



Journal of Applied Sciences

ISSN 1812-5654

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An Empirical Study of Impact Factors of Information Sharing among Partners of “A Company+Farmers” from Chinese Data

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Abstract: The study is aimed at discussing how a company shares information with farmers and whether information sharing would improve company’s performance in “a company+farmers” pattern. Based on related literature, a theoretical relationship model of trust, relationship commitment, information sharing and alliance performance in “a company+farmers” is proposed. This model is empirically tested using data from 202 agricultural companies in Guangdong and Hainan Provinces in China. The result shows that trust significantly and positively impacts relationship commitment, information sharing and alliance performance. And it confirms that relationship commitment and information sharing also have a significant positive impact on alliance performance. These findings provide guidelines for managers of agricultural companies. Managers should not only emphasize the development of high level trust and relationship commitment with farmers but also should improve enterprise performance through more effective information sharing with farmers.

Key words: “A company+farmers”, trust, relationship commitment, information sharing, alliance performance

INTRODUCTION

Information has become the most important resource for the survival and growth of enterprises in the modern era. Information sharing among alliance partners is crucial to achieving success. Most scholars indicate that information sharing reduces the bullwhip effect, information distortion and risks, thus improving alliance performance. Information sharing allows alliance partners to effectively coordinate to achieve long-term cooperation and maximize individual strengths, thus increasing the competitive advantage of the alliance. Multinational corporations, such as Wal-Mart and its suppliers have proven that information sharing has a positive impact on alliance performance. Information sharing among partners is considered as a synthetic and complex system project that can be influenced by the internal and external factors of the enterprise. Among these factors, trust, relationship and commitment have been gaining considerable attention from scholars. Li and Lin (2006) consider that trust and relationship commitment have a significant positive impact on information sharing. However, subjective and objective environments in China vary. Therefore, further empirical studies are necessary to determine the extent of influence of information sharing on performance, trust and relationship commitment of Chinese agricultural enterprises.

“a company+farmers” (also called “contract farming”) has emerged as one of the most important forms of organization during the agricultural industrialization of China. “a company+farmers” refers to agricultural enterprises that enter into agreements with farmers to acquire agricultural products according to contract price (Liu, 2003). By taking “a company+farmers” in China for example, this study attempts to discuss whether information sharing between a company and farmers would improve alliance performance when a company cooperates with farmers? In relationship-based Chinese village, whether a company’s trust and relationship commitment on farmers would improve information sharing and alliance performance?

This study surveys agricultural companies which employ the “a company+farmers” scheme. A total of 202 samples are collected. Empirical research methods are used to research and test the relationship among variables. This study reveals factors that influence information sharing of companies and farmers and offers practical theoretical basis and guidance on how to improve agricultural enterprise management of “a company+farmers.”

MATERIALS AND METHODS

Research model and hypothesis: Information sharing is considered during trade or cooperation. Different

enterprises exchange and transmit information; and timely and effective sharing of information is particularly important for enterprises. Trust is the key factor of information sharing (Smith and Donald, 1997). Trust means, due to own vulnerability, persons face with potential risk in transaction, their trust on trustee means they don't believe trustees do harm to them by opportunistic behavior. Essentially trust belongs to human mental attitude, so it has characteristics of reason, sensibility and sociality (Zaheer and Venkatraman, 1995; Parkhe, 1998; Cullen *et al.*, 2000). A closer relationship among partners corresponds to greater information exchange. When no contract exists to stipulate the behavior of members, mutual trust promotes information sharing behavior among partners (Munch, 1993). Klein (2007) confirmed that customer trust on suppliers has a significant impact on information sharing behavior. Relationship commitment emphasizes a long-term view for the relationship among partners to develop trust and to prevent opportunistic behavior, thereby contributing to cooperation among trading partners. Such cooperation includes information sharing behavior among trading partners. By contrast, a decrease in relationship commitment may encourage trading partners to relinquish the idea of long-term cooperation. Therefore, reductions in relationship commitment will hinder the level of information sharing among trading partners. Relationship commitment is considered as the attitude of wanting to maintain a valuable relationship (Moorman, *et al.*, 1992). Relationship commitment involves willingness to pursue goals, assimilate values and invest emotionally in another party. This type of commitment is inherent because it is based on the recognition and internalization of common norms and values of one party to another (Brown, *et al.*, 1995). A lasting commitment is the basic requirement for the successful implementation of an alliance. Several studies show that relationship commitment plays a role in information sharing. Nevertheless, a number of researchers stated that relationship commitment do not have a significant impact on information sharing. Li and Lin (2006) indicated that relationship commitment has an insignificant impact on information sharing. Based on the aforementioned discussions, two hypotheses are developed:

H1a: Trust is positively related to information sharing

H1b: Relationship commitment is positively related to information sharing

Social exchange theory, empirical research and case studies have strongly supported the relationship between trust and relationship commitment. Social exchange theory encourages trustworthy behavior (Granovetter, 1985). Relationship commitment is fragile because it requires investments and efforts, thus leading people to seek

trustworthy partners. In a trusted relationship, reciprocity is important for both parties to commit to a relationship (Morgan and Hunt, 1994). Trust enhances relationship commitment because it strengthens the confidence of both parties on the effectiveness of future exchanges (Morgan and Hunt, 1994; Moore, 1998). Thus, trust is the main determinant of relationship commitment. Based on these discussions, the following hypothesis is posed:

H1c: Trust is positively related to relationship commitment

Alliance performance is both complex and vague. Two points of view exist for investigating an alliance: the point of view of the alliance and the point of view of cooperative enterprise investigators. This study uses the latter to investigate alliance performance. Alliance performance is measured by value creation and cost reduction which are only considered in economics. Value creation involves upgrading competitiveness, including improvements in product quality, production capacity, sales ability, revenue and return on investment. Cost reduction through cooperation reduces total operating cost among cooperative members, thus allowing each partner in the alliance to gain profits. Cost reduction involves both the company and the farmer. An alliance is not effective if only one party gains profits. Information sharing reduces the bullwhip effect which stems from inadequate information sharing among partners (Chen *et al.*, 2000; Tang *et al.*, 2012; Liu *et al.*, 2011). Zhou and Benton Jr. (2007) found that information sharing has a significant impact on the performance of supply chains through empirical analysis. Paulraj *et al.* (2008) also found that information sharing significantly and positively impacts operational performance of the supply and demand side of cross-organization enterprises. Zhao *et al.* (2002) indicated that information sharing obviously affects the performance of supply chains. In other words, a higher extent of information sharing corresponds to better performance. Ye and Li (2006) used multiple regression analysis to verify if the level of information sharing in supply chains has a significant positive impact on corporate operational performance.

This study investigates whether information sharing has a significant positive impact on alliance performance when agricultural enterprises and farmers share information under the Chinese agricultural environment. the following hypotheses are developed:

H2a: Information sharing is positively related to value creation

H2b: Information sharing is positively related to cost reduction

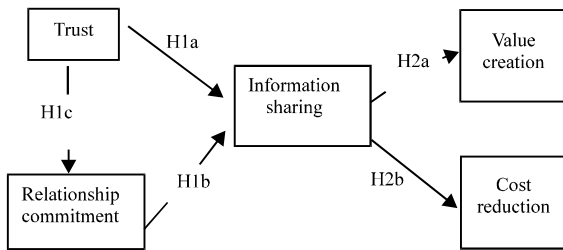


Fig. 1: Conceptual model for information sharing and alliance performance

Based on the aforementioned analyses, a conceptual model of this research is proposed (Fig. 1).

Data collection: The survey method is used to test the empirical model. The questionnaire is divided into two parts. The first part includes all variable measurements of the empirical model. All survey questions are based on a seven-point Likert scale. All variables are measured by using more than one item. The items are adopted from previous literature to ensure content validity. Initially, the study invited 20 company managers for the pre-test. After that, the questionnaires are revised to make ambiguous questions clear according to the feedback of the managers. The second part includes respondent characteristics, such as cooperation, farmer households, time of cooperation, annual time of purchasing agricultural products and enterprise property.

The respondents in this research are companies that cooperate with farmers. Samples are from Hainan and Guangdong Provinces in China. Data mainly involve information sharing between enterprises and alliance partners; and most key data such as trust, relationship commitment, information sharing and alliance performance cannot obtain objective information via external channels. Therefore it's necessary to choose middle and senior managers who are aware of the situation in inner alliance operations as respondents to collect data.

A total of 280 questionnaires with 202 questionnaires considered as valid (72.1%) are obtained. The high response rate of the questionnaires indicates that the samples easily achieve the requirements of empirical research.

The study have surveyed 202 enterprises from Guangdong (61.4%) and Hainan Provinces (38.6%) in China. The number of enterprises in Guangdong and Hainan is 124 and 78, respectively. The percentage of companies that have no more than 500 farmers is 59.8% and the percentage of alliances that are less than 10 years accounts for 79.6%. The percentage of purchasing agricultural products is less than 10 times a year accounts for 65.9%. The percentage of private companies accounts for 61.0%.

RESULTS

Sample reliability and validity: Reliability refers to the reliability of a scale, including its stability and consistency. In this study, the reliability of the variables are tested by using Cronbach's alpha coefficient. For a scale or questionnaire, a reliability coefficient of 0.80 or more is preferable, whereas a reliability coefficient of 0.70 to 0.80 is still within an acceptable range. For a sub-scale, a reliability coefficient of 0.70 or more will be the best, whereas a coefficient of 0.60 to 0.70 is still acceptable (Wu, 2010). In this study, 0.6 is set as the minimum standard of Cronbach's alpha coefficient. The results of the reliability test are shown in Table 1. All factors of Cronbach's alpha are greater than 0.70, thus indicating that this research has high reliability.

To further test the reliability and validity of the scale, confirmatory factor analysis are performed to verify the measurement model by using the PLS-Graph 3.0 software. The results are shown in Table 1 and 2. Standard load values of all factors are above 0.70 and the Average Variance Extracted (AVE) for all factors are more than 0.50. These results show that the measurements have high convergent validity. Composite Reliability (CR) is greater than 0.70 which shows that the measurement has good internal consistency.

For discriminant validity, if the square roots of the AVE for each factor are greater than the correlation coefficients of other factors, then the measurement model will have good discriminant validity. As shown in Table 2., the square roots of the AVE for each variable are greater than the correlation coefficients of other factors, thus showing high discriminant validity among factors.

Structural equation analysis and hypothesis testing: This study applies the PLS-Graph 3.0 software to test the hypotheses presented in the conceptual model by analyzing the standardized coefficients of latent variables in the structural equation model. A high standardized coefficient indicates greater importance in a path relationship. Fig. 2 shows the p-value of the standardized coefficient of each hypothesis relationship in the structure, as well as the equations for trust, relationship commitment, information sharing and alliance performance.

The R^2 value of relationship commitment, information sharing, value creation and cost reduction are 38.1%, 52.4, 44.7 and 35.3%, respectively. Thus, the theory explains the good variance of the variables. Fig. 2 shows the result. H1a, H1b, H1c, H2a and H2b are supported in this research.

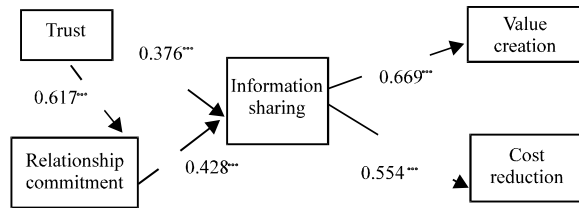
Table 1: Reliability and convergent validity by confirmatory factor analysis

Factor	Items	Factor load	Cronbach's alpha
Trust (Tr)	Trust adapted from Zaheer and Venkatraman (1995) Parkhe (1998) Cullen and Dave (2000)	0.8135	0.830
	The company believes that farmers will comply with agreements and commitments based on past cooperation (Tr ₁)		
	Farmers will give us maximum assistance when circumstances change (Tr ₂)	0.8276	
	The company trusts that farmers will be frank and honest in the transactions (Tr ₃)	0.8063	
	The company believes that farmers will highly regard the benefit of the company (Tr ₄)	0.6895	
Relationship Commitment (Rc)	The company believes that farmers will consider possible influences of their decisions to the company (Tr ₅)	0.7215	0.810
	Relationship Commitment (adapted from Zhao <i>et al.</i> , 2008; Brown <i>et al.</i> , 1995)		
	The farmers consider The company as 'team members', not just buyers (Rc ₁)	0.7889	
	The company is very proud to tell others that the company buys from farmers (Rc ₂)	0.6470	
	The company recognizes the method of production used by farmers (Rc ₃)	0.7389	
Information sharing	The company will renew the contract with the farmers in the future (Rc ₄)	0.8281	0.917
	The company will not easily terminate the cooperation with farmers (Rc ₅)	0.7889	
	Information sharing (adapted from Lee <i>et al.</i> , 2007; Li <i>et al.</i> , 2006)		
	The company will monitor the production process with farmers (Is ₁)	0.7576	
	The company will establish and sustain performance evaluation systems with farmers (Is ₂)	0.8628	
	The company will improve the production process together with farmers to better meet the needs of both sides (Is ₃)	0.8620	
	The company will share the sales information with farmers (Is ₄)	0.8198	
	The company will share the demand forecasts with farmers (Is ₅)	0.8303	
Value creation (Vc)	The company will share inventory information with farmers (Is ₆)	0.7611	0.860
	The company will share the production plan with farmers (Is ₇)	0.8297	
	Alliance Performance (adapted from Bucklin and Sengupta, 1993; Geyskens <i>et al.</i> , 1999)		
	Mutual cooperation to improve sales income (Vc ₁)	0.8838	
Cost reduction (Cr)	Mutual cooperation to improve supply capacity (Vc ₂)	0.7805	0.830
	Cooperating with farmers can rapidly and positively impact investments in the short term (Vc ₃)	0.7696	
	Cooperating with farmers can ensure a stable source of profit (Vc ₄)	0.7283	
	Mutual cooperation to improve the quality of products (Vc ₅)	0.8289	
Cost reduction (Cr)	Reducing product costs through cooperation (Cr ₁)	0.7696	0.830
	Reducing inventory management cost of the product through cooperation (Cr ₂)	0.8043	
	Reducing investments in fixed assets through cooperation (Cr ₃)	0.8666	
	Reducing capital investments through cooperation (Cr ₄)	0.8115	

Table 2.: The discriminant validity by confirmatory factor analysis

	AVE	CR	Tr	Rc	Is	Vc	Cr
Tr	0.599	0.881	0.774				
Rc	0.810	0.579	0.617	0.761			
Is	0.670	0.934	0.641	0.661	0.819		
Vc	0.640	0.898	0.736	0.653	0.669	0.800	
Cr	0.662	0.887	0.620	0.527	0.594	0.699	0.814

Trust: Tr; Relationship commitment: Rc; Information sharing: Is; Value Creation: Vc; Cost reduction: Cr., Diagonal values represent the AVE. Non-diagonal values represent the values of the square of the correlation coefficient



Note: Significant at:***p<0.001

Fig. 2: Regression coefficient of hypotheses

DISCUSSION AND CONCLUSION

This study surveys agricultural companies under the “a Company+farmers” scheme in Guangdong and Hainan

Provinces in China. The study uses the structural equation model to discuss the relationships of trust, relationship commitment, information sharing and alliance performance in the “a company+farmers” scheme under the Chinese environment. According to the study above, the following conclusions on specific practice value are obtained:

- When a company is cooperating with farmers, information sharing between the company and farmers has a significant positive impact on their alliance performance which means information sharing has a significant positive impact on income increase ($\beta = 0.669, p<0.001$), H2a is supported; information sharing has a significant positive impact on cost reduction $\beta = 0.554, p<0.001$), H2b is also supported. This shows that Chinese agricultural enterprises strengthening information sharing with farmers do improve the alliance performance of the enterprises. How to improve the level of information sharing between a company and farmers is a very important thing in agricultural enterprise’s operation and management
- When a company is cooperating with farmers, relationship commitment given to farmers by the

company has a significant positive impact on information sharing between a company and farmers ($\beta = 0.428, p < 0.001$) which means H1b is supported. This shows that relationship commitment contributes to improve the behavior of information sharing between trading partners and illustrates that given the close environment in rural China, relationship commitment given to farmers by the company plays a very important role in communication

- When a company is cooperating with farmers, company's trust on the farmers has a significant positive impact on information sharing between a company and farmers ($\beta = 0.376, p < 0.001$) which means H1a is supported. This means that it is necessary for the Chinese agricultural enterprises to strengthen the construction of trust relationship with farmers. It will help to elevate the level of information sharing between the company and farmers, reduce the bullwhip effect and then increase the company's competitiveness
- When a company is cooperating with farmers, company's trust on the farmers has a significant positive impact on the relationship commitment given to farmers by the company ($\beta = 0.617, p < 0.001$) which means H1c is supported. This shows that trust can promote the cooperative partners' value identification and internalization which has a great impact on the cooperative long-term orientation. Therefore it will not lead to the calculation of extra reward and interest. Agricultural enterprises in China can enhance the level of relationship commitment among partners by building mutual trust mechanism to better maintain partnership stability

The results of the above empirical analyses indicate that in the management practice, if the agricultural enterprises can reasonably make use of the relational governance, such as trust, relationship commitment, etc, to cooperate with farmers, then they can promote the information sharing between the company and farmers, finally improving the performance level of the cooperation between the company and farmers efficiently. It is suggested that when Chinese governmental departments examine and appraise agricultural enterprises at all levels, they should pay more attention to the company's governance behavior on the relationship with the cooperative farmers. Therefore it can promote the cooperation performance between the company and farmers and meanwhile it can fully exert the advantage of the company and farmers cooperation mode, promoting China's agricultural industrialization.

Although, this study contributes in the fields of education and management, limited time and personal capacity led to deficiencies that need to be addressed in future studies:

- This cross-sectional study uses data from questionnaires to test the model. Data are static and cross-sectional and only consider the relationship among trust, relationship commitment, information sharing and alliance performance at a certain point in time. In any causal model, a longitudinal study can provide more useful conclusions and insights into the problem. Therefore, the model proposed and tested in this study can be verified by a longitudinal study
- This study used data from Guangdong and Hainan Provinces in China. Only companies and farmers in those provinces are involved, thus limiting the application of the model to other areas. The range of samples should be expanded to make the model more universal
- Attributions and dimensions of the variables, trust and relationship commitment, need to be refined. No unified measurement exists for these variables. These variables are also multi-dimensional. For instance, trust can be divided into capability trust, goodwill trust and so on. Relationship commitment can be divided into normative commitment, calculative commitment and so on. Measuring these variables with more items will increase the validity of this study

ACKNOWLEDGMENT

This study is partially supported by the Philosophical and Social Science Foundation of Guangdong Province "Transaction characteristics, performance and Alliance Stability"(GD11CGL18), Guangdong province development and reform commission on low carbon development fund projects "Innovation mechanism of low carbon development system, Promoting ecological civilization construction in Guangdong" ([2012]12)

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