain and Feed Association) worked together to revise the Section 199A language. Legislation containing the “grain glitch fix” was introduced as part of the omnibus spending bill (Consolidated Appropriations Act 2018) and was passed into law on March 23, 2018 (Davis Brown 2018).

The provisions of the final Section 199A are somewhat complex. The Section 199A creates both a deduction at the cooperative level and a separate potential tax penalty (reduction is an otherwise available tax deduction) for producers who market through cooperatives. Marketing cooperatives can retain the deduction or pass any portion of it on to its members. Therefore, a producer marketing through a cooperative can be advantaged, equivalent or disadvantaged relative to a producer marketing to a non-cooperative firm depending on the amount of Section 199A deduction passed on by the cooperative and their producer level offset. The structure of Section 199A makes the tax deduction decision an important part of the cooperative value package and an important decision for the cooperative board. Under the previous structure of DPAD, a cooperative board could ignore the potential deduction and concentrate on other aspects of the value package. Under the producer level offset provision of Section 199A, it is essential for marketing cooperatives to take the deduction and pass on an appropriate percentage or risk having their producer members disadvantaged by patronizing the cooperative.

Illustration of Section 199A with Representative Cooperatives
The calculations of Section 199A are firm and farm specific depending on the qualifying income and wage levels of both the cooperative and the patron. At the request of NCFC, a group of academic cooperative specialists developed a set of representative grain marketing cooperatives (Kenkel et. al. 2019). Analysis based on the representative cooperatives has been presented in educational programs in several states. The representative grain marketing cooperatives provide a good illustration of the issues surrounding the Section 199A deduction.

Four representative cooperatives were developed. An Iowa corn and soybean marketing cooperative was created using the CoMetrics database. The data came from a case study cooperative in the database that was the closest to the median levels of size and profitability. Two Illinois corn and soybean marketing cooperative were created using a database of a regional cooperative. The cooperative data did not correspond to specific cooperatives but rather from the average financial results of roughly 200-grain marketing and farm supply cooperatives and 100-grain marketing only cooperatives in the database. A representative Nebraska wheat marketing cooperative was based on

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7 This was a major source of education and research for faculty working with cooperatives in 2018 and 2019.
8 CoMetrics is a technology company that collects and standardizes data for independent businesses, cooperatives, nonprofit foundations and social enterprises.
a case study cooperative subjectively selected by cooperative specialists as being representative of the region. Selected data from the representative cooperatives are provided in Table 1.

Table 1. Financial Characteristics of Representative Cooperative

<table>
<thead>
<tr>
<th></th>
<th>Iowa Corn, Soybean and Farm Supply</th>
<th>Illinois Corn Soybean and Farm Supply</th>
<th>Illinois Corn and Soybean</th>
<th>Nebraska Wheat and Farm Supply</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grain Sales to Total Sales</td>
<td>64%</td>
<td>64%</td>
<td>100%</td>
<td>65%</td>
</tr>
<tr>
<td>Profit Margin</td>
<td>1.7%</td>
<td>1.1%</td>
<td>2.1%</td>
<td>1.9%</td>
</tr>
<tr>
<td>Personnel Expense to Gross Margin</td>
<td>51.2%</td>
<td>50%</td>
<td>51.2%</td>
<td>55.5%</td>
</tr>
<tr>
<td>Personnel Expense per Bushel</td>
<td>$.35</td>
<td>$.41</td>
<td>$.13</td>
<td>$.26</td>
</tr>
<tr>
<td>Sales/Total Assets</td>
<td>3.86</td>
<td>2.26</td>
<td>2.14</td>
<td>2.04</td>
</tr>
<tr>
<td>Return on Assets</td>
<td>4.2%</td>
<td>4.8%</td>
<td>2.4%</td>
<td>4.0%</td>
</tr>
<tr>
<td>Cash Patronage per Bushel (50%)</td>
<td>$0.10</td>
<td>$0.13</td>
<td>$0.03</td>
<td>$0.07</td>
</tr>
</tbody>
</table>

Despite being constructed for different geographic regions and using different methods, the financial characteristics of the representative cooperative were similar. The cooperative examples had similar profit margins, total asset turnover (sales/total assets) and return on assets (ROA). The ratio of personnel expense to gross margin (a key efficiency ratio) was also fairly consistent across the firms. The ratio of personnel expense per bushel showed more variation based on the activity mix of the cooperative. The grain-only example had lower personnel expense per bushel since there were no wages associated with farm supply activities.

Section 199A Deduction Modeling
The cooperative level Section 199A deductions are provided in Table 2. The deduction is calculated as the minimum of 20% of qualified business income or 50% of W-2 wages. The W-2 wage restriction was the binding constraint for all of the representative cooperatives, resulting in deductions from $0.06 per bushel to $0.21 per bushel. The activity mix was the major factor behind that range. The cooperatives with only grain sales had lower W-2 per bushel resulting in a lower per bushel Section 199A deduction.
Table 2. Cooperative Level Section 199A Deduction on a per Bushel Basis

<table>
<thead>
<tr>
<th></th>
<th>Iowa Corn, Soybean and Farm Supply</th>
<th>Illinois Corn Soybean and Farm Supply</th>
<th>Illinois Corn and Soybean</th>
<th>Nebraska Wheat and Farm Supply</th>
</tr>
</thead>
<tbody>
<tr>
<td>Section 199A</td>
<td>$.18</td>
<td>$.21</td>
<td>$.06</td>
<td>$.13</td>
</tr>
</tbody>
</table>

Section 199A also involves a tax deduction offset, or reduction in an otherwise available deduction at the producer level (Table 3). The producer level offset is calculated as the minimum of 20% of the producers’ qualified business income or 50% of the producers’ W-2 wages. Information from the Iowa Farm Business Association is used to model the cost and returns of a representative corn and soybean producer and the information from the Kansas Farm Management Association (KFMA) are used to model a representative wheat farm (Kansas Farm Management Association 2018; Plastina and Johanns, 2017). Similar to the cooperative level calculation, the binding deduction was 50% of the producers’ W-2 wage expense. The resulting tax deduction offset was determined to be $0.04 per bushel for a typical Midwestern corn and soybean producer and $0.07 per bushel for a typical Plains wheat producer.

Table 3. Producer Level Section for the 199A Calculations

<table>
<thead>
<tr>
<th></th>
<th>Corn</th>
<th>Soybeans</th>
<th>Wheat</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yield per acre</td>
<td>214</td>
<td>60</td>
<td>43</td>
</tr>
<tr>
<td>Price per bushel</td>
<td>$3.28</td>
<td>$9.32</td>
<td>$5.66</td>
</tr>
<tr>
<td>Gross Income/acre</td>
<td>$701.92</td>
<td>$559.20</td>
<td>$243.15</td>
</tr>
<tr>
<td>W-2 wage/acre</td>
<td>$11.51</td>
<td>$9.97</td>
<td>$2.71</td>
</tr>
<tr>
<td>Other Expenses/acre</td>
<td>$546.77</td>
<td>$373.58</td>
<td>$177.44</td>
</tr>
<tr>
<td>Qualified Business Income/acre</td>
<td>$155.15</td>
<td>$185.62</td>
<td>$65.71</td>
</tr>
<tr>
<td>9% of QBI/acre</td>
<td>$13.96</td>
<td>$16.71</td>
<td>$5.91</td>
</tr>
<tr>
<td>50% of W-2 wage/acre</td>
<td>$5.76</td>
<td>$4.99</td>
<td>$1.36</td>
</tr>
<tr>
<td>Binding Offset/acre</td>
<td>$5.75</td>
<td>$4.99</td>
<td>$1.36</td>
</tr>
<tr>
<td>Section 199A Offset per Bushel</td>
<td>$0.026</td>
<td>$0.083</td>
<td>$0.036</td>
</tr>
<tr>
<td>Section 199A Offset per bushel-weighted average 80% corn, 20% soybeans</td>
<td>$0.038</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Portion of the Pass Necessary for Producer Equivalency

Cooperatives can retain the Section 199A deduction or pass on any portion to members who markets commodities through the cooperative. As discussed, the producer’s offset is based on farm level calculations and is independent of the amount pass through. Under that structure, a producer delivering to a cooperative is disadvantaged unless the cooperative passes a portion of the cooperative level deduction that is at least equal to their offset. The required pass through depends on the producer’s W-2 wages, so each patron will likely face a different situation. The boards of most cooperatives are interested in determining the percentage pass through needed to keep the average cooperative patron equivalent with a producer marketing through a non-cooperative firm. The percentage pass through to keep the representative farm operator equivalent to a non-cooperative marketing cooperative is illustrated in Table 4.

Table 4: Portion of the Pass Necessary for Producer Equivalency in Bushels

<table>
<thead>
<tr>
<th></th>
<th>Iowa Corn, Soybean and Farm Supply</th>
<th>Illinois Corn Soybean and Farm Supply</th>
<th>Illinois Corn and Soybean</th>
<th>Nebraska Wheat and Farm Supply</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cooperative Section 199A/bu.</td>
<td>$0.18</td>
<td>$0.21</td>
<td>$0.06</td>
<td>$0.13</td>
</tr>
<tr>
<td>Producer Offset</td>
<td>$0.038</td>
<td>$0.038</td>
<td>$0.038</td>
<td>$0.036</td>
</tr>
<tr>
<td>Required Pass Through</td>
<td>22%</td>
<td>21%</td>
<td>67%</td>
<td>34%</td>
</tr>
<tr>
<td>Cash Patronage (50%)</td>
<td>$0.10</td>
<td>$0.13</td>
<td>$0.03</td>
<td>$0.07</td>
</tr>
</tbody>
</table>

The required pass through percentage ranged from 22% to 67%. This Illinois grain and oilseed only example has a lower Section 199A deduction per bushel due to lower wage expense and thus had to pass on the highest proportion of the cooperative deduction. Notably, the pass through needed by the producer is based on representative crop budgets and reflects the amount needed by the average producer. Producers with lower than average W-2 wage expense would face a lower offset and require a smaller pass through to remain equivalent. Conversely, producers with higher than average W-2 wages would face higher offsets and require a higher pass through to remain equivalent. Cooperative boards of directors would presumably strive to keep their average patron equivalent and pass through a portion equal or greater than the calculated percentages.

The total cooperative level Section 199A deduction is significantly higher than the cash patronage distribution for all of the representative cooperatives. As discussed, most cooperatives would pass on a portion of that deduction to prevent the “average” patron from being disadvantaged from marketing through the cooperative. In the case of three of the four representative cooperatives, the remaining portion of the Section 199A deduction was still larger than their cash patronage
distribution. The Section 199A deduction can clearly be an important part of the cooperative value package, which was likely the intent of the policymakers when they passed the tax reform legislation.

Conclusions
The role of agricultural cooperatives in pooling and distributing tax deductions has emerged over time. The DPAD became available in 2005. Initially, most agricultural marketing cooperatives did not understand the deduction and how it could be captured at the cooperative level. By 2017, when the TCJA was passed, many agricultural marketing cooperatives structured their producer payments to take full advantage of DPAD at the cooperative level. Still, the practice was not universal and some cooperative boards elected not to pursue the deduction.

The inclusion of Section 199A in the TCJA was notable for two reasons. First, it represented a new deduction that was available only to agricultural and horticultural cooperatives. It is unusual for agricultural cooperatives to receive special tax provisions. Second, it somewhat institutionalized the role of agricultural cooperatives in pooling and distributing tax deductions for their member owners. Our analysis, which is based on representative cooperatives, suggests that the Section 199A tax deduction should be an important component of the cooperative value package. By 2025, the year of its anticipated expiration, cooperatives will understand further the impact on its income tax strategy.

Cooperative boards of directors already face complex financial decisions relating to profit distribution and equity management. Those decisions have cash flow and taxation impacts for both the cooperative and the patron owners. Section 199A has added another layer to that complexity. The provisions of Section 199A are multifaceted and cooperative boards must balance the value of the deduction at the cooperative level with the benefits of passing on the deduction to their members. The cooperative level deduction is specific to each cooperative and heavily influenced by the level of W-2 wages. The producer level impacts are also farm specific. Larger producers likely have different wage expense structures and Section 199A impacts relative to smaller producers. Cooperative boards may need to educate themselves about the wage and tax situations of their farmer members and make strategic decisions as to the importance of tax deductions in their value package.
References


The Emergence of GICL, the Graduate Institute of Cooperative Leadership: Engaged Scholarship, Theory and Practice in Cooperative Education

Michael L. Cook

Introduction
By the 1950’s, the United States agriculture sector was populated with more than 10,000 marketing and multipurpose cooperatives – a new institutional form of organization born in the early 20th century. Enthusiasm and the intellectual attractiveness for this producer-owned and governed institutional form of collective action was beginning to wane. Agricultural economists, the primary source of research on the impact and competitive role of cooperatives in an increasingly globalized and industrialized food and fiber sector documented the consequences of increased rivalry in numerous subsectors and supply chains. However, their interests were usually limited to the mezzo level (market structure) and seldom expanded to the micro-analytic level of how strategic behavior of these patrons, rather than investor-owned entities, impacted farm decision making and subsequent governance behaviors of their user-owned cooperatives. Agricultural economists noted cooperatives’ positive impact in establishing countervailing market power in output and input markets, particularly at the first handler and increasingly in some of the upstream and downstream processing and manufacturing sectors. Many Nourse inspired, multi-purpose local cooperatives organized into vertically integrated supply chains, particularly in the capital-intensive input industries including petroleum, fertilizer, and chemicals. These multi-purpose federated regional cooperatives had also integrated into grain handling, terminal elevator storage, and commodity trading functions as they extended their reach into the global markets by beginning to acquire export facilities. Additionally, mid-century, Sapiro influenced, single commodity, centralized market-processing cooperatives were well known for their established brands supported by well-coordinated value chains.
Meanwhile, academics were involved in debating the Helmberger-Philips discussion of whether a cooperative should be analyzed as an extension of the farm or a separate firm. For the more developed multipurpose and vertically integrated marketing cooperatives, scaling up was the challenge they faced, not starting up. The start-up cooperative role of ameliorating the negative consequences of imperfect markets and the accompanying market failures was accomplished already and cooperatives were now seen by non-cooperatives as rival firms. Consequently, for survival reasons, general managers and boards of directors were incentivized to behave in a more strategic manner. However, university researchers, particularly agricultural economists trained to study markets and market performance, paid little attention to the unique skills and traits and the accompanying tools needed to manage, lead, and govern these patron-owned and controlled entities.
There were exceptions, particularly among extension personnel. However, there were exceptions, particularly among extension personnel who utilized investor-owned firm analytical tools rather than multiple objective approaches needed to understand more clearly the complexities of cooperative entities. This was the cooperative knowledge creation and dispersion environment in 1970.

The Birth of Executive Education for Cooperative Leaders at the University of Missouri
By the late 1960's Howard Cowden, former employee of MFA Inc., (one of the first Midwestern multipurpose cooperatives founded in 1914) and later founder of Farmland Industries, observed the aforementioned trends. He noted the need for more sophisticated governance and management training, thus starting a management and governance division in the Farmland Industries training complex in Kansas City. He also noted the decrease in allocation of monies being appropriated for research and extension services to cooperative education efforts by state and federal governments. After several years of observing the output of Farmland’s training efforts, he determined that the training should include more research-oriented findings. As a result, the Cowden Foundation was instructed to provide funds to the University of Missouri to initiate a research-oriented executive education program to provide applied research-generated learnings to more cooperative managers through an advanced set of education experiences. Thus, the Graduate Institute of Cooperative Leadership (GICL) was created in 1971. This initiative was led by Elmer Kiehl, Dean of the College of Food, Agriculture, and Natural Resources, Professor Charles Cramer, head of the Agriculture Economics Department, and Randall Torgerson, a newly minted assistant professor in agricultural economics from the University of Wisconsin. The GICL was governed by a fifteen person Board of Trustees, which was elected and selected from leading rural cooperatives in the United States.

Evolution of the Graduate Institute of Cooperative Leadership
Initially, the primary outputs of GICL programs were directed towards middle and upper middle cooperative management. The program outputs emphasized on fostering, nurturing and embedding a culture of flexibility comfortable with rapidly consolidating and globalizing the agriculture sector (Cramer, 1994). During the first twenty years, GICL practiced different program formats, contents, curriculum designs and leadership portfolios. Meanwhile, Cowden’s endowment inspired other agricultural cooperatives to invest more heavily in cooperative education. Feedback from GICL training programs inspired board chairs and CEOs to request the establishment of an executive education program for cooperative senior leadership. Thus, the Chair/CEO Program emerged in 1982. In addition, they funded the first endowed chair in cooperative leadership at the University of Missouri in the College of Agriculture, Food, and Natural Resources. The chair was named after Robert D. Partridge, the former CEO of the National Rural Electric Cooperative Association. Subsequently, further named professor positions were established at the University of Missouri commemorating past cooperative leaders: William Hirth, the first CEO of MFA, a successful Missouri cooperative, which is currently 105 years old; Fred Heinzel, the second CEO of MFA; Howard Cowden, the founder of a GICL endowment and founder of Farmland Industries; and, in 2016, the MFA Professorship in Agribusiness.

In the early 1990s, the GICL Board of Trustees and the University of Missouri were determined to experiment with a more research-informed and theoretical approach to cooperative education. This purpose and culture change launched GICL toward a new abductive approach to executive education. The endowments and the net revenues generated enough cash flow to hire experienced professional staff and attract highly motivated and qualified PhD students. Visiting scholars and professionals from around the world with interests in organizational design and new industrial economics developed a critical mass of
institutional theory. The institutional theory developed new research programs and generated an innovative theoretical and conceptual platform from which emerged a dynamic micro-analytical executive education framework (Cook, 1995). Concepts developed by Oliver Williamson, Bengt Holström, Elinor Ostrom, Douglass North, Herbert Simon, Richard Thaler, Oliver Hart, Leonid Hurwicz and James Buchanan challenged a number of neoclassical economic assumptions. These concepts paved the path to introduction of incentive concepts, self-seeking behavior with guile, and the inability of transactors to know all attributes of a transaction. Insights from institutional and behavioral economics, psychology, sociology, political science, law and anthropology allowed for a more realistic analysis of the complexity of patron-controlled entities such as cooperatives. By the mid-1990s, the GICL Process emerged and informed the development of the Life Cycle Framework.

This institutionalized framework created a dynamic learning ambience among staff, students and scholars. This process evolved in a dynamic, abductive form and resulted in the GICL outputs. The GICL outputs include Summer Institute, Board Chair/CEO, workshops, customized programs, graduate seminars and undergraduate courses. Each program fosters new networks that in turn generate additional research ideas and stories as well as student opportunities. These research ideas and stories are shared with academic colleagues in social sciences and management studies. These exchanges inform conceptual model development, leading to empirical testing and academic outputs. The testing and outputs are translated into practitioner language utilized in teaching, case studies, histories and stories, which are embedded into the subsequent outputs. This circular and dynamic approach has fostered a growing, multidisciplinary, collaborative enthusiasm for studying and analyzing complex group action.

The basic platform employed in these varying cooperative education efforts is the ‘Cooperative Life Cycle Framework’ (Cook, 2018). The life cycle framework is the result of interaction between cooperative management, board of director participants, organizational social science and management scientists. The framework divides the evolution of a cooperative life cycle...
into five separate and sequenced phases (see Figure 2). The framework is the result of 25 years of iterative sessions with more than 5,000 engaged practitioners. The primary purpose of the framework is to serve as a guide for starting up cooperatives.

Figure 2.

**Cooperative Life Cycle**

Phase 1, economic justification, discusses producer reasoning behind the decision to enter the costly process of determining whether collective action is justified. During phase 2, organizational design, producers determine the legal–business–organizational model that best fits their group’s needs and preferences. Next, the rules of the game are decided: responsibilities, benefits, penalties, adjudication processes, purpose, cooperative health and performance measure(s).

Once the organizing phases are complete, the cooperative enters phase 3, which is designated as the “growth, glory and heterogeneity” phase. In this phase, the decision-makers address the rate of growth or non-growth, the glory and success achieved, and disagreements generated by the heterogeneity of preferences emerging as time passes. Potential disruptive frictions may result from the broad and diverse objective functions of members and agents in a patron (user)-owned and controlled entity embedded in the performance metrics. These frictions must be ameliorated if the cooperative is going to continue meeting member needs. External disruptions may occur by rivals within the industry or by macro phenomena such as trade, economic or political policy shifts and/or intra-firm frictions. We find that the surviving cooperatives develop a collective process called ‘cooperative genius’ associated with the longevity of agricultural cooperatives in North America. However, compromise is not always attainable and subgroup frictions turn into rudiments of factions. At this stage of phase 3, cooperative leaders assess what probabilities exist for cooperative survival. To assist with making this decision, the cooperative engages in an introspective analytical process charged with determining what factors give rise to the collective decision-making cost frictions and sometimes resultant factions.
During this introspective phase 4, root causes of these friction/faction disturbances are identified. Disturbances usually emanate from a set of unique cooperative structural characteristics embedded in capital constraints and control/governance policies and practices. Generic solutions – in the form of realigning user incentives, policies balancing supply and demand, member retention investments and transparency practices – that have the potential to regenerate the level of cooperative health are also evaluated (Cook and Iliopoulos, 2016).

Having identified the causes and potential solutions in phase 4, the membership moves toward deciding the future of the cooperative in phase 5. Members have the following options: (a) exit through liquidation, merger or bankruptcy; (b) maintain the status quo with little or no change; (c) spawn; and/or (d) reinvention or significant overhaul. If patrons reject the exit, status quo or spawn options, reinvention is chosen. Reinvention occurs when one or a combination of the following elements occurs, each of which will vary across business entities: (a) modification to residual claim rights or rules that determine who receives what proportion of the earnings/savings; (b) readjustment to control rights that define how votes and power are distributed; (c) a significant change in the purpose of the cooperative; or (d) a dramatic shift in cooperative culture and/or mindset.

Cooperative Life Cycle Longevity

Figure 3.
GICL participants engage in studying, discussing and interacting at each phase. This exercise takes approximately 30 hours at the Summer Institute session (times vary at workshops, graduate seminars and customized exercises). Participants are divided into two teams: one is a similar function team and the other is a similar or related cooperative team. The assignment at the end of the program is for the participants to draft their cooperative’s most recent life cycle.
Observations and Concerns
Analyzing detailed participant evaluations and shared experiences provide important insights into this process. The participant behaviors described below are derived from cooperative management employees and boards of directors, the vast majority of whom have a minimum of five years of experience either with an agricultural-oriented cooperative or with a non-cooperative agribusiness entity. These observations are from approximately 5,000 cooperative management and director participants.

1) Cooperative employee participants prefer to be guided by a conceptual framework when involved in a learning process. Participants initially attach their personal and cooperative experiences to the framework in an unorganized manner. Their experiences are subsequently rearranged once exposed to the logic of a chronologically organized architecture. Participants immediately identify with the simplicity of the skeleton framework of the life cycle. Over time, frictions caused by changing membership preferences emerge and the rate of growth in cooperative health moderates. After recognizing and analyzing this change in direction of cooperative health, membership must decide whether to continue as currently organized. The subsequent curvatures in succeeding life cycles indicate that cooperatives are quite resilient. Participants identify with this optimism as it suggests that their future is in their hands.

2) Once confronted with the abstract and simple Figures 2 and 3, participants begin to think in a longitudinal manner that is more temporal and conceptual. Indeed, the selection process conducted by senior cooperative leadership in choosing participants uses ‘comfort with abstractness’ as a criterion. This supports the supposition that “managers love theory”. Cooperative leaders, both senior management and board members, agree with empirical studies where one of the key factors in successfully leading complex organizations, such as cooperatives, demands comfort with flexible abstractness.

3) We conclude that the employment of historical context is underused in cooperative education. Our conclusion is drawn given the interest expressed by the participants through both verbal and written reaction (a ten-page evaluation instrument is administered during and after each session). A need appears to exist to understand the significant continuities with the past as well as how to use such insights to respond to future challenges. Moreover, participants enjoy learning from stories. The original purpose and reasons for forming a cooperative garners more attention when embedded in real world stories formulated and derived from historical documents. The importance of history highlights the fact that longevity is crucial to cooperatives, which are formed to meet member needs rather than shareholder returns. Discussion of the original purpose of the cooperative’s founders leads to another interesting observation. The closer the current purpose is to the original purpose of the founding members, the lower the level of anxiety encountered by current cooperative leaders and employees. Anxiety is caused by rapid change emanating from volatile competitive and global environments. One of the refreshing lessons drawn from this exercise is that the power of the original purpose attracts interest in the history of the organization, including decisions that led to the cooperative’s enduring longevity. This interest contributes to a culture of respect for understanding survivability factors.

4) Additionally, participants enjoy sharing stories. They appear to learn from reacting to other participants’ stories and then countering with stories of their own. Embedding critical structural and strategic decisions into historical story contexts creates a learning environment that motivates participants to contact veteran employees back home to probe, extract and construct even better
stories related to the organizational concepts under discussion in a given session. Before attending the workshop, a future participant is asked to contact other employees with a historical appreciation of their cooperative’s past. These veterans are also forewarned that the participant might contact them during the program, seeking validation of certain concepts and supporting stories.

5) Increasingly, the participants arrive with more advanced formal education (50 to 75 percent of the participants in recent years have undergraduate and advanced graduate degrees). Thus, demanding rigorous theoretical explanations and sophisticated solutions to cooperative challenges. Yet, almost none of the participants are exposed to formal instruction or experience in confronting unique cooperative issues. Concepts include but are not limited to vaguely defined property rights, patron-oriented ownership rights, member responsibility contracts, imbalances between control rights and residual claim rights, cooperative health, reinvention and balancing volatility of supply and demand. These concepts, which rarely appear in MBA courses, are addressed in detail in GICL workshops and are supported by evidence-based social science research.

6) Many of the participants graduated with an academic discipline degree rather than a professional degree. Consequently, their analytical skills are formed by a specific set of theories and a predetermined outline for solutions. GICL attempts to incorporate a more inter/multidisciplinary approach emanating from social sciences and management sciences due to the complexity of the cooperative organization. Understanding a cooperative, its members, organization, governance, management and life cycle demands a broad understanding of conceptual approaches and the ability to use them to inform complex cooperative problems. Participants enjoy knowing the relevance of these differing views when addressing the problems and challenges faced by cooperative decision-makers. The knowledge helps in particular when digesting phase 3 of the aforementioned Life Cycle Framework. Phase 3 explores the positive, neutral and negative implications of growing forms of heterogeneously created frictions (Cook and Iliopoulos, 2016).

7) Participants thrive in a learning environment where peers have experienced the same cooperative user-patron-member issues. When engaged in team exercises, where teams have experienced similar functions and common histories, participants are frequently surprised by the number of solutions that address similar problems. They also celebrate the learning of a new vocabulary. By sharing stories of issues, concerns and behaviors that are difficult to define or describe, they become excited when phenomena are defined and put into the context of a cooperative-laden story. Examples of phenomena discussed are temporal asset specificity, tinkering, cooperative genius process, influence costs, internal versus external free-rider constraints, and ownership costs. We find them practicing this new vocabulary during breaks and mealtimes. We receive feedback once they return to their cooperatives about how their use of certain terms raises the interest of a peer or colleague. Thus, an opportunity arises to share their newly acquired cooperative knowledge and education. Indeed some evidence exists that this method of training is implemented and shared with other employees.

8) Debate on cooperative health is always a highlight in a GICL workshop. How does a group define or measure cooperative health, or achieve a consensus about its meaning among members, management, employees, and subgroups of each? This is one of the most fundamental elements of cooperative education and cooperative success. When conducting member surveys, we find a multitude of responses or measures. Exercises within GICL workshops have resulted in more
than 50 perceived definitions of cooperative health. We find that truly understanding cooperative health requires an acceptance of the concept as self-defined by each individual cooperative. This is a difficult reality for cooperative researchers to accept. However, this reflects the fact that cooperatives are autonomous enterprises and developing their own criteria for success is crucial to building an engaged democratic team. This is particularly true in the U.S. where more than 100 cooperative incorporation statutes exist. These statutes are vague in their explanation of performance.

9) Management participants at GICL sessions are selected primarily by senior leaders in their cooperatives. The participants are known explicitly or implicitly as the future senior leaders of their organizations. They arrive with a high degree of confidence and elevated standards, yet few have been exposed to cooperative theory, history or structure. Many have the impression that cooperatives are considered an inferior or inefficient form of business governed by an inexperienced group of patrons. This presents the cooperative educator with a unique challenge. GICL confronts this challenge by working through an exercise on the 26 advantages of being a cooperative, which are organized into five categories: (a) competitive advantage elements; (b) public authorization advantages; (c) positive externalities; (d) defensive gain advantages; and (e) offensive gain advantages. Discussion of these points and the countering disadvantage brings participants’ attention to the stories of how each of the long-enduring cooperative entities in US agriculture has employed these advantages to serve their members for more than four times longer than their investor-owned rivals. As of 2018, more than 970 agricultural cooperatives have been operating for more than 75 years, and of those, 259 for more than 100 years (Wadsworth). The average investor-owned firm in the USA has a life span of less than 20 years. Thus, the supposed inefficiencies of cooperatives are not borne out by the facts. Combining these facts with stories of success and near failure with the ability to rebound and continue appears to change attitudes. When exposed to stories and readings on whether competitor entities are more efficient, participants are surprised to learn how professionally managed and governed cooperatives are today, with many cooperatives considered leaders in their value chains. In discussing the participants’ inferiority attitude, the importance of defining and understanding purpose and cooperative health becomes apparent.

10) Theoretical advances have helped. In the USA, consolidation at the farm level and the advances in agribusiness and management education have had considerable impact on the concept of collective action. Farmers are becoming more individualistic and more demanding of their collectively controlled assets. As this phenomenon was fostered by the agricultural depression of the 1980s and rekindled in the early 2000s, cooperatives consolidated very rapidly and farming became driven almost entirely by business and economics. There are a few exceptions to this pattern, but even the organic cooperatives are now reaching a large scale. On observing these trends, we examine new advances in institutional and behavioral research and in social and management science. The insights from these advances inform the theoretical underpinnings of the predecessors to the Life Cycle Framework, particularly developing the concept of vaguely defined property rights (Cook, 1995; Chaddad and Cook, 2004). The assumptions underlying the theoretical concepts were tested with the participants (particularly the assumptions of bounded rationality and opportunism) and were found to be non-heroic. A basic premise of classical social science is that the parties of a transaction both have perfect knowledge of all attributes of the asset being exchanged, such as cost, quality and price. The new institutional and behavioral approach
draws on Herbert Simon’s findings that humans do not have the capacity to know everything and do not have the time to gather the information because of the complexity involved. A further premise is that parties to a transaction want to know the rules of a game so they can play by those rules. Oliver Williamson describes a behavior called opportunism that suggests people want to know the rules to determine how far they can bend them. Free-riding behavior is often observed in cooperatives. Relaxing these two assumptions, perfect knowledge and non-opportunistic behavior, enables cooperative scholars to develop greater understanding of frictions, factions and broken norms and rules with more predictability. Participants in GICL programs identify these behaviors and much time is spent discussing the solutions to the resultant opportunistic behaviors (Cook and Iliopoulos, 2016). Thus, advances in organization economics formed the basis of a new conceptual framework that has served as a lightning rod for cooperatives (Royer, 1987).

11) Identifying conceptual approaches to explore the complexity of cooperatives is only one of the challenges for cooperative educators working in this narrow yet important agricultural field where cooperatives play very important economic, community and social roles. In the mid-1990s, GICL staff faced a number of serious challenges. GICL staff realized federal and state resources were decreasing; cooperative employees and farmer members were becoming more educated and sophisticated; cooperatives themselves were becoming more complex and their design was more of a hybrid form than a traditional cooperative organization; and social scientists were making great strides in fields such as mechanistic design, organizational architecture, contract formulation, governance, property rights enforcement, and individual and group incentive understanding. GICL staff and board members questioned whether cooperative education had a future. This is a story, albeit incomplete, of what they decided. They combined new conceptual fields and designed programs that would engage with and extract knowledge from participants as to what skills and concepts they really needed in order to lead a sustainable and competitive agricultural cooperative. As a result, GICL staff built a process that facilitates interactive learning and started a process that continues to be modified. Participants and educators co-design methods to explore alternatives to finding group solutions, how to ameliorate frictions, how to design and develop cooperative genius processes, and to determine how to communicate to a leadership that might not understand how rapidly the world is changing.

Another major challenge for cooperative education is to determine an appropriate degree of engagement. Originally, higher education was available only to the elite. Passing the Land Grant Act of 1862 introduced the concept of inclusiveness to the American public--particularly rural America. The Hatch Act of 1887 and Smith-Lever Act of 1914 furthered the ability to connect knowledge creation with knowledge dispersion/applicability. As state and federal funds have decreased for these public good provided activities, more incentives emerge for private food solicitation (McDowell 2003). The challenge to remain objective and non-adulating often remains difficult as our profession introduces more executive education activities. The set of challenges awaiting the future of cooperative education merits more attention. Particularly, when working through challenges that might be considered wicked problems. In a world demanding more attention for alternative organizational forms that promote community and social capital in addition to positive financial return, is it imperative that cooperative education continues to evolve.
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St Louis, MO: National Institute on Cooperative Education, speech, 6 August 1

Livestock Marketing Cooperative Benefits in the 21st Century

Gregory McKee¹, Jay Parsons² and Phil Kenkel³

Abstract
The formation of livestock marketing cooperatives occurred in response to market failures. This article features the benefits these cooperatives have generated in their recent operations. Pork, beef, and lamb cooperatives are described. Open and closed membership cooperatives are considered. The structure and services of livestock marketing cooperatives demonstrate the flexibility of cooperatives as a mechanism to respond to changes in the livestock market, including food safety and trade concerns.

JEL codes: D23, L66, P13, Q13

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Introduction
Livestock producers began forming marketing cooperatives in the early part of the twentieth century to provide greater competition, bargaining power, and market access. These cooperatives occupy various positions in the value chain in order to provide services to their members (Katz & Boland, 2002). Services provided may include marketing via auction or electronic means, sales to farmers for feeder stock, procurement services for slaughter livestock, credit, and a mechanism to communicate consumer preferences for product quality. Cooperatives help members increase control over how the market for their production develops by allowing them to bypass one or more layers of the marketing channel. In this way, and by virtue of operating in portions of the value chain closer to the consumer, livestock marketing cooperatives capture a greater share of the value of their output that would otherwise go to other members of the value chain. Depending on the desired economic benefits, membership size, and the geographic market they serve, livestock marketing cooperatives are organized using either a closed or open membership structure.

This paper provides an overview of three livestock marketing cooperatives. These cooperatives show how variations on the cooperative corporation can be used to respond strategically to changes in the livestock industry. Information was gathered through direct conversations with leadership of each cooperative. A discussion of their functions and rationale for participating in the market is given. The ability of a cooperative to link more closely how livestock producers and final consumers affect food safety is presented.

Producers Livestock Marketing Association
Founded in the 1920s, Producers Livestock Marketing Association (PLMA) in Omaha, Nebraska, was formed to provide marketing services of fed beef cattle for slaughter. By organizing larger lots of animals for sale, members obtained increased bargaining power with packers for terms of sale. Today, the cooperative provides marketing, risk management, and credit services for beef and pork producers. Marketing services include nationwide connections to identify feeder beef cattle for sale to its members who then purchase animals in quantity. Services also include monitoring the development of member animals to assure timely sales and market-based pricing. The cooperative coordinates sales with livestock processors nationwide and obtains terms of trade with suppliers or packers. Members may choose to use the cooperative’s sale price risk management tools, including hedging contracts. The cooperative also provides financing services for members, which provide funds for the financing of animals, feed or other operational expenses. Members benefit by having regular access to suppliers or buyers and competitive terms of sale. No patronage is paid; market access and a favorable negotiating position are the core financial benefits members receive. On-farm benefits include reduced operations costs through reduced procurement or marketing effort, availability of risk management tools and competitively priced financing.

The cooperative is organized as a non-stock cooperative, which was a common structure for cooperatives formed prior to the Capper Volstead Act of 1922 (Suhler & Cook, 1993). Producers who transact with the cooperative are eligible for membership after three continuous years of using any of the cooperative’s services. Membership is achieved after the third year of transactions and grants voting rights in cooperative governance. A majority of the cooperative’s members operate within 200 miles of Interstate 29, a north-south roadway extending from the Canadian border to Kansas City, MO, USA. Total membership, which consists of pork and beef producers, has averaged around 1,200.
PLMA sold over 900,000 cattle and over 900,000 swine in 2018. The cooperative is funded through commission charges incurred through using the cooperative’s services. Charges are set at a flat rate per hundredweight for beef cattle and hogs. The cooperative is a member of National Livestock Producers Association (NLPA), a federated cooperative. NLPA provides educational programming to improve member operations, represents member interests for legislative purposes, facilitates marketing and financing ventures among member cooperatives. PLMA is the largest member of NLPA in terms of livestock marketed and gross revenue, accounting for nearly half of total sales by all NLPA members.

Member production practices are affected by membership in the cooperative. The cooperative maintains a team of sales agents who make regular visits to each member. Agents are familiar with the production conditions at each member’s operations and provide feedback about likely demand conditions for animals of various quality. The cooperative has developed a reputation of accurately presenting the condition of animals in the lots sold to packers. In turn, packers provide information to the cooperative about desired animal attributes for their customers and anticipate accurate descriptions of quality when animals are aggregated. The cooperative arranges both open market sales as well as sales based on grade and yield. The cooperative also circulates a bimonthly newsletter that includes regular sales visits, informal communication with members, systematic information to apprise producers about animal health issues, operations practices, and preparation for successful animal marketing, including risk management.

The cooperative also, through its financing operations, provides a rationale for maintaining product quality. Although operational requirements are not part of any loan agreement, the cooperative has a team of inspectors, separate from sales agents, who inspect member operations to verify the marketability of the livestock, including animal quality and quantity. Members have an incentive to obtain financing through the cooperative since it provides an alternative to local community banks or other financing options, which already may have approached loan limits for agricultural loans.

The cooperative also facilitates member attention to food safety practices (Klementina Kirezieva, Bijman, Jacxsens, & Luning, 2016; Klementiena Kirezieva et al., 2013). The cooperative interacts with packers based on the requirements of the Beef Quality Assurance (BQA) protocol. The BQA provides information about proper production practices that affect animal health, product quality, and on-farm or processing/fabrication practices that affect food safety. Cooperative sales agents assist members in their certification by making certification forms available and linking them with needed training. Agents are tasked to maintain a relationship with the member to ensure that the production environment facilitates a successful sale.

Allied Producers Cooperative
Pork producers in Iowa, Kansas, Minnesota, and Nebraska formed Allied Producers Cooperative (APC) in 2006. Other livestock cooperatives were formed during this period (Kenkel & Holcomb, 2009). APC organizes the lots of swine from among its members for processing. Additionally, APC monitors the development of swine herds among its members and allocates a quota of production to each member. By owning processing resources, the membership is able to capture an increased
fraction of the value of final production and market-based terms of sale regardless of the size of their operation. Profit is distributed as patronage in proportion to the number of animals marketed.

Concentration in the pork processing market, and pork price variability in the 1990s and 2000s, encouraged a group of 30 to 40 pork producers to form the cooperative as a means of purchasing pork processing and fabrication facilities. The cooperative is organized as a closed, or value-added, cooperative (Grashuis & Cook, 2018). The founding members, who are still active today, purchased equity in the cooperative in proportion to their desired portion of the total processing capacity. Members then sign a contract with the cooperative granting them the right to market their swine production through the cooperative in exchange for an obligation to deliver their assigned quota to the processing facility. Under this structure, the cooperative benefits by maintaining stable processing costs at volume to approach minimum average operating costs. Processing capacity of the original processing facility, located in St. Joseph, MO, USA, remains unchanged since operations began in 2006. No additional shares were available until the recent completion of a Sioux City, IA, USA facility. The St. Joseph and Sioux City facilities process approximately 18,000 swine per day. Members may exchange shares among themselves, with each exchange creating its own terms of trade. The value of shares has increased since 2006. The additional capacity generated by the opening of the IA facility allowed the cooperative to generate new shares. Initially, these shares were offered to existing members who purchased all available shares.

Equity available from original members was insufficient to fund the entire cost of constructing the original processing facility, located in St. Joseph, MO, USA. The cooperative formed a joint venture with other, non-cooperative, pork producers named Triumph Foods (TF). Triumph owns the processing assets with APC being a partial owner and having representation on TF’s board of directors. TF receives the proceeds from sales and proportionally distributes them to all partners based on number of animals provided. APC then distributes revenue; profits generated during the year by TF sales are distributed as an additional payment to members at the end of the year. Total profits distributed to members since the beginning of operations have been in excess of $1 billion.

Despite the APC contract requirements, members have some flexibility in marketing decisions. Members are allocated a weekly delivery quota based on their annual delivery requirement. APC makes weekly deliveries of member output to the TF-owned facility, which, by virtue of the APC joint venture with other pork producers, is owned indirectly by the members of APC. The financial benefits of membership allows individual members to expand their operations. Members are able to sell their output to the APC to meet their quota and still have excess production, which is sold elsewhere. In addition, TF purchases from non-member producers as well. These purchases, made on the open market, tend to stabilize pork prices in the region and provide a pro-competitive benefit to all producers.

Despite the supply of swine from member and non-member producers, TF closely monitors the quality of incoming animals. TF’s wholly owned marketing subsidiary, Seaboard Foods, coordinates with its customers to identify desired quality attributes. Seaboard Foods coordinates with TF to write a series of requirements for animal characteristics and associated production requirements. Among these requirements are descriptions of nutrition, handling, animal welfare, veterinary standards, and transportation requirements. Members agree to these requirements and confirm their compliance through annual certification. On-farm contact by TF representatives
verifies compliance and TF employees inspect animal shipments upon arrival at the processing facilities. Members also participate in regular, on-farm training for members and their employees. Food safety requirements vary by country and both APC and TF weigh the benefits and costs of compliance. TF documents compliance with any sales claim and, by virtue, can show full compliance along a value chain owned by producers through vertical integration among producers and their ownership of the processed facility (Ji, Jin, Wang, & Ye, 2019; Mérel, Saitone, & Sexton, 2009).

Despite the benefits of forward integration along the supply chain, organizers of the cooperative faced an initial cultural challenge in persuading members to make downstream investments. Historically, pork packers were perceived in an adversarial position in the pork industry. Individual producers strove for fair sale terms, while packers sought to offer bids advantageous to their own bottom line. At first, producers were reluctant to consider the processing facility investment, as they feared they would be perceived negatively as the packers were in the past. Consistent education and a steady flow of financial benefits, while enforcing food safety requirements, have helped producers accept the long-term investment required to join a closed cooperative. Furthermore, benefits from certification compliance, as a group, may serve to insulate a consistent supply of swine from consumer perceptions of low output quality.

Mountain States Lamb Cooperative

The Mountain States Lamb Cooperative (MSL) originated in 2001 when twenty sheep producers gathered at the Wyoming Ram Sale to discuss joining together to sell feeder lambs as a group (Boland, Bosse, & Brester, 2007). Sheep producers were frustrated with the low prices they were receiving at the time. As a result, each producer agreed to contribute the average sale price for a ram at that year’s sale ($350) as seed money to explore the idea of creating bargaining power by forming a cooperative alliance (Bensemann & Shadbolt, 2015). At the time, most of these producers did not retain ownership of their lambs into the feedlot and finishing phase. However, membership soon looked for opportunities to capture an increased percentage of the total value chain of production. By 2005, the cooperative had completed the purchase of 50% of B. Rosen and Sons, a full-service lamb fabrication, distribution, and sales company based in New York with a fabrication facility attached to the JBS USA Greeley Lamb Plant in Greeley, Colorado. In 2008, the cooperative purchased the remaining 50% ownership of B. Rosen and Sons as sales and distribution of the end product was viewed as critical to the future success of MSL. In 2015, JBS informed MSL of its intent to turn the Greeley Lamb Plant into a case-ready beef facility. MSL members decided to purchase the JBS Lamb Plant based on their need to either build their own plant or purchase the JBS Plant on which they were already paying $500,000 in annual rent to JBS for the B. Rosen facility in Greeley. The plant officially re-opened as the Mountain States Lamb Cooperative’s Lamb Plant on January 5, 2016. Thus, MSL evolved from a marketing co-op focused on bargaining power at the end of the first step in the value chain, into a cooperative capturing value from all segments of the chain. At the time of acquisition, B. Rosen and Sons was the largest distributor of lamb product in the U.S. Currently, MSL’s lamb plant in Greeley handles about 28% of the slaughter lambs in the U.S. MSL recruited members across the Western United States while forming as a closed membership structure consisting of 500,000 shares. Half of those shares are classified as delivery (A) shares, which obligates the owners to deliver one lamb per year. If members sell lambs somewhere else and do not
fulfill their delivery obligations to MSL, they are fined up to $20 per head. Over 90 percent of the producer members of MSL market all of their lambs through the cooperative so non-delivery typically is not problematic. Like most of agriculture, the average age of members is 55 to 60 years old. As members retire, member shares are sold to other members, sometimes at a discount, to make sure delivery quotas are maintained. New shares were not created but some investment (B) shares were converted to (A) shares over the years for members wanting to increase their delivery quotas.

A few feedlot owners are members of MSL but most are currently range sheep operators maintaining ownership through the feed yard. Membership has held steady since inception with about 145 total members. Approximately 100 of these members are in Wyoming with the rest spread throughout several other Western U.S. states. MSL has paid patronage dividends to members a couple of times since its formation. However, MSL has most consistently employed a re-investment strategy to acquire other companies and more segments of the marketing channel. Two primary benefits of membership in MSL are reliable access to a harvest facility and a more stable market price. Until September 1 of each year, members are provided first priority to slot lambs for delivery to the lamb plant for slaughter during the upcoming marketing year. After September 1, slots are filled on a competitive basis. Members receive grid summary information from lamb lots delivered including live weights off the truck, carcass weights, yield grade, quality grade, pelt values (and pelt value descriptions), premium and discount information compared to the market average as defined by the USDA Agricultural Marketing Service (AMS) weekly LM352 report. An objective of the market pricing structure for MLS is to provide the membership more consistent pricing. Unlike swine and beef, there are no futures market pricing tools for lamb. Market risk management tools are limited to private contracting and Livestock Risk Protection (LRP-Lamb) insurance offered by the USDA Risk Management Agency through private insurers. There have been several occasions since the inception of LRP-Lamb in 2007, when the product was not available due to unforeseen and prolonged volatility in the market place.

MSL members also attribute value to being part of something bigger. They gather annually for a membership meeting in July as well as informally at sheep meetings held throughout the year including the American Sheep Industry Convention held in January. A newsletter is issued four to five times a year with market information, production education topics, grid premium information, and top producer awards covered on a regular basis. Imports continue to put pressure on domestic lamb prices and recent trade policies have put significant pressure on the export value of lamb pelts. MSL members appreciate the value of staying informed on these issues and having a collective voice that is heard within the U.S. sheep industry as a whole.

Like all marketing channels, food safety risks and compliance regulations vary by market. MSL uses the Global Food Safety Initiative (GFSI) and British Retail Consortium (BRC) certifications. MSL conducts member training at its annual meetings to inform members about basic certification requirements and recent or pending changes. MSL assesses member compliance with certification requirements by visiting member operations and requiring annual affidavits of compliance from each producer, as well as from truck drivers upon delivery (in compliance with transportation standards). MSL management regularly interacts with representatives of Colorado State University to update best practices and then inform the membership. Given the concentration of domestic lamb marketing, certification allows producers a useful means to differentiate their product vertically as
horizontal competition intensifies, especially with imports. All cooperative members, for the sake of maintaining the cooperative’s reputation in the market, generate incentives to create high-quality production among the membership.

Conclusions
Livestock marketing cooperatives form for many reasons. This paper provides a summary description of three US livestock marketing cooperatives operating with some degree of success over a significant period of time. These cooperatives provide members numerous benefits, some of the most important of which being market access, more consistent market prices (market risk management), and bargaining power, including access to information and a collective voice in the market place. Members of cooperatives enjoy economies of scale and collective influence. The cooperatives use that influence to encourage the livestock industry to address consumer concerns about food safety and humane treatment of livestock. A compliance protocol in each cooperative addresses these consumer concerns. The existence of those protocols is an important benefit to the membership. It improves the collective reputation of the livestock producer members and may serve to partially insulate the membership from this institutional risk.
References


Governance in Agricultural Cooperatives

Michael A. Boland

Abstract
Cooperatives are often thought to require open membership policies, use patronage-based financing, and employ decision-making based on unanimity. The objective is to measure whether large, as measured by dollar volume of assets and sales, cooperatives in the United States utilize practices which are embedded in cooperative principles. Consolidation in production agriculture is occurring in many countries in Western Europe and North America. Agricultural cooperatives, owned by farmers, are increasing in size globally. Governance systems are beginning to evolve as cooperatives get larger in size and compete across a larger geography. Some new cooperative structures are discussed in this article.

Keywords: agribusiness, cooperatives, governance, institutions
JEL codes: D23, L66, P13, Q13

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Sexton (2012) describes three key trends in U.S. agricultural markets: greater concentration in many industries; greater degree of product quality and differentiation; and increased vertical coordination through marketing and production contracts, which has led to greater control of suppliers in a vertical supply chain. Cooperatives are involved in all of these activities, which has made them the subject of much research. Cooperatives are often thought to have open membership policies, use patronage-based financing, and employ decision-making based on unanimity. The objective is to measure whether large, as measured by dollar volume of assets and sales, cooperatives in United States utilize practices which are embedded in cooperative principles. A missing piece in the literature on the economic theory of cooperatives is corporate governance. Because corporate governance has not been written about widely in agricultural and applied economics literature, the topic is introduced within the context of the cooperative business model.

Corporate Governance

Keasey and Wright (1993) define corporate governance in terms of “structures, process, cultures and systems that engender the successful operation of organizations”. Williamson (2002, 2005) notes that governance is a critical issue in understanding transactions while Coase’s (1937) transactions costs theory helps to understand why agricultural producers have invested in cooperatives. Rogers and Sexton (1994) note that these transactions occur within agricultural industries that often have asset specificity. In particular, three of Williamson’s five types of asset specificity discussed are: specialized physical assets for handling a farmer’s agricultural products; site specificity or located in close proximity to where agricultural production occurs; and dedicated assets which are large discrete investments made in expectation of continuing business with agricultural producers.

Hermalin and Weibach (2003) and Adams, Hermalin, and Weisbach (2010) summarize the literature on corporative governance and conclude “Governance structures arise endogenously because economic actors choose them in response to the governance issues they face” (p.59). The same holds true for cooperatives. Fama and Jensen (1983) show why separation of responsibilities between a principal (board of directors) and agent (CEO) is important. The articles of incorporation dictate which policies are needed in the particular state of incorporation. However, the corporate bylaws dictate the specific purpose, operation, duties and responsibilities of each principal and agent.

As principals representing the owners, boards of directors must monitor the actions of the agent they have hired. An important aspect of monitoring is hiring an external auditor to examine the internal controls and request an independent opinion on internal controls and accounting statements from the auditor. Audits provide detailed information on items such as how income is distributed as patronage or used to create equity (retention of patronage) or destroy equity (through redemption). Additionally, audits provide information regarding percentage of patronage and non-patronage business as well as explanatory notes on determinations and calculations of various accounting data. Corporate audits are not public documents but are typically available for scrutiny by members at the cooperative’s headquarters. Annual reports have less detailed information than these reports. The board of directors have corporate minutes taken at every meeting or any membership meeting, which are the official records of decisions and activities. Such records often

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2 Boland (2018) describes the history and use of the words supply chains and value chains. In this manuscript, the word vertical supply chain is used.
include the votes made on a decision. Like audits, minute books are not publicly available to researchers, but information on voting outcomes in board meetings and membership meetings are ascertained from interviews with directors.

Sources of Data
The U.S. Department of Agriculture Rural Development (2014) reports that 2,106 agricultural cooperatives existed in 2014 with almost two million memberships in the United States. In 2014, the top 100 agricultural cooperatives based on sales volume comprise 72% of the total number of agricultural cooperative sales volume and 67% of all assets. With regard to cooperative memberships, the top 100 have 30% while 38.5% memberships reside in cooperatives with $49 million or less in annual sales. This is misleading because several federated cooperatives in the marketing and farm supply industries such as CHS and Land O’Lakes have independent member cooperatives and direct producer members. For example, in 2014, CHS had 625,000 members with 77,000 being direct members through CHS retail operations and 573,000 being members through their independent cooperatives for whom they serve as a wholesaler. Thus, the top 100 have significantly more memberships than that reported by the U.S. Department of Agriculture.

One obvious way to determine whether cooperatives have open membership policies, use patronage-based financing, and employ decision-making based on unanimity is to analyze each of the 2,106 U.S. agricultural cooperatives. However, due to confidentiality reasons, the U.S. Department of Agriculture cannot disclose the names or addresses of these cooperatives. Although, it does list the top 100 cooperatives which have the majority of cooperative memberships, sales and hence, income which determines patronage, and assets. Thus, an analysis of these cooperatives could be done to determine the extent of whether these three conditions continue to exist. Much of the data needed to analyze the first three conditions lie within corporate governance documents such as articles of incorporation (“articles”), bylaws, minutes, audits, and annual reports or with interviews with directors and managers.

Description of the Cooperative Data
Of the U.S. Department of Agriculture’s top 100 cooperatives, complete data is available on 65 to address the three conditions. Six cooperatives which operate as federated models are not used, which yields data on 59 cooperatives. In addition, 142 cooperatives operate in the $200 million to $499 million sales volume. Of these, 113 are not in the top 100 and complete information on 74 of these 113 cooperatives is available to the author. Thus, the data represents cooperatives who comprise 81.1% of the total sales volume in 2014. Of the total 133 (59 of the top 100 plus 74 other) cooperatives, 67 are classified as a having a mixed portfolio of both marketing and purchasing activities and were involved in selling farm inputs such as crop nutrients, chemicals, animal nutrition, energy, capital, crop insurance, and agronomic and energy services. Four were solely farm input purchasing cooperatives and 62 were marketing cooperatives operating in the corn-ethanol, 3

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3 The word multipurpose is sometimes used to describe these types of cooperatives. However, in keeping with the definition employed by the USDA, which reflects the broad literature, the word mixed is used.
sugar beet, citrus, fluid milk and related products, tree nuts, figs, dried fruit, stone fruit, tree fruit, rice, cranberries, grapes, cherries, blueberries, and vegetable industries.4

Thus, the data used in this research is representative of cooperatives more likely to be making governance decisions that would make them economically viable. Cresswell (2013) suggests that there are five types of qualitative approaches used in research: narrative studies, phenomenology, grounded theory, ethnography, and case study. The analysis used in this study is case studies of individual cooperatives using public data, private data, and interviews. This method is commonly used in social sciences such as law, political science, and psychology. Boland (2019) and Boland and Caķir (2018) describe the use of cases in the agricultural and applied economics literature.

Overview

Open Membership Policies

Buchanan (1965) writes, “Hence, the theory of clubs is, in one sense, a theory of optimal exclusion, as well as one of inclusion” (p.13). The same is true for cooperatives. A board of directors is elected by the agricultural cooperative’s membership, who are agricultural producers. This board of producers is responsible for drafting and maintaining the cooperative’s membership criteria, which is ratified by the membership and defines the boundaries for inclusion of members. Thus, the criteria resides in the articles and bylaws of the cooperative.

Cooperatives may have multiple classes of members. The broadest membership class, which includes anyone (producer or consumer) who does business with the cooperative as a member-patron. This class of membership allows anyone doing business with the cooperative to receive economic benefits for using the cooperative. A second class of membership, which is more restrictive, are consumers or producers who may patronize (less than some minimum amount) or may not (because they are retired) patronize the cooperative and have equity in the cooperative. A third class might be voting members who patronize the cooperative beyond a minimum amount of business, are active agricultural producers, and have equity in the cooperative. Boland and Kenkel (2016) note that the legal definition of a member is increasingly being linked with their type of business organizational structure (corporation, limited liability company, sole proprietorship, etc.). These producers have the voting rights to elect a board of directors and vote in any other special issues related to the cooperatives such as changing the bylaws, approving a merger, or other activities specified in the bylaws. The neoclassical economic theory of cooperatives makes no distinction in membership classes except to suggest that a cooperative will not have defection among its core members if utilizing marginal cost pricing.

Use of Patronage-Based Financing

Cooperative finance principles are well known (Barton et al. 2011). The user-owner principle is a key financial principle in which members must provide the capital needed to finance the cooperative. Most U.S. agricultural cooperatives obtain equity by requiring members to purchase an equity certificate as a condition of membership and by distributing a portion of profits in the form of

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4 The data are not considered random in the sense that the USDA top 100 is a sample taken from all 2,106 cooperatives in the USDA data for 2014. However, as described, the data clearly are from the largest cooperatives based on sales volume and dollar value of assets and do reflect these types of cooperatives. Given that in some industries such as tree nut, pome fruit, and citrus there may only be one or several cooperatives, it does reflect the many industries that farmers use for their cooperatives.
additional equity certificates which were derived from patronage (hence the term, patronage-based financing) proportional to use. The distributed equity is eventually redeemed, subject to board approval, by the cooperative at book value, which is referred to as revolving equity. Historically, cooperatives were permitted to retain a portion of profits in a general reserve fund commonly referred to as unallocated equity or surplus. The members had a collective rather than an individual ownership of the unallocated equity, which was permanent, non-revolving capital. This information can be found in corporate audits.

**Decision-Making Based on Unanimity**

Unanimous decisions are an important part of governance. Two types of decisions are described in the articles and bylaws. The first type of decisions are those that must be ratified by the voting membership. In general, articles and bylaws require voting members to ratify decisions made by the board that involve a wide array of items: dissolution, mergers, a change in incorporation or change in articles or bylaws, director elections, or actions that can legally happen at a special meeting of the membership, or other decisions identified in the bylaws. All other decisions not listed in the bylaws are left to the discretion of the board of directors without ratification by the voting members. Many typical bylaws require any decision made by the membership of a cooperative to be at least a super-majority (“2/3 + 1”). Cooperative bylaws can and often do, have different quorum requirements for different types of ratification decisions. This data can be found in corporate minutes, bylaws, or in interviews with directors.

**Results and Discussion**

Sexton (1986a, 1986b) reconciles the various aspects of the neoclassical economic theory of marketing cooperatives and purchasing cooperatives. In doing so, he articulates the theoretical conditions showing why policymakers granted these limited antitrust conditions and other policies favorable to the cooperative business model. He argues that membership size, membership policy, methods of finance (patronage-based financing), and decision-making process built around unanimity are key theoretical elements for a competitive industry. He further notes that these conditions cannot be formally tested due to unobservable data. The results are discussed within the context of each of those three theoretical conditions.

**Open Membership Policies**

All 71 cooperatives classified as purchasing or mixed cooperatives had open membership policies according to their articles and bylaws with 94% having the three classifications of membership. These mixed cooperatives were supplying farm inputs and marketing crops such as oilseeds, feed or energy grains, and food grains. These types of crops were not perishable and had risk management tools readily available. The membership fee was minimal with only three having a membership fee of more than $25. Nine marketing cooperatives had similar policies.

The other marketing cooperatives had membership policies, which required an upfront investment linked with some form of a marketing agreement or contract. Efficient use of assets and accurate demand forecasting are critical components of profitability because the crops are perishable and have a high degree of asset specificity. The investment could be earned over time with the board
authorizing deductions from patronage. Only nine of these cooperatives did not operate under a pooling basis. These marketing cooperatives must have some form of marketing agreement and investment. In these type of cooperatives, there were generally two membership classes with member-patrons who also had voting rights as long as they were active agricultural producers. Finally, all but six of the 133 cooperatives practice some form of democratic voting with voting members having one vote. There is no discrimination based on size of producer’s operations (number of acres, animals, etc.), gender, ethnic background or other form of discrimination.

Use of Patronage-Based Financing
Only two of the 133 cooperatives did not use patronage-based financing due to all of their equity being unallocated and paying 100% patronage in each year. Thus, 131 cooperatives were creating equity each year through retention of patronage and destroying equity by redeeming equity from a previous year. Boland and Kenkel (2016) note that in recent years, for a variety of reasons, mixed cooperatives have significantly increased their use of unallocated equity relative to allocated equity. The ratio of unallocated equity to total equity among all cooperatives has been gradually increasing for decades. Bijman, Hanisch and Sangen (2014) suggest that the same is occurring in the EU. Finally, there is a high degree of business done with patrons with all but 11 cooperatives doing 90% or more of their business with patron members according to the audits and interviews. Clearly, patronage-based financing continues to be used by cooperatives.

Decision-Making Based on Unanimity
Every cooperative reports that unanimity on major decisions is universal in that even if a director votes against fellow directors in a decision, the board remains united in communicating that decision. Interviews, surveys, and minutes found very few decisions that were not unanimous. An examination of the articles and bylaws found variability in quorum requirements with annual meetings having the lowest quorum requirements and meetings where the dissolution of the cooperative or a change in structure having the highest quorum requirements. For example, a decision to dissolve a cooperative typically has a higher majority vote requirement such as 80%. Overall, 71% reported having different quorum requirements. Thus, unanimity of decision-making is used by cooperatives.

Implications
MacDonald, Hoppe, and Newton (2018) describe the consolidation in agriculture. Risch et al. (2014) describe how this influences cooperatives. For example, corn yields per acre are greater than those of small grains and require much greater volumes of nitrogen fertilizer. In addition, farming changed as new planting and harvesting equipment was needed to produce feed grains such as corn and oilseeds such as soybeans. Technological innovation such as advances in genetics, yield, and planting density have enabled farmers to work faster and operate more acres (Pardey and Wright 2003). Corn and soybeans have much narrower planting and harvest windows that challenge existing facilities and operations (Bechdol et al. 2010; Beddow and Pardey 2015). Boland (2018) describes similar technological improvements that have increased productivity in perennial crops.
Cooperative governance systems are evolving as cooperatives get larger with regard to geographic area and numbers of producers, especially in farm input supply cooperatives. Globally, dairy cooperatives have developed the most sophisticated structures because of the large number of producers and geographic size. Many use a dual or two-tier board system with an “outer board” that is quite large and meets several times a year with committee structures. The outer board handles many of the issues that members face such as quality control systems, producer liquid milk payments and member communications. The “outer board” may have several hundred producers on it especially if the cooperative operates in multiple countries in Western Europe. The “inner board” is much smaller and handles the income distribution decision (with input from the outer board); CEO recruitment, evaluation, retention, and compensation; audit and internal controls; strategy; and other issues common to corporate governance. Depending upon the laws, members of management or employee unions may also serve on this inner board. Both sets of boards are elected, but the inner board may have some outside, independent appointed directors and the producers are chosen from the outer board.

In the United States, several cooperatives have structures such as dairy Farmers of America DFA (regional councils and the DFA corporate board); National Grape Cooperative and its wholly-owned subsidiary Welch Foods (Amanor-Boadu, Boland, and Barton 2006); Organic Valley (Su and Cook 2015); and Agtegra (Miller 2011). Land O’Lakes has an extensive nomination process that uses elected committees. Sugar beet cooperatives have a close relationship between grower boards and their board of directors. Dual boards will likely become more popular as farm consolidation happens and cooperatives get larger in size.
References


Value of Migratory Bird Recreation at the Bosque del Apache National Wildlife Refuge in New Mexico

Christopher Huber\(^1\) and Natalie Sexton\(^2\)

Acknowledgements
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Abstract
Each fall, thousands of Rocky Mountain Sandhill Cranes and other migratory birds congregate at the Bosque del Apache National Wildlife Refuge in New Mexico’s Rio Grande Valley in search of wintering habitat. As such, this refuge is known as one of the premier destinations for bird viewing and photography in the United States. Using contingent valuation data, this case study quantifies the value associated with migratory bird recreation at this refuge to be $7.5 million in 2010. It is estimated that this annual value increased by more than $6.4 million in 2017 due to growth in annual refuge visitation.

Key Words: Bosque del Apache National Wildlife Refuge, contingent valuation, migratory birds, willingness to pay

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Introduction and Background

The United States Fish and Wildlife Service (USFWS) in the Department of the Interior (Interior, DOI) manages more than 560 wildlife refuges within the National Wildlife Refuge System (Refuge System). Many of these refuges represent critical stopovers between winter and summer habitats for migratory birds. The USFWS is directed by the National Wildlife Refuge System Improvement Act of 1997 to recognize the importance of wildlife-based recreation at national wildlife refuges, including migratory bird watching and photography. The quality of migratory bird recreation opportunities at refuges depends on the availability and quality of habitat at the refuge and other breeding and nesting sites along species’ migratory corridors. This concept can be thought of as a “spatial subsidy” and is defined as the migratory services in one location being subsidized by ecological conditions and processes in other locations (Semmens et al. 2011). Beyond recreational uses, migratory wildlife also provide a variety of spatial subsidy benefits for ecosystem functions, including contributions to seed dispersal, pest control, and nutrient cycling (de Groot et al. 2002; Duffy 2009). In 2017, the United States Secretary of the Interior signed Secretarial Order 3356 to expand access and increase public involvement in outdoor recreation opportunities on DOI managed lands, increase migratory waterfowl populations using voluntary perpetual grassland and wetland conservation easements, expand habitat and water conservation of wintering habitat, and utilize sound scientific evidence in conjunction with landowner and stakeholder input. Having a clearer understanding of the economic benefits of migratory birds as a spatial subsidy can help the USFWS and other Interior bureaus move forward with prioritizing investments in migratory bird habitat and access. This paper presents a case study on the economic benefits of migratory bird-related recreation at one USFWS managed refuge: the Bosque del Apache National Wildlife Refuge (NWR).

Bosque del Apache NWR is known throughout the bird viewing community for the opportunity to witness and photograph the congregation of thousands of migratory birds, including Rocky Mountain Sandhill Cranes (Antigone canadensis) and snow geese (Anser caerulescens). Located in Central New Mexico, USA, the 57,331-acre Bosque del Apache NWR was established in 1939 to protect important wintering habitat along the Rio Grande River for waterfowl and North American migratory birds. In the summer months, Rocky Mountain Sandhill Cranes find suitable nesting habitat in Wyoming, Central Utah, Northwestern Colorado, Idaho, Montana, and the Providence of Alberta in Canada (Mitchusson 2003). In the fall, most Rocky Mountain Sandhill Cranes migrate to New Mexico’s Middle Rio Grande Valley (Drewien and Bizeau 1974; Stahlecker 1992). The Bosque del Apache NWR contains the most important winter nesting sites within the Middle Rio Grande Valley and has been found to be used by roughly half of all migrating Rocky Mountain Sandhill Cranes during the winter months (Drewien and Bizeau 1974; Ligon 1961). The refuge also represents important wintering habitat for snow geese, who migrate south in the winter from their summer nesting habitat along the North American Arctic Coast (Mowbray et al. 2000). Other wildlife can be found at the refuge, including numerous other bird species, black bear, mountain lion, fish, and reptiles (USFWS 2008). Bosque del Apache NWR received more than 306,000 visitors in 2017, an 85% increase from the approximately 165,000 visitors in 2010 (based on 2010 and 2017 Refuge Annual Performance Plan data; U.S., Fish and Wildlife Service 2019, written comm.; USFWS, 2019). Most visitation occurs during the winter months to view the congregation of thousands of migratory birds at their winter nesting habitat (Mitchusson 2003). Each November, the six-day Festival of the Cranes
attracts roughly 6,000 visitors per year to celebrate the arrival of the Rocky Mountain Sandhill Crane and snow geese seasonal migration to the refuge (Caldwell 2017). In addition to bird viewing, the Festival of the Cranes also includes a series of educational workshops, lectures, hikes, field tours, and exhibits.

It can be useful to understand what the two types of economic outcomes from migratory bird recreation and tourism are and how they differ. The first are economic impacts and contributions analyses and measure how money spent by refuge visitors supports jobs and business activities in local communities (Caudill and Carver, 2019; USFWS, 2019). The second, and the focus of this study, is consumer surplus (i.e., economic value) and measures the amount of money an individual is willing to pay for a recreation experience beyond any costs actually paid (Loomis and Walsh 1997). In the context of evaluating publicly funded investments, consumer surplus is the appropriate economic value measure for goods and services that are not be traded in an observable market (Brown, Bergstrom and Loomis 2007). However, without observable market prices, nonmarket valuation techniques must be relied upon to estimate consumer surplus of migratory bird recreation experiences (Champ et al. 2017). Previous research has estimated consumer surplus benefits of migratory bird recreation, including sandhill crane viewing in Nebraska (Stoll et al. 2006), shorebird viewing in New Jersey (Eubanks et al. 2000), and shorebird viewing on the Delaware Bay (Edwards et al. 2011; Myers et al. 2010). The consumer surplus estimates of migratory bird recreation at Bosque del Apache NWR from this current case study adds to the understanding of the benefits of interconnected migratory bird flyways across North America as spatial subsidies. Ultimately, failure to monetize migratory bird recreation values limits the ability to weigh economic outcomes from project investments that may affect migratory bird habitat and migration corridors necessary for the on-site economic benefits to be realized.

Methods
Using survey data collected in 2010 at Bosque del Apache NWR, consumer surplus is estimated for migratory bird recreation using the contingent valuation method (CVM) (Boyle 2017; Flores 2017). Data are drawn from the National Wildlife Refuge visitor survey administered by the U.S. Geological Survey (USGS) for the USFWS (Sexton et al. 2012a; b). The questionnaire was administered to refuge visitors during two sampling periods from August 16-30, 2010 and November 16-30, 2010. The second sampling period in November covered the annual Festival of the Cranes. The sampling periods and intercept locations were selected by refuge staff to best reflect the diversity of use and specific visitation patterns of the refuge. Eight sampling shifts of three to five-hour time bands were randomly selected within the two sampling periods. Every tenth visitor willing to participate provided their name, mailing address, and specified whether an online or mail survey was preferred. A postcard was then mailed within ten days of the initial on-site contact asking them to complete the questionnaire online, even if they selected the paper option. Visitors who chose not to complete the online version were then sent a paper version one week after the postcard. Two additional contacts were made by mail, including a postcard reminder one week after the initial survey and a second paper questionnaire another two weeks after the reminder postcard (Dillman 2007). Each mailing included instructions for the online questionnaire or a pre-paid envelope for returning the paper version of the questionnaire. A total of 300 visitors agreed to participate after being contacted on-site
and 229 questionnaires were returned for a response rate of 76%. The majority (80%) of questionnaires were completed online. Of the 229 completed survey respondents, 66% were contacted during the Festival of the Cranes event in November, while the remaining 34% were contacted during the earlier sampling period in August.

Survey respondents were asked a series of questions to characterize their trip, including group size, primary recreation activity, demographics, satisfaction of visit, and trip purpose (Sexton et al. 2012a; b). Finally, to capture the consumer surplus of refuge recreation, all survey respondents were asked the following CVM question: “As you know, some of the costs of travel such as gasoline, hotels, and airline tickets often increase. If your total trip costs were to increase, what is the maximum extra amount you would pay and still visit this Refuge?” Respondents were asked to circle the highest dollar amount from a list of options ranging from $0 to $250 (Table 1).

This type of CVM question format (i.e., payment card) eliciting the respondent’s consumer surplus provides a bound around where their true consumer surplus value lies. For example, if a respondent selects $10, it is assumed their true value is greater than or equal to $10 but less than $20. We model consumer surplus as a linear function of independent explanatory variables:

\[
\ln(\text{consumer surplus}) = x' \beta + e \quad \text{where} \ e \sim N(0, \sigma^2)
\]

Where \(x'\) is the independent explanatory variable hypothesized to influence the individual’s consumer surplus, and \(e\) is the random error term. Variables tested in the full-unrestricted model include age, education, gender, income, and primary recreation activity (bird viewing, wildlife viewing, and photography). The regression also includes a variable to test for differences in consumer surplus between respondents who were sampled during the Festival of the Cranes in November and those who were contacted during the prior sampling period in August. If the respondent’s true consumer surplus is assumed to lie within the interval defined by lower and upper bound \(z_{ll}\) and \(z_{ul}\), then for a given observation, the probability that the consumer surplus falls between any two price thresholds is \(\Phi(z_{ul}) - \Phi(z_{ll})\), where \(\Phi\) is the cumulative standard normal density function (Cameron and Huppert 1989). The log-likelihood function is:

\[
\ln L = \sum_{i=1}^{n} \log[\Phi(z_{ul}) - \Phi(z_{ll})]
\]

Using the method of maximum likelihood and assuming a lognormal conditional distribution for consumer surplus, the unknown parameters, \(\beta\) and \(\sigma\), are estimated. Mean consumer surplus is \(\exp(x' \beta + \sigma^2/2)\), where \(\sigma\) is an estimate of the true population error variance.

Results
The sample of Bosque del Apache NWR visitors are 48% male and 52% female, primarily U.S. citizens (98%), well-educated (77% reported having at least a bachelor’s degree), identify as white (94%), have a mean age of 58.4 years, and more than one third (36%) report a household income of more than $100,000 per year (Table 2). With respect to trip characteristics, 74% indicate visiting Bosque del Apache NWR is the primary reason for making the trip, 18% view the refuge as one of many equally important reasons, and the remaining 8% say the visit was an incidental stop. Bird viewing (49%) is the most frequently reported primary activity on their most recent trip to Bosque del Apache NWR. An additional 15% of respondents indicate that attending the Festival of the Cranes is the primary purpose for visiting the refuge, followed by wildlife viewing (10%) and photography (10%).
majority of respondents (59%) spent less than one day at the refuge on their most recent trip (averaging 4.4 hours). Those who stayed more than one day at the refuge reported an average visit of 3.5 days. During the past year, respondents visited Bosque del Apache NWR an average of 2.9 times and other refuges within the Refuge System an average of 3.3 times. Lastly, the mean visitor group size is 3.6 people (n=165).

Interval regression results of consumer surplus for refuge visitation are presented in both restricted and unrestricted models in Table 3. The restricted model contains variables for Age, Income, and the Crane Festival Attendance dummy variable. The likelihood ratio chi² test statistic for the restricted model indicates a high level of overall model significance (chi²(3)=26.720; Prob>chi²=0.000). Age is positively and statistically significant at the 1% level of significance. Income is also positive and significant at the 5% level of significance. The statistically significant, positive effect of the Crane Festival Attendance dummy variable on consumer surplus implies how the value of refuge recreation is influenced by the quality of the experience through festival events and denser bird populations relative to the earlier August sampling period. Additional variables in the unrestricted model include Education, Gender, and dummy variables for primary recreation purpose (bird viewing, wildlife viewing, or photography). Neither Education nor Gender are found to be statistically significant in the unrestricted model. Similarly, no statistically significant effect on consumer surplus is found among the primary purpose activity dummy variables. One possible explanation for this result is how similar the reported primary activities are, given the setting and situation experienced at Bosque del Apache NWR. A likelihood ratio test confirms that the restricted model is preferred over the unrestricted model (chi²(5)=6.856; Prob>chi²=0.232), as does the lack of statistical significance on the additional variables included in the unrestricted model.

The restricted model is used to calculate consumer surplus per trip to Bosque del Apache NWR for both visitors who attended the Festival of the Cranes event and those who did not (Table 4). Confidence intervals for mean consumer surplus estimates are calculated using the bootstrap method with 1,000 replications. Restricted model results indicate at a 5% level of significance, respondents who attended the Festival of the Cranes are predicted to be willing to pay 35% more per trip than respondents who did not, all else equal. Setting the Crane Festival Attendance variable to 1 yields a mean consumer surplus of $118.59 per person per trip. Setting the same Crane Festival Attendance variable to zero yields a mean willingness to pay of $87.72 per person per trip for respondents who visited outside the festival time period.

Dividing estimated mean consumer surplus per trip by the average number of days per trip yields a consumer surplus per day. This value can then be used to aggregate the economic benefits over total annual visitation to the refuge. Respondents who visited during the Festival of the Cranes stayed an average of 2.30 days, while those who were contacted during times outside the Festival of the Cranes reported an average of 1.42 days. This results in a value of $51.56 per person per day during the Festival of the Cranes and a $61.77 consumer surplus per day for visitors during the remainder of the year. Approximately 306,000 people visited Bosque del Apache NWR in 2017, representing an increase of 141,000 annual visitors since 2010. Subtracting crane festival visitation estimates (6,000 people per year) from annual visitation yields total non-festival visitation of roughly 300,000 visitors in 2017 and 159,000 visitors in 2010. Assuming 74% of visitors made sole-purpose trips (the same proportion as our sample), multiplying per day values (i.e., Festival of the Cranes and
the remainder of year values, respectively) yields a total annual value of approximately $7.5 million in 2010, which increased to $13.9 million in 2017 without adjusting for inflation. This represents an increase of $6.4 million in economic benefits since 2010.

Discussion and Conclusions
Mean consumer surplus per trip to the Bosque del Apache NWR is estimated to be between $87 and $118, which translates to a value of $51 to $61 per person per day depending on seasonal effects and length of stay. These results are comparable to estimates from previous studies. Cooper and Loomis (1991) found bird viewing in California to be approximately $73 per person per trip (in 2010 dollars). Viewing migratory shorebirds on the Delaware Bay has an estimated value of $38 per person per trip using a travel cost model (Edwards et al. 2011) and between $40 to $60 per day trip when relying on the contingent valuation method (Myers et al. 2010). The most comparable study is Stoll et al. (2006) who found bird viewers were willing to pay an estimated $412.65 per person per year to view migratory sandhill cranes in the Platte River Valley of Nebraska (in 2010 USD). This translates to a value of $80 per person per trip and is within the 90% confidence interval [$69.35, $109.74] for the mean non-festival time period estimated in our case study ($87 per person per trip). Better accounting of the economic benefits of migratory bird recreation opportunities can be used to help evaluate investments aimed at improving bird habitat and migration corridors. Measuring the benefits derived from wildlife viewing and photography is especially important because each are documented areas of growth in wildlife recreation participation in the U.S. In fact, more than 86 million American adults participated in some form of wildlife viewing in 2016—representing an increase of more than 20% from ten years prior (DOI-DOC 2018). However, these on-site recreation value estimates represent only a small portion of the total economic value of this migratory system. This refuge protects some of Rocky Mountain Sandhill Crane’s most important wintering habitat, and as a result, supports larger system-wide benefits beyond the refuge boundary. People benefit from indirect services provided (e.g., seed dispersal and nutrient cycling) and recreation activities at other locations along the migratory route, including fall staging areas in Southern Colorado’s San Luis Valley. Lastly, many people may place a high value on ensuring that this important habitat exists in a relatively unaltered state regardless of whether they personally visit the Refuge or not.
References


<table>
<thead>
<tr>
<th>Dollar Amount</th>
<th>Frequency Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>$0</td>
<td>2%</td>
</tr>
<tr>
<td>$10</td>
<td>9%</td>
</tr>
<tr>
<td>$20</td>
<td>17%</td>
</tr>
<tr>
<td>$35</td>
<td>9%</td>
</tr>
<tr>
<td>$50</td>
<td>14%</td>
</tr>
<tr>
<td>$75</td>
<td>4%</td>
</tr>
<tr>
<td>$100</td>
<td>20%</td>
</tr>
<tr>
<td>$125</td>
<td>2%</td>
</tr>
<tr>
<td>$150</td>
<td>7%</td>
</tr>
<tr>
<td>$200</td>
<td>7%</td>
</tr>
<tr>
<td>$250</td>
<td>9%</td>
</tr>
<tr>
<td>Table 2</td>
<td></td>
</tr>
<tr>
<td>------------------------------------------------------------------------</td>
<td></td>
</tr>
<tr>
<td>Survey Respondent Demographics and Trip Characteristics</td>
<td></td>
</tr>
<tr>
<td>Primary activity</td>
<td></td>
</tr>
<tr>
<td>Bird watching                                                          49%</td>
<td></td>
</tr>
<tr>
<td>Crane Festival Attendance                                              15%</td>
<td></td>
</tr>
<tr>
<td>Wildlife viewing                                                       10%</td>
<td></td>
</tr>
<tr>
<td>Photography                                                            10%</td>
<td></td>
</tr>
<tr>
<td>Gender (n=221)</td>
<td></td>
</tr>
<tr>
<td>Female                                                                 52%</td>
<td></td>
</tr>
<tr>
<td>Male                                                                   48%</td>
<td></td>
</tr>
<tr>
<td>Residence (n=223)</td>
<td></td>
</tr>
<tr>
<td>United States                                                          98%</td>
<td></td>
</tr>
<tr>
<td>Other                                                                  2%</td>
<td></td>
</tr>
<tr>
<td>White                                                                  94%</td>
<td></td>
</tr>
<tr>
<td>Hispanic                                                               7%</td>
<td></td>
</tr>
<tr>
<td>Education (n=221)</td>
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</tr>
<tr>
<td>Some high school or less                                               1%</td>
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</tr>
<tr>
<td>High school diploma/GED                                                4%</td>
<td></td>
</tr>
<tr>
<td>Some college                                                           18%</td>
<td></td>
</tr>
<tr>
<td>Bachelor’s degree                                                      20%</td>
<td></td>
</tr>
<tr>
<td>Post-bachelor or graduate degree                                       57%</td>
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</tr>
<tr>
<td>Income (n=202)</td>
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<tr>
<td>less than $10,000                                                      2%</td>
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<tr>
<td>$10,000-$24,999                                                        4%</td>
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<tr>
<td>25,000-$34,999                                                         8%</td>
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<td>$35,000-$49,999                                                        10%</td>
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<td>$50,000-$74,999                                                        27%</td>
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<td>$75,000-$99,999                                                        13%</td>
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<td>$100,000-$149,999                                                      22%</td>
<td></td>
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<tr>
<td>$150,000-$199,999                                                      6%</td>
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<tr>
<td>$200,000 or greater                                                    8%</td>
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### Table 3
Interval Regression of Willingness-to-Pay for Additional Costs to Make Current Trip Possible

<table>
<thead>
<tr>
<th>Variable</th>
<th>Unrestricted Model (N=190)</th>
<th></th>
<th>Restricted Model (N=191)</th>
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<tr>
<td></td>
<td>Coefficient</td>
<td>Robust std. error</td>
<td>Coefficient</td>
<td>Robust std. error</td>
</tr>
<tr>
<td>Age</td>
<td>0.016***</td>
<td>0.005</td>
<td>0.017***</td>
<td>0.005</td>
</tr>
<tr>
<td>Education</td>
<td>0.011</td>
<td>0.030</td>
<td></td>
<td></td>
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<tr>
<td>Gender (1 if female, 0 otherwise)</td>
<td>0.016</td>
<td>0.131</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Income</td>
<td>0.00000348**</td>
<td>0.00000149</td>
<td>0.00000371***</td>
<td>0.00000138</td>
</tr>
<tr>
<td>Crane Festival Attendance (1 if yes, 0 otherwise)</td>
<td>0.298**</td>
<td>0.150</td>
<td>0.301**</td>
<td>0.151</td>
</tr>
<tr>
<td>Participated in photography (1 if yes, 0 otherwise)</td>
<td>0.168</td>
<td>0.254</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Participated in wildlife viewing (1 if yes, 0 otherwise)</td>
<td>-0.061</td>
<td>0.252</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Participated in bird viewing (1 if yes, 0 if no)</td>
<td>0.022</td>
<td>0.161</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Constant</td>
<td>2.613***</td>
<td>0.574</td>
<td>2.732***</td>
<td>0.315</td>
</tr>
<tr>
<td>sigma</td>
<td>0.901*</td>
<td>0.050</td>
<td>0.910*</td>
<td>0.050</td>
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<tr>
<td>Log likelihood</td>
<td>-425.952</td>
<td></td>
<td>-429.380</td>
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<tr>
<td>chi² statistics</td>
<td>30.75</td>
<td></td>
<td>28.400</td>
<td></td>
</tr>
<tr>
<td>Prob &gt; chi²</td>
<td>0.000</td>
<td></td>
<td>0.000</td>
<td></td>
</tr>
</tbody>
</table>

*: p<0.10, **: p<0.05, ***: p<0.01

### Table 4
Consumer Surplus of Non-consumptive Recreation per Person per Trip at Bosque del Apache NWR

<table>
<thead>
<tr>
<th></th>
<th>Mean WTP [90% CI]</th>
</tr>
</thead>
<tbody>
<tr>
<td>Remainder of year</td>
<td>$87.72 [69.35, 109.74]</td>
</tr>
<tr>
<td>During Festival of the Cranes</td>
<td>$118.59 [103.25, 140.07]</td>
</tr>
</tbody>
</table>