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A Research Agenda for Cooperatives

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A RESEARCH AGENDA FOR COOPERATIVES

Justin G. Gardner, Jason R.V. Franken, & Maria A. Boerngen

Abstract

This study uses survey responses from cooperative industry leaders and academics to inform priority cooperative research topics and progress on those topics, thereby informing an agenda for further cooperative research. Specifically, factor analysis of respondents' importance ratings for cooperative research topics identifies the following groupings of larger research areas/themes in order of importance: cooperative governance and performance, life cycle and survival, and risk-oriented research. Future work on these topics will help to address the needs and challenges of agricultural cooperatives and promote the sustainability of this business form.

Introduction/Motivation

Cooperatives are a prominent organizational form in agriculture, and as such, these businesses are of longstanding interest to farmers, agricultural economists, policymakers, and industry stakeholders. In 2019, there were 931 marketing cooperatives and 848 supply and service cooperatives in the U.S. (U.S. Department of Agriculture 2021). Mergers and dissolutions reduced the number of agricultural cooperatives by 70%

between the 1940s and the 1990s, with another 47% reduction between 2000 and 2019 (Demko 2018; U.S. Department of Agriculture 2021). Agricultural cooperatives employed 183,635 workers in 2019 and served nearly 1.9 million voting members (U.S. Department of Agriculture 2021). These cooperatives marketed approximately \$125 billion worth of agricultural commodities and sold \$71 billion in supplies (U.S. Department of Agriculture 2021).

It is a normal business practice among cooperatives for their patrons to hold an ownership stake as a cooperative member. In 2019, these members collectively held \$45.9 billion in cooperative equity (U.S. Department of Agriculture 2021). Agricultural cooperatives differ from investor-owned firms in that they exist for the benefit of those user-owners (farmers). However, challenges inherent in the structure of the cooperative business model could potentially create a significant reduction in farm profit and farmer equity, thus harming rural communities. With approximately 2 million farms in the United States (U.S. Department of Agriculture 2019), a non-trivial number of US farms utilize cooperatives, and overcoming challenges inherent in cooperatives has important implications for the rural economy. While scholars criticize traditional cooperatives for a number of inefficiencies (Cook 1995; Porter and Scully 1987; Vitaliano 1983), numerous cooperatives continue to thrive and serve their farmer-members. In 2019, the 100 largest agricultural cooperatives (ranked by gross business volume) set records for total net income and total assets, with over 47% of equity allocated to cooperative members (U.S. Department of Agriculture 2021).

This study seeks to identify the highest priority cooperative research topics, and to evaluate the current state of research progress on those topics. This will inform further work in addressing the needs and challenges of agricultural cooperatives and promote sustainability of this business form.

Methods and Findings

Survey

A fifteen-item survey was designed and distributed to past attendees of NCERA-210 annual meetings; leaders of the Tennessee Council of Cooperatives, the Illinois Cooperative Council, and the Missouri Institute of Cooperatives; and regular participants in the Graduate Institute of Cooperative Leadership at the University of Missouri. Questions addressed the priority and timeliness of cooperative research topics, progress made on those research areas, the availability of cooperative educational and training resources, and respondents' professional backgrounds. The survey was administered in Qualtrics, and 41 surveys were completed and returned out of the 114 that were distributed, for a 36% response rate. Twenty-nine responses were received from industry stakeholders, the majority of whom are employed by agricultural cooperatives in management roles. The remaining 12 responses were received from university faculty at a variety of academic ranks at both land grant (10) and non-land grant (2) universities.

Participants were asked to evaluate the importance and priority of eleven cooperative research topics on a scale of 1 (low priority/importance) to 5 (high priority/importance), as well as the state of research progress on each of those eleven topics on a scale of 1 (not addressed at all) to 5 (fully addressed). The eleven topics are listed in

Table 1. These topics were selected after a review of the available literature (e.g. Boland et al. 2020; Grashuis and Su 2019; Hohler and Kuhl 2018). Respondents were able to write in and rank additional research topics. Only five survey respondents wrote in additional topics. Suggestions primarily revolved around cooperative vs IOF culture and governance and the education of consumers, directors, and employees. Response rates for write-in topics were too low to achieve statistical significance, so these were excluded from the analysis. Bold text indicates the topics selected by survey respondents as the most important, and the topics for which the level of research progress is the lowest. Academic and industry personnel (i.e. stakeholders) gave the highest priority to the areas of measuring cooperative performance, governance, and survival. The topics most lacking in research progress were perceived to be collective entrepreneurship, member heterogeneity, free riders, and risk management by academic participants; industry respondents perceived member heterogeneity, free riders, and governance to be the topics with the least amount of research progress. Similar topics related to heterogeneity (e.g., balancing needs of small and large farmers) are identified as important topics for future research in other recent review studies (Boland et al. 2020; Hohler and Kuhl 2018). Given the degree of agreement amongst academic and industry respondents, the remaining analysis is performed on the aggregate dataset.

Factor Analysis of Research Topics' Importance Ratings

With the assumption that survey respondents may rate similar or related topics at similar levels of importance, factor analytic methods (Thompson 2004) were applied to identify larger research areas or themes that consist of related topics, following Franken and Cook's (2015) and

Franken and Cook's (2019) demonstration of these methods to categorize different dimensions of cooperative performance. This more parsimonious set (i.e., eigenvectors, also called factors) capture the relevant variation of the larger set by effectively grouping like-items together. In a practical sense, it can be difficult to categorize and draw distinctions about research on related topics, so if the response patterns for a group of topics are similar, it is useful to group those topics to more effectively evaluate research activity. The analysis detailed below identifies three aggregate research themes listed here in order of survey respondents' importance rankings for their underlying components: (1) Cooperative governance and performance, (2) Life cycle and survival, and (3) Risk-oriented topics.

Reported results are obtained via principal components analysis of the correlation matrix (the most common extraction method for exploratory factor analysis) and varimax rotation. Research topics with notable correlation tend to load on the same factors, as indicated by bolded factor loadings in Table 2 (i.e., higher numbers indicate higher loading). For our purposes, a factor is essentially a set of survey questions with similar response patterns, as indicated by correlation in this case, as corresponding analyses alternatively may be conducted on a covariance matrix. Note that not all items load unilaterally on one factor or another, implying that some overlap exists across factors.

Measuring cooperative performance and Governance impact on performance/survival load on Factor 1 (thus labeled "Cooperative governance and performance"), perhaps along with *Principal-Agent issues* reflecting concerns about whether managers and/or directors act in their own or the cooperative's best interest. This last one does not load on Factor 1 unilaterally, however, as it has a somewhat larger weight on

Factor 3. *Mergers and Acquisitions*, with its small positive loading, seems to fit best with Factor 1, given that its strongly negative loading on Factor 3 reflects an inverse correlation to other research topics loading on that factor. Here, the relative performance of a cooperative may affect its candidacy for merger or acquisition (Grashuis and Franken 2020).

Ignoring *Principal-Agent issues*, mean importance for these topics ranges from 3.61 for *Mergers and Acquisitions* to 4.11 for *Governance* to 4.44 for *Performance*, making Factor 1, which can be conceived as research on performance related issues, the research area rated of utmost importance.

Life Cycle, Survival, Investment Constraints, and How member heterogeneity changes over life-cycle, perhaps along with *Collective Entrepreneurship*, all load most strongly on Factor 2 (“Life cycle and survival”), which taken together can be considered research related to the endurance and durability of cooperatives. Survey respondents may perceive that heterogeneity can change over the life cycle, making certain investment constraints more pertinent and impacting survival. Means for items loading on this factor range from 3.56 for *Heterogeneity* to 4.39 for *Survival*, with only *Survival* and *Collective Entrepreneurship* exhibiting mean importance ratings above 4.00.

Factor 3 (“Risk-oriented topics”) consists of *Risk Management* as the only item loading unilaterally on it and several other research topics that load at similar levels on other factors (e.g., *Free-Riding* and *Collective Entrepreneurship* also load on Factor 2, and *Principal-Agent issues* also loads on Factor 1). With the prominence of the *Risk Management* factor loading, this factor can be viewed as risk-oriented research, as *Free-Riding* and *Principal-Agent issues* both involve risks of opportunistic behavior, and risk-taking is a defining feature of entrepreneurship, whether it be in

the individual or collective form. As the *Risk Management* and *Collective Entrepreneurship* are the only research topics with importance ratings exceeding 4.00 for this factor, it can be considered the lowest priority, though still important, research area.

Literature Review

As previously described, the eleven cooperative research topics can be grouped into three overarching factors based on how survey respondents rated their relative importance. Existing literature on those topics is discussed below.

Factor 1: Cooperative governance and performance

The literature relating cooperative governance to performance consists of two types of studies: 1) those on the ownership structure characteristics of cooperatives, e.g., open or closed membership, one vote per member or share, and equity redeemability characteristics, which essentially correspond to differences across cooperative types, e.g., traditional, member-investor, and new generation cooperatives (NGCs), and 2) those on internal governance aspects, e.g., size of the board of directors and its composition—tenure and diversity of directors and inclusion of industry experts as outside directors—and tenure of CEO, as well as board processes—training of new directors and frequency of meetings with directors and management. Although recent innovations in cooperative governance (e.g., hybrid forms, proportional member voting rights, placing professionals/experts on the board of directors, etc.) spark academics' interest (Bijman, et al. 2014; Boland 2019), existing empirical work is sparse.

Grashuis and Su (2019 p. 14) identify and review four recent studies of the former type and conclude, “(T)here is no clear empirical evidence to suggest non-traditional ownership or governance is linked to superior performance ... (but) performance is perhaps not the right outcome variable. Instead, adaptation of the ownership structure may impact the willingness of members to invest equity, improve product quality, or commit supply.”

With respect to internal governance, Burress, et al. (2011) find that smaller boards with outside directors granted voting rights perform better, and Bond (2009) similarly finds that additional board members do eventually reduce some measures of performance. Cook and Burress (2013) find that experienced cooperative CEOs (i.e., tenure >10 years) are unable to significantly influence board composition due to few formal avenues for such actions in cooperatives, but they may negotiate more lenient monitoring through procedural and formal committee aspects of board governance. Liang and Hendrikse (2013) present a mathematical model indicating that cooperative member CEOs, as opposed to outside/hired CEOs, should be efficient if upstream and downstream activities are complements or in cases of substitutes if the substitution effect is sufficiently small or large and/or the difference in marginal productivity of those activities is sufficiently large. Franken and Cook (2019) revisit some of these issues, while controlling for potential endogeneity not addressed in prior work (i.e., circular effects where past performance may impact adopted cooperative governance traits of interest, such as increasing board size or adding outside directors). The study finds better performance by larger cooperatives with smaller boards and limited evidence that seating outside experts on the board improves performance,

given the low frequency of such expert directors in the sample. While CEO tenure grows with past performance and increases one measure of performance (i.e., ROA), there is no statistically significant link between CEO tenure and board size, as democratically chosen boards offer CEOs of cooperatives less influence over board composition than in corporations. Hueth and Marcoul (2008) interviewed cooperative CEO's and concluded that CEO's are not compensated based on any specific measure of performance and CEOs are closely monitored by their boards.

Factor 2: Life cycle and survival

The concept of a cooperative life cycle has been addressed in studies such as LeVay (1983), Cook (1995; 2018), and Boland (2020). LeVay (1983) appears to be the first to identify the need to define the life cycle of an agricultural cooperative. He noted the lack of data to support the common belief that cooperatives were frequently “short-lived” (p. 31), questioned whether or not that belief was true, and suggested that rigorous study was therefore needed of the various stages through which a cooperative passed over its life. Cook (1995) asserted that a more complete comprehension of the stages through which a cooperative typically passes would be valuable in understanding the role of the cooperative business model in agribusiness. He offered the first life cycle framework with his “five-stage crude model of cooperative genesis, growth, and demise”

(p. 1155). Cook (2018) provided a more thorough discussion of his five proposed stages, beginning with “economic justification” – defining the need for the formation of a coop – and culminating in “choice.” In this fifth and final phase, the members of a cooperative must choose the future direction of the organization – “to maintain the status quo position [which

frequently leads to exit as defined below], to spawn [a new venture formed by current employees and members of the coop], to exit [liquidation or reorganization as, for example, an IOF], or to reinvent the cooperative's organizational structure [e.g., altering ownership rights]" (p. 12). Boland (2020) offers a standard four-phase life cycle consisting of "birth, growth, maturity, and decline" (p. 6).

In both Cook's 5-phase model and Boland's 4-phase approach, the final stage of the cooperative life cycle entails stakeholders making a deliberate choice on how to move forward – in other words, does the cooperative survive (either in its original form or in a new iteration)? Though the literature on cooperative survival is limited (Grashuis and Franken, unpublished), factors that impact the survival of a cooperative have been addressed in previous studies including recent work by Grashuis and Franken (2020), Grashuis (2020) and Chlebika and Pietrzak (2018).

Chlebika and Pietrzak (2018) studied Polish agricultural cooperatives and compared those with 5 or fewer, 6 to 19, and 20 or more members, finding that the likelihood of survival was positively correlated with increasing membership size. This conclusion is consistent with Cazzuffi and Moradi's (2012) findings that Ghanaian cocoa cooperatives with membership less than 10 were less likely to survive. In his study of 950 of the largest U.S. agricultural cooperatives with median membership of 626 farmers, Grashuis (2020, p. 80) posed the following research question: "[W]hich demographic, financial, and strategic characteristics inform the survival probability of farmer cooperatives?" He found that relatively new and relatively old cooperatives, those with "mid-sized" membership (p. 88), and those with "intangible asset portfolios" (p. 80;

i.e., a strategic focus that expands beyond supplying inputs and providing marketing services to members, including the ownership of trademarks) were less likely to survive. Cooperatives with differentiated service portfolios including supplying inputs and marketing are more likely to survive; financial performance was found to have neither a positive nor a negative impact on the survival of the cooperative.

While some studies treat cooperative survival as one-dimensional where the cooperative either exists or ceases to exist (e.g., Cazzuffi and Moradi 2012; Valette et al. 2018), Grashuis and Franken (2020) delineated two categories of cooperative failure, namely mergers and acquisitions (M&As) entailing “another organization tak[ing] ownership of the [cooperative’s] joint assets,” and liquidation and dissolutions (L&Ds), whereby “[t]he joint assets of the organised farm producers cease to be used in economic activities” (p. 1). Examining 2,260 U.S. farmer cooperatives from 2004-2017, they evaluated the impacts of factors such as membership size, cooperative age and financial performance, and level of portfolio diversification on the likelihood of each type of failure. M&As are more likely with cooperatives that are older, have a larger membership and higher sales, and a more diversified portfolio of products and services. The likelihood of L&Ds increases with younger cooperatives, those with a smaller number of members and a higher sales volume, and those with a more specialized product and service portfolio. A lower current ratio (which indicates lower liquidity) is associated with a greater likelihood of M&As, while L&Ds are associated with higher debt-to-asset and current ratios. A higher rate of return on assets is associated with a lower incidence of either type of cooperative failure. Grashuis and Franken (unpublished) studied 1,568 U.S. farmer cooperatives between 2010 and

2017, with similar findings to Grashuis and Franken (2020). In addition, the authors concluded that mergers and acquisitions were more responsible for the decrease in farmer cooperatives than liquidation and dissolutions.

Factor 3: Risk-oriented topics

The term collective entrepreneurship is ambiguous, and the definition tends to morph to fit specific applications, as do the terms “collective” and “entrepreneurship.” Collective could be anything from group decision making to group ownership, and entrepreneurship involves multiple dimensions that include creativity, risk-taking, and rent-seeking. Our survey results show that researchers in agricultural economics believe that the topic is relatively unimportant and relatively under-researched. It makes sense that an unimportant subtopic has not been well researched. Combined with the ambiguous nature of the term it seems that further research on the topic is low priority.

Burris and Cook (2009) document the increased use of the term collective entrepreneurship and note that “wide variations in the use of the term collective entrepreneurship have left little common ground on which to build a comprehensive theory of collective entrepreneurship” (p. 5). Indeed, they further explain that both the word “collective” and the word “entrepreneurship” have significant variance in how they are applied and interpreted. Thus, the first challenge in research on collective entrepreneurship is pinning down exactly what collective entrepreneurship entails. Is it merely entrepreneurs working together (i.e., a partnership), or is it entrepreneurs working in nearby clusters, each on individual projects?

To further understand the ambiguous definition of the term, consider the work of Manouchehrabadi, Letizia, and Hendrikse (2021, p.

371) who define collective entrepreneurship as “an association of entrepreneurs.” They go on to further specify that this association has shared ownership, shared control and thus is subject to collective decision making. Clearly this fits the definition of a cooperative. However, the authors interpret this more broadly. They claim that partnerships qualify as collective entrepreneurship and consider agricultural cooperatives a subset of collective entrepreneurship. This definition is quite clearly collective, but it does not explain how the term “entrepreneurship” fits into this definition, unless it is assumed to focus solely on collective action among collectively owned businesses. Interestingly enough, in their paper they discuss one of the classic problems of agricultural cooperatives – heterogeneity. They make the case that heterogeneity is a problem common to many different governance structures. Then they go on to demonstrate that heterogeneity is costly, assigning optimal control rights will be dependent upon the business environment, and control rights will determine which members of the collective bear the cost of the group’s heterogeneity. These results all extend to agricultural cooperatives.

When using this broad definition cooperative researchers can extend their reach beyond cooperatives to any situation that involves group decision making. Heterogeneity, for example, is at the heart of the horizon problem. One could imagine examples of this problem arising in families, clubs, non-profit organizations, or even academic departments. These examples are clearly “collective,” but do they qualify as “entrepreneurship” Does entrepreneurship require risk taking and a profit motive? This is the core concern with Manouchehrbadi, Letzia, and Hendrikses’ (2021) definition of collective entrepreneurship. It assumes entrepreneurship without ever explaining how collective entrepreneurship

differs from collective decision making or how partnerships, stock and stock corporations differ from cooperatives.

Yan and Yan (2017) cite yet another definition of the term. “The theory of collective entrepreneurship believes that a small business can develop collective entrepreneurial capability by drawing on the talents and creativity of all its employees in a synergistic way and use the capability to generate continuous and incremental innovation” (p. 2),” or more succinctly, “collective capability” (p. 4). This definition is based upon the work of Reich (1987), who equates collective entrepreneurship with teamwork and attempts to debunk the myth of the heroic individual entrepreneur using a series of anecdotes. The problem with this definition is the exclusion of risk and group decision making from the definition. Nobody doubts that a well- functioning team of bright workers is needed for success in any endeavor. These workers may be doing the creative work of the entrepreneur, but they have not placed any capital at risk, and they have no role in governance. Hence, teamwork should not be equated with collective entrepreneurship. It is interesting to note that this definition only equates successful teams with collective entrepreneurship and the authors do not address the pitfalls of collective governance brought on by heterogeneity.

In the cooperative literature the term has been defined by Cook and Plunket (2006) as rent-seeking behavior, typically associated with Investor Oriented Firms, that is undertaken by a cooperative; in other words, entrepreneurial risk-taking, carried out by a collective organization – a cooperative. The standard, traditional, model of a cooperative is primarily associated with collective action to correct market failures and diffuse risk. Cook and Plunket (2006) called this the defensive model and

contrasted this with the way that NGCs seek out risk; deemed the offensive model.

Cook, Burrell, and Iliopoulos (2008) extend the connection between the new generation cooperative and collective entrepreneurship by further delineating the difference between the risk-dissipating, defensive, traditional cooperative and the risk-seeking, rent-seeking offensive cooperative. They list distinct characteristics of the collective entrepreneurial style cooperative:

- Transferable delivery rights and obligations
- Appreciable equity
- Defined membership
- Stock shares
- Large up-front capital investment

Compare this to the list of characteristics of NGCs provided by Holland and Brunch (2004):

- Focus on profit
- Limited membership
- Member delivery obligations
- Substantial upfront investment
- Transferable Equity Shares

The difference between the two is largely semantics. Cook, Burrell and Iliopoulos (2008) did not list the profit motive as a characteristic, but this is presupposed by the term entrepreneurship which implies risk taking

and rent seeking in order to earn a profit. Membership in both definitions is limited and tied to member obligations. The producer enters a contractual arrangement and must bear the risk of failing to meet the obligation while the cooperative bears the risk of processing a consumer product. Because these cooperatives are typically processing rather than brokering or storing, they require substantial capital from the farmer-members. These farmers are typically able to pull their investment out of the cooperative because the shares can be sold. In the agriculture cooperative literature there is no tangible or meaningful distinction between the terms “collective entrepreneurship” and “new generation cooperative.” As such one of the terms should be abandoned and the two lines of research should be folded into one.

Implications and Directions for Future Research

With the topics identified as priorities for further research, this study recognizes that a further investigation of research priorities is warranted. Additionally, while existing data sources (e.g., ARMS data and cooperative level financial data available from the USDA) may be helpful in addressing relevant research questions, extensive and recurring survey data collection will be necessary to complement those sources. Specific topics for future research are discussed below.

Cooperative governance and performance

Two data challenges exist for this area of research: specifically, how to measure performance and how to address potential endogeneity among governance and performance and potentially other variables (i.e., does past performance affect governance choices?). While researchers often rely on readily available financial statistics to measure cooperative performance, cooperatives’ dual functions of profitability and member

benefits implies that such measures may not fully reflect overall performance. By applying factor analysis to survey and financial data, Franken and Cook (2015) suggest that interrelationships (i.e., covariation) among various financial ratios appear to be indicative of overall performance, as measured by survey responses of chairs of the board of directors. This approach can be extended to proxy overall performance using existing financial data (Franken and Cook 2019). A related question is whether financial measures are generally better (or sufficient) proxies of overall performance for certain types of cooperatives (i.e., supply, marketing, multipurpose, NGC). The aforementioned endogeneity issues can be addressed with panel data (from multiple years of surveys, for instance) and generalized method of moments procedures or perhaps structural equation modeling and directed acyclic graphs (Franken, Pennings, and Garcia 2012).

Life cycle and survival

Numerous hypotheses can be drawn from Cook's (2018) cooperative lifecycle model, including implications of membership heterogeneity increasing over time and resulting potential investment constraints (i.e., horizon and portfolio problems from variation in members' ages and risk preferences, respectively) for performance, and ultimately, survival. Note that this point acknowledges that there exists some overlap between this and the previous subsection, as survival of course depends on performance.

Hohler and Kuhl (2018) summarize the literature on membership heterogeneity, its various dimensions, and variable measurement, and identify four unanswered research questions: (1) How do the different kinds of heterogeneity influence the decision-making process in

cooperatives? (2) How do different kinds of heterogeneity influence the overall performance of a cooperative? (3) If the differences between the members grow, what will be their common interest in the future? (4) How does heterogeneity develop along a cooperative's life cycle?

Table 3, which was compiled using USDA ARMS data from 2018, shows how stark the heterogeneity problem is. 10% of all farms reported owning equity in a cooperative, and 14% of all farms reported receiving a patronage refund. However, the reported economic participation varied by farm size. 33% of large-scale farms owned equity in a cooperative, compared to only 6% for small farms. A similar trend can be seen in patronage refunds.

While Cook's (2018) lifecycle implies that membership heterogeneity may grow over time with cooperative size, both size and age may reflect other effects on performance or survival (e.g., economies of scale and liability of newness as many new firms fail early on). Cooperative type (i.e., supply, marketing, multipurpose, or even single vs multicommodity) may be an overly simplistic proxy for heterogeneity. For instance, the positive effects of diversification across commodities may make it difficult to disentangle any negative effects of the related heterogeneity. To effectively gain insights into the characteristics of cooperative memberships seems to require surveying the cooperative membership. Franken and Cook (2020) survey the memberships of just three cooperatives to evaluate how heterogeneous member preferences manifest in horizon and portfolio problems, and while some significant effects are apparent, the models explain little of the variation in investment preferences, implying more work is warranted. While data on cooperative survival may be obtained through other means, existing work utilizes

variables such as cooperative age and size, and commodity diversification that may or may not reflect aspects of membership heterogeneity (Grashuis and Franken 2020). Hence, further assessing the linkages between survival and issues related to membership heterogeneity (e.g., horizon and portfolio problems) would likely entail extensive survey work, as well.

Risk-oriented topics

The final research priority area to discuss entails risk-oriented topics. Scholars have long argued that cooperatives traditionally arise for defensive purposes to thwart risks of opportunism by trade partners in (regional) oligopoly/monopoly (oligopsony/monopsony) settings and to perform a number of risk-mitigating functions, including assurance of access to markets and pooling of growers' revenues and expenses across products, space, and time, among others. Still, little effort has been exerted to codify the various aspects of risk-related motives in a conceptual model of cooperative use, and no study has empirically investigated whether risk-averse producers are more likely to utilize traditional cooperatives. A better understanding of risk-related motives for cooperative use and whether the type of risks and its effects vary across commodities or sectors seems warranted.

More recent strains of cooperative research, identifying the more offensive risk-taking strategies of NGCs as examples of collective entrepreneurship, suggest that cooperatives again play a risk-spreading role by allowing producers to collectively bear risks that they would not otherwise be able to individually. Empirical work along these lines is sparse. Chambers (2007) finds that transaction costs (i.e., physical asset specificity) and agency and collective decision-making costs (i.e., ability

to have a “fair say” and to exit) are important factors, and that producers who perceive greater risk are more likely to invest in a NGC and invest a greater share of their farm assets as means to spread risk across the group. Other studies find that risk aversion deters investment in NGCs (Puaha and Tilley 2003; Turko 2008). Differences between traditional and newer forms of collective action are important to understand, and to the extent that the lens of entrepreneurship can provide useful additional perspective, such work may merit further scholarly exploration.

NGCs are believed to have evolved in response to five vaguely defined property rights issues of free rider, horizon, portfolio, influence costs, and control problems (Cook 2018). Three of these (free-riding and influence cost and control problems) reflect risks of opportunism and principal-agent issues that are part of the third research area on risk-related topics identified in the earlier factor analysis, while the other two (horizon and portfolio problems) are encompassed in the investment constraints included in the second research area discussed in the prior subsection.

Little empirical work exists on NGCs’ ability to overcome the five vaguely defined property rights, and hence out-perform or survive traditional cooperatives. In Franken and Cook’s (2020) survey of members of three cooperatives, the one NGC doesn’t suffer from the classic horizon problem but may be plagued by a novel *return of capital* or *wait-to-receive* horizon problem where members near retirement are significantly more likely to support investments in processing technology that likely appreciate the value of their tradable shares. In a comparison of financial performance of 14 Dutch cooperatives, Kalogeras, et al. (2013) are unable to ascertain that cooperatives with innovative ownership structures perform better than those with more traditional structures. Similar

approaches as these last two studies, but with larger samples containing more variation in cooperative types, may prove fruitful. Grashuis and Cook's (2018) study of the survival of 88 of the original NGCs formed in the U.S. in the 1990s finds 65 exited with many by means of bankruptcy or liquidation due to challenges common to most business organizations and that they did not exit much faster or slower than other business organizations formed during the period. Clearly, further research is needed on NGCs.

Conclusion

This study identifies priority cooperative research topics and evaluates the current level of progress on those topics, and thereby informs an agenda for further cooperative research. Specifically, cooperative governance and performance, lifecycle and survival, and risk-oriented research are topic areas identified in order of importance ratings. Future work on these topics will help to address the needs and challenges of agricultural cooperatives and promote sustainability of this business form.

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Table 1. Importance and current progress on cooperative research topics.

Research topic	Academic respondents		Industry respondents	
	Importance	Progress	Importance	Progress
Measuring performance	4.3	3.2	4.48	3.57
Survival	4.2	3.2	4.46	3.3
Life Cycle	3.8	3.1	3.89	3.26
Mergers	3.9	3.5	3.52	3.35
Governance	4.3	3	4.4	3.22
Investment	3.5	3.67	3.85	3.39
Heterogeneity	3.2	2.78	3.74	2.78
Free Riders	3.7	2.87	3.7	2.87
Principal-Agent	3.7	3.22	3.81	3.26
Risk Management	3.8	2.89	4.22	3.55
Collective entrepreneurship	3.7	2.67	4.19	3.35

Table 2. Factor analysis of research importance ratings

	Factor		
	1	2	3
	Cooperative governance and performance	Life cycle and survival	Risk-oriented topics
Cooperative Performance	0.808	0.038	0.172
Survival	0.197	0.597	-0.153
Life Cycle	-0.021	0.863	0.077
Merger & Acquisitions	0.266	0.088	-0.723
Governance	0.798	0.118	-0.006
Investment Constraints	0.278	0.73	-0.042
Heterogeneity	-0.313	0.712	0.298
Free Riding	0.156	0.62	0.564
Principal-Agent Issues	0.481	0.064	0.693
Risk Management	0.262	0.194	0.608
Collective Entrepreneurship	0.046	0.666	0.4