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## Cooperation among Ugandan farmers: cultivating social capital

### RESEARCH ARTICLE

J.L. Morrow, Jr.<sup>Ⓐ</sup>, Richard Patrick Joyce III<sup>Ⓑ</sup>, William J. McMahon<sup>Ⓑ</sup>, Antonio M. DeMaia<sup>Ⓑ</sup>,  
S. Caleb McVicker<sup>Ⓑ</sup>, Ashley E. Parsons<sup>Ⓑ</sup>, and Kristin Wilcox<sup>Ⓒ</sup>

<sup>Ⓐ</sup>Associate Professor of Business Administration, and <sup>Ⓑ</sup>Research Assistant, Department of Business and Accounting,  
Birmingham-Southern College, 900 Arkadelphia Road, P.O. Box 549023, Birmingham, AL 35254, USA

<sup>Ⓒ</sup>Technical Specialist, Food Security and Cooperatives, Global Communities,  
8601 Georgia Avenue, Suite 300, Silver Spring, MD 20910-3440, USA

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### Abstract

A survey was administered to 183 Ugandan farmers in August 2014 to assess the factors that influence their willingness to become members of a proposed new agricultural cooperative. In particular, we were interested in a better understanding of how farmers viewed the social benefits associated with cooperation. These social benefits have the potential to become valuable sources of social capital. Four valid and reliable measures of social benefits were identified. Social benefits that farmers may use to get by (bonding networks) had two dimensions: emotional support and social support. Social benefits that farmers may use to get ahead (bridging networks) also had two dimensions: tangible and intangible resource sharing. The desire to gain these social benefits from cooperation (except for emotional support) emerged as strong predictors of farmers' willingness to cooperate in a proposed new agricultural cooperative. Surprisingly, the expected economic benefits of cooperation did not have a significant effect on willingness to cooperate. Implications and suggestions for future research and cooperative development and management are also discussed.

**Keywords:** farmer cooperative formation, Uganda, social capital, social benefits

**JEL code:** P13, Q13

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<sup>Ⓐ</sup>Corresponding author: [bmorrow@bsc.edu](mailto:bmorrow@bsc.edu)

## 1. Introduction

A cooperative alliance may be defined as an inter-firm arrangement that involves the utilization of resources from autonomous organizations for the joint accomplishment of individual goals (Parkhe, 1993). The alliance form of organization is widely used throughout the food and agribusiness industry and the agricultural cooperative may be one of the oldest, most well established forms of strategic alliance in the world (Oregon State University, 2004). Farmers may decide to join co-ops for several reasons. The most obvious reason farmers join cooperatives is to satisfy their economic goals, or the desire to become better off financially. This may occur when their co-op membership enables the farmer to reduce costs and/or increase revenues. Both supply (input) and marketing (output) co-ops may be used to accomplish these objectives. One could certainly argue that at its core, a farmer owned cooperative is a business organization used as a tool to accomplish economic objectives. However, there is also no doubt that these same organizations have a large social component such that an agribusiness firm does not operate solely as a production function 'stripped of all human identity' (Wilson and Kennedy, 1999: 191). Indeed, cooperatives have been characterized as having dual attributes – an economic attribute and a social attribute (Nilsson *et al.*, 2012).

Goler von Ravensburg (2010) referred to the economic motivations to join a cooperative as direct effects but also suggested that farmers may be motivated to join cooperatives in hopes of realizing indirect effects that accrue to members based on their social interactions within the cooperative. Similarly, Liu and Sumelius (2010), in their study of members of a Finnish dairy cooperative, concluded that farmers did not join and participate in a cooperative solely to accomplish economic objectives and that future research should consider sociological perspectives as a basis for understanding cooperative members' motivations and behaviors. A cooperative must have the support of its members in order to survive and a pure economic motivation for member's support and participation appears incomplete (Liu and Sumelius, 2010).

The aim of a cooperative is to create benefits for its members (Nilsson *et al.*, 2012). Thus, before a cooperative is formed, it is important to understand what benefits members desire to achieve. Nilsson *et al.* (2012) have even suggested that some large complex cooperatives have been losing a portion of their stocks of social capital leading to a decrease among members in their willingness to engage in cooperative behaviors. They attribute this decline in part due to a dissatisfaction among members that their expectations were not being met, which leads to members ultimately abandoning their membership.

While it seems clear that farmers may enjoy economic benefits from joining agricultural cooperatives, it remains unclear what social benefits farmers may be seeking when making a decision to join and actively participate in a new agricultural cooperative. Thus, our research addresses the following question: What social benefits do Ugandan farmers hope to gain from participating in a proposed agricultural cooperative and how do these anticipated benefits affect their willingness to cooperate (WTC)? We contend that these desired social benefits act as antecedents in a decision to join a cooperative and that they also have the potential to later develop into valuable sources of social capital within the cooperative.

## 2. Farmer cooperatives in Africa

Connolly (2014) noted that much of sub-Saharan Africa has ample land and water resources to potentially meet the food needs of a growing population. However he also notes that small farmers in Africa have difficulty accessing both supply and output markets. The formation of new cooperatives has the potential to provide this market access, which of course is an economic benefit. Understanding the social benefits that farmers in Africa hope to achieve by joining a new agricultural cooperative is particularly important in countries where there is a mixed history of cooperation among farmers. In Uganda, cooperatives were established as early as 1900 (Kyazze, 2010) and reached the peak of their economic influence in the early 1970s (Kyazze, 2010). However, for a variety of reasons, participation in cooperatives began to decline. As recently as 1992, cooperatives still accounted for 22% of marketed agricultural produce, but by 2001, this

percentage had fallen to 2% and then to 1% in 2006 (Kyazze, 2010). Today, agricultural cooperatives in Uganda are experiencing a resurgence, due in part to government support.

In nearby Ethiopia, a coffee cooperative was found to provide both economic and social benefits for their members in such endeavors as coffee production and marketing, but these social benefits were not explicitly identified (Meskela and Teshome, 2014). In a study that examined a dairy goat cooperative in neighboring Tanzania, Lie *et al.* (2012) suggested that farmer cooperatives in many African countries have a long and rather difficult history for reasons that range from poor management and governance structures to lack of working capital and supporting organizations. This suggests that starting new cooperatives in these areas may be more difficult than typically expected and that it is important to consider the resources that the proposed cooperative would control (Lie *et al.*, 2012).

Finally, social capital, which is a productive resource built from social interactions (Uphoff and Wijayarathna, 2000), has been a widely studied construct but its precise antecedents are not well understood (Liang *et al.*, 2015). In a study that examined a highly successful 30 year old cooperative in Zambia, the organization's current stock of social capital was found to be related to the initial conditions that were present prior to joining the cooperative and that these conditions contributed to the cooperative's eventual success (Mungandi *et al.*, 2012). Among these initial conditions are prospective members' expectations about their future cooperative activities. Mungandi *et al.* (2012) found that the initial conditions faced by a cooperative positively influenced long term success. Thus, when forming new cooperatives in sub-Saharan Africa one key to success is gaining an understanding of potential members' expectations about the social benefits that may be available to them.

### 3. Willingness to cooperate

The willingness of individuals to cooperate has been examined in such settings as a willingness to reduce automobile use in order to reduce pollution (Nordlund and Garvill, 2003), racial differences in WTC with police (Viki *et al.*, 2006) and the willingness of private agricultural firms to participate in research studies (Al-Rimawi and Al-Karablieh, 2002). A common theme throughout all of these studies is that cooperation is the act of working with others to achieve a common purpose and that one's 'willingness to cooperate' is an intention to exhibit cooperative behavior. Thus, we define WTC as the extent to which an individual farmer is agreeable to joining and participating in an agricultural cooperative.

In their study of entrepreneurial behavior, Steensma *et al.* (2000) argued that an individual's attitude toward cooperation reflected the extent to which he/she is receptive toward cooperative strategies. Further, this attitude was indicative of a belief that cooperation was necessary for success. Thus, a farmer's attitude toward cooperation reflects the degree to which he/she believes that there are benefits from cooperation and therefore may be predisposed toward exhibiting cooperative behavior (Zhang *et al.*, 2006).

By their nature, individuals seek to fulfill their self-interests (Williamson, 1979). Indeed, classical economic theory is founded on the premise that we are collectively 'better off' if we individually pursue our self-interests (Smith, 1776). Just since the mid twentieth century have scholars begun to develop an understanding of how cooperation may be expected to occur in an economic exchange (Axelrod, 1984; Nash, 1950). Much of the theoretical literature on the formation of strategic alliances (e.g. cooperatives) is grounded in the strategic choice paradigm (Child, 1972), which argues that individual decisions are based on cognitive processes that result in rational choices, such as maximizing revenues and minimizing costs (Williamson, 1979). However, most of these economic views of cooperation ignore the value that one may gain from social interactions within cooperative organizations. Thus, prior to joining a cooperative prospective members are expected to make decisions about the likely consequences of their actions including an assessment of the possible social benefits that other members may be able to provide. The decision to join a cooperative will be made by calculating the expected risks and benefits in hopes of maximizing the potential gains and these expected gains from cooperative membership are likely to be both economic and social (Barraud-Didier *et al.*, 2012). Put simply, a WTC will arise if cooperation enables an individual to accomplish goals that could not be

accomplished through competition, and while perhaps not immediately apparent, it is reasonable to suggest that in some cases, these desired goals may be both economic and social in nature.

#### 4. Social capital in cooperative organizations

Social capital refers to the idea that there is value in our social fabric. Like our economic capital enables us to buy resources, our social capital enables us to access resources, providing access to information through the members of our networks and facilitating the achievement of common goals (Seferiadis *et al.*, 2015: 171).

Social capital has been studied extensively and there is ample theoretical and empirical research that suggests social capital is a valuable socio-economic resource (Aguilar and Sen, 2009; Grootaert *et al.*, 2004; Putnam, 1995, 2000; Woolcock and Narayan, 2000). Social capital has also been linked to cooperation and an increase in individual farm performance (Uphoff and Wijayaratna, 2000). While there are many different perspectives of what social capital actually is, we suggest that social capital consists of the value that is available to individuals and groups from multiple dimensions of their various social relationships (Adler and Kwon, 2002; Paldam, 2000; Sporleder and Wu, 2006). This may include social attributes such as counsel and advice, sympathy, trust, forgiveness and the like that are offered to individuals by friends and acquaintances (Adler, 2001; Dore, 1983). Moreover, social ties of one kind (e.g. friendship) may be used for different purposes, such as moral and material support or perhaps work and nonwork advice (Adler and Kwon, 2002). Finally the pursuit of one's social goals fosters the development of social capital, which may serve as motivation for individuals to seek membership and active participation in cooperative organizations (Collier, 2002).

This suggests that for social capital to have an opportunity to develop and flourish, it must first have a place – a place where individuals may come together in a social context, or what Cilliers and Wepener termed a *structural opportunity to meet* (Cilliers and Wepener, 2007; Seferiadis *et al.*, 2015). Cooperatives have been referred to as people centered businesses that offer social benefits for members by providing opportunities for increased social interactions and by providing a structure to enhance economic activities (Kwapong and Hanisch, 2013; Majee and Hoyt, 2010). Thus, while an agricultural cooperative is typically thought of as an economic organization, it clearly may also serve as a mechanism for the development of social capital (Wilson, 2000). Elder and her colleagues (Elder *et al.*, 2012) found that coffee farmers in Rwanda, who were members of a cooperative, developed social capital by interacting with their neighbors. Farmers in their study felt the cooperative provided the place where individual farmers could gain advantages by listening to the ideas of other farmers, although the authors attributed the development of social capital to these increased social interactions, and not to the cooperative itself. Despite this, it seems clear that these social interactions were facilitated by the group structure provided by the cooperative they had joined.

Gomez-Limon *et al.* (2014) argued that social capital may lead to what they called bonding and bridging networks. Bonding networks are horizontal in nature, in that they occur among those who are on the same level. These are people we perceive to be similar to ourselves, such as our friends and family. Bridging networks on the other hand are vertical and serve to link us with those who we perceive to be different, such as those who have resources that we do not have. This suggests that from our social interactions, we identify other people who may be able to provide us with resources and support that we value but do not have (Elder *et al.*, 2012; Gomez-Limon *et al.*, 2014).

#### 5. Conceptual framework

##### 5.1 Bonding networks: social capital useful for getting by

A bonding network is created from social capital that is useful for getting by, because it provides support for people in managing issues that arise during their day-to-day activities (de Souza Briggs 1997; Gomez-Limon *et al.*, 2014). These benefits flow from people within a community who depend on one another in

order to cope with life's challenges that may arise unexpectedly every day (Woolcock and Narayan, 2000). In western societies, these actions may include such things as offering a neighbor a ride to work, picking up a friend's child from school, helping to care for an ailing parent or sharing a cup of coffee with a friend while discussing life's problems or concerns. Further, the social capital developed from these getting by social activities is likely to come from people who are similar to us, such as our friends, family and neighbors (Lickerman, 2013). This type of social capital has been referred to as bonding networks, because it acts to bring people closer together within their communities in ways that may give them advantages over others who do not share these social benefits (de Souza Briggs, 1997; Gomez-Limon *et al.*, 2014).

We suggest social capital that is present in these bonding networks is likely to develop in two distinct ways. First, is what we term *social support*, which is the extent to which farmers know others with whom they can socialize during their leisure time. Farmers in the study by Elder *et al.* (2012) talked specifically about the opportunities involved in such simple social interactions as 'meeting people to share a bottle of beer and ideas' and that through discussions with other farmers 'I don't feel isolated' (Elder *et al.*, 2012: 2365). Similarly, Putnam (1995, 2000) notes that such simple social interactions as bowling in a league or having coffee with a friend leads to the creation of social capital. He goes further to suggest that social capital declines as individuals begin to engage in fewer social interactions.

The second type of social capital that is present in bonding networks is emotional support, which we define as knowing others who can provide help and comfort in time of need. Life in much of Africa can be difficult, and many farmers likely live in rural areas, often with low levels of connectivity to local or wider networks. During difficult and challenging times, these people would naturally seek emotional support from a friend or someone they know (Lickerman, 2013). Emotional support has been conceptualized as expressions of care, concern, value, love and interest, especially during life's difficult times (Burleson, 2003; Cutrona and Russell, 1990).

**Hypothesis 1a:** bonding networks will consist of two dimensions: social support and emotional support.

**Hypothesis 1b:** social support will have a positive effect on WTC.

**Hypothesis 1c:** emotional support will have a positive effect on WTC.

### 5.2 Bridging networks: social capital useful for getting ahead

In addition to getting by, social capital may also be used to help individuals get ahead (de Souza Briggs, 1997; Gomez-Limon *et al.*, 2014). This means that individuals can use the capital developed from their social relationships in an effort to improve their life's circumstances in hopes of becoming 'better off.' This type of social capital is likely to accrue from those within our social network who have both tangible (e.g. tools and equipment) and intangible (e.g. knowledge and skills) resources that we do not have (Galunic *et al.*, 2012). In other words, this social capital is likely to come from people who are different from us (Gomez-Limon *et al.*, 2014; Han *et al.*, 2014), in the sense that these people possess resources that we need but do not have. In western societies, examples may include seeking legal advice from an acquaintance who is an attorney, medical advice from a casual friend who is a physician or borrowing a truck from a co-worker. Social capital that develops from this type of sharing has been termed 'bridging networks', because it serves to move people into a new, stronger position in life relative to those who do not share this social benefit (de Souza Briggs, 1997; Gomez-Limon *et al.*, 2014).

Majee and Hoyt (2010) found that frequent interaction among cooperative members enabled network building among members (horizontal) and between members and others with whom they came in contact (vertical). These vertical interactions were also found to provide cooperative members access to new resources. Aguilar and Sen (2009) noted that social capital may enable people to solve problems and get ahead in life. This means that a better understanding of social capital within cooperative organizations may lead to better strategies for

upward mobility (e.g. getting ahead). Accessing skills and know-how (e.g. intangible resources) from other farmers collectively led to the development of social capital among potato farmers in Uganda that allowed them to access new markets for their crops (Kaganzi *et al.*, 2009).

**Hypothesis 2a:** bridging networks will consist of two dimensions: tangible and intangible resource sharing.

**Hypothesis 2b:** sharing tangible resources will have a positive effect on WTC.

**Hypothesis 2c:** sharing intangible resources will have a positive effect on WTC.

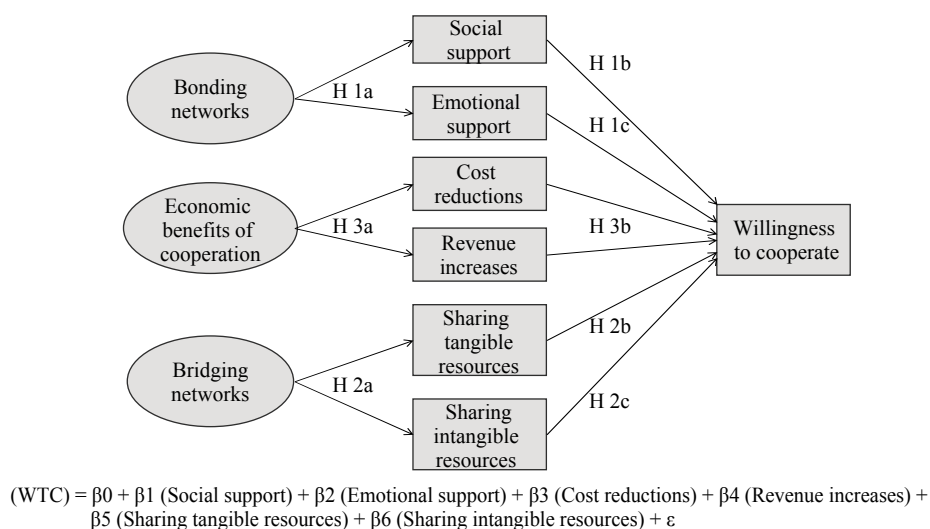
### 5.3 Economic benefits of cooperation

Goler von Ravensburg (2010) wrote extensively about the economic benefits associated with the cooperative form of organization. These benefits are essentially grounded in classical economic theory which seeks to identify the means of maximizing the benefits while minimizing the costs associated with utilizing an organization to achieve economic objectives. If the farmer owned cooperative is viewed as a business firm pursuing profit maximization, Barney (2011) succinctly notes that value creation within a firm is anything that enables a firm to increase revenues and decrease costs. Historically, farmers have formed supply co-ops (which provide inputs such as seed, fertilizers, herbicides, pesticides, tools and equipment) with the goal of minimizing costs while marketing co-ops, which assist the farmer in selling or marketing his/her output, may be used for both cost efficiencies and maximizing revenues. Consistent with these arguments (Goler von Ravensburg, 2010), we have conceptualized the economic benefits of cooperation as the extent to which cooperation will enable an individual farmer to decrease costs (e.g. efficiency actions) and increase revenues (e.g. effectiveness actions).

**Hypothesis 3a:** the economic benefits of cooperation will consist of two dimensions: efficiency (cost reductions) and effectiveness (revenue increases).

**Hypothesis 3b:** the economic benefits of cooperation, both efficiency and effectiveness, will have positive effects on WTC.

A summary of our proposed model and its hypothesized effects on WTC are presented in Figure 1.



**Figure 1.** The effects of economic and social benefits (bonding and bridging networks) on willingness to cooperate among potential members of a new farmer cooperative.

## 6. Methodology

A survey methodology was used to collect data over a three day period from 183 farmers representing six different parishes within the Bushenyi District of western Uganda where there were no existing agricultural cooperatives at that time. We contacted the district commercial officer who works in cooperative development within the district and he identified a local mobilizer who arranged for a group of farmers to meet with us at various locations around the district (typically health centers, schools or churches). These farmers were informed that the purpose of our research was to gain an understanding of the factors that might facilitate cooperation within their community in hopes of developing better approaches to cooperative development. The participating farmers were not compensated except that we provided soft drinks and snacks while they waited to be interviewed.

We surveyed approximately 60 farmers each day with these numbers divided about evenly between a morning and an afternoon session. Each session was held at a different parish within the Bushenyi District and we surveyed all farmers who were present at each session. Because many of these farmers were illiterate and/or had poor eyesight, the survey was administered orally by a group of five facilitators. Prior to data collection, each facilitator underwent a day long training exercise where we reviewed each question in the survey to make certain that everyone understood the questions and how they were to collect the responses. There were 74 men and 100 women who participated in the study (gender was missing from nine surveys). Among the survey participants, the average age was 46.76 years, the farmers' average household size was 6.94 people and the average farm size was 3.32 acres.

## 7. Measures

### 7.1 Control variables

The dependent variable in our study was WTC in a proposed new agricultural cooperative and our explanatory variables were the anticipated economic and social benefits that might accrue to the farmers from their cooperation. Thus, we wanted to control for additional variables that might impact one's WTC. Farm size (measured in acres), age of the farmer (measured in years), household size (including the farmer) and gender were chosen as control variables. Gender was dummy coded 1=male and 0=female.

### 7.2 Development of measurement scales

In developing our measurement scales, we began with our theoretical definition of each construct and then wrote a series of questions that appeared to correspond to this definition. When measuring latent variables in the social sciences, one should avoid single-item scales because their psychometric properties are likely to be poor or unknown (Furr, 2011). We set of minimum requirement of identifying at least a three-item scale and evaluated the psychometric properties of each scale using factor analysis to assess construct validity, and where appropriate, discriminant validity. Factor analysis is a data analytic technique used to determine which questions in a survey are associated with a single construct, as known as a factor (Bagozzi *et al.*, 1991). For questionnaire data, factor analysis is used to determine the construct validity of the survey instrument with the resulting factors expected to correspond to the underlying constructs (Shmueli, 2010). In other words, if a group of questions that were written to measure a single construct all load together on a single factor, this provides evidence that we appear to be measuring what we expected to measure, which validates our measurement scales.

Once a scale has been validated, the scores from each item in the scale are averaged to yield the measure for that construct. Discriminant validity is used to assess whether survey respondents appear to be differentiating between two distinct but similar constructs and provides evidence that we successfully identified valid and unique measures for each construct (Bagozzi *et al.*, 1991). Finally, Cronbach's alpha was used to determine the reliability of each scale by assessing the internal consistency or average correlation of the items within



each scale (Shrout and Fleiss, 1979). We describe each of our measurement scales below and the questions that were used in each scale are presented in Supplementary Methods S1.

### *7.3 Willingness to cooperate*

Earlier we defined WTC as the extent to which an individual farmer is agreeable to joining and participating in a proposed new agricultural cooperative. WTC, the dependent variable, was measured using a four-item scale that was developed based on this definition.

### *7.4 Economic benefits of cooperation*

We sought to develop survey questions that would measure two dimensions of the anticipated economic benefits of cooperation: cost minimization (efficiency) and revenue maximization (effectiveness). For example, for the efficiency dimension we asked such questions as ‘being a member of an agricultural oriented group might help me lower the cost of my supplies and/or reduce the time it takes to buy supplies’. Among the questions that we developed to measure the effectiveness dimension were ‘being a member of an agricultural oriented group might help me find new markets for my crops and/or find more people to trade with’.

### *7.5 Bonding networks*

We defined bonding networks as flowing from social interactions that are built around personal relationships and provide support for people to help them with the day-to-day issues of their lives. We further suggested that these networks are likely to have two distinct dimensions. Social support is the extent to which farmers hope to meet others with whom they may socialize during their leisure time and emotional support, which reflects whether individual farmers hope to meet others who may provide them with help and comfort in time of need. We developed a total of nine questions to capture these two dimensions of bonding networks.

### *7.6 Bridging networks*

Bridging networks are believed to be based on developing new social contacts who may be able to provide access to resources that a farmer may need but currently does not have. Access to these resources may allow the farmer to improve their personal or work lives. We have suggested that these bridging networks would consist of two dimensions that include the desire to meet others who have tangible resources (e.g. tools and equipment) and intangible resources (e.g. knowledge and skills) that one may be able to borrow or utilize. Six questions were developed to measure these two distinct dimensions of bridging networks.

### *7.7 Testing the hypotheses*

It is possible that endogeneity may exist if one of our independent variables is correlated with the error term. This may occur because of simultaneity or omitted variables. If ordinary least squares regression is used to estimate models where endogeneity is present, the effort will be inefficient and yield biased coefficients (Heckman, 1979). To remedy model misspecification due to unobserved factors, we employed the Two-stage Least Squares (TSLS) procedure (Newey, 1987). After testing the hypotheses, we conducted a post hoc analysis using hierarchical regression in order to understand how much the social benefit variables contributed to the variation in WTC relative to the variance explained by the economic and control variables.

## 8 Results

### 8.1 Tests for reliability and validity of the measurement scales

The factor analyses and Cronbach's alpha results are presented in Table 1. The four-item WTC scale was factor analyzed and each item loaded on a single factor with factor loading coefficients that ranged from 0.672-0.746. This provides evidence of construct validity using this scale to measure WTC. Cronbach's alpha for this four-item scale was 0.68, which provides evidence of reliability.

Also using factor analysis, we identified a four-item scale for emotional support and a five-item scale for social support. More importantly, we were able to demonstrate discriminant validity between these two similar constructs because they each loaded on a separate factor. This provides support for Hypothesis 1a and suggests that we are measuring two different dimensions of social capital that exist within an individual's

**Table 1.** Results of factor analyses tests for construct and discriminant validity and Cronbach's alpha test for reliability.<sup>1</sup>

Willingness to cooperate (WTC) $\alpha$ =0.68		Economic benefits of cooperation $\alpha$ =0.82	
Question	Factor loading	Question	Factor loading
WTC 1	0.746	Economic benefits 1	0.761
WTC 2	0.739	Economic benefits 2	0.717
WTC 3	0.718	Economic benefits 3	0.700
WTC 4	0.672	Economic benefits 4	0.694
		Economic benefits 5	0.692
		Economic benefits 6	0.686
		Economic benefits 7	0.658
		Economic benefits 8	0.656
<b>Bonding networks</b>			
<b>Emotional support <math>\alpha</math>=0.73 and Social support <math>\alpha</math>=0.67</b>			
Question	Factor loading 1	Factor loading 2	
Emotional 1	0.801	0.196	
Emotional 2	0.774	0.013	
Emotional 3	0.653	0.171	
Emotional 4	0.616	0.349	
Social 1	0.019	0.744	
Social 2	0.170	0.637	
Social 3	0.236	0.599	
Social 4	0.093	0.597	
Social 5	0.191	0.487	
<b>Bridging networks</b>			
<b>Sharing of tangible <math>\alpha</math>=0.69 and intangible resources <math>\alpha</math>=0.68</b>			
Question	Factor loading 1	Factor loading 2	
Tangible 1	0.843	-0.028	
Tangible 2	0.752	0.215	
Tangible 3	0.682	0.246	
Intangible 1	0.062	0.864	
Intangible 2	0.122	0.801	
Intangible 3	0.423	0.591	

<sup>1</sup>  $\alpha$  = Cronbach's alpha

bonding network. Cronbach's alpha for the emotional support and social support dimensions were 0.73 and 0.67 respectively while the nine items loaded on two distinct factors ranging from 0.616-0.801 for the emotional support scales and 0.487-0.744 for the social support scale.

When the six items that were developed to measure bridging networks were factor analyzed, we identified a three-item scale for the sharing of tangible resources and another three-item scale for the sharing of intangible resources. As with the bonding network, these two distinct factor loadings demonstrate discriminant validity and supports Hypothesis 2a, which hypothesized two different dimensions of social capital that exists within an individual's bridging network. The factor loading coefficients ranged from 0.682-0.843 for the tangible dimension and 0.591-0.864 for the intangible dimension. The tests for reliability using Cronbach's alpha were 0.69 and 0.68, respectively.

When the eight questions that were developed to measure two dimensions of the anticipated economic benefits of cooperation (efficiency and effectiveness) were factor analyzed, we were only able to identify a single dimension for this construct. In other words, we do not have empirical support for our conceptualization of a two dimensional construct and Hypothesis 3a is not supported. Instead, all of the scale items loaded on a single factor with the factor loading coefficients ranging from 0.656-0.761. This means that the farmers in our study do not appear to differentiate between the dual economic benefits of increasing revenues and decreasing costs. Thus, we were left with an eight-item scale that measures a single dimension of the economic benefits of cooperation that is a mix between efficiency and effectiveness benefits. Cronbach's alpha was 0.82. All scaled measures were on a 7-point scale (1=strongly disagree; 7=strongly agree).

The means, ranges, standard deviations and Pearson correlation coefficients for all of the variables used in this study and the results of the TSLS regression procedure used to test the hypotheses are presented in Tables 2 and 3. Variance inflation factors (VIF) were used to test the data for multicollinearity and the highest VIF coefficient was 1.758 indicating that multicollinearity was not a problem in the dataset. The overall TSLS model had an F value of 5.213, which was statistically significant ( $P < 0.001$ ) and the  $R^2$  was 0.23. None of the control variables was statistically significant.

Joining a cooperative in hopes of meeting others who may provide social support had a statistically significant ( $P < 0.10$ ) and positive effect on WTC. This finding supports Hypothesis 1b. However, the desire to meet others who could provide emotional support did not have a statistically significant effect on WTC. Thus, Hypothesis 1c was not supported. Together, these findings provide partial support for the theoretical argument that Ugandan farmers are motivated to cooperate in hopes of meeting other farmers who may provide social and emotional support.

The desire to join a cooperative in order to meet other farmers with whom one might share tangible resources had a statistically significant ( $P < 0.01$ ) and positive effect on WTC. This finding supports Hypothesis 2b. The desire to cooperate in hopes of meeting other farmers who are able to provide one with intangible resources also had a statistically significant ( $P < 0.05$ ) and positive effect on WTC, which supports Hypothesis 2c. Together, these findings support the proposition that Ugandan farmers are motivated to cooperate, at least in part, in hopes of meeting other farmers who may be able to help them get ahead by providing both tangible and intangible resources to enhance their farming operation. Finally, joining a cooperative in order to achieve economic benefits did not have a statistically significant on WTC, which fails to support Hypothesis 3b.

The results of the post hoc analysis using hierarchical regression are presented in Table 4. In step one, we added the control variables. This model had an F value of 0.579, which was not statistically significant. The  $R^2$  was 0.02. In step two, we added the economic benefits variable which increased the  $R^2$  by 0.12, which was a statistically significant increase ( $P < 0.001$ ). In the third step all of the social benefits variables were added, which increased  $R^2$  by 0.09, which was a statistically significant increase ( $P < 0.01$ ). We elected to add the economic benefits variable in the second step, even though we knew it would be statistically insignificant in the final analysis in order to test its contribution to explaining WTC in the absence of the social benefits

**Table 2a.** Minimum, maximum, mean and standard deviation.

Variable	Min	Max	Mean	s.d.
Farm size (measured in acres)	1	20	3.32	2.98
Age of the farmer	14	88	46.76	15.62
Household size	2	18	6.94	2.51
Willingness to cooperate	5.00	7.00	6.67	0.28
Economic benefits of cooperation	4.67	7.00	6.45	0.47
Emotional support	5.00	7.00	6.42	0.44
Social support	5.20	7.00	6.43	0.39
Sharing of tangible resources	4.33	7.00	6.30	0.59
Sharing of intangible resources	5.33	7.00	6.58	0.44

**Table 2b.** Pearson product moment correlation coefficients.<sup>1</sup>

	1	2	3	4	5	6	7	8	9
1 Farm size	1.00								
2 Age of the farmer	0.25***								
3 Gender	0.16*	0.28***							
4 Household size	0.02	-0.06	-0.06						
5 Economic benefits	-0.04	-0.06	0.01	0.13 <sup>†</sup>					
6 WTC <sup>2</sup>	-0.01	-0.11	0.03	0.13 <sup>†</sup>	0.45***				
7 Emotional support	0.03	0.01	0.01	0.31***	0.25***	0.25***			
8 Intangible resources	0.02	-0.03	0.12	-0.15*	0.54***	0.38***	0.35***		
9 Tangible resources	0.03	-0.08	0.07	0.02	0.52***	0.46***	0.34***	0.39***	
10 Social support	0.03	-0.02	0.09	-0.16*	0.46***	0.39***	0.43***	0.54***	0.56***

<sup>1</sup> <sup>†</sup> =  $P < 0.10$ ; \* =  $P < 0.05$ ; \*\* =  $P < 0.01$ ; \*\*\* =  $P < 0.001$ .

<sup>2</sup> WTC = Willingness to cooperate.

**Table 3.** Results of two-stage least squares regression analysis predicting willingness to cooperate.<sup>1</sup>

Independent variables	$\beta$ estimate
Constant	3.598***
Farm size	-0.001
Age of the farmer	-0.002
Gender	0.010
Household size	0.015
Economic benefits	0.081
Emotional support	0.021
Social Support	0.086 <sup>†</sup>
Sharing tangible resources	0.152**
Sharing intangible resources	0.135*
F	5.213***
R <sup>2</sup>	0.23

<sup>1</sup> <sup>†</sup> =  $P < 0.10$ ; \* =  $P < 0.05$ ; \*\* =  $P < 0.01$ ; \*\*\* =  $P < 0.001$ .

**Table 4.** Results of hierarchical regression analyses testing the effects of social capital and economic benefits on willingness to cooperate.<sup>1</sup>

	Independent variables	$\beta$ estimate
Step 1	Constant	6.685***
	Farm size	0.000
	Age of the farmer	-0.002
	Gender	0.038
	Household size	0.014
	F	0.579
	R <sup>2</sup>	0.02
Step 2	Constant	4.890***
	Economic benefits	0.281***
	F	5.191***
	R <sup>2</sup> change	0.12***
	Total R <sup>2</sup>	0.14
Step 3	Constant	3.598***
	Economic benefits	0.081
	Emotional support	0.021
	Social support	0.086 <sup>†</sup>
	Sharing tangible resources	0.152**
	Sharing intangible resources	0.135*
	F	5.213***
	R <sup>2</sup> change	0.09**
	Total R <sup>2</sup>	0.23

<sup>†</sup>  $\dagger = P < 0.10$ ; \* =  $P < 0.05$ ; \*\* =  $P < 0.001$ ; \*\*\* =  $P < 0.001$ .

variables. If the social benefits variables had been added in the second step, they would have increased the R<sup>2</sup> by 0.21 and the economic benefits (added in the third step) would have had no additional explanatory power. In other words, the anticipated economic benefits of cooperation alone explain about 12% of the variation in WTC but in the presence of the expected social benefits of cooperation the anticipated economic benefits explained zero. All of this suggests that the expected social benefits from participating in a proposed new agricultural cooperative account for almost all of the variation in Ugandan farmers' WTC and in the presence of these social benefits the economic benefits are not statistically significant.

## 9. Conclusions and recommendations

This research suggests that the expected social benefits associated with participating in a proposed new agricultural cooperative play a significant role in determining Ugandan farmers' WTC. It appears farmers may be motivated to join an agricultural cooperative, at least in part, in an effort to build social capital that they currently do not have by interacting with other farmers. Further, among the farmers in our sample, the potential economic benefits of cooperation appear insignificant in the presence of the potential social benefits.

From these social interactions, farmers in our study hope to create bonding networks that have two dimensions: emotional support, which is the desire to meet others who can provide help and comfort in time of need and social support, which is the desire to meet others with whom one can socialize during leisure time. Even though the emotional support dimension did not have a statistically significant effect on WTC, finding support for the social support dimension and construct and discriminant validity for the two measurement scales are important new findings. Regarding the lack of the support for the emotional support dimension, one reasonable explanation is that the farmers in our study are meeting their emotional support needs in other group activities.

The social interactions that farmers in our study hoped to achieve by joining a proposed cooperative also led to the creation of bridging networks, which had two dimensions: the desire to meet other people who have needed tangible resources, such as tools and equipment, and intangible resources, such as knowledge and skills (Galunic *et al.*, 2012). Again, we found evidence of construct and discriminant validity of the measurement scales used to capture these two dimensions of bridging networks.

Our discovery of these four distinct dimensions of social capital has important managerial implications for the operation of cooperatives in Uganda. Emotional and social support will likely develop over time as cooperative members are placed in social settings with each other. While these social settings may include gatherings in which members simply relax, enjoy the company of each other and perhaps share a meal together, they may also include gatherings that provide formal seminars on topics of interest to members that are unrelated to farming activities (such as health and wellness seminars).

Ugandan farmers also appear interested in meeting others with whom they can share both tangible and intangible farm-related resources. This suggests that cooperative managers should consider organizing formal seminars in which people who cooperative members perceive as experts offer advice, guidance and share know-how on a variety of farm-related topics. Managers should also consider developing a formal system that enables farmers to share tangible resources with each other. Perhaps a 'resource bank' of some sort could be established where tools, equipment and other resources could be 'deposited' and then 'borrowed' by cooperative members.

A better understanding of Ugandan farmers' views regarding the economic benefits that should accrue to them from cooperation presents an interesting topic for future research. Consistent with classical economic theory, we attempted to develop measures of two separate dimensions of the economic benefits of cooperation: lowering costs (efficiency) and maximizing revenues (effectiveness). However, results from our study suggest that farmers view the potential economic benefits of cooperation as only having one dimension, which appears to represent a mix of both efficiency and effectiveness goals. Perhaps these farmers do not view their farming activities as a typical business model in which managers attempt to maximize revenues and minimize costs. Despite their many years of farming experience, discussions suggest that farmers do not see farming as a business activity where the goal is higher income for the household. Discussions further suggest they may be engaged largely in subsistence farming because they are not employed elsewhere. There were also indications that any surplus was sometimes used to barter for other goods or services. Future research should continue to identify measures that will fully capture the theorized economic benefits of maximizing revenues (effectiveness) and minimizing costs (efficiency) to better understand how this may impact motivations to cooperate.

## Acknowledgements

This study was made possible by the generous support of the American people through the United States Agency for International Development (USAID). The contents are the responsibility of Global Communities and Dr. J.L. Morrow, Jr. and do not necessarily reflect the views of USAID or the United States Government. The Joseph S. Bruno Endowed Fund at Birmingham-Southern College also contributed funds for this research. The authors would like to thank Cara Bidwell, Chris Ibyisintabyo, Richard Mumuni and Annet Tumwesige for their assistance with this research study.

## Supplementary material

Supplementary material can be found online at <https://doi.org/10.22434/IFAMR2014.0181>.

## Methods S1. Measurements scales.

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### **Cooperation among Ugandan farmers: cultivating social capital**

J.L. Morrow Jr.<sup>Ⓐ</sup>, Richard Patrick Joyce III<sup>ᵇ</sup>, William J. McMahon<sup>ᵇ</sup>, Antonio M. DeMaia<sup>ᵇ</sup>, S. Caleb McVicker<sup>ᵇ</sup>, Ashley E. Parsons<sup>ᵇ</sup>, and Kristin Wilcox<sup>ᶜ</sup>

*<sup>ᵃ</sup>Associate Professor of Business Administration, and <sup>ᵇ</sup>Research Assistant, Department of Business and Accounting, Birmingham-Southern College, 900 Arkadelphia Road, P.O. Box 549023, Birmingham, AL 35254, USA*

*<sup>ᶜ</sup>Technical Specialist, Food Security and Cooperatives, Global Communities, 8601 Georgia Avenue, Suite 300, Silver Spring, MD 20910-3440, USA*

*<sup>Ⓐ</sup>Corresponding author: [bmorrow@bsc.edu](mailto:bmorrow@bsc.edu)*

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## **Methods S1. Measurements scales.**

All scaled measures were on a 7-point scale (1=strong disagree; 7=strongly agree)

### **Willingness to cooperate (WTC)**

1. I am willing to join a new farmer cooperative.
2. I am willing to support a new farmer cooperative.
3. I am willing to participate in a new farmer cooperative.
4. I am willing to ask other farmers to join a new farmer cooperative.

### **Emotional support**

1. I am interested in finding group members who will console me when I am upset.
2. I would like to meet other group members who will help me feel better when I am tense or under pressure.
3. I would like to meet other group members who will help me feel better when I am sad or depressed.
4. I hope that my group membership will enable me to meet someone who will care about me during difficult times.

### **Social support**

1. I hope to experience feelings of closeness or togetherness by being around other people in this group.
2. I expect to experience enjoyment when I get encouragement from other members of this group.
3. I hope that my membership in this group will allow me to spend time with other members.
4. I will enjoy making new friends by joining this group.
5. I would enjoy doing things with other group members outside of our normal group activities.

### **Sharing of intangible resources**

1. I hope to meet other farmers in this group who can offer me useful advice.
2. I hope my group membership would allow me to meet other farmers who can help make me a better farmer.
3. I would like to meet other farmers in this group who have information about farming that I do not have.

### **Sharing of tangible resources**

1. I hope to find others in this group who will help me when I need another worker.
2. After joining this group, I hope to meet others who can help me with my farm.
3. I hope to find others in this group who will lend me resources that I do not have.

**Economic benefits of cooperation**

1. Being a member of an agricultural oriented group might help lower the cost of supplies that I need.
2. Being a member of an agricultural oriented group might make it easier to sell the crops that I grow.
3. Being a member of an agricultural oriented group might help me increase the price that I get for my crops.
4. Being a member of an agricultural oriented group might help make it easier to acquire the supplies that I need.
5. Being a member of an agricultural oriented group might help me find more people to trade with.
6. Being a member of an agricultural oriented group might reduce the amount of time that it takes me to acquire the supplies that I need.
7. Being a member of an agricultural oriented group might help me find new markets for the crops that I grow.
8. Being a member of an agricultural oriented group might give me greater access to the resources/inputs that I need.