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## A structural equation model of cooperative member satisfaction and long-term commitment

### RESEARCH ARTICLE

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### Abstract

The organizational growth of farmer cooperatives is tied to increased heterogeneity in member attitudes and perceptions. To inform possible solutions, a better understanding of the complex interrelationships of member attitudes and perceptions is necessary. Using survey responses from 1,116 members of an organic marketing cooperative in the United States, this paper develops a structural equation model of six factors: organic lifestyle, mission support, participation, trust, satisfaction, and long-term commitment. The final model illustrates nine significant relationships, including satisfaction and long-term commitment. The result suggests the long-term survival or viability of farmer cooperatives is not only dependent on its financial performance but also the utility of its members. In terms of member attitudes and perceptions, trust and mission support may offer the best opportunities for farmer cooperatives to foster member satisfaction and thus address the negative consequences of heterogeneity.

**Keywords:** agricultural cooperative, member satisfaction, structural equation model

**JEL code:** Q13, D71, D91, L21

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## 1. Introduction

In the aggregate, American and European cooperatives in the farm production sector have been successful (Cooperatives Europe, 2016; United States Department of Agriculture (USDA), 2017). Yet many cooperatives face pressure to improve efficiency and thus pursue external growth by means of mergers and acquisitions to drive scale and scope economies (Grashuis, 2018). The ongoing trend of consolidation thus facilitates the creation of ‘super locals’ and regional cooperatives with thousands of members (Eversull, 2014), but also the exit of many others (Merlo, 2017; USDA, 2017).

While necessary to combat ongoing consolidation of power in input supply and output demand sectors (Saitone and Sexton, 2017), the increasing size and complexity of farmer cooperatives is problematic. As reviewed by Höhler and Köhl (2018), the organizational growth of farmer cooperatives drives heterogeneity in member attitudes and perceptions, particularly in terms of commitment and participation (e.g. Feng *et al.*, 2016; Hakelius and Hansson, 2016; Österberg and Nilsson, 2009). Decreasing member commitment and participation may reflect the ongoing divergence in the objectives of farmer cooperatives and its members (Nilsson *et al.*, 2012; Puusa *et al.*, 2016).

The evolving function and behavior of farmer cooperatives has spurred much academic attention to trust, commitment, participation, and other member attitudes and perceptions in relation to cooperative performance or member satisfaction. As reviewed by Grashuis and Su (2019), the recent empirical literature has produced evidence of the relationships of trust to satisfaction (Hansen *et al.*, 2002; Morrow *et al.*, 2004), trust to commitment (Barraud-Didier *et al.*, 2012), involvement and communication to commitment (Cechin *et al.*, 2013), satisfaction to long-term commitment (Arcas-Lario *et al.*, 2014; Hernandez-Espallardo *et al.*, 2012), and ideology to loyalty (Morfi *et al.*, 2015).

While illustrative of the complexity of cooperative performance and member satisfaction (e.g. Franken and Cook, 2015; Soboh *et al.*, 2009), many studies only emphasize part of the relationship and use empirical techniques which at times leave doubt regarding the true causal interrelationships of various measures or constructs. Moreover, as of yet, member satisfaction has not yet been studied in context of an organic marketing cooperative, which is important for two reasons: (1) organic agriculture is increasing in importance (Willer and Lernoud, 2016), and (2) there often exist significant differences in the attitudes of organic and conventional farm producers (e.g. Läßle, 2013; Wallenbeck *et al.*, 2016; Wayman *et al.*, 2017), which may or may not extend to attitudes and perceptions in terms of cooperative membership.

Considering the foregoing, the purpose of our paper is to inform the relationships of multiple member attitudes and perceptions to satisfaction and long-term commitment in one framework and empirical model for a collective of organic farm producers. The research question is as follows: What is the relationship of organic lifestyle, cooperative mission support, participation, and trust to satisfaction and long-term commitment? The research question is addressed by means of structural equation modeling (SEM) to analyze survey data from 1,116 members of an organic marketing cooperative in the United States. The underlying objective is to form recommendations for academics and practitioners to help improve the general performance of farmer cooperatives via member satisfaction and long-term commitment, which we define as the intention to continue membership in the foreseeable future.

Our empirical study facilitates three novel observations. First, using SEM, the study illustrates the complex interrelationships of six different member attitudes and perceptions: organic lifestyle, cooperative mission support, participation, trust, satisfaction, and long-term commitment. The prior literature had not yet considered the endogenous nature of all six factors in one study by means of simultaneous estimation. Second, in addition to the eight hypothesized relationships among member attitudes and perceptions, the iterative process of model respecification also revealed a negative relationship of trust to participation, suggesting members who trust board directors and managers feel less compelled to exert control by voting or monitoring and thus exhibit free rider behavior. Third, adherence to an organic lifestyle is found to be of importance to the support of

the cooperative mission. Cooperatives with an organic identity, as well as cooperatives with similar product or process characteristics which facilitate differentiation, thus have to beware of its foundational values and principles and its possible impact on the ability or willingness of members to be part of the collective.

Our paper proceeds as follows. The conceptual framework, which concerns the interrelationships of the member attitudes and perceptions, is developed in Section 2. Section 3 presents the data sources, the summary statistics, and empirical model specifications. The results of the structural equation model are reported in Section 4, and Section 5 contains a discussion and conclusion.

## 2. Conceptual framework

### 2.1 Trust

Trust, which is an indicator of social capital (Nilsson *et al.*, 2012), is likely strong at the formation of the cooperative as individuals must work together to become organized. Traditionally, ownership and control of the cooperative is held entirely by the members, although the law mandates the election or appointment of board directors to represent the various interests of the collective. However, as cooperatives grow to become complex and diverse business organizations, effective control is often delegated to professionals or decision specialists to secure specific knowledge of non-member business activities (Chaddad and Iliopoulos, 2013). Assuming contractual incompleteness, there may exist a divergence between the interests of members and managers (Deng and Hendrikse, 2013; Fulton and Pohler, 2015), in particular in case of information asymmetry. Organizational growth is also tied to heterogeneity in member attitudes and objectives (Hakelius and Hansson, 2016; Höhler and Kühl, 2018), which implies the existence of multiple principal-agent relationships among members, board directors, and the general manager. Trust may therefore be of high importance to help limit agency problems.

Empirically, Hansen *et al.* (2002) first studied trust in relation to other member attitudes and perceptions. With 779 survey responses, the study analyzed the causal relationship of trust among members and also between members and managers to group cohesion and member satisfaction. Using hierarchical regression, Hansen *et al.* (2002) found trust among members explained 17% of the variance in group cohesion, which in turn positively impacted satisfaction. In France, Barraud-Didier *et al.* (2012) collected survey data from 259 members of grain cereal marketing cooperatives to study trust in relation to commitment and participation. Using SEM, the study supported the hypothesized causal relationship of trust to participation via commitment. In Ethiopia, Ruben and Heras (2012) studied five coffee marketing cooperatives and observed significant differences in social capital and performance in terms of member commitment. Specifically, the cooperatives with superior performance also possessed more social capital, defined in the study as trust, reciprocity, cohesion, and external relationships. With a sample of 277 Spanish fruit and vegetable producers, Arcas-Lario *et al.* (2014) used two separate OLS regressions to illustrate the positive impact of trust on member satisfaction and subsequently the positive impact of member satisfaction on the future intention to continue membership in the cooperative. In Costa Rica, Wollni and Fischer (2014) concluded the supply decision for coffee producers is impacted by trust perceptions. Their survey respondents showed a greater propensity to supply cooperatives if their decision is based on trust as opposed to price alone.

**Hypothesis 1:** trust is related positively to affective commitment (i.e. cooperative mission support).

**Hypothesis 2:** members who have trust in the directors and the managers of the cooperative are more satisfied.

## 2.2 Participation

Member control is traditionally manifested by the one-member one-vote system. However, participation in the governance of the cooperative is voluntary, and as cooperatives grow in size members may have less motivation to exert influence on the outcome of joint decisions (Nilsson *et al.*, 2012). While non-participation is an issue common to large cooperatives, participation may not necessarily assume a binary character with only participants and non-participants (Nilsson and Hendrikse, 2011). Participation is not only exercised by voting, but also attendance at regional or annual meetings and service on boards or committees.

In the empirical literature, the decision to participate or not participate in the governance of the cooperative has been related to trust (Nilsson *et al.*, 2009; Österberg and Nilsson, 2009). Trust in board directors and managers is enhanced by monitoring or even influencing their behavior, which likely constitutes a confirmation or adjustment of the alignment of individual and joint objectives. The hypothesized impact of participation on trust has two implications: (1) active participation may facilitate an indirect effect on satisfaction via trust, and (2) there may exist a feedback loop in which causal effects go back and forth. In addition, Arcas-Lario *et al.* (2014) also found evidence of a direct effect of participation on satisfaction, which implies the exertion of control is positively related to utility and perhaps cooperative performance as well.

**Hypothesis 3:** participation in the governance of the cooperative facilitates more trust in its board directors and managers.

**Hypothesis 4:** monitoring or influencing the behavior of board directors and managers via participation has a positive impact on membership satisfaction.

## 2.3 Mission support

As owners of the cooperative, members have a dual function as its suppliers as well as its capitalists (Feng and Hendrikse, 2008). Members thus hold ownership in two businesses: the farm and the cooperative, and the objectives of the two are connected. As such, members may not only experience an economic commitment to the cooperative but also an affective commitment (Jusilla *et al.*, 2012). The affective commitment is based on an emotional attachment to the cooperative (Jimenez *et al.*, 2010; Jusilla *et al.*, 2012; Ollila *et al.*, 2014), which may be expressed as support of the cooperative mission. Generally, the cooperative mission is often defined in terms of the marketing of pooled resources. On the same note, affective commitment has also been described as commitment to collective action (Borgen, 2001; Cechin *et al.*, 2013; Morfi *et al.*, 2015).

Empirically, affective commitment or cooperative mission support has been studied in relation to trust and participation. For example, Barraud-Didier *et al.* (2012) specified a structural equation model to prove the hypothesized relationship of trust to commitment as well as the relationship of commitment to participation for French farmers. With survey data from Norwegian farm producers, Borgen (2001) also used SEM to study trust as an intermediate construct in the relationship of cooperative ideology to an investor-oriented strategy. The analysis revealed a positive relationship of affective commitment to trust. Similarly, Morfi *et al.* (2015) observed significant differences in the attitudes of members who are loyal or disloyal to the cooperative. Loyal members had a stronger commitment to the cooperative mission and had more trust in information from board directors and managers.

**Hypothesis 5:** participation in the governance of the cooperative is related positively to the individual support of the cooperative mission.

**Hypothesis 6:** strong support of the cooperative mission is associated with increased trust in board directors and managers.

## 2.4 Organic lifestyle

In terms of organic food consumption, food consumers may not relate to the binary categorization of pure organic or pure conventional food. Just as the marketplace is characterized by hybrid food products with organic and non-organic attributes, there exist consumers whose utility function is maximized by consumption of both organic and conventional food products (e.g. Stolz *et al.*, 2011). Research has indicated a consistent relationship of certain demographic characteristics to the probability and intensity of organic food consumption (Dimitri and Dettmann, 2011). The same applies to organic food producers. For example, Mzoughi (2011) found organic food producers in France to have more moral and social concerns as compared to conventional food producers. As the identity of the cooperative is associated with organic food production, the adherence to an organic lifestyle may relate positively to the individual support of its mission.

**Hypothesis 7:** adherence to an organic lifestyle relates positively to the support of the cooperative mission.

## 2.5 Member satisfaction

Cooperative performance is an ambiguous concept as there exist multiple parameters and constraints (Soboh *et al.*, 2009). While the empirical literature on cooperative performance is dominated by a financial perspective (Grashuis and Su, 2019), member satisfaction is another possible indicator (Franken and Cook, 2015). Satisfaction is the product of a positive impact of the cooperative on the utility of the member, whether it is manifested by improved price, product quality, input access, or some other variable. Satisfaction is not only indicative of perceived impact in period  $t$ , but also predictive of member behavior in period  $t_{+j}$ . For example, Hernandez-Espallardo *et al.* (2012) and Arcas-Lario *et al.* (2014) found evidence of member satisfaction having a significant and positive relationship to the intention to continue membership, which we describe as long-term commitment. Considering the importance of supply and equity contributions, long-term commitment to the cooperative is possibly an important indicator of its future viability or survival probability.

**Hypothesis 8:** membership satisfaction is positively related to the intention to continue membership in the future.

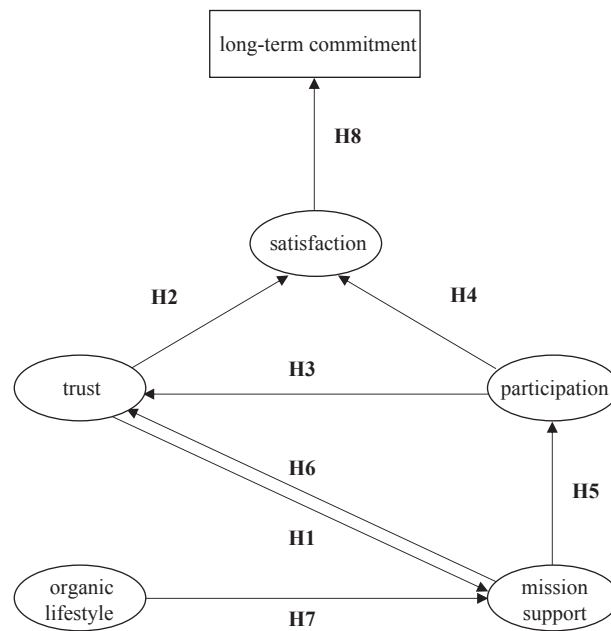
Figure 1 illustrates the conceptual model and the hypothesized relationships. Latent factors are represented by circles and observed factors by rectangles. The model contains five latent factors (trust, participation, mission support, organic lifestyle, and satisfaction) and one observed factor (long-term commitment). We explain the measurement of these member attitudes and perceptions in the next section.

## 3. Methodology

### 3.1 Data collection

In March 2017, an organic marketing cooperative in the United States surveyed its entire membership of over 2,000 farm producers to measure heterogeneity. The general increase in consumer demand for organic food and drink products has facilitated strong growth of the cooperative in its recent history. By June 2017, the cooperative had received 1,402 responses. However, because of missing information we deleted 286 responses, which reduced the final sample to 1,116 responses.

In addition to information on attitudes and perceptions, the survey also elicited information on demographic characteristics to inform the representativeness of the sample. As illustrated in Table 1, most of the survey respondents are first generation farm producers (44%), male (96%), religious (76%), and married (86%). The high degree of homogeneity in demographic characteristics is not uncommon in the empirical literature on farmer cooperatives. For example, the samples of French grain producers in Barraud-Didier *et al.* (2012) and Spanish fruit and vegetable producers in Arcas-Lario *et al.* (2014) also consisted primarily of older males with limited education.



**Figure 1.** Path diagram of the hypothesized model of member attitudes and perceptions. H1-H8: hypotheses explained in text.

**Table 1.** Demographic characteristics of survey respondents.

Variable		Mean	Std. Dev.	Min	Max
Family farm generation (%)	First	0.44	0.50	0	1
	Second	0.21	0.41	0	1
	Third	0.16	0.37	0	1
	Fourth or more	0.16	0.37	0	1
	Not family farm	0.03	0.17	0	1
Farm experience (years)		21.38	13.62	0	69
Size (acres)		294.85	372.85	4.00	6,027
Household size (n)		5.49	3.02	1	15
Religious (%)		0.76	0.42	0	1
Age	24 or younger	0.02	0.14	0	1
	25-34	0.17	0.38	0	1
	35-44	0.28	0.45	0	1
	45-54	0.23	0.42	0	1
	55-64	0.24	0.42	0	1
	65+	0.06	0.25	0	1
Married (%)		0.86	0.35	0	1
Male (%)		0.96	0.20	0	1
Education (%)	8 <sup>th</sup> grade equivalent	0.49	0.50	0	1
	Some high school	0.02	0.14	0	1
	High school diploma or equivalent	0.18	0.39	0	1
	Technical degree	0.08	0.27	0	1
	Some college	0.09	0.28	0	1
	College degree (BA/BS)	0.11	0.32	0	1
	Advanced degree	0.02	0.15	0	1
Membership length (years)		5.67	4.88	0	23.5

### 3.2 Structural equation model

As explained by Bollen (1989), SEM involves the analysis of covariances and correlations to test causal assumptions (Bollen and Pearl, 2013). SEM has been described as a combination of exploratory factor analysis and multiple regression (Ullman, 2001). The technique comprises the simultaneous estimation of the structural model, which contains the relationships between the latent variables and the observed variables, and the measurement model, which contains the relationships between the latent variables and its manifest variables. SEM has several advantages as compared to multiple regression, including the construction of hypothetical or latent factors, the simultaneous estimation of a system of equations which reflect the interrelationships of exogenous and endogenous variables, and the measurement of direct and indirect causal relationships (Kline, 2015; Tarka, 2017). The technique is especially useful and important to researchers who conceptualize farmer cooperatives, or business organizations in general, as not only economic or financial but also social and political institutions whose characteristics do not necessarily appear on the balance sheet or income statement.

Conforming to standard notation (Jöreskog, 1973), the structural model is defined as:

$$\eta = B\eta + \Gamma\zeta + \zeta \quad (1)$$

where  $\eta$  is the vector of endogenous latent variables,  $\zeta$  is the vector of exogenous latent variables, and  $\zeta$  is the latent stochastic term.  $B$  and  $\Gamma$  are the coefficient matrices for the endogenous and exogenous latent variables, respectively. The measurement model is given by:

$$y = A_y\eta + \varepsilon \quad (2)$$

and

$$x = A_x\zeta + \delta \quad (3)$$

where  $x$  is the vector of manifest indicators of the exogenous latent variables,  $y$  is the vector of manifest indicators of the endogenous latent variables,  $A$  is the vector of random parameters to be estimated, and  $\delta$  and  $\varepsilon$  are the stochastic terms for  $x$  and  $y$ , respectively.

Corresponding to Equation 2 and Equation 3, our measurement model is comprised of five latent factors: trust, participation, mission support, organic lifestyle, and satisfaction (Table 2). Each factor is instrumented by three to five manifest variables. Except for the factor participation, each manifest variable is based on survey responses to five-point Likert statements with a standard range of 'strongly disagree' to 'strongly agree'. The manifest variables which instrument the latent factor participation have a binary structure and correspond to simple yes/no survey responses. As illustrated in Table 3, strong internal consistency is indicated by Cronbach's alpha coefficients with a range of 0.66 to 0.87.

Based on Equation 1, the full structural equation model corresponding to the hypothetical model to be estimated is illustrated in Figure 2. To be clear, the structural equation model is comprised of the five latent factors in the measurement model, as well as the observed factor of long-term commitment. The empirical analysis is conducted in Stata 15 with maximum likelihood as the estimation technique (Acock, 2013).

**Table 2.** Measures of member attitudes and perceptions.

Variable	Mean	Std. Dev.	Scale <sup>1</sup>
Latent factor 1: trust			
1. I trust the integrity of the leadership of the cooperative.	3.30	0.65	0-4
2. I trust the cooperative board to make balanced decisions.	3.26	0.71	0-4
3. I trust the cooperative to support its members.	3.23	0.68	0-4
Latent factor 2: participation			
1. In the past year, I have attended a regional meeting.	0.28	0.45	0-1
2. In the past year, I have attended an annual meeting.	0.78	0.42	0-1
3. In the past year, I have voted on cooperative business.	0.65	0.48	0-1
4. In the past year, I have served on a committee.	0.38	0.48	0-1
Latent factor 3: mission support			
1. I understand the mission of the cooperative.	3.17	0.65	0-4
2. I fully support the mission of the cooperative.	3.27	0.69	0-4
3. The cooperative stays true to its mission.	3.31	0.73	0-4
4. I feel personally connected to the cooperative.	3.05	0.81	0-4
Latent factor 4: organic lifestyle			
1. I buy organic whenever possible.	2.57	0.95	0-4
2. It is worth the extra money to buy organic products.	2.84	0.82	0-4
3. I encourage friends and family to buy organic products.	2.72	0.83	0-4
4. I am committed to living organically.	2.62	0.88	0-4
Latent factor 5: satisfaction			
1. I am satisfied with my membership in the cooperative.	3.13	0.82	0-4
2. The cooperative pays fair prices.	3.41	0.71	0-4
3. I feel grateful to be a member of the cooperative.	3.60	0.59	0-4
4. I would recommend membership to another farmer.	3.55	0.73	0-4
5. I am satisfied with the quality of the communication.	3.04	0.85	0-4
Observed factor 1: long-term commitment			
1. I am likely to remain a member in the near future.	2.62	0.55	0-4

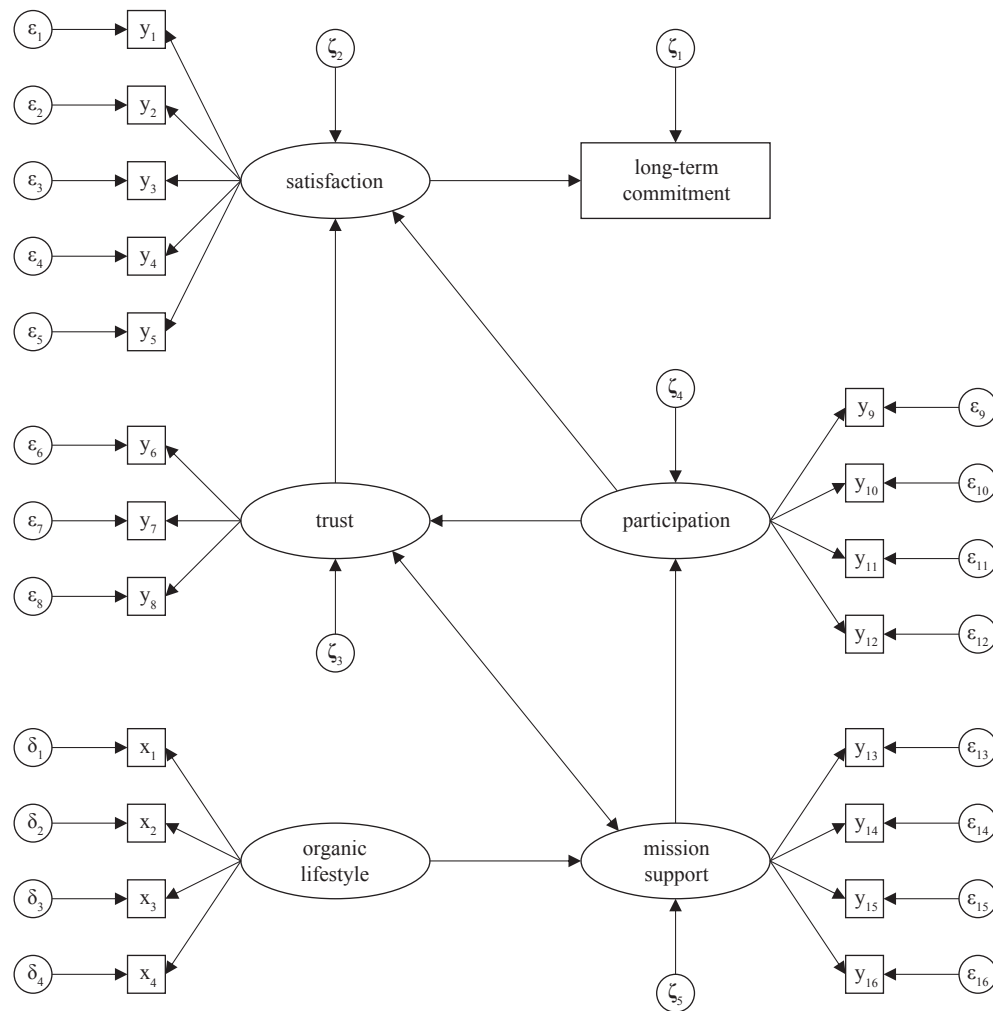
<sup>1</sup> Values are based on a five-point Likert scale, or binary option.

**Table 3.** Overview of latent factors.

Latent factor (Scale)	Summary statistics		Internal consistency Cronbach's $\alpha$	Correlation matrix				
	Mean	SD		1	2	3	4	5
1. Trust (0-4)	3.26	0.58	0.82					
2. Participation (0-1)	0.52	0.32	0.66	0.18				
3. Mission support (0-4)	3.20	0.57	0.80	0.72	0.32			
4. Organic lifestyle (0-4)	2.67	0.75	0.87	0.23	0.27	0.32		
5. Satisfaction (0-4)	3.34	0.56	0.79	0.70	0.28	0.67	0.22	

<sup>1</sup> SD = standard deviation.





**Figure 2.** Structural equation model of member attitudes and perceptions.

## 4. Results

### 4.1 Confirmatory factor analysis

First, it is customary to conduct confirmatory factor analysis to examine and evaluate if the structural model is valid (Kline, 2015). The purpose is thus to determine if the manifest variables are accurate reflections of the latent factors. As indicated in Table 4, each of the standardized path loadings is characterized by statistical significance. Seventeen of the 20 factor loadings have a magnitude of 0.60 or higher. Common goodness-of-fit statistics (comparative fit index = 0.92, Tucker-Lewis index = 0.90, root mean square error of approximation = 0.07) also indicate an acceptable fit between the measurement model and the observed data (Hooper *et al.*, 2008; Kline, 2015; Schreiber *et al.*, 2006). There is thus no reason to make modifications to the measurement model.

### 4.2 Model respecification

Second, we estimate the null model (Figure 2). We do not report the results as the values of the comparative fit index (0.90), the Tucker-Lewis index (0.89), and the root mean square error of approximation (0.07) do not comfortably meet or exceed the cutoff criteria specified in various publications (Hooper *et al.*, 2008; Kline, 2015; Schreiber *et al.*, 2006). We are thus motivated to inspect the modification index values to

**Table 4.** Results of the confirmatory factor analysis.

Variable	$\beta$	SE <sup>1</sup>	B
Factor 1: trust			
1. I trust the integrity of the leadership of the cooperative.	-		0.808
2. I trust the cooperative board to make balanced decisions.	1.044	0.039	0.762
3. I trust the cooperative to support its members.	0.973	0.036	0.750
Factor 2: participation			
1. In the past year, I have attended a regional meeting.	-		0.172
2. In the past year, I have attended an annual meeting.	4.910	0.945	0.981
3. In the past year, I have voted on cooperative business.	4.369	0.791	0.744
4. In the past year, I have served on a committee.	2.612	0.503	0.416
Factor 3: mission support			
1. I understand the mission of the cooperative.	-		0.604
2. I fully support the mission of the cooperative.	1.310	0.065	0.749
3. The cooperative stays true to its mission.	1.437	0.078	0.760
4. I feel personally connected to the cooperative.	1.457	0.079	0.702
Factor 4: organic lifestyle			
1. I buy organic whenever possible.	-		0.851
2. It is worth the extra money to buy organic products.	0.900	0.027	0.865
3. I encourage friends and family to buy organic products.	0.797	0.028	0.764
4. I am committed to living organically.	0.783	0.030	0.711
Factor 5: membership satisfaction			
1. I am satisfied with my membership in the cooperative.	-		0.676
2. The cooperative pays fair prices.	1.187	0.058	0.705
3. I feel grateful to be a member of the cooperative.	1.016	0.049	0.728
4. I would recommend membership to another farmer.	0.835	0.042	0.669
5. I am satisfied with the quality of the communication.	0.822	0.050	0.535
N	1,116		
Chi-Square	1,034.44		
Degrees of freedom	160		
Root mean square error of approximation	0.07		
Comparative fit index	0.92		
Tucker-Lewis fit index	0.90		

<sup>1</sup> SE = standard error.

inform possible improvements in the model, which implies a transition from confirmatory to exploratory factor analysis.

Upon examination of the modification index values, we added a path from trust to participation to model a reciprocal relationship for the two latent factors. We also added various covariances to the model to improve its fit without compromising the general interpretation of the structural model or the measurement model. Finally, the values of the comparative fit index (0.98), the Tucker-Lewis index (0.98), and the root mean square error of approximation (0.04) are superior for the alternative model as compared to the null model (Table 5).

Table 6 reports the standardized as well as the unstandardized path loadings, and Figure 3 provides a visual presentation of the alternative model. Relating to the hypothesized relationships, each of the path loadings is positive and statistically significant (Table 6). As hypothesized, we observe positive relationships of organic lifestyle to cooperative mission support, cooperative mission support to participation, cooperative mission support to trust, participation to satisfaction, trust to cooperative mission support, trust to satisfaction, and

**Table 5.** Comparison of goodness-of-fit statistics for the null and alternative model specifications.<sup>1</sup>

	Chi-Square	RMSEA	CFI	TLI	AIC
Null	1,265.248	0.07	0.90	0.89	33,309.740
Alternative	384.522	0.04	0.98	0.98	32,463.012

<sup>1</sup> RMSEA = root mean square error of approximation; CFI = confirmatory fit index; TLI = Tucker Lewis index; AIC = Akaike's information criteria.

**Table 6.** Results for the estimated structural equation model.<sup>1,2</sup>

Hypothesized relationship			$\beta$	SE	B
1	Trust	→ Mission support	0.521***	0.044	0.708
2	Trust	→ Satisfaction	0.652***	0.033	0.794
-	Trust	→ Participation	-0.295***	0.086	-1.082
3	Participation	→ Trust	-0.515**	0.205	-0.141
4	Participation	→ Satisfaction	0.628***	0.125	0.209
5	Mission support	→ Participation	0.593***	0.134	1.596
6	Mission support	→ Trust	1.017***	0.124	0.747
7	Organic lifestyle	→ Mission support	0.140***	0.019	0.215
8	Satisfaction	→ Future membership	0.726***	0.042	0.585
N			1,116		
Chi-square			384.52		
Degrees of freedom			165		
Normed chi-square			2.33		
RMSEA			0.04		
CFI			0.98		
TLI			0.98		

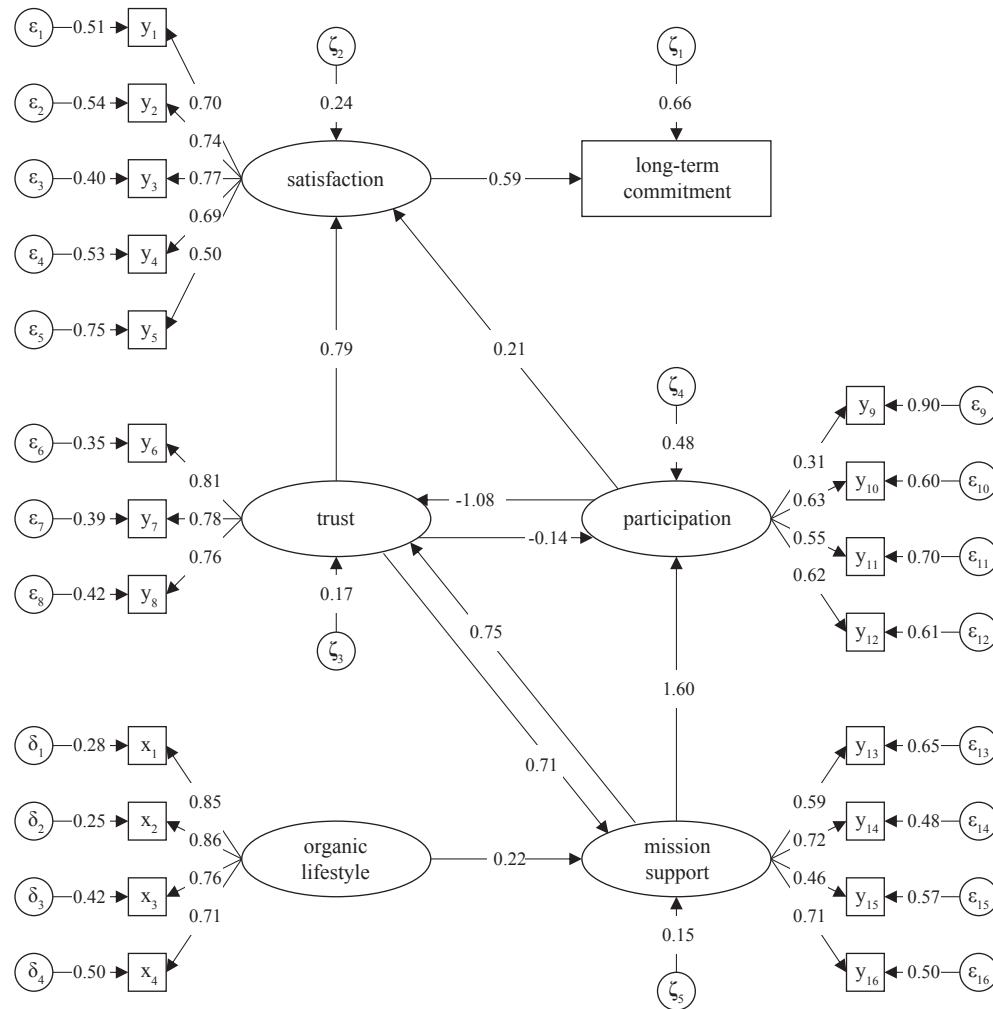
<sup>1</sup> RMSEA = root mean square error of approximation; CFI = confirmatory fit index; TLI = Tucker Lewis index; SE = standard error.

<sup>2</sup> Significant at \*\*  $P < 0.05$  and \*\*\*  $P < 0.01$ .

satisfaction to long-term commitment. The only exception is the relationship of participation to trust, which is estimated to be negative and thus contradicts prior findings by Nilsson *et al.* (2009) and Österberg and Nilsson (2009). We thus reject Hypothesis 3.

#### 4.3 Direct, indirect, and total effects

The interrelationships of the member attitudes and perceptions are complex. The latent factors are interconnected and have both direct and indirect relationships to each other. Even organic lifestyle, the only exogenous latent factor in the estimated model, is indirectly related to long-term commitment via the other latent factors. Furthermore, the model includes two reciprocal relationships, one between trust and cooperative mission support and the other between trust and participation. In theory, the feedback loop continues to infinity (Kline, 2015). The latent factors thus have effects on themselves. Table 7 reports the effect decomposition for each interrelationship. For example, the standardized indirect effect of trust on long-term commitment is estimated at 0.986, and the indirect effect of cooperative mission support on satisfaction is estimated at 1.213. Effect decomposition also reveals the intricate relationship of participation to satisfaction. Its direct effect on satisfaction is 0.209, but the magnitude of its indirect effect is negative and stronger (-0.237). As compared to the existing literature on member attitudes and perceptions, full conceptualization of the interrelationships of member attitudes and perceptions thus facilitates better insight regarding the dynamic interactions.



**Figure 3.** Results for the estimated structural equation model.

## 5. Discussion and conclusions

The positive relationship of organic lifestyle to mission support adds a novel dimension to the interrelationship of member attitudes and perceptions. The magnitude of the total effect (0.382) on cooperative mission support is not as large as exhibited by other relationships in the model, but the result is nonetheless indicative of the importance of common values and principles in terms of not only collective action but also farm production and even home consumption. For the cooperative in this study, the relationship of organic lifestyle to mission support is likely explained by its organic identity, suggesting the relationship may not exist for non-organic marketing cooperatives. However, non-organic marketing cooperatives may have other product or process characteristics, such as natural or non-GMO, which require a similar alignment between values and principles both individually and collectively.

Cooperative mission support, which is related to the latent factor affective commitment (e.g. Barraud-Didier *et al.*, 2012; Jusilla *et al.*, 2012), is in turn positively related to participation in the governance of the cooperative (total effect = 1.650). The result indicates self-identification as a member as opposed to a supplier increases motivation to exert control of joint assets and resources. As such, the monitoring and influencing of board directors and managers is perhaps interpretable as an attempt to support and advance the cooperative mission. Cooperatives with poor member involvement and poor member participation may examine if their members have individual motivations which do not correspond to the cooperative mission (e.g. Nilsson *et*

**Table 7.** Direct, indirect, and total effects by interrelationship.

Hypothesized relationship	Direct effect	Indirect effect	Total effect
Satisfaction → Long-term commitment	0.585		0.585
Trust → Long-term commitment		0.986	0.986
Participation → Long-term commitment		-0.016	-0.016
Mission support → Long-term commitment		0.710	0.710
Organic lifestyle → Long-term commitment		0.153	0.153
Trust → Trust		1.094	1.094
Participation → Trust	-0.141	-0.154	-0.294
Mission support → Trust	0.747	0.347	1.094
Organic lifestyle → Trust		0.236	0.236
Trust → Participation	-1.082	1.184	0.103
Participation → Participation		-0.014	-0.014
Mission support → Participation	1.596	0.054	1.650
Organic lifestyle → Participation		0.355	0.355
Trust → Satisfaction	0.794	0.890	1.684
Participation → Satisfaction	0.209	-0.237	-0.028
Mission support → Satisfaction		1.213	1.213
Organic lifestyle → Satisfaction		0.261	0.261
Trust → Mission support	0.708	0.775	1.483
Participation → Mission support		-0.208	-0.208
Mission support → Mission support		0.775	0.775
Organic lifestyle → Mission support	0.215	0.167	0.382

*al.*, 2012). With an honest assessment, cooperatives may then choose to either facilitate a superior alignment of individual and joint objectives, or to adjust the way member control is assigned and exerted.

While defined differently, the estimated model corroborates prior findings by Borgen (2001) and Barraud-Didier *et al.* (2012) regarding the positive relationship of cooperative mission support to trust (total effect = 1.094) and trust to cooperative mission support (total effect = 0.708), respectively. The result implies members who support the cooperative mission have greater trust in board directors and managers. Because of the belief in collective action, such members may not perceive discrepancies in the utility functions of members, board directors, and managers. *Vice versa*, trust earned by board directors and managers by representing member interests in turn reinforces the support of the cooperative mission. With respect to large cooperatives facing heterogeneous member attitudes and perspectives, the structural equation model suggests it might be important to facilitate trust in cooperative leaders and representatives to inform solutions to weak support of the cooperative mission. Transparency and communication may help.

Contrary to Nilsson *et al.* (2009) and Österberg and Nilsson (2009), the relationship of participation to trust is observed to be negative (total effect = -0.294). The result is not open to easy interpretation. Members who participate in the governance of the cooperative by means of voting and monitoring are perhaps characterized by motivations which do not correspond to the observed or perceived objectives of the board directors and managers. Among the survey respondents, the governance participants may not have been satisfied with recent decisions by board directors and managers. *Vice versa*, the relationship of trust to participation is more ambiguous (direct effect = -1.082, indirect effect = 1.184). According to the direct effect, members who have more trust in board directors and managers are less compelled to exert control as the interests of the principals and agents are not perceived to be different. As control is held by all members, these members free ride on the participation of other members.

The direct effect of participation on satisfaction is positive (0.209), which relates to the findings by Arcas-Lario *et al.* (2014). Of course, by participating in the governance of the cooperative, members have greater influence on the outcome of decisions by board directors and managers and thus reduce the potential for agency problems. Such decisions may relate to board director elections, membership access policies, mergers, equity retirements, or any other proposal from board directors and managers. Assuming rationality, members will vote on such decisions to improve their utility. Yet participation itself, regardless of the outcome of decisions, may also improve utility if voting and monitoring are perceived as good member behavior. Regardless of the motivation, the result implies participation in the governance of the cooperative should be encouraged. Cooperatives may identify the various obstacles to participation, such as knowledge, technology, transportation, or general exclusiveness to help facilitate member control.

Corresponding to the empirical work of Hansen *et al.* (2002) and Arcas-Lario *et al.* (2014), trust is related significantly to satisfaction (total effect = 1.684). In fact, the total effect is the largest in magnitude among all the interrelationships between attitudes and perceptions. Trust is facilitated when leaders and representatives appear to work on behalf of the members. If so, decisions will likely have a positive impact on member utility, which is indicated by member satisfaction. Cooperatives are thus encouraged to inspire trust by minimizing the actual or perceived divergence of principal-agent interests by means of contracting and communicating. As owners of the organization, members have a right to be informed regarding the deployment of joint assets and resources.

Finally, as concluded previously by Hernandez-Espallardo *et al.* (2012) and Arcas-Lario *et al.* (2014), satisfaction is a strong indicator of long-term commitment in terms of future membership (total effect = 0.584). In addition to the analysis of financial ratios, the result implies satisfaction should be considered a strong indicator of cooperative performance. Improving member satisfaction may also alleviate the tension between the desire to patronize and the obligation to capitalize the cooperative (Grashuis and Cook, 2017; Puusa *et al.*, 2016).

### 5.1 Weaknesses and limitations

The empirical study has several weaknesses and limitations. First, the findings are not generalizable to all farmer cooperatives. The sample is derived from a marketing cooperative with an orientation toward organic production. However, almost all the results correspond to earlier findings in the literature, suggesting the modeled interrelationships may exist across the population of marketing cooperatives. Second, the latent factor participation is informed by binary variables as opposed to continuous or ordinal variables with a greater capacity to indicate variability. According to the confirmatory factor analysis, the factor is characterized by the lowest Cronbach's alpha coefficient and two of the weakest path loadings in the measurement model. Its relatively poor internal consistency is perhaps also attributable to the specific character of the survey questions (e.g. 'In the past year, I have served on a committee.'). A superior conceptualization of the factor may allow further improvements in model fitness. Third, the structural equation model is estimated with cross-sectional data which neglects the dynamic relationship of member attitudes and perceptions. Particularly the reciprocal relationships of trust and cooperative mission support and trust and participation are likely better approached with longitudinal data. The static nature of the model implies caution is warranted when interpreting the estimated relationships. Fourth, the observed factor of long-term commitment is informed by one Likert statement ('I am likely to remain a member in the near future'). While the answer provides a static interpretation, long-term commitment is a dynamic concept which is ideally measured with time-series data.

### 5.2 Future research

There exist various directions in which future research may progress. However, arguably the most urgent matter is the relationship of member heterogeneity to the long-term viability of farmer cooperatives. There are several questions which warrant attention. For example, at which point do the positives of organizational size no longer exceed the negatives of member heterogeneity? With increased heterogeneity in member

attitudes and perceptions, can farmer cooperatives resist the temptation of conversion to another ownership structure which facilitates the pursuit of more homogeneous cost or profit objectives? Exactly what is the cost associated with increased heterogeneity in the various attitudes and perceptions of members? Are there hybrid configurations of ownership and governance characteristics which may ameliorate such costs? Answers to such questions may help inform the survival and viability of an organizational form with a long and successful history in the farm production sector.

## References

- Acock, A.C. 2013. *Discovering structural equation modeling using Stata*. Stata Press, College Station, TX, USA.
- Arcas-Lario, N., J.F. Martín-Ugedo and A. Mínguez-Vera. 2014. Farmers' satisfaction with fresh fruit and vegetable marketing spanish co-operatives: an explanation from agency theory. *International Food and Agribusiness Management Review* 17 (1): 127-146.
- Barraud-Didier, V., M.C. Henninger and A. Akremi. 2012. The relationship between members' trust and participation in the governance of cooperatives: the role of organizational commitment. *International Food and Agribusiness Management Review* 15 (1): 1-24.
- Bollen, K.A. 1989. *Structural equations with latent variables*. Wiley, New York, NY, USA.
- Bollen, K.A. and J. Pearl. 2013. Eight myths about causality and structural equation models. In: *Handbook of causal analysis for social research*, edited by S. Morgan. Springer, Dordrecht, the Netherlands, pp. 301-328.
- Borgen, S. 2001. Identification as a trust-generating mechanism in cooperatives. *Annals of Public and Cooperative Economics* 72 (2): 209-228.
- Briggeman, B.C., K.L. Jacobs, P. Kenkel and G. Mckee. 2016. Current trends in cooperative finance. *Agricultural Finance Review* 76 (3): 402-410.
- Cechin, A., J. Bijman, S. Pascucci and O. Omta. 2013. Decomposing the member relationship in agricultural cooperatives: Implications for commitment. *Agribusiness* 29 (1): 39-61.
- Chaddad, F. and C. Iliopoulos. 2013. Control rights, governance, and the costs of ownership in agricultural cooperatives. *Agribusiness* 29 (1): 3-22.
- Cooperatives Europe 2016. *The power of cooperation*. Cooperatives Europe, Brussels, Belgium.
- Deng, W. and G. Hendrikse. 2013. Uncertainties and governance structure in incentives provision for product quality. In: *Network governance. Contributions to management science*, edited by T. Ehrmann, J. Windsperger, G. Cliquet, G. Hendrikse, Physica, Berlin, Germany, pp. 179-203.
- Dimitri, C. and R.L. Dettmann. 2012. Organic food consumers: what do we really know about them? *British Food Journal* 114 (8): 1157-1183.
- Eversull, E. 2014. Co-op mergers, acquisitions, 2000-2013. *Rural Cooperatives, November/December 2014*. United States Department of Agriculture, Washington, DC, USA.
- Feng, L., A. Friis and J. Nilsson. 2016. Social capital among members in grain marketing cooperatives of different sizes. *Agribusiness* 32 (1): 113-126.
- Feng, L. and G. Hendrikse. 2008. On the nature of a cooperative: a system of attributes perspective. In: *Network governance. Contributions to management science*, edited by T. Ehrmann, J. Windsperger, G. Cliquet, G. Hendrikse Physica, Berlin, Germany, pp. 13-26.
- Franken, J.R. and M.L. Cook. 2015. Informing measurement of cooperative performance. In: *Interfirm networks*, edited by J. Windsperger, G. Cliquet, T. Ehrmann and G. Hendrikse. Springer, Germany, pp. 209-226.
- Fulton, M. and D. Pohler. 2015. Governance and managerial effort in consumer-owned enterprises. *European Review of Agricultural Economics* 42 (5): 713-737.
- Grashuis, J. 2018. An exploratory study of cooperative survival: Strategic adaptation to external developments. *Sustainability* 10: 652-666.

- Grashuis, J. and M.L. Cook. 2017. Farmer cooperatives as systems of attributes: an analysis of ownership and investment complementarities. In: *Management and governance of networks: franchising, cooperatives and strategic alliances*, edited by G. Hendrikse, G. Cliquet, T. Ehrmann, J. Windsperger. Springer, Heidelberg, Germany, pp. 131-147.
- Grashuis, J. and Y. Su. 2019. A review of the empirical literature on farmer cooperatives: performance, ownership and governance, finance, and member attitude. *Annals of Public and Cooperative Economics* 90 (1): 77-102.
- Hakelius, K. and H. Hansson. 2016. Members' attitudes towards cooperatives and their perception of agency problems. *International Food and Agribusiness Management Review* 19 (4): 23-36.
- Hansen, M.H., J.L. Morrow and J.C. Batista. 2002. The impact of trust on cooperative membership retention, performance, and satisfaction: an exploratory study. *International Food and Agribusiness Management Review* 5 (1): 41-59.
- Hernández-Espallardo, M., N. Arcas-Lario and G. Marcos-Matás. 2012. Farmers' satisfaction and intention to continue membership in agricultural marketing co-operatives: neoclassical versus transaction cost considerations. *European Review of Agricultural Economics* 40 (2): 239-260.
- Höhler, J. and R. Köhl. 2018. Dimensions of member heterogeneity in cooperatives and their impact on organization – a literature review. *Annals of Public and Cooperative Economics* 89 (4): 697-712.
- Hooper, D., J. Coughlan and M. Mullen. 2008. Structural equation modelling: guidelines for determining model fit. *Electronic Journal of Business Research Methods* 6 (1): 53-60.
- Jiménez, M.C.R., E.G. Martí and M.J.H. Ortiz. 2010. Member commitment in olive oil co-operatives: cause and consequences. *Journal of Co-operative Studies* 43 (2): 24-35.
- Jöreskog, K.G. 1973. A general method for estimating a linear structural equation system. In: *Structural equation models in the social sciences*, edited by K.G. Jöreskog. Academic Press, New York, NY, USA
- Jussila, I., N. Byrne and H. Tuominen. 2012. Affective commitment in co-operative organizations: what makes members want to stay? *International Business Research* 5 (10): 1-10.
- Kline, R.B. 2015. *Principles and practice of structural equation modeling*. 4<sup>th</sup> edition. Guilford Press, New York, NY, USA.
- Läpple, D. 2013. Comparing attitudes and characteristics of organic, former organic and conventional farmers: evidence from Ireland. *Renewable Agriculture and Food Systems* 28 (4): 329-337.
- Merlo, C. 2017. Crossing the merger finish line. In: *Rural cooperatives, September/October 2017*, edited by D. Campbell. United States Department of Agriculture, Washington, DC, USA, pp. 4-8.
- Morfi, C., P. Ollila, J. Nilsson, L. Feng and K. Karantininis. 2015. Motivation Behind Members' Loyalty to Agricultural Cooperatives. In: *Interfirm Networks*, edited by J. Windsperger, G. Cliquet, T. Ehrmann, G. Hendrikse. Springer, Cham, Germany, pp. 173-190.
- Morrow Jr, J.L., M.H. Hansen and A.W. Pearson. 2004. The cognitive and affective antecedents of general trust within cooperative organizations. *Journal of Managerial Issues* 16 (1): 48-64.
- Mzoughi, N. 2011. Farmers adoption of integrated crop protection and organic farming: Do moral and social concerns matter? *Ecological Economics* 70 (8): 1536-1545.
- Nilsson, J. and G. Hendrikse. 2011. Gemeinschaft and Gesellschaft in cooperatives. In: *New developments in the theory of networks*, edited by M. Tuunanen, J. Windsperger, G. Cliquet, G. Hendrikse. Springer-Verlag, Berlin Heidelberg, Germany, pp. 339-352.
- Nilsson, J., A. Kihlén and L. Norell. 2009. Are traditional cooperatives an endangered species? About shrinking satisfaction, involvement and trust. *International Food and Agribusiness Management Review* 12 (4): 103-123.
- Nilsson, J., G.L. Svendsen and G.T. Svendsen. 2012. Are large and complex agricultural cooperatives losing their social capital? *Agribusiness* 28 (2): 187-204.
- Ollila, P., J. Nilsson and S. Hess. 2014. Farmers' reactions to the internationalisation of cooperatives. *Agricultural and Food Science* 23: 291-306.
- Österberg, P. and J. Nilsson. 2009. Members' perception of their participation in the governance of cooperatives: the key to trust and commitment in agricultural cooperatives. *Agribusiness* 25 (2): 181-197.
- Puusa, A., K. Hokkila and A. Varis. 2016. Individuality vs. communality: A new dual role of co-operatives? *Journal of Co-operative Organization and Management* 4 (1): 22-30.



- Ruben, R. and J. Heras. 2012. Social capital, governance and performance of Ethiopian coffee cooperatives. *Annals of Public and Cooperative Economics* 83 (4): 463-484.
- Saitone, T.L. and R.J. Sexton. 2017. Concentration and consolidation in the U.S. food supply chain: the latest evidence and implications for consumers, farmers, and policymakers. *Federal Reserve Bank of Kansas City, Economic Review* 102: 25-59.
- Schreiber, J.B., A. Nora, F.K. Stage, E.A. Barlow and J. King. 2006. Reporting structural equation modeling and confirmatory factor analysis results: a review. *The Journal of Educational Research* 99 (6): 323-338.
- Soboh, R.A., A.O. Lansink, G. Giesen and G. Van Dijk. 2009. Performance measurement of the agricultural marketing cooperatives: the gap between theory and practice. *Review of Agricultural Economics* 31 (3): 446-469.
- Spear, R. 2000. The co-operative advantage. *Annals of Public and Cooperative Economics* 71 (4): 507-523.
- Stolz, H., M. Stolze, M. Janssen and U. Hamm. 2011. Preferences and determinants for organic, conventional and conventional-plus products – The case of occasional organic consumers. *Food Quality and Preference* 22 (8): 772-779.
- Tarka, P. 2017. An overview of structural equation modeling: its beginnings, historical development, usefulness and controversies in the social sciences. *Quality & Quantity* 52 (1): 1-42.
- Ullman, J.B. 2001. Structural equation modeling. In: *Using multivariate statistics*, edited by B.G. Tabachnick, L.S. Fidell. Allyn & Bacon, Boston, MA, USA, pp. 653-771.
- United States Department of Agriculture. 2017. *Cooperative statistics 2016. Rural Development Service Report 80*. United States Department of Agriculture, Washington, DC, USA.
- Wallenbeck, A., L. Rydhmer, H. Röcklinsberg, M. Ljung, E. Strandberg and T. Ahlman. 2016. Preferences for pig breeding goals among organic and conventional farmers in Sweden. *Organic Agriculture* 6 (3): 171-182.
- Wayman, S., L.K. Kucek, S.B. Mirsky, V. Ackroyd, S. Cordeau and M.R. Ryan. 2017. Organic and conventional farmers differ in their perspectives on cover crop use and breeding. *Renewable Agriculture and Food Systems* 32 (4): 376-385.
- Willer, H. and J. Lernoud. 2016. *The world of organic agriculture. Statistics and emerging trends 2016*. Research Institute of Organic Agriculture FiBL and IFOAM Organics International, Bonn, Germany.
- Wollni, M. and E. Fischer. 2014. Member deliveries in collective marketing relationships: Evidence from coffee cooperatives in Costa Rica. *European Review of Agricultural Economics* 42 (2): 287-314.

