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Benefits and pitfalls of social capital for farmer cooperatives: evidence from China

RESEARCH ARTICLE

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Abstract

This paper conducts an exploratory analysis on the role of social capital in influencing both economic and social performance of farmer cooperatives based on a sample of 156 farmers from 54 vegetable cooperatives in China's Hebei and Zhejiang provinces. Social capital is distinguished into bonding and bridging dimensions, with the former referring to the internal aspect of social capital and the latter the external "*Guanxi*" (meaning relationship) possessed by core members. The statistical results display that specific dimensions of social capital may not deliver the benefits expected by cooperative practitioners and academics. Both positive and negative effects of social capital on performances of farmer cooperatives are observed. To be specific, bonding social capital is positively associated with common members' economic benefits. Bridging social capital generates beneficial outcomes for the financial and social performances of cooperatives, while exhibiting negative influence on common members' income increase because of member heterogeneity.

Keywords: farmer cooperative, social capital, benefits, pitfalls
JEL code: Q13

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1. Introduction

Rural areas in developing countries are characterized by several features challenging to economic growth, including poor infrastructure, physical distance to end market, technical incapability and relatively low education level of farmers. Numerous studies reveal that farmers could overcome these constrains by organizing themselves into cooperatives and acting collectively (Bernard *et al.*, 2008; Staatz, 1987). A cooperative is defined by Dunn (1988) as 'a user-owned and controlled business form which benefits are derived and distributed on the basis of use'. The main activities of a farmer cooperative are providing technique services for members, bargaining for better prices, selling members' products, and so on (Feng and Hendrikse, 2012). These activities benefits members by economic scale, risk reduction, the establishment of countervailing power, value added from processing, auxiliary services for members, and assurance of product outlet, etc. (Cook, 1995; Ito *et al.*, 2012; Yang *et al.*, 2013).

In addition to the economic functions mentioned above, many cooperatives act similarly to associations and provide services such as speaking with the governments as representatives of farmers, reduce the problems of the feminization and ageing of the agricultural workforce, and so on (Liang and Hendrikse, 2013; Song and Vernooy, 2010). This diversity of the roles adds to even more importance of cooperatives in the social and economic development in agriculture.

However, the collective ownership and decision-making process of cooperatives tend to result in high governance costs. Just as Valentinov (2004) puts that, cooperatives are social capital-based organizations due to the high involvement and interaction among members during decision making. Social capital, facilitating cooperation and information exchange, has a special role in cooperatives. Social capital is broadly defined as a valuable asset based on inter-personal social relationship (Adler and Kwon, 2002).

Cooperatives in China have a couple of distinguished features from those in the western world. One feature lies in *Guanxi* culture, the Chinese form of relationship management (Jia and Zsidisin, 2014). It refers to the relation mechanism bonding exchange partners and is the major informal institution in China, which makes social capital even more important in Chinese cooperatives (Jia and Zsidisin, 2014; Liang *et al.*, 2015a). People use their "*Guanxi*" to facilitate activities such as transactions in business and acquirement of resources. Farmer cooperatives in China are usually small and embedded in local villages, thus, the "*Guanxi*" may on the one hand benefit communication and on the other hand hinder external resources (Liang and Hendrikse, 2013).

The other is the heterogeneity of members in cooperatives. The distinction of core and common members is recognized, with the former dominant in both control and income rights while the latter specializes in production but hardly takes part in decision making (Liang *et al.*, 2015b). The heterogeneity of the membership, on the one hand, requires a higher demand of social capital to coordinate between alternative groups of members; whereas, on the other hand, it may cause benefits brought by the social capital unevenly allocated between core and common members.

This paper, therefore, distinguishes different dimensions of social capital for both core and common members, investigated the benefits and pitfalls of various social capital components for the economic and non-economic performances in Chinese cooperative context. There are several ways to position this research in the literature of social capital and cooperative. First, this paper is among the first to incorporate the diverse compositions of social capital possessed by different types of members, i.e. core and common members, in cooperatives. Although the research in social capital of cooperatives is growing, most studies focus on part or specific aspects of social capital. Second, this paper provides s special interest to the pitfalls of social capital, beyond its benefits. The benefits of social capital are broadly investigated in the previous research, yet little attention is given to the pitfalls of social capital. Third, this paper attempts to address the multiple performances of cooperatives. Since a cooperative has simultaneous economic and non-economic objectives, it should not be studied from the perspective of one or the other in isolation.

The rest of the paper is organized in the following way. Theories with regard to social capital and cooperative performance are addressed in Section 2. Section 3 is dedicated to the methodology, while the results are presented in Section 4 and followed by a discussion in Section 5. Section 6 concludes.

2 Social capital and farmer cooperatives

This section defines social capital and identifies its composition (2.1) and analyses the benefits and pitfalls of social capital (2.2 and 2.3). A review of the literature regarding social capital in farmer cooperative is provided in Section 2.4.

2.1 Definition and composition of social capital

The study of social capital initiated in the macro level and has been applied in the micro level in the last decade. Social capital is defined and studied in multiple disciplines such as political economics, sociology, organizational economics, business management, and so on. From the perspective of analytical levels, social capital has been investigated ranging from the region and nation level social capital (Knack and Keefer, 1997; Malecki, 2012; Putnam, 1995) to communities (Cooke *et al.*, 2005; Hayami, 2009), organizations including firms (Arregle *et al.*, 2007; Belliveau *et al.*, 1996; Cooke and Wills, 1999; Liang *et al.*, 2015a; Nahapiet and Ghoshal, 1998), and even families and individuals (Pearson *et al.*, 2008; Westlund and Gawell, 2012). Its definition therefore varies broadly across different domains and analytical levels. For example, social capital at the individual level is defined by Burt (1992) as "friends, colleagues, and more general contacts through whom you receive opportunities to use your financial and human capital", while Putnam (1995) defines macro-level social capital as "networks, norms, and social trust that facilitate coordination and cooperation for mutual benefits." At the organizational level, "social capital is the goodwill available to individuals or groups. Its source lies in the structure and content of the actor's social relations" (Adler and Kwon, 2002). Hence, it is a jointly owned good as opposed to individually possessed financial or human capital.

Due to the complexity of social capital, ingredients of social capital are demonstrated to make it more understandable and measurable. There are two ways commonly adopted to recognize the ingredients of social capital in business and management studies at the organizational level. One is illustrated by Tsai and Ghoshal (1998) who recognize three dimensions of social capital, i.e. structural, relational, and cognitive dimensions of social capital. The structural social capital pertains to the social networks or social interactions of an organization that can be used to access resources or facilitate transactions. The relational social capital refers to the trust as well as trustworthiness that are embedded in the organization or among its members. The cognitive social capital addresses the shared vision among members of an organization that contributes to collective orientation and action.

The distinction between bridging and bonding social capital, also known as external and internal social capital, is adopted by many scholars as well. Bridging social capital is the external relations with heterogeneous groups, while bonding social capital refers to the ties among members within a group or an organization (Adler and Kwon, 2002). The distinction of bridging and bonding social capital is relative and not fixed. For example, a firm's linkages with other firms in the market are considered to be bridging social capital from the perspective of firm employees, whereas they are regarded as bonding social capital if firm communities or institutions are the unit of analysis. This paper adopts the view of bridging and bonding social capital.

2.2 Benefits of social capital in organizations

One of the sources of an organization's competitive advantage resides in social capital. Intra-organizational bridging social capital facilitates information exchange and resource flow, saves transaction costs, and motivates product innovation (Knack and Keefer, 1997; Pennings *et al.*, 1998; Robison *et al.*, 2002; Schiele *et al.*, 2015). To put it in another way, it reduces the risk of opportunism and maintains smooth cooperation

(Lins *et al.*, 2017; Raub and Weessie 1990). As Nahapiet and Ghoshal (1998:252) stress, the information one possesses determines the resources available.

Bonding social capital within organizations positively influences the intellectual capital creation, commitment justification, and work flexibility (Nahapiet and Ghoshal, 1998; Pearson *et al.*, 2008). The productive potential of social capital lies in its ability to promote the building of human capital or intellectual capital (Florin *et al.*, 2003; Semrau and Hopp, 2016). Ties among organization members can facilitate coordination of tasks and overcome the dilemmas of cooperation (Gargiulo and Benassi, 2000). Edelman *et al.* (2004) express a similar view, arguing that social capital can give members a sense of cohesion and identity. Members therefore tend to be committed to the organization featured by a high level of social capital. In addition, fewer contracts are needed to maintain the cooperation and there is more flexibility.

2.3 Pitfalls of social capital in organizations

Besides the more-is-better argument, drawbacks of social capital for organizations are noticed by a few scholars as well. Adler and Kwon (2002) indicate that social capital is beneficial and concurrently detrimental. The disadvantages of using social capital lie in three dimensions of risks. First, over-investment in creating and maintaining social capital may happen if a firm is over-committed to some relationships. The creation of social capital may also exert excessive claims on successful members by others within a network (Portes, 2014). Hence, social capital investment may be cost inefficient, since it is costly to maintain some ties. In addition, Hanses (1993) finds that it takes longer for project teams strongly tied, compared to relatively weakly tied, with others to complete a task.

Second, the exclusionary effects of close networks result in the localization of ties and limit the diversity of networks. The strong identification of members in a network causes the fragmentation of the whole and consequently results in dependence-oriented culture (Eklinder-Frick *et al.*, 2011, 2012) and low efficiency of information exchange. Opportunities of broader collaboration may be missed as well. Granovetter (1985) and Gargiulo and Benassi (2000) stresses that strongly tied links between traders cause relation closure and little autonomy to negotiate. Such links hinder, rather than help, organization performance. Conversely, those who are not engaged in strongly linked social networks have more opportunities to look for traders or pursue more favorable terms. For one thing, the inflow of information may be hampered by the closure. Locke *et al.* (1999) recognizes the danger of utilizing social capital, such as the loss of useful information and communication with stakeholders outside the network. He stresses that "strong personal bonds between executives can facilitate communication between those executives but, for the same reason, can isolate those who do not have such bonds." For another thing, possible downsides of social capital also lie in the negative externalities, i.e. closure of the network hampers the outflow of valuable information to broader stakeholders (Adler and Kwon, 2002).

Third, the solidarity benefits of social capital may hinder the generation of new ideas and innovation in firms. The membership in some network simultaneously causes exclusion of new knowledge from other sources and impedes the adoption of innovations (Edelman *et al.*, 2004; Portes and Sensenbrenner, 1993; Weber and Weber, 2011). Over-embeddedness in communities or networks can result in inertia in adopting or creating novel ideas (Gargiulo and Bernassi, 1999). Besides, social capital in closely tied networks may cause free-riding problems and hinder entrepreneurial ideas (Portes, 2014). These potential pitfalls of social capital may result in negative consequence of performance.

2.4 Social capital in farmer cooperatives

In spite of the broad investigation of social capital in firms, corresponding research for cooperatives is relatively limited. Exceptions are Valentinov (2004), Nilsson *et al.*, 2012; Ruben and Heras (2012), and Liang *et al.* (2015a). Valentinov (2004) is the first to define and demonstrate the role of social capital in cooperatives. Nilsson *et al.* (2012) argue that cooperatives are losing social capital because of their economic orientation.

A few studies based on data from different sectors and countries/regions also confirm the positive impact of social capital on economic performance of cooperatives. Ruben and Heras (2012) and Liang *et al.* (2015a) investigate the role of social capital based on empirical evidence from Ethiopian coffee cooperatives and Chinese vegetable & fruit cooperatives, respectively.

A cooperative is an entity based on vertical integration of a heterogeneous membership. Social capital possessed by different groups of members might be different. Core members in a Chinese cooperative use their external "*Guanxi*" to seek for better market opportunities and obtain resources from the government, and meanwhile coordinate members to provide qualified products (Liang and Hendrikse, 2013). Common members exchange information with managers and other members of the cooperative, but have little "*Guanxi*" for external resources (Liang *et al.*, 2015a). A thorough study on various aspects of social capital possessed by alternative groups of members in farmer cooperatives, and both the positive and negative effects of these social capital components is desirable.

3. Methodology

This section delineates the sample used in the statistical analysis, illustrates the measurement of dependent, independent, and control variables, and establishes the statistical model.

3.1 Sample

Cooperatives in China mostly emerged in 2000s and have been experiencing a rapid growth since 2007 in which year the national Cooperative Law was promulgated. There were 26,400 farmer cooperatives in 2007 and the number increased to 1.93 million by the end of July 2017.[1] We limit the population to vegetable cooperatives to control for the heterogeneity of cooperatives related to products. The communication and relationships between members, and between managers and external stakeholders in production and marketing vary among different sectors due to product attributes, which results in different stocks of social capital in cooperatives. Performance of cooperatives is largely dependent on the product as well. Vegetable cooperatives in China provides members with inputs and technology services, collect products from farmers, and deliver to wholesale markets, retailers, or directly to consumers. Some cooperatives additionally conduct first-stage processing, such as grading and packing, and/or secondary processing. They are supposed to have advantages in vertical integration, quality enhancement, and value adding.

A multistage sampling procedure is used to choose cooperatives to be surveyed. First, we purposely selected Hebei and Zhejiang provinces as the sampling areas based on the production intensity and target markets. Hebei is one of the largest provinces in terms of vegetable production.[2] Zhejiang is the main vegetable producing area for the Yangtze River Delta region of China. Farmer cooperatives play a key role in helping farmers sell vegetables to the market in these two provinces. There were 13,622 vegetable cooperatives in Hebei and 6,113 in Zhejiang, both of which are among the largest provinces in terms of the vegetable cooperative quantity. Furthermore, the market environment and value chain assignment of the two provinces are different (Huang *et al.,* 2008), which may have influence on both social capital and its role on the performance of cooperatives.

In the second stage, a pre-investigation of vegetable cooperatives was conducted in Hebei and Zhejiang in August, 2014. Face-to-face interviews were done with officials from various governmental departments responsible for the regulation of the vegetable sector to obtain an overview of vegetable production and marketing in the local province. We then visited a few vegetable cooperatives and interviewed both chairpersons

[1] The data were collected from the official website of the State Administration for Industry and Commerce which organization existed before March 2018 and then was merged with part of the department from the other two governmental organizations, i.e. State Administration for Quality Supervision and Inspection and Quarantine and China Food and Drug Administration, and formed a new organization named State Administration for Market Regulation. The data can be accessed via the link: http://samr.saic.gov.cn.

[2] Data source: Hebei Rural Statistics Yearbook 2014. China Statistics Press, 2015.

and members to pre-test the structured questionnaires. The questionnaires were revised for several times based on multiple pre-tests. Based on respondents' feedback, we choose items which are understandable and highly responded.

Third, twelve prefectures in Hebei and Zhejiang were chosen according to the production intensity and vegetable varieties. The formal survey was carried out during July to September, 2015. We randomly chose 57 villages having vegetable cooperatives and surveyed a vegetable cooperative in each of the villages. For each cooperative, we first interviewed the chairperson, using the structured questionnaire, to obtain organizational level data; and then we surveyed three to four common members from each cooperative to collect individual level data and confirm the reliability of chairperson's answers. Both chairpersons and members were interviewed face-to-face privately between the interviewee and interviewer, either at the cooperative office or a member's farm. Three cooperative questionnaires and quite a few member questionnaires were abandoned due to the lack of important information. We finally obtained a database consisting of 156 farmers from 54 cooperatives.

3.2 Measure

- *Performance*

Unlike for-profit firms which pursue only financial goals, cooperatives have dual attributes comprised of an economic attribute and a social attribute. Both economic benefits and non-economic purposes such as social evaluation are objectives of cooperatives. However, researchers tend to neglect the non-economic dimension, because of the difficulty in measuring the latter or the unavailability of data. We adopt a more inclusive approach developed in Franken and Cook (2015) to evaluate cooperative performance in terms of multiple facets.

Cooperatives' economic performance could be integrally evaluated at both the member level and organizational level. The former is measured by members' evaluation on the increase of agricultural income due to the membership. We choose this indicator rather than farmers' factual income for two reasons. First, cooperatives play a more significant role in increasing the income of low income farmers than high income farmers (Markelova *et al.*, 2009). Low income members are more dependent on cooperatives due to the less professional production and weaker position in the market. If we use the members' income, it may underestimate cooperatives' influence in increasing smaller farmers' income. Second, members' unobservable characteristics may cause endogeneity and simultaneous causality problem between income and social capital. We cannot control this problem with the cross-sectional data from the survey. Therefore, members' subjective evaluation on the income increase after they join the cooperative would be a better indicator to measure the cooperatives' economic performance at the member level. The organizational level economic performance is measured by cooperatives' net profit last year.

Cooperatives' social performance is measured by the cooperatives' identity rating, which is awarded by the authority. When grading the identity of a farmer cooperative, the authority evaluates mainly the following facets: (1) the capability of serving members as well as local non-member farmers; (2) normative management as a cooperative; (3) standardized production and food safety control; (4) brand construction and certificates of green and organic products; (5) access to broad market and decreasing the local price fluctuation. Identity rating is a comprehensive index indicating the social influence and the social image of a farmer cooperative to its stakeholders. Due to the formal publication of the list of demonstration cooperatives every year by the government, it is regarded as an effective indicator of cooperatives' social contributions. There are five levels of identity rating, the state, provincial, prefectural, county level demonstration cooperatives, and common cooperatives. The five facets of identity rating the authority uses may be correlated to the scale and revenue of cooperative and influence members' income, thus we need checking the correlation problem among the three performance indicators before doing regression. The statistic result shows that there is no significant relationship among them.

To sum up, three performance indicators are taken as dependent variables. They are members' evaluation on agricultural income increase, cooperatives' net profit, and cooperatives' identity rating, among which the former two representing economic and the third representing social performances of cooperatives. The definition of each variable is presented in Table 1.

Table 1. Variable and items defining and measurement.

Variable	Definition	Measurement
Income increase	Members' income increased due to the membership of the cooperative	Very small 1 2 3 4 5 Very large
Net profit	The cooperative's net profit last year	10,000 yuan
Identity rating	The cooperative's identity rank	1=Common cooperative 2=County-level demonstration cooperative 3=Prefectural demonstration cooperative 4=Provincial demonstration cooperative 5=National demonstration cooperative
Info_share_1	Members frequently share technical or market information with others	Disagree 1 2 3 4 5 Agree
Info_share_2	The cooperative frequently organizes technical training meetings	Disagree 1 2 3 4 5 Agree
Info_share_3	It is easy to get the market or technical information	Disagree 1 2 3 4 5 Agree
Info_share_individual	The mean value of info_share_1, info_share_2 and info_share_3	
Info_share_cooperative	The mean value of info_share_individual within the cooperative	
Trust_1	I believe the chairperson always takes members' benefits into consideration	Disagree 1 2 3 4 5 Agree
Trust_2	I believe the chairperson does not doubt my loyalty and commitment	Disagree 1 2 3 4 5 Agree
Trust_3	The chairperson and I trust each other	Disagree 1 2 3 4 5 Agree
Trust_4	Members trust each other	Disagree 1 2 3 4 5 Agree
Trust_individual	The mean value of trust_1, trust_2, trust_3 and trust_4	
Trust_cooperative	The mean value of trust_indivudual within the cooperative	
Goal_1	I know the common goal of our cooperative	Disagree 1 2 3 4 5 Agree
Goal_2	All the members fight for the common goal	Disagree 1 2 3 4 5 Agree
Goal_individual	The mean value of goal_1 and goal_2	
Goal_cooperative	The mean value of goal_individual within the cooperative	
Supplier	The number of linked suppliers by the chairperson	
Buyer	The number of linked buyers by the chairperson	
Bank staffs	The number of linked financial employees by the chairperson	
Government	The chairperson's closeness with the government	Distant 1 2 3 4 5 Very close
Location	Province where the cooperative is located	1=Zhejiang, 0=Hebei

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Table 1. Continued.

Variable	Definition	Measurement
Coop age	The age of cooperative	Years
Membersize	Total number of members	Number of members
Decision_making	Decision making right in general meeting is based on one-person-one-vote	1=One person one vote, 0=One share one vote or hybrid rule
Chair_ age	Age of the chairperson	Years
Chair_edu	Education level of the chairperson	1=Illiteracy 2=Primary level 3=Junior high school level 4=Senior high school level 5=College level and above
Member_age	Age of the member	Years
Member_edu	Education level of the member	1=Illiteracy 2=Primary level 3=Junior high school level 4=Senior high school level 5=College level and above
Mem_veg_year	Members' vegetable planting experience	Years

■ *Social capital*

Due to the complexity of social capital, we subdivide bonding and bridging social capitals into more detailed ingredients based on the literature review, so as to develop a more comprehensive explanation for both the pros and cons of social capital.

Bonding social capital is the ties among members within a cooperative. It binds members and makes collective action function in the form of a sense of information and knowledge exchange (Gargiulo and Benassi, 2000), trust (Cohen and Prusak, 2001), and cohesion and shared value (Edelman *et al.*, 2004). Hence, three variables, information sharing, trust, common goal are developed to measuring the bonding social capital. As all of these variables are subjective, we use a Likert Five-Point Scale to measure them. Each variable is indicated by three to four items in the questionnaire for members, all of which are presented in Table 1. We check the reliability, unidimensionality and validity of these items. Factor analysis shows that items indicating the same variable have been loaded in the same dimension with high loading. However, one item of common goal has a cross-loading problem. We therefore drop it and have two items to score the common goal. Other items are unidimensional with high validity. The reliability test shows that Cronbach's alpha of information sharing, trust, and common goal are respectively 0.678, 0.812, and 0.824, implying a high reliability of all the three variables. Based on these tests, we average respondent's scores for the items indicating the same variable and get three scores, i.e. information sharing, trust, and common goal at the member level. Then, we test the interrater reliability and interrater agreement of them. ICC (1)s (reliability of score within group) are over 0.3, and ICC (2) (reliability of mean group score) of the three average scores are over 0.7, both of which meet the requirement of variables in the organizational research. Sequentially, we compute the mean of members' scores for each variable to obtain the organizational level score. Scores of the three bonding social capital variables at the organizational level are finally obtained.

Bridging social capital captures the intra-organization relationships, so it is explicitly specified by core members' "*Guanxi*" with external stakeholders (Leana and Pil, 2006). External stakeholders of farmer cooperatives are upstream inputs suppliers, downstream products buyers, banks, and the government. We develop four variables to measure cooperatives' bridging social capital. They are the number of tied suppliers, tied buyers and tied bank staffs, and the closeness of the "*Guanxi*" with the government that core members

have. Generally, bridging social capital is held by top managers (Leana and Pil, 2006). The cooperative's chairperson is the key person who connects the organization and the outside stakeholders, hence, indicators of bridging social capital are specified by chairpersons' links with the four types of stakeholders.

■ *Control variables*

Cooperatives' characteristics, such as location, age, size, governance factors, and managerial factors are also associated with the success and performance of the cooperative (Banaszak, 2008; Dejene and Regasa, 2015; Liang *et al.*, 2015a; Sexton and Iskow, 1988). Regional differences are represented by the dummy province. Governance factors are specified by the decision-making rights distribution. We use a dummy variable to represent alternative decision-making rules in the general meeting, one-person-one-vote, or otherwise. Managerial factors contain chairpersons' age and education. Farmers' demographic characteristics like their age, education and vegetable planting experience may influence members' income. A multicollinearity check for the controlling variables has been conducted before the estimation of regression model. No multicollinearity problem is found.

3.3 Model

Income increased, among the three performance indicators, is a member level indicator, while the cooperative's social capital is the organizational level variable. In order to capture the dependency of members within the cooperative and separate its influence from individual factors, we adopt the two-level hierarchical Linear Model (HLM). HLM is an appropriate method to analyze the cross-level data, for example, farmers embedded in cooperatives.

The other two performance indicators, net profit and identity rating, are measured at the organizational level. The effect of net profit on social capital is estimated by Ordinary Least Squares Regression, while that of identity rating on social capital is calculated by Ordered Probit Regression.

4. Results

Table 2 displays the descriptive statistics of each variable, including the mean, minimum, maximum, and standard deviation values. The distribution range of both cooperatives' net profit, members' income increased and cooperatives' identity rating covers a broad scope. Information sharing within cooperative is 3.71, which is a little higher than the medium. Trust within the cooperative is 4.24, which is high compared with other bonding social capital indicators. Awareness of the common goals of their cooperatives is scored at 3.61. Cooperatives have 3.17 linked suppliers, 9.78 linked buyers, and 1.37 linked persons working in banks on average. Cooperative chairpersons' closeness with the government is evaluated by 3.67, representing a relatively high level of closeness between chairpersons and the government.

Table 3 displays the influences of social capital on cooperative performance. The statistical results demonstrate that specific dimensions of social capital may not deliver the benefits expected by cooperative practitioners and academics. First, both positive and negative effects of social capital on performances of farmer cooperatives are observed. Bonding social capital has significantly positive effects on common members' income increase and the cooperative's identity rating. Some bridging social capital indicators are negatively correlated with common members' income increase, while some are positively with the net profit and identity rating of cooperatives. Second, bonding social capital plays a more important role in common members' economic benefits, while bridging social capital is more helpful in organizational economic and social performance.

Among cooperative characteristics, the location influences the economic performance. Cooperatives located in Heibei have higher net profit than cooperative in Zhejiang. Cooperatives with a longer history basically perform better than the younger peers in increasing members' income and identity rating. Cooperatives with larger membership sizes obtain higher identity ratings. Cooperatives adopting "one person one vote"

Table 2. Descriptive statistics of variables.

	Variable	Mean	S.D.	Min	Max
Performance variables	Income increased	3.34	1.308	1	5
	Net profit	92.06	160.56	-200	700
	Identity rating	3.30	1.297	1	5
Social capital variables	Info_share_cooperative	3.71	0.667	1.83	4.78
	Trust_cooperative	4.24	0.55	2.63	5
	Goal_cooperative	3.61	0.792	1.33	4.67
	Supplier	3.17	3.994	0	30
	Buyer	9.78	15.953	0	100
	Bank staffs	1.37	1.570	0	6
	Government	3.67	1.303	1	5
Control variables	Location	0.65	0.482	0	1
	Cooperative age	8.41	3.300	3	16
	Membersize	114.61	199.993	5	1,318
	Decision_making	0.52	0.504	0	1
	Chair_ age	47.22	7.654	30	62
	Chair_edu	3.85	0.899	1	5
	Member_age	48.63	10.216	25	78
	Member_edu	2.93	0.828	1	5
	Mem_veg_year	14.53	10.699	0	50

Table 3. The influences of social capital on cooperative performance.[1]

Variables	(1) Income increase		(2) Net profit		(3) Identity rating	
	Coefficient	S.E.	Coefficient	S.E.	Coefficient	S.E.
Bonding social capital						
Info_aggregate	0.384** (3.27)	0.0987	-14.690 (-0.40)	36.6259	-0.193 (-0.52)	0.3704
Trust_aggregate	0.368** (2.70)	0.1360	7.911 (0.19)	42.2941	-0.330 (-0.80)	0.4142
Goal_aggregate	0.205* (2.08)	0.1175	-29.220 (-1.31)	22.2901	0.717** (2.95)	0.2344
Bridging social capital						
Supplier	-0.023 (-0.88)	0.0261	2.457 (0.56)	4.3636	-0.045 (-0.91)	0.0450
Buyer	-0.015* (-2.33)	0.0066	0.633 (0.57)	1.1145	0.021 (1.87) ***	0.0112
Bank staffs	0.046 (0.67)	0.0683	34.980** (2.95)	11.8445	0.210 (1.48)	0.1416
Government	0.104 (1.23)	0.0840	37.870* (2.70)	14.0334	0.791*** (4.39)	0.1799
Control variables						
Location	-0.360 (-1.21)	0.2990	-146.200** (-2.85)	6.5482	-0.293 (-0.57)	0.5164
Coop_age	0.078* (1.96)	0.0407	-5.116 (-0.78)	0.0911	0.126 (1.79) ***	0.0703
Member_size	0.0001 (0.22)	0.0005	-0.003 (-0.03)	37.3385	0.003** (2.60)	0.0010
Decisionmaking	-0.195 (-0.90)	0.2156	44.96 (1.20)	2.4417	-1.098** (-2.73)	0.4016
Mana_age	-0.016 (-1.08)	0.0147	5.303* (2.17)	23.0782	-0.010 (-0.38)	0.0252
Mana_edu	-0.345** (-2.61)	0.1323	-5.385 (-0.23)	51.2336	0.391 (1.67) ***	0.2345
Mem_age	0.011 (1.09)	0.0104				
Mem_edu	0.208 (1.78)	0.1173				
Mem_veg_year	-0.011 (-1.23)	0.0092				
Level 1 number of observations		156				
Level 2 number of observations		54		54		54

[1] ***, ** and * represent $P<0.001$, $P<0.01$ and $P<0.05$ respectively, with t-values in parentheses.

decision-making rule tend to have lower identity ratings. Generally older chairpersons perform better in terms of cooperatives' net profit. Chairpersons' education is positively associated with the cooperative's identity rating, while exhibiting a negative effect on members' income increase.

5. Discussion

5.1 Bonding social capital and cooperative performance

Bonding social capital plays an important role from the perspective of individual members. All the bonding social capital variables, information sharing, trust, and members' common goals, have significantly positive effect on members' income increase. Nilsson *et al.* (2012) indicate that the function of social capital within an organization may vary along alternative life cycle stages of cooperatives, yet most probably is positive. Our estimation basically confirms Nilsson *et al.* (2012), but has some episodes. In general, bonding social capital has positive effects on members' income increase and cooperatives' identity rating, while exert no significant influence on net profit of cooperatives.

Technology and market information sharing exhibits significant and positive effect on members' income increase. Cooperatives are formed to promote the innovation and adoption of production technology, and gain market access and value added (Abebaw and Haile, 2013; Ito *et al.*, 2012; Jia *et al.*, 2012). The realization of these functions is dependent on efficient information sharing within cooperatives. Farmers in China are characterized by the disparity of entrepreneurial and common farmers (Liang *et al.*, 2015b). The former type of farmers are mostly cooperative managers and farming technology experts. Common farmers rely on entrepreneurial farmers to adopt advanced technology and get access to market information, which contributes to their income increase. Nevertheless, trainings of technology and market information do not generate benefits in terms of cooperatives' net profits and identity rating.

Our results, that trust in cooperatives has a positive impact on farmers' economic performance, are consistent with the evidence from many previous studies. Trust reduces coordination costs and facilitates the pursuit of collective goals (Tsai and Ghoshal, 1998). When individuals trust each other, they are more likely to cooperate and participate in collective actions (Gulati, 1995; Nilsson, *et al.*, 2012). In addition, trust helps to reduce agent problems and lead to efficient control (Søgaard, 1994). The interesting thing is that trust within a cooperative does not help to enhance the economic or social performance of the cooperative. Managers of a cooperative take care of the interests of both the organization and members, and these two streams of interests are not always consistent.

Members' awareness of a common goal positively influences members' economic performance and cooperative social influence. Cooperatives are faced with the challenge of a common goal awareness by members as they undergo the transformation to be more market-oriented and members produce more differentiated products (Fulton, 1999). Heterogeneity of members causes different objective functions between members, which consequently leads to inefficiency. Though core members play an essential role in Chinese farmer cooperatives, they depend on common members to deliver products in order to obtain scale economies and sustain stable provision of products (Liang *et al.*, 2015b). Members being aware of common goals of their organizations exert efforts in pursuing the goals and achieve better economic and social outcomes.

5.2 Bridging social capital and cooperative performance

The influence of bridging social capital on various aspects of cooperative performance varies. The chairperson's rich "*Guanxi*" with downstream buyers enhances a cooperative's identity rating, yet exhibits negative influence on common members' economic performance. There is always a tradeoff between the economic goals and social influence for cooperative enterprises due to their dual objectives. Cooperatives attach more importance to member services and member satisfaction in early stages of their development and tend to lose member focus and become more economic-oriented later on (Nilsson *et al.*, 2012). The links between

cooperatives and buyers provide safety for members within the network, yet meanwhile may reduce flexibility and diversity, which therefore forms a tradeoff (Gargiulo and Benassi, 2000). On the one hand, long-term relationships with buyers reduce transaction costs such as information searching and negotiation costs. Risks of opportunities behaviors are lowered as well. On the other hand, opportunities for better economic pursuit are missed if cooperatives transact with fixed partners. In addition, costs occur in order to identify, develop, and maintain relationships with others (McFadyen and Cannella, 2004). Liang *et al.* (2015a) find a positive relationship between social capital and revenue of cooperatives. That is to say, although various social capital dimensions may contribute to the increase of revenue, it affects alternatively on common members' income. Chairpersons' close links with more buyers may reveal an orientation towards organizational level benefits over member interests.

Broad "*Guanxi*" of chairpersons with bank staffs is positively associated with the net profit of cooperatives. Cooperatives traditionally suffer from shortage of financial capital due to the member patronage principle (Chaddad and Cook, 2004). Nowadays cooperatives either search for investment from non-member investors or appeal to financial organizations in order to obtain additional capital. Farmer cooperatives in China are characterized by that initial physical capital is contributed mainly by a few core members, while most common members hardly pay patronage (Liang *et al.*, 2015b). Further investment and development of cooperatives are therefore restrained because of the limited sources of capital. However, a loan from financial organizations is difficult because of the collective ownership of cooperatives and the lack of public listing (Feng and Hendrikse, 2012). Fixed assets of cooperatives are not easy to be evaluated. Neither the property rights of assets are clearly defined. Hence, the availability of a cooperative to loans is largely dependent on the private "*Guanxi*" between the chairperson (as well as other managers) and bank staffs. The more bank staffs the chairperson have links with, the more chances that loans are obtained.

A cooperative chairperson's good "*Guanxi*" with officials from the governments is positively related to net profit and identity rating. The governments play an important role in the initiation and development of farmer cooperatives in China (Jia *et al.*, 2012; Liang and Hendrikse, 2013). Chairpersons put a lot of effort in creating "*Guanxi*" with the governments in order to gain "convenience" in various activities such as trademark registration, product certification, and so on. All of these activities need permissions from corresponding governmental departments. Funding support from the governments is also one of the key enticements that drive chairpersons to build and maintain good "*Guanxi*" with the governments. The close "*Guanxi*" with the government therefore generates economic benefits and good social performance outcomes for cooperatives.

Various social capital indicators which benefit cooperatives' revenue does not necessarily increases members' income. It is quite different from cooperatives in western world and worth a discussion. Valentinov (2004) stresses that the social capital decreases the transaction cost in the market and increases the well-being of their members. The subsequent empirical research, such as Nilsson (2012) and Ruben and Heras (2012) confirms that social capital brings benefits to cooperatives, which is equivalent to the whole membership. However, cooperatives in China are faced with such a paradox that bridging social capital prospers the cooperative whereas exhibits no significant benefit or even negative economic consequence on common members. Liang *et al.* (2015b) point out that core members dominant in both control and income rights while the common members hardly takes part in decision making. This member heterogeneity may explain the cooperative social capital's paradox in China, because it implies that common members' interests, unlike core members', are not bound up with the profit of cooperatives. Social capitals' positive influences on cooperatives' revenue, therefore, do not always benefit members.

For other characteristics, cooperatives located in Heibei have higher net profit than cooperative in Zhejiang, which may result from that cooperatives in Hebei widely use greenhouses and improve both quality and quantity of vegetables. Generally elder chairpersons perform better than younger ones in increasing cooperatives' net profit, which implies that management experiences help the development of cooperatives. Older cooperatives increase members' income and has a higher identity rating than the younger, because a long history shows that the cooperative can steadily serve its members in the long run. Chairpersons' education is positively

associated with the cooperative's identity rating, while exhibits a negative effect on members' income increase. Well-educated chairpersons are good at learning government documents and they establish cooperatives according with the identity rating standards so as to obtain funds and supports from government. However, when chairpersons, one of the core members, pay much attention on getting resources outside, they may ignore the welfare of common members in the cooperative. Cooperatives adopting "one person one vote" decision-making rule tend to have lower identity ratings than "one share one vote" and hybrid rules. It may because the conventional "one person one vote" rule is less inefficient in making decisions such as increasing scale, standardizing production and getting brands and certificates. The low decision-making efficiency makes the cooperative grow slowly and be defeated in the identity rating competition.

5.3 Policy implications

Our analysis arrives at three major implications. First, it is basically beneficial to develop and nurture bonding social capital, i.e. communication, trust, and awareness of a common goal, within cooperatives to gain a better outcome. The level of bonding social capital may decline as cooperatives become larger and more complex. Inadequacies of bonding social capital tend to cause opportunistic behaviors. The market orientation of cooperatives can bring economic gains, yet meanwhile, the loss of social capital may outweigh the economic benefits. Hence, it is important for both managers and members to elicit efforts to maintain bonding social capital in cooperatives. Cooperatives could rely on internal governance and member education to create and enhance the magnitude of bonding social capital.

Second, limited relationships with transaction parties may be more favorable for cooperatives at current stages in China. Farmer cooperatives in China are mostly experiencing the stage of initiation and development, with limited capabilities in creating revenues and earnings. Although, market expansion is important in order to establish broad networks for future business, cooperatives are not powerful yet to maintain many links with buyers. Besides, it is possible that the dominant position of the chairperson or a few core members obtain most benefits from the transactions based on "*Guanxi*" network.

Third, given the important role of the government in cooperative development in China, effort in the "*Guanxi*" with the government is valued. Nevertheless, the government needs to be neutral and fair, rather than provide preferential support to cooperatives with good "*Guanxi*". Otherwise, it may cause corruption and over investment of cooperatives in seeking for connection with the government, which consequently results in low efficiency and hurts economic benefits of cooperatives.

6. Conclusions and future research

This paper conducts an exploratory analysis on the role of social capital in influencing both economic and social performance of farmer cooperatives based on a sample of 156 farmers from 54 vegetable cooperatives in China's Hebei and Zhejiang provinces. Social capital is distinguished into bonding and bridging dimensions. Bonding social capital is illustrated by technology and market information sharing, trust, and members' awareness of common goals in this paper. Bridging social capital refers to the "*Guanxi*" possessed by chairpersons of cooperatives and is measured by the number of chairpersons' links with input suppliers, product buyers, and bank staffs, and the closeness with the government. Due to the dual goals of cooperatives in terms of both economic and social dimensions and at both organizational and farmer levels, we look at the impacts of social capital on various performance aspects, i.e. members' income increase, cooperatives' net profit, and cooperatives' identity rating, representing member economic, cooperative economic and social performances respectively.

The statistical results display that specific dimensions of social capital may not deliver the benefits expected by cooperative practitioners and academics. Both positive and negative effects of social capital on performances of farmer cooperatives are observed. Bonding social capital is positively associated with common members' economic benefits. Bridging social capital generates beneficial outcomes for the financial and social

performances of cooperatives while exhibits negative influence on common members' income increase, which may be due to member heterogeneity.

There are a couple of possibilities for future research. First, there may be scope for improving the evaluation of social capital because there is no standardized method yet to measure social capital. The measure of bridging social capital in the current paper is based on feedbacks from chairpersons, while bonding dimension basically from members. The integration of responses from both managers and members are desirable. Second, the impact of social capital on performance is not static and may vary along the lifecycle of cooperatives. It is of interests to look at the functions of social capital at different development stages of farmer cooperatives.

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