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How to cite this article:

Gray, T. (2016). A meta-analysis of member satisfaction studies of US dairy co-operatives. *Journal of Co-operative Studies*, 49(1), 5-19.

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Over the last two decades The US Department of Agriculture (USDA) Cooperative Programs has provided technical assistance to several major dairy co-operatives in the US. Surveys were conducted on a series of internal management questions, operational issues, member satisfaction ratings, and more general member opinions. A central thesis of these studies centered on the assumption that the “key to operating a successful co-operative is for it to perform functions and provide services needed and desired by the member-owners to their satisfaction” (Liebrand and Ling, 2014: 1). The studies were conducted during the period 1993-2012. This paper provides a meta-analysis of four of these studies providing a critique of the assumed neoclassical approach of the research by bringing forth a sociological local/global tension view of the data.

Introduction

Historically, US agricultural co-operatives have been structured for ‘member use’ (Gray 2001) whereby the co-operative is ‘a user-owned, and controlled business form in which benefits are derived and distributed on the basis of use’ (Dunn, 1988: 85); this ‘use’ aspect of co-operatives is perhaps best captured in the US, by Schaars (1980) and, later, Dunn (1988) in three co-operative principles:

1. The User-Owner Principle: Those who own and finance the co-operative are those who use the co-operative.
2. The User-Control Principle: Those who democratically control the co-operative are those who use the co-operative.
3. The User-Benefits Principle: The co-operative’s sole purpose is to provide and distribute benefits to its users on the basis of their use.

There are other versions of these principles, notably those proffered by the International Co-operative Alliance (see Reynolds, 2014); however, the above three best capture the polemic between co-operatively organised businesses and investment-oriented firms (IOFs). Co-operatives are organised for use by member-users, while IOFs are organised to make a return on investment (ROI) for investors (Gray et al, 2001).

Various tensions are built into co-operatives that are structured in a manner congruent with these principles. Embedded are values of equality, equity, participation and self-governance, but also efficiency, performance, and economic return. They are at once democratic associations of members as well as businesses (Craig 1993; Lasley 1981; Gray et al, 2001).

Most of the literature on agricultural co-operatives exists within two academic disciplines: agricultural economics and rural sociology. Of these two agricultural economics predominates by sheer volume of work. The agricultural economic lens tends to focus on a neoclassical perspective, with much of the writing conflating ultimately to questions of efficiency and survival in the market place, with important sub-topics on finance, market concentration, market structure, life cycle of firms, value-added, and new generation co-operatives among others. Rural sociology studies tend to focus on issues of power, democracy, and social justice as viewed in terms of participation and involvement at a micro level; organisational design and governance at a mezzo organisational level; and market concentration, conversion of co-operatives, and co-operatives in alternative food systems at a macro level of analysis (Gray 2014a; 2014b).

Much of this literature is uni-dimensional in the sense that it does not present co-operative intrinsic design and history as full of opposing tensions and contradictions. Rather there is a tendency to provide strictly linear economic or sociological analyses without a more holistic detailing of various trade-offs and dilemmas embedded in the history and development of agricultural co-operatives. Mooney (2004), however, takes a decided turn in the theoretical approach to agricultural co-operatives by including socio-political-economic contradictions to the study of agricultural co-operatives, eg tensions between local/global, capitalism/democracy, traditional/new social movements, and production/consumption; a shift later followed by Gray, Stofferahn and Hipple (2014) and Gray (2014a, 2014b).

Agricultural co-operatives occupy political-economic space within the larger civil society such that with an appropriate research lens, these tensions become visible. In an applied setting, once visible, tensions may be addressed along the lines of various sociological agendas, eg civic voice, local empowerment, and social justice. This is clearly a different approach from neoclassical economics models that give primary focus to performance and efficiency, or even sociologies that model participation agendas solely to support business ends of the organisation.

Over the last two decades The US Department of Agriculture (USDA) Cooperative Programs has provided technical assistance to several major dairy co-operatives in the US. Surveys were conducted on a series of internal management questions, operational issues, member satisfaction ratings, and more general member opinions. A central thesis of these studies centred on the assumption that the

key to operating a successful co-operative is for it to perform functions and provide services needed and desired by the member-owners to their satisfaction (Liebrand and Ling, 2014: 1).

The studies were conducted during the period 1993-2012 with results provided to each dairy co-operative via basic modes of technical assistance and exposition.

This paper re-examines four of these studies in a meta-analysis. Meta-analyses are ideal where there are common, though unrevealed factors, behind conceptually similar studies (Greenland and O'Rourke 2008). While the studies at hand were conducted from within a neoclassical economics perspective, Mooney's (2004) work suggests that allowing larger socio-political-economic tensions to play into the data can reveal their articulation and visibility, which then can provide possibility for leverage and change in applied settings ie in this instance in agricultural co-operatives. In the remainder of this paper we: 1) Present a neoclassical economics approach to identifying determinants of co-operative success and member satisfaction with agricultural co-operatives, as assessed by co-operative members. 2) Provide a critique of the neoclassical approach by bringing forth a sociological local/global tension view of the data, ie a de/reconstruction. 3) Review methodological considerations. 4) Facilitate the critiques with Spearman correlation and Cluster analysis approaches.

Research Limitations of Technical Assistance Project and Approach to Meta-Analysis

The technical assistance nature of these projects comes with inherent confidentiality guarantees to member respondents and co-operatives. Requests were made by the authors for co-operative-firm identity disclosures in order to make comparisons (and publish) across individual studies. Two of the four clients denied our requests. Confidentiality concerns also limited our freedom to pair co-operative size with geographic location, other than by general State locations of all firms (see below). Given the large predominant size of these organisations, identifying geographic location of firms, would by their predominance in a region, also disclose co-operative-firm identity. We therefore combined responses across all four studies and ran correlation studies on the entire sample. We eliminated questions that were not close approximates or exact duplicates across all four studies. To check on influences from differing

sample sizes, we ran correlation studies on a sample size of 190 observations from each study. The smallest of the four studies had 190 observations. Selection of observations was made using a random number generator. We used simple Spearman correlations (given the lay character of the predominant audience) and tested and made comparisons across studies (all data, four samples of 190) for Very Strong, Strong, Moderate and Weak relationships. Results were consistent across studies.

Co-operative memberships were arrayed over eleven states, primarily on the west coast and mid-west: California, Iowa, Indiana, Illinois, Minnesota, Missouri, Montana, Oregon, Utah, Washington, and Wisconsin. Each member of all four co-operatives received an instrument in the original studies, as requested by the co-operative firm. This was thought of prime importance for member relations, in that all members were afforded an opportunity for voice. The response rates ranged from 64 to 80 per cent. The number of total members responding was 2,379. We eliminated instruments not having common questions across the four surveys resulting in a total of 1,736 respondents and final response rates ranging from 38-42 per cent of total members.

The original studies, as previously stated, assumed that:

the key to being a successful co-operative is to perform functions and provide services needed and desired by its members to their satisfaction (Liebrand and Ling 2014: 1).

Membership satisfaction with the co-operative “over-all” is understood primarily as economic services and functions. There were 41 variable in total in the analysis. Respondents were asked to indicate their level of agreement with various Likert scale items in ranges from 1-5 indicating the strength and direction of their opinions. Variables are shown in Table 1, where ‘Satisfaction with co-operative over all’ — S1 — is a function of (S2—S6, P1—P4, I1—I2, C1—C6, G1—G4, O1—O4, CP1—CP6).

<p>Co-operative Services S2: Bulk milk hauling services S3: Laboratory services S4: Providing market information S5: Milk hauling policy S6: Returns for my milk</p>	<p>Governance G1: Members have a great amount of influence on how the co-operative is run G2: Satisfied with how the co-operative is run G3: Members have too much say on how the co-operative is run</p>
<p>Pricing P1: Pricing policies P2: Paid fairly for milk P3: Paying different milk prices by region P4: Where one lives affects how fair a price one gets</p>	<p>Operations O1: Operations should only be the concern of management O2: Satisfied with management of operating costs O3: Co-operative more concerned with operations than members O4: Satisfied with co-operative management</p>
<p>Member Information: I1: Members kept well informed I2: Members receive as much information as needed</p>	<p>Selective Practices of Co-operative Principles CP1: Year-end earnings considered return on investment CP2: Patronage refunds paid in proportion of patronage CP3: Co-operative supports co-operative education CP4: Co-operative works with other co-operatives CP5: Co-operative tries to cover too big an area CP6: Every dairy farmer should have a choice on where to sell their milk</p>
<p>Member Connection to the Co-operative: C1: I feel I am part owner of the co-operative C2: Belonging to the co-operative is an important of my identity C3: Co-operative just another place to do business C4: Willing to assume a leadership role C5: No time to attend most co-operative functions C6: Discontinue membership if alternatives were available</p>	

Table 1: Member satisfaction variables

Freedman et al’s (2007) guidelines were followed for Spearman rank order correlations in determining cutting points for strength of relationship, shown in Table 2.

Strength of relationship	Positive correlation coefficient value	Negative correlation coefficient value
Perfectly related	1.0	-1.0
Very strong	0.7 to less than 1.0	-0.7 to less than -1.0
Strong	0.5 to less than 0.7	-0.5 to less than -0.7
Moderate	0.3 to less than 0.5	-0.3 to less than -0.5
Weak	0.1 to less than 0.3	-0.1 to less than -0.3
No relationship	0.0 to less than 0.1	-0.0 to less than -0.1

Table 2: Relative strength of correlation coefficient values (Freedman et al, 2007)

Findings: Relationships Between Variables and Overall Satisfaction

Following Freedman (2007), Table 2 above depicts the correlations across the samples for each item in the surveys and the strength of the associations, ie very strong, strong, moderate, and weak. When looking at specific variables, rather than satisfaction as a whole, all items, with the exception of just two variables, were found to be of consistent strength in association across surveys, regardless of the source of the data. The items of difference were

The co-operative is more concerned about operations than its members” and “satisfaction with the co-operative’s provision of market information.

The former was found to be strongly associated with over-all satisfaction (S1) in the equal sample size data and only moderately so when analysed from the entire data set. An inverse relationship was found in both samples. Similarly the latter was found to be strongly associated with over-all satisfaction (S1) in the equal sample size data and again only moderately so in the entire data set. The association was positive in both data sources. Tables 3a to 3d, show the relationships found between variables identified in Table 1 above and “satisfaction with the co-operative over-all’.

Code	Variable	Correlation with satisfaction with co-operative over-all			Strength category of correlations		
		Entire database	Equal samples	4-survey average	Entire database	Equal samples	4-survey average
O4	Co-operative management	0.744	0.7857	0.7231	VS	VS	VS
P1	Pricing policies	0.7064	0.7251	0.6904	VS	VS	S
S6	Returns for my milk	0.6537	0.6699	0.5868	S	S	S
O2	Management of operating costs	0.6519	0.6825	0.6210	S	S	S
C6	Discontinue membership if alternatives were available	(0.5966)	(0.5924)	(0.5370)	S	S	S
G4	Co-operative board of directors	0.5940	0.5947	0.5843	S	S	S
I1	Members kept well informed	0.5467	0.5730	0.4996	S	S	M
G2	Amount of influence on how co-operative is run	0.5246	0.5525	0.4944	S	S	M
G1	Members have a great amount of influence on how co-operative is run	0.5216	0.5304	0.4785	S	S	M

Strength category of the correlation coefficients: VS=Very strong, S=Strong, M=Moderate, W=Weak

Table 3-a: Satisfaction with their co-operative over-all

Code	Variable	Correlation with satisfaction with co-operative over-all			Strength category of correlations		
		Entire database	Equal samples	4-survey average	Entire database	Equal samples	4-survey average
O3	Co-operative more concerned with operations than members	(0.4971)	(0.5027)	(0.4376)	M	S	M
P2	Co-operative pays all members fairly for their milk	0.4779	0.4855	0.4232	M	M	M
I2	Members receive as much information as needed about operations/ programme	0.4770	0.4951	0.4298	M	M	M
C1	Member feels they are part owner of co-operative	0.4567	0.4708	0.4182	M	M	M
C2	Belonging to co-operative is important part of identity as a farmer	0.4527	0.4801	0.4108	M	M	M
C3	Co-operative is just another place to do business	(0.3561)	(0.3811)	(0.3263)	M	M	M
S4	Satisfaction with co-operative's provision of market information	0.4907	0.5017	0.4630	M	S	M

Table 3-b: Satisfaction with their co-operative over-all

Code	Variable	Correlation with satisfaction with co-operative over-all			Strength category of correlations		
		Entire data set	Equal sample	4-survey average	Entire data set	Equal sample	4-survey average
CP5	Co-operative tries to cover too big an area	(0.3934)	(0.4090)	(0.3467)	M	M	M
CP1	Year-end earnings considered return on investment	0.3832	0.3533	0.3103	M	M	M
CP4	Co-operative works with other co-operatives	0.3726	0.4092	0.3741	M	M	M
CP2	Patronage refunds paid in proportion of patronage	0.3559	0.3920	0.2800	M	M	M
CP3	Co-operative supports co-operative education	0.3480	0.3223	0.3226	M	M	M
		Weak correlations			Weak correlations		
S1	Satisfaction with milk hauling	0.2274	0.2296	0.2491	W	W	W
CP6	Every dairy farmer should have a choice of more than one place to sell their milk	(0.2049)	(0.2274)	(0.2099)	W	W	W
P3	Paying different milk prices by area is justified	0.1907	0.2234	0.2632	W	W	W
G3	Members have too much say on how the co-operative is run	0.1736	0.2439	0.1904	W	W	W

Table 3-c: Satisfaction with their co-operative over-all: Selected practices of co-operative principles

Code	Variable	Correlation with satisfaction with co-operative over-all			Strength category of correlations		
		Entire data set	Equal sample	4-survey average	Entire data set	Equal sample	4-survey average
P4	Where one lives within the co-operative's territory affects how fair a price one gets for their milk	(0.1218)	(0.1623)	(0.0877)	W	W	W
O1	Co-operative operations should be the concern of only co-operative management	0.1081	0.1419	0.0852	W	W	W
C4	Member is willing to assume leadership role in co-operative	0.0548	0.0263	0.0336	W	W	W
C5	Member doesn't have time to attend most co-operative functions	(0.0104)	(0.0174)	(0.0358)	W	W	W

Table 3-d: Satisfaction with their co-operative over-all: Remaining variables with only weak relationships

Findings: Spearman Rank Order Analysis

Co-operative Leadership: Table 4 presents items with the highest associations (strong and very strong) to member satisfaction with the co-operative over-all. These were identified as: satisfaction with management; pricing policies; agreement that co-operatives do a good job marketing members milk; satisfaction with the co-operative's management of operating costs; satisfaction with actions of their board of directors; and disagreement with the statement that they would drop out of the co-operative if an alternative were available.

With the exception of the inverse relationship of "dropping out of the co-operative" all of these items were associated with the co-operative leadership (either management or the board) and fundamentally important economic functions of dairy co-operatives, ie pricing, marketing member milk, managing costs of operation. Liebrand and Ling's (2014) contention was born out that "the key to operating a successful co-operative is to perform functions and provide services needed and desired by the member-owners to their satisfaction". Further members satisfied with the "co-operative over-all" were not inclined to leave, ie "drop out of the organisation".

	Correlation co-efficient
Satisfaction with co-operative's management	0.7448
Satisfaction with co-operative's pricing policies	0.7064
Level of agreement that co-operative does a good job of marketing members' milk and returns the best price for them	0.6537
Satisfaction with co-operative management of operating and marketing costs	0.6519
Satisfaction with co-operative's board of directors	0.5940
Level of agreement that member would drop out if an alternative were available	(0.5966)

Table 4: Co-operative leadership: Very strong and strong associations to "satisfaction with co-operative over-all"

Communication and Influence: Co-operatives are member driven organisations. Members who were "satisfied over-all" were also likely to state they felt "well informed about what was going on in the organisation", and were "satisfied with the amount of influence they had on

the co-operative". They also felt that "members have a great amount of influence on how the co-operative is run". Table 5 shows these aspects of communication and felt influence of members as strongly associated with "over-all satisfaction with the co-operative".

Levels of agreement that:	Correlation co-efficient
Co-operative keeps me well informed about its operations	0.5467
Satisfied with amount of influence on how co-operative is run	0.5246
Members have a great amount of influence on how the co-operative is run	0.5216

Table 5: Communication and influence factors strongly related to "satisfaction with co-operative over-all"

Member Connection: Recalling co-operatives are membership organisations such that member-users are the member-owners of the organisation, there were a series of measures used to assess member connection. At a moderate degree of association, members who were "satisfied over-all" with the co-operative felt that their "membership was important part of their identity as a farmer" and that they were "part owners of the organisation". With this identification and feelings of part-ownership, they did not agree that the "co-operative was just another place to do business", nor that the "co-operative was more concerned about operations than its members". Table 6 details the correlations.

Levels of agreement that:	Correlation co-efficient
Co-operative is more concerned about operations than its members	(0.4957)
Belonging to the co-operative is an important part of the member's identity as a farmer	0.4527
Member feels he or she is part owner of the co-operative	0.4567
The co-operative is just another place to do business	(0.3561)

Table 6: Member connection and moderate correlations related to "satisfaction with co-operative over-all"

Co-operative's Economic Services: There was a series of other "economically related services" provided to dairy farmers that were moderately (rather than strongly) associated with "satisfaction over-all" (Table 7). These services involved satisfaction with co-operative's milk hauling policies; field representatives' engagement with members; laboratory services; and co-operative's provision of market information. At the concrete level of everyday servicing, members in total were less willing to endorse "satisfaction over-all".

Satisfaction with:	Correlation co-efficient
Co-operative's provision of market information	0.4907
Co-operative's milk hauling policy	0.4300
Field representation (farm visits, interference between producers and co-operative)	0.3940
Laboratory services (component quality tests and reports)	0.3375

Table 7: Member services and moderate correlations related to "satisfaction with co-operative over-all"

Application of Co-operative Principles and Practices: As a larger movement, co-operatives have a series of guides and suggestions on how to continue to function as a co-operative through time. These are articulated by the International Co-operative Alliance (ICA) as principles (Reynolds, 2014) though Dunn (1988) has understood them as practices that come from principles. Six were drawn upon for these analyses and included: 1) "The co-operative supports co-operative education for members and the public", 2) "The co-operative works with other co-operatives", 3) "The co-operative pays patronage refunds in proportion to use of the co-operative", 4) "The co-operative pays all members fairly for their milk", 5) "The co-operative's

year-end earnings can be considered a return on member investment”, 6) “The co-operative keeps members informed about operations and programmes”. All are moderately associated with “satisfied with the co-operative over-all”.

While they are not as strongly related to “satisfaction”, members who are “satisfied with the co-operative over-all” do have some moderate affinity for co-operative principles/practices (Table 8).

Agreement that:	Correlation co-efficient
Co-operative pays all members fairly for their milk	0.4779
Co-operative members receive as much information as they need about operations and programmes	0.4770
Co-operative tries to cover too big an area as an organisation	(0.3934)
Co-operative’s year-end earnings are considered a return on a member’s investment	0.3832
Co-operative works appropriately with other agricultural co-operatives	0.3726
Co-operative pays patronage refunds in proportion to patronage	0.3559
Co-operative supports co-operative education for members and public	0.3480

Table 8: Co-operative principles and practices and moderate correlations related to “satisfaction with co-operative over-all”

Findings: Cluster Analysis

Cluster analysis is a pattern-discovery procedure suited for building up typologies based on finding similarities among respondents (Cooksey, 2014; Acook, 2014). A non-hierarchical choice was used to find first, pairs and then clusters of respondents with similar item responses. Cluster analysis may be approached in different ways. In this study a correlation matrix was examined to identify highly correlated pairs (see Table 9 in Appendix A). Additional variables highly correlated with a particular set of variables were then sought (Cooksey, 2014; Kendall, 1975). A cutting requirement is imposed on the matrix to screen for variables (in this case 0.500 or greater).

Corporate Management Cluster: Two variables — 1) “satisfaction with management of operating/marketing costs” and 2) “satisfaction with management” — are the most strongly correlated pair of variables in the matrix (0.7316). These two items form the nucleus of a “corporate management” cluster. Two other variables 3) “pricing policies” and 4) “satisfaction with the co-operative board of directors” were strongly correlated with this pair and with each other. These four variables are also most highly correlated with “satisfaction with the co-operative over-all” (Table 10). These relationships suggest members are most satisfied with the co-operative leadership (management and the board) when costs of operations and marketing are well managed and kept low, and pricing policies satisfy farmers, ie relatively low costs and high prices. These items are “on farm”, economic pocketbook considerations for farmers.

	Satisfaction with co-operative’s		
	Management	Pricing policies	Management of operating and marketing costs
Satisfaction with	Correlation co-efficient		
Co-operative’s pricing policies	0.6516		
Co-operative’s management of operating and marketing costs	0.7316	0.5956	
Co-operative’s board of directors	0.7129	0.5128	0.5488

Table 10: Corporate management cluster

Once identified the above four variables (ie corporate management cluster) are eliminated from consideration in the correlation matrix. Four variables form a second cluster in a “co-operative governance” area (Table 11). Member satisfaction with 1) “the amount of influence on how the co-operative is run”, is most strongly correlated with agreement that 2) “members have a great amount of influence on how it is run” form a core of a second cluster.

	Agreement that		
	Co-operative keeps me well informed about its operations	Members receive as much information as they need about operations and programmes	Members have a great amount of influence on how the co-operative is run
Satisfaction with	Correlation co-efficient		
Co-operative’s pricing policies	0.6203		
Co-operative’s management of operating and marketing costs	0.5578	0.6397	
Co-operative’s board of directors	0.5354	0.6596	0.6672

Table 11: Corporate governance cluster

Additionally, agreement that 3) “members receive as much information as they need about operations and programmes” is strongly correlated with each of the first two items and adds to the cluster. Similarly agreement that 4) the “co-operative keeps me well informed about its operations”, is strongly correlated with the other three variables. This second cluster suggests that communication with members and perception of member influence are positively related to each other. Three of the variables in this cluster are strongly correlated with “member over-all satisfaction with the co-operative”, while the remaining item “co-operative members receive as much information as they need about operations and programmes”, is moderately correlated with overall satisfaction.

A third pairing (rather than a cluster) of items related to “satisfaction to the co-operative overall” involved just two items, 1) “the co-operative does a good job marketing members’ milk”, and 2) members disagreed that they “would drop out if an alternative were available”.

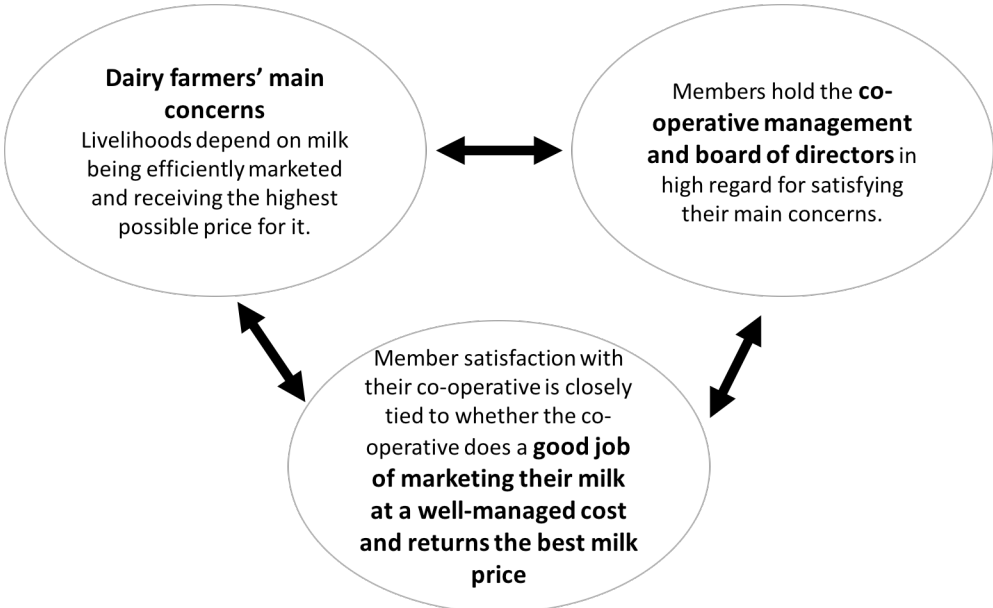


Figure 1 Member satisfaction with their co-operatives: an economics view

From these correlations and clustering analyses agricultural economists Liebrand and Ling (2014) conclude that in future technical assistance projects involving dairy co-operatives, a first priority should be given to the corporate management cluster; ie a competent board of directors and capable management team focused on marketing member milk, while minimising operating

costs and setting satisfactory milk pricing policies. A second focus should be given to the governance cluster: emphases should be given to developing and using a sound communication mechanism in order to keep members well informed of its operations and to receive feedback from members regarding their wishes and concerns. The relationship between these wishes and concerns as understood from this economics perspective, is shown in Figure 1.

To summarise, 1) dairy farmers' main concern is their livelihood. Their livelihood depends on their milk being efficiently marketed and receiving the highest possible price for it. 2) Members' satisfaction with their co-operative is closely tied to whether the co-operative does a good job of marketing their milk, is able to manage costs, and works to return the best milk price to farmers. 3) Dairy farmer-members are satisfied with their co-operative overall, and their co-operative management and board of directors are held in high regard if they are able to satisfy these main concerns.

A Local/Global and Tension Critique

As outlined in the introduction, most of the literature on agricultural co-operatives exists within two academic disciplines: agricultural economics and rural sociology. Of these two, agricultural economics predominates by sheer volume of work. The agricultural economic lens tends to resolve within a neoclassical perspective, with much of the writing conflating ultimately to questions of efficiency, and (in some combination) minimising costs and maximising returns. Rural sociology, in the analyses of agricultural co-operatives, has tended to conflate to participation studies and organisational design around governance and democracy issues (Gray 2014a; 2014b). These studies can often complement economic approaches by seeking to understand how greater involvement by members can help create a more effective, and member responsive business. We can see in the above analysis a place for such views, in the prominent position of the second cluster, ie governance, and as interpreted here, a role for understanding and improving communications mechanisms, member involvement and participation. While improving the democratic voice aspect of co-operatives is certainly laudatory from a sociological perspective, what has been missing, until Mooney's (2004) work, has been a contextualisation of larger socio-political-economic contradictions to the study of agricultural co-operatives. To provide a brief overview of this analysis, the "local/global" tension is introduced.

An understanding of the political economy of agricultural co-operatives is incomplete without an appreciation of the predominant organisational business form that opposes them, ie the investment oriented firm (IOF). IOFs are organised to make a return on investment (roi) rather than "use" as is the case in co-operatives. Flexibility in location (sourcing and selling), fluidity and diversity of product offerings, organisational complexity (horizontal and vertical integration) and ultimately the fluidity of their capital are of prime importance to IOFs in competition with other IOFs as well as co-operatives. Agricultural co-operatives have a natural embeddedness in farmer-member-locations, product specialisation (their farm-member products) and "member" primary "use" of the organisation, rather than a secondary affiliation to the organisation as an instrument for "roi" by "stockholders". Over the last several decades IOFs have taken a decided turn to globalisation, horizontal and vertical integration, and complex bureaucratisation. IOFs are agricultural co-operative competitors, and as such, they place homogenising pressures on co-operatives through market competition (Gray, Hendrickson, Heffernan 2001). Some agricultural co-operatives have sought to survive under these pressures by globalising, integrating, and diversifying within their own orbits. However, these strategies create tensions in the co-operative field between local embeddedness and geographic expansion/globalisation.

Applying a Spearman rank order analysis to the item "the co-operative tries to cover too big an area as an organisation", can speak to a local/global tension when utilised as a dependent variable (Table 12).

Variable	Correlation co-efficient
Level of satisfaction with the co-operative overall	(0.3934)
Pricing policies	(0.3460)
Co-operative pays members fairly for their milk	(0.3525)
Co-operative does a good job of marketing my milk	(0.3384)
Co-operative keeps members well informed about its operations and programmes	(0.3055)
I feel I am part owner of the co-operative	(0.3148)
I would discontinue my membership with the co-operative if an alternative was available	0.4180
Members have a great amount of influence on how the co-operative is run	(0.3388)
Satisfied with the level of influence I have on how the co-operative is run	(0.3301)
Level of satisfaction with the co-op board of directors	(0.3315)
Level of satisfaction with management of operating and marketing costs	(0.3751)
Co-operative is more concerned with operations than about its members	0.3888
Level of satisfaction with co-operative management	(0.3842)

Table 12: Local/global tension: The co-operative tries to cover too big an area as an organisation

From Table 12, within moderate level of correlation, these results show a near opposite result from the neoclassical economics view. Members who agreed that the 1) “co-operative tries to cover too big an area” had 2) lower levels of “satisfaction with the co-operative over-all”, 3) were more likely to agree that “the co-operative was more concerned with operations than about its members”, 4) and that “members do not receive as much information as they need about operations and programmes”. Members tend not to agree that 5) “the co-operative does a good job marketing their milk”, and that 6) “the co-operative pays members fairly for their milk”. They have only 7) “low levels of satisfaction with management and the board of directors”, and 8) do not agree that members have a great amount of influence on how the co-operative is run”. Perhaps most telling of their dissatisfaction, 9) they do not feel “they are part owners of the co-operative”, and 10) “would discontinue their membership if an alternative were available”.

Conclusion

Liebrand and Ling’s (2014) analysis of the original technical assistance projects are congruent with expectations, ie that “economics matters”, particularly when survival concerns are an issue. The results found in the analyses, are in turn a product of the neoclassical orientation itself, ie a way of knowing that is based in individualism and equilibrium theory. The results in a certain sense are a product of and reproduce the focus: *Dairy farmers wish to survive economically; Strategies that are focused on reducing costs and increasing prices are valued; and Members are satisfied with co-operatives overall that are perceived able to do this*. While extremely important, the neoclassical approach in these technical assistance projects missed considerable dissatisfaction among the membership.

A sociological tension approach, in this case the local/global tension, is able to bring in larger, though perhaps more muted, socio-political-economic tensions and contradictions. While some expansion is likely necessary in a co-operative, a growth trajectory that ignores local/global tensions and such concerns as “the co-operative tries to cover too big an area as an organisation”, may in fact lose its own effectiveness in the long run (Fairbairn, 1999). Over the last several decades many agricultural co-operatives both in the US and Canada have pursued a competitive survival strategy of expanding, merging, rationalising and becoming geographically extant and large bureaucratic organisations in their own right. These actions distance the farmer from the co-operative bureaucratically as well as by actual physical distance. The once member and geographically embedded organisation, now a distant and

global organisation, can in turn produce such experiences as “the co-operative is more concerned with operations than about its members”, “I feel I’m no longer a part owner of the co-operative” and “I would discontinue my membership with the co-operative if an alternative was available”.

A more careful consideration of the trade-offs and dilemmas inherent in a tension focus, in this case a local/global tension, might in the longer run, preserve a sense of ownership rather than loss of ownership, a sense of identity with the organisation rather than a loss of identity, a sense of democratic voice rather than a passive fit within a bureaucracy, and ultimately a making visible paths for re-democratisation, rather than loss of democracy.

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Appendix

Table 9: Correlation matrix, equal number of observations from each survey

NOTE: A sample of 190 observations each was drawn from surveys #1, #2 and #3 to match the number of observations from survey #4.

Code	S	P1	P2	P3	P4	S1	S2	S3	S4	S5	S6	I1	I2
Correlation Coefficient													
P1	0.7251	1.0000											
P2	0.4855	0.5648	1.0000										
P3	0.2234	0.2683	0.2610	1.0000									
P4	(0.1623)	(0.1829)	(0.2517)	0.0158	1.0000								
S1	0.2296	0.2176	0.2047	0.1674	(0.0575)	1.0000							
S2	0.3620	0.3268	0.2860	0.1649	(0.1031)	0.2548	1.0000						
S3	0.3767	0.3877	0.2583	0.2168	(0.1311)	0.3525	0.3908	1.0000					
S4	0.5017	0.4575	0.3325	0.1557	(0.1337)	0.2376	0.3423	0.4022	1.0000				
S5	0.4409	0.4953	0.3618	0.2583	(0.2271)	0.4362	0.2640	0.4052	0.3121	1.0000			
S6	0.6699	0.6418	0.5793	0.3078	(0.1669)	0.2250	0.3028	0.3294	0.4175	0.3793	1.0000		
I1	0.5730	0.5112	0.4263	0.1240	(0.1818)	0.1921	0.2934	0.2430	0.4847	0.3670	0.4990	1.0000	
I2	0.4951	0.4713	0.3990	0.1553	(0.1366)	0.1990	0.2553	0.1901	0.4498	0.3766	0.4864	0.6292	1.0000
C1	0.4708	0.4343	0.4162	0.2665	(0.1024)	0.1638	0.2516	0.2354	0.3143	0.3196	0.5136	0.4338	0.4494
C2	0.4801	0.4138	0.4249	0.2401	(0.0598)	0.1619	0.2284	0.2243	0.3297	0.2791	0.5215	0.4088	0.4225
C3	(0.3811)	(0.3520)	(0.3250)	(0.1652)	0.0938	(0.0930)	(0.1981)	(0.1747)	(0.2578)	(0.2068)	(0.3825)	(0.3101)	(0.2952)
C4	0.0263	0.0160	0.0776	0.0812	(0.0264)	0.0064	(0.0338)	0.0088	(0.0120)	(0.0323)	(0.0326)	(0.0363)	(0.0743)
C5	(0.0174)	(0.0124)	(0.0478)	(0.1744)	(0.0799)	0.0439	(0.1052)	(0.0648)	(0.0376)	0.0345	(0.0763)	0.0638	0.0484
C6	(0.5924)	(0.5453)	(0.4909)	(0.2071)	0.1639	(0.1603)	(0.2710)	(0.2630)	(0.3802)	(0.3832)	(0.5504)	(0.4789)	(0.3865)
G1	0.5304	0.4932	0.4515	0.1767	(0.2020)	0.1716	0.2401	0.2543	0.4058	0.3586	0.5208	0.5458	0.6035
G2	0.5525	0.4855	0.4386	0.2507	(0.1902)	0.1426	0.2929	0.2565	0.4219	0.3796	0.5343	0.5290	0.6440
G3	0.2439	0.1851	0.1756	0.0774	(0.0307)	0.0793	0.1086	0.0308	0.0915	0.1697	0.2485	0.1552	0.2077
G4	0.5947	0.4883	0.3701	0.2386	(0.1109)	0.1737	0.3134	0.3091	0.4096	0.3403	0.4713	0.4301	0.4165
O1	0.1419	0.1172	0.1033	0.0548	0.0094	0.0376	0.0605	0.0622	0.1000	0.1366	0.1897	0.0883	0.1380
O2	0.6825	0.6317	0.5010	0.2474	(0.1683)	0.2416	0.3333	0.3570	0.4976	0.4106	0.6440	0.5286	0.4918
O3	(0.5027)	(0.4969)	(0.4884)	(0.2567)	0.2316	(0.1785)	(0.3095)	(0.2372)	(0.3468)	(0.3506)	(0.4989)	(0.4743)	(0.4805)
O4	0.7857	0.6903	0.5221	0.2706	(0.1869)	0.2270	0.3438	0.3807	0.5040	0.4434	0.6432	0.5766	0.5145
CP1	0.3533	0.3627	0.3939	0.1782	(0.0635)	0.1235	0.1165	0.2088	0.2625	0.2391	0.3768	0.3387	0.3513
CP2	0.3920	0.3872	0.3886	0.1999	(0.1163)	0.1645	0.1521	0.2110	0.2693	0.2680	0.3796	0.3485	0.2986
CP3	0.3223	0.3414	0.3425	0.2349	(0.1288)	0.1655	0.1557	0.1950	0.3168	0.2659	0.3408	0.3321	0.3242
CP4	0.4092	0.3821	0.3830	0.2768	(0.0852)	0.1092	0.1866	0.2208	0.3142	0.2455	0.4366	0.3595	0.3219
CP5	(0.4090)	(0.3379)	(0.3473)	(0.1933)	0.1889	(0.1670)	(0.1563)	(0.2070)	(0.2740)	(0.2253)	(0.3570)	(0.3292)	(0.2804)
CP6	(0.2274)	(0.2759)	(0.2417)	(0.0958)	0.1568	(0.0881)	(0.1019)	(0.1549)	(0.1282)	(0.2056)	(0.3226)	(0.2381)	(0.1960)

Code	C1	C2	C3	C4	C5	C6	G1	G2	G3	G4	O1	O2	O3	O4
	Correlation Coefficient													
P1														
P2														
P3														
P4														
S1														
S2														
S3														
S4														
S5														
S6														
I1														
I2														
C1	1.0000													
C2	0.6412	1.0000												
C3	(0.4441)	(0.5535)	1.0000											
C4	0.1276	0.1354	(0.1565)	1.0000										
C5	(0.1248)	(0.1330)	0.1565	(0.3243)	1.0000									
C6	(0.4405)	(0.5050)	0.4571	(0.0895)	0.0777	1.0000								
G1	0.5349	0.5235	(0.3620)	0.0831	(0.0756)	(0.4639)	1.0000							
G2	0.5127	0.5004	(0.3730)	0.0806	(0.0855)	(0.4772)	0.6830	1.0000						
G3	0.1668	0.1750	0.0125	(0.1079)	0.0820	(0.1321)	0.2113	0.1924	1.0000					
G4	0.4146	0.4131	(0.3428)	0.0807	(0.1197)	(0.4317)	0.4384	0.4833	0.1712	1.0000				
O1	0.0994	0.1363	0.0618	(0.1406)	0.0635	0.1014	0.1132	0.1352	0.3825	0.1227	1.0000			
O2	0.4215	0.4719	(0.3285)	(0.0041)	0.0056	(0.5370)	0.5220	0.5108	0.1983	0.5625	0.1465	1.0000		
O3	(0.4682)	(0.4468)	0.4026	(0.0514)	0.0907	0.5320	(0.5643)	(0.5164)	(0.1392)	(0.4213)	(0.0357)	(0.5314)	1.0000	
O4	0.5008	0.4995	(0.3909)	0.0144	(0.0577)	(0.5599)	0.5639	0.5727	0.2323	0.6987	0.1605	0.7494	(0.5568)	1.0000
CP1	0.4993	0.4450	(0.3682)	0.0766	(0.0561)	(0.3726)	0.4080	0.3769	0.1331	0.3217	0.0957	0.4015	(0.3584)	0.4036
CP2	0.4103	0.3506	(0.2603)	0.1391	(0.0825)	(0.3786)	0.3979	0.3594	0.1084	0.3104	0.0647	0.3630	(0.3365)	0.3949
CP3	0.3511	0.3284	(0.2579)	0.0886	(0.0346)	(0.2985)	0.3860	0.3447	0.0417	0.2896	0.0268	0.3210	(0.3278)	0.3213
CP4	0.3771	0.3710	(0.2467)	0.0831	(0.1135)	(0.3463)	0.4027	0.3500	0.0540	0.3425	0.0291	0.4078	(0.3884)	0.4038
CP5	(0.3143)	(0.2679)	0.2407	(0.1065)	0.0870	0.4410	(0.3143)	(0.3132)	(0.0296)	(0.3130)	(0.0276)	(0.3585)	0.3824	(0.3912)
CP6	(0.2250)	(0.2928)	0.2478	(0.0269)	0.0284	0.3197	(0.2452)	(0.2377)	0.1147	(0.2439)	(0.1213)	(0.2400)	0.2460	(0.2511)

Code	CP1	CP2	CP3	CP4	CP5	CP6	Code	Item
Correlation Coefficient								
P1							P1	Satisfaction with pricing policies
P2							P2	Co-operative pays all members fairly for their milk
P3							P3	Co-operative's practice of paying different milk prices by area is justified
P4							P4	Where one lives within the co-operative's territory affects how fair a price one gets for milk
S1							S1	Satisfaction with milk hauling (operating or arranging routes)
S2							S2	Satisfaction with field representation
S3							S3	Satisfaction with laboratory services
S4							S4	Satisfaction with co-operative's provision of market information
S5							S5	Satisfaction with co-operative's milk hauling policy
S6							S6	Co-operative does a good job of marketing member's milk and returns the best price
I1							I1	Co-operative keeps me well informed about its operations
I2							I2	Members receive as much information as they need about operations and programmes.
C1							C1	Member feels part owner of co-operative
C2							C2	Belonging to co-operative is important part of identity as a farmer
C3							C3	Co-operative is just another place to do business
C4							C4	Member willing to assume leadership role in co-operative
C5							C5	Member doesn't have time to attend most co-operative functions
C6							C6	Member would drop out if an alternative available
G1							G1	Members have great amount of influence on how co-operative is run
G2							G2	Satisfied with amount of influence member has on how co-operative is run
G3							G3	Members have too much say on how the co-operative is run
G4							G4	Satisfaction with co-operative board of directors
O1							O1	Co-operative operations should be the concern of only co-operative management
O2							O2	Satisfaction with co-operative's management of operating and marketing costs
O3							O3	Co-operative is more concerned about operations than its members
O4							O4	Satisfaction with co-operative management
CP1	1.0000						CP1	Member considers co-operative's year-end earnings a return on their investment
CP2	0.5867	1.0000					CP2	Co-operative pays patronage refunds in proportion to patronage
CP3	0.3255	0.3785	1.0000				CP3	Co-operative supports cooperative education for members and the public
CP4	0.3428	0.3696	0.4820	1.0000			CP4	Co-operative works appropriately with other agricultural coops
CP5	0.2698	0.3169	0.2209	0.2939	1.0000		CP5	Co-operative tries to cover too big an area as an organisation
CP6	(0.2175)	(0.2105)	(0.1331)	(0.1334)	0.2272	1.0000	CP6	Every dairy farmer should have a choice of more than one place to sell their milk