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The impact of guanxi, xinyong and buyer collaboration on the loyalty and financial performance of vegetable farmers in China

1. Introduction

China produced 459 million tonnes of vegetables in 2009, which equates to approximately 48 per cent of the world's production of vegetables (FAO, 2010). However, as Liu, Chen, Zhang and Kamphuis (2004) suggest, this agricultural sector of China faces immense challenges in both national and international markets, owing to the stringent quality and safety requirements. The Chinese vegetable farmers, who predominantly own small and medium size enterprises, depend on their buyers, i.e. co-operatives, wholesalers and retailers to ensure smooth, effective and efficient vegetable supply chains. From the vegetable farmers' perspectives there are distinct advantages to building relationships with their buyers, with recent research confirming that the key success factor for business performance is relational exchange (Rajamma, Zolfagharian, & Petlon, 2011). Creating barriers against competition, decreased price sensitivity and increased profitability through cost reduction as well as increased revenue are some of the key advantages of having strong business relationships (Hennig-Thurau, Gwinner and Gremler, 2002; Venetis and Ghauri, 2004). Ndubisi (2003) contends that the only way that businesses can achieve sustainable growth is via a mutually beneficial relationship with clients through which they are better able to understand the needs and wants of their clients and ultimately deliver superior value.

In the Chinese business-to-business (B2B) environment, the two cultural variables of guanxi and xinyong are believed to influence long-term business relationships. Guanxi refers to "an intricate and persuasive relational network that contains implicit mutual obligations, assurances and understanding" (Park & Luo, 2001). Xinyong, on the other hand, refers to

personal trust rather than trust to conduct businesses (Xu, 1999). Tong and Yong (1998) remark that businesses are conducted upon the honesty and integrity of individuals, “a gentleman’s word” rather than the legal bonding between two firms. By developing and testing a model of guanxi and xinyong in the context of collaboration between Chinese vegetable growers and their buyers, this study will add to our understanding of guanxi and xinyong and provide marketers with practical implications on ways to develop relational exchanges and outcomes in China.

This study focuses on two outcome variables, namely the supplier’s loyalty to the buyer and the supplier’s financial performance in the vegetable industry in China. Loyalty is widely recognised as being one of the most important construct, especially in the marketing literature (Caceres & Paparoidamis, 2007; Oliver, 1999; Singh & Sirdeshmukh, 2000). Loyalty of buyers is considered to “drive important personal, noneconomic satisfactions from repeated social exchange with a seller” and consequently buyers find the overall experience with a seller more satisfying (Dwyer, Schurr, & Oh, 1987; Lam, Shankar, Erramilli, & Murthy, 2004). Despite the general acceptance that loyalty in business relationships is essential in buyer-seller relationships, most literature concentrates on the loyalty of the buyers and inadequate attention has been given to the loyalty of the suppliers (Boniface, Gyau, & Stringer, 2010). Maintaining loyal suppliers is of paramount importance for buyers in the agribusiness context due to lower transaction costs and higher efficiencies resulting from working with the same suppliers (Boniface, Gyau, Stringer, & Umberger, 2010). Thus, this study focuses on supplier’s loyalty as a relational outcome construct (Caceres & Paparoidamis, 2007; C. Homburg, Giering, & Menon, 2003). We define suppliers’ loyalty as their willingness to continue to do business with the buyers in the future and recommend the buyers to other persons, and this approach is consistent with previous studies (Boniface, Gyau, Stringer, et al., 2010; Lam et al., 2004).

Additionally, prior studies have substantiated the benefit of long term, sustainable business relationships between exchange partners (Boniface, Gyau, Stringer, et al., 2010; Ganesan, 1994; Kalwani & Narayandas, 1995). In particular, studies on inter-firm relationships and performance have focused on output performance, including financial and non-financial measures (Donaldson & O'Toole, 2000; O'Toole & Donaldson, 2002). This paper pursues performance viewed from the perspective of the supplier (for a more detailed discussion see O'Toole and Donaldson (2002)). The literature associated with channels discusses economic benefits (costs and profits) from relational bonds between suppliers and buyers (Heide & John, 1988; Norordewier, John, & Nevin, 1990). Also, as discussed in Palmatier, Scheer, Evans and Arnold's (2008) study, there are benefits and costs associated with relationship marketing activities (resources, efforts and attention that seller firms put forward into building and maintaining their relationships with buyers). Thus, evaluating the financial performance resulting from the supplier's perspective will contribute to the studies focusing on performance implications of relationship marketing strategies.

Previous research has provided some evidence with regards to the effect of guanxi on financial performance. Park and Luo (2001) demonstrate that guanxi positively influences a firm's growth in terms of market expansion, but not in terms of improving net profit. Luo and Chen (1996) suggest that guanxi contributes to an increase in sales for the sellers, but at the expense of the buyers. However, some scholars have commented on the dark side of guanxi networks. Personal attachment among firms within guanxi networks can provide inertia since it can operate against changes needed to enhance profits and growth (Seabright, Levinthal and Fichman, 1992) and undermine firm efficiency (Lou, 2002; Uzzi, 1996, 1997) due to high costs of building and utilising guanxi networks (Park & Luo, 2001). Thus, there is an opportunity to further develop and test the effect of guanxi networks in the vegetable industry.

Previous empirical studies have shown the mediating effect of relational constructs such as trust and commitment on the partners' relationship (Leung, Lai, Chan and Wong, 2005; Morgan and Hunt, 1994). Prior studies have substantiated the role of collaboration and trust in various agricultural supply chains (Batt, 2003; Batt & Purchase, 2004; Gyau & Spiller, 2007). This study intends to investigate the role of xinyong and buyer's collaboration as mediators through which guanxi networks contribute to both relational outcome (supplier loyalty) and superior firm performance (the supplier's financial performance). This study aims to investigate the interrelationships between guanxi, xinyong and buyer's collaboration and their influence on loyalty and financial performance of vegetable farmers in China and generate academic and practical recommendations which would be beneficial to interested parties. In order to achieve the research objectives stated above, a model is proposed as depicted in Figure 1. The literature review and formulation of hypotheses related to each construct are then discussed next. Then, the results of hypotheses are presented. We conclude with a discussion of the results, implications of the research as well as limitations and future research direction.

-- Insert Figure 1 about here --

2. Literature Review

2.1 Guanxi

Guanxi is a Chinese cultural construct which refers to interpersonal connections (Xin and Pearce, 1996) or networks of informal relationships (Lovett, Simmons and Kali, 1999). It is often believed that guanxi is a necessary condition to conducting business in China (Xin and Pearce, 1996). Guanxi networks can be defined as networks of personal relationships

embedded in informal social bonds that an individual has to facilitate relationships (Leung et al., 2005). It is based on the unspoken or hidden system of reciprocity in that individuals in the same guanxi network carry expectations and obligations to exchange favours among them (Ambler, Styles and Wang, 1999; Davies, Leung, Luk and Wong, 1995; De Keijzer, 1992; Lovett et al., 1999). Guanxi may also refer to “the establishment of a connection between two independent individuals to enable a bilateral flow of personal and social transactions” (Yeung and Tung, 1996) or “a mechanism by which individuals are able to achieve personal, family, or business objectives” (Bell, 2000).

Relationships in guanxi networks are based on the rules of orderly hierarchy (Hwang, 1987; Park and Luo, 2001) in order to maintain harmony. It operates in a hierarchy structure, placing family at the centre, followed by distant relatives, friends and acquaintances (Yang, 1994). Through wealth or social position, a person has so called mianzi (face) that signifies his/her ability to offer assistance (Hwang, 1987). An individual with higher rank in the hierarchy generally has stronger social power to grant favours or assistance to less powerful subordinates. In this way, the higher rank individual accumulates his/her mianzi while simultaneously saving others’ mianzi (Su, Yang, Zhuang, Zhou and Dou, 2009). Relatively weaker social entities are able to resolve or harmonise conflicts with business partners or competitors by capitalising on their guanxi comprising of powerful people (Yang, 1994).

The establishment of guanxi networks often involves lengthy, complex and time consuming efforts (Arias, 1998). The development of guanxi network depends on the commonality of a guanxi base (Kiong and Kee, 1998) and closeness (Xin and Pearce, 1996). The shared identification with family, hometown, region, school or place of work helps individuals to develop guanxi which can be furthered strengthened by social interactions (Jacobs, 1980). Reciprocated social interactions via mutual help or exchanges of favours contribute to affection (renqing) which indicates the level of closeness among individuals in

the guanxi network (Kiong and Kee, 1998; Xin and Pearce, 1996). Renqing is associated with the human aspect of providing sympathy and assistance to friends and acquaintances when needed (Hwang, 1987). This affection or intimacy among individuals in guanxi networks acts as a mechanism that promotes harmony and is the motivation for mianzi (Yang, 1994).

Although guanxi is based on the concept of hierarchy and harmony, it also advocates a long term orientation (Yeung and Tung, 1996). It is reciprocal and utilitarian in that a recipient of a favour is obligated or expected to return the favour at some point in the future (Park and Luo, 2001). The failure to repay the favour will seriously affect one's mianzi, social status, and trust of the other partner. Practising guanxi requires skill and patience since it involves more than simple exchanges of gifts or favours. Skilful practitioners of guanxi would avoid explicit gift giving in an attempt to procure immediate favours. They would rather that an obligation promotes amicable relationships through exchanges of respect and affection as well as specific favours (Yang, 1994). Although guanxi is based on the concept of reciprocity and equality, there is no precise formula on the exchange of favours. People practice guanxi according to their personal experiences (Lu and Reve, 2011).

2.2 Xinyong

Xinyong is a Chinese cultural construct which refers to personal trust (Leung et al., 2005). It is associated with honesty, credibility, reputation and integrity of an individual based on a gentleman's word (Tong and Yong, 1998) or personal guarantee (Low, 2001) or a person's credit rating (Kiong and Kee, 1998). Xinyong is different from interpersonal trust or system trust outlined in the western cultures. Leung et al. (2005) differentiate xinyong from "interpersonal trust" in that xinyong implies a hierarchical relationship. An individual placed at the top of the hierarchical ladder generally possesses higher xinyong. This is unlike

“interpersonal trust” which generally implies horizontal human relationships. Kiong and Kee (1998) also differentiate xinyong from “system trust”, a term which assumes that the system is functioning and trust is placed in this system, not in people or specific individuals (Luhmann, 1979). For example, parties to an exchange rely on a written contract bounded by laws to govern the transactions between them. Such reliance on external agencies (laws) places the importance of system trust and reduces the reliance of personal guarantees (Kiong and Kee, 1998). Xinyong relies on trust between individuals, bypassing third party agencies (such as legal institutions) (Kiong and Kee, 1998). The principle of social sanctions embedded in a web of social relationships underlies the importance of a gentle man’s word. It is not uncommon for Chinese businessmen to engage in business transactions using verbal contracts since the violation of one’s words will potentially harm one’s reputation in business circles. Thus, the use of verbal agreement symbolises the extent of xinyong or trust between exchange partners (Kiong and Kee, 1998).

Owing to the fact that China is regarded as a transition economy with weak capital market structure, poor property rights and institutional instability (Nee, 1992), businesses utilise guanxi networks to manage uncertainties in the market (Xin and Pearce, 1996). In such a business environment, xinyong acts as a governance mechanism in inter-firm relationships (Wong and Chan, 1999). This is because xinyong operates on the principle of social sanctions. Personal trust is embedded in the networks of interpersonal relationships and thus the obligations to adhere to one’s words discourage wrongdoing (Kiong and Kee, 1998). The rules of reciprocity in guanxi networks also create a structural constraint that prohibits self-seeking opportunism (Coleman, 1990). Leung et al. (2005) demonstrated that guanxi has a positive influence on a buyer’s perception of a seller’s xinyong because in order for xinyong to act as a governance mechanism that replaces system trust, it must be based on

prior relationships (guanxi network). Based on the previous discussion of guanxi and xinyong, the following has been hypothesised:

H₁: *Guanxi networks are positively related to Xinyong.*

2.3 Buyer's collaboration

Collaboration refers to “a close, functionally interdependent relationship in which organisations strive to create mutually beneficial outcomes for all participants” (Jap, 2001). Collaboration can be described as an inter-organisational relationship in which parties may engage in various activities ranging from sharing information, planning and solving problems jointly to arrive at decisions (Soosay, Hyland and Ferrer, 2008). Hogarth-Scott (1999) argues that although partners in collaborative relationships must share risks and costs, successful collaboration based on mutual trust and openness is rewarding and yields competitive advantage since partners can achieve higher performance than they would without the collaboration.

Previous studies have substantiated the key role of knowledge transfer and resources exchange in the supplier chain collaboration. Collaboration between suppliers and buyers facilitate the sharing of tacit and explicit knowledge which promotes innovation within the supply chain (Inkpen, 1996; Shrader, 2001). Sharing information is essential for collaborative partners to ease the flow of products, services and feedback from customers (Soonhong et al., 2005). In terms of international business, collaboration with local partners can benefit multinational firms since local partners can provide knowledge with regards to local market, demand, culture as well as resources (e.g. information, labour and raw materials) (Shrader,

2001). Likewise, joint planning is required to co-align processes, operations and capacities of supply chain members in collaborating efforts (Soosay, Hyland, & Ferrer, 2008).

As mentioned earlier, Chinese businessman prefers to engage in business activities with persons who share the same guanxi networks. Guanxi is an important resource for firms in China to gain cooperation (Park and Luo, 2001). Inter-organisational networks such as guanxi have been suggested as a tool for survival or gaining competitive advantage since such networks provide opportunities for shared learning, transfer of knowledge and resources exchange (Nohria and Eccles, 1992). Batt and Purchase (2004) contend that reciprocity and interdependence are key ingredients of collaboration in networks. Members of a network do not operate in isolation and thus collaboration with one relationship will affect relationships with other firms within the network (Hakansson & Ford, 2002). Thus, members of a network need to learn how to manage the intricacy of interactions that occur within their relationships both internally and externally (Ritter, Wilkinson, & Johnson, 2004). Business networks including guanxi can be considered knowledge-driven networks in which a focal partner relies on network actors to collaborate by acquiring knowledge and resources for growth and survival (Batt & Purchase, 2004). We therefore hypothesise the following:

H₂: Guanxi is positively related to a buyer's collaboration.

The Chinese prefer to conduct business with those who have xinyong and avoid those with little xinyong (Xu, 1999). Leung et al. (2005) contend that the supplier's xinyong motivates successful outcomes in complex collaboration contexts. This author suggests that organisations in collaboration must work with each other on a repeated basis. If they decide to act opportunistically in the short run, they will develop negative reputation and inhibit other organisations from working with them in the future. Prior studies in food supply chain

also emphasised on the importance of collaborative relationships. In the context of the Perth fruit and vegetable market in Australia, the growers' trust in their market agents allows them to share sensitive market information and such practices improve transparency in the exchange and signal their desire to collaborate (Batt, 2003). In the Finnish organic food chain, Kottila and Rönni's (2008) study indicates that trust is a prerequisite for collaboration.

Interpersonal trust is also found to enhance the inter-organisational coordination effort (Jap, 1999; Morgan and Hunt, 1994). Since both parties need to put in irreversible effort and idiosyncratic investments into the collaboration, interpersonal trust provides an assurance of reduced opportunistic behaviour and safeguards against unfair distribution of rewards from joint efforts (Jap, 1999). Partners in the collaboration effort may be reluctant to invest resources into the relationship unless they are certain of the integrity and credibility of each other. Thus, interpersonal trust plays a crucial role in shaping and modifying evolving structures of cooperation and it is a necessary antecedent of market exchange (Ring and Van de Ven, 1992). Based on the above discussion, we hypothesise the following:

H₃: Xinyong is positively related to a buyer's collaboration.

Prior studies in the relationship marketing literature shed some light with regards to the relationship between xinyong (personal trust) and relational outcomes. Interpersonal trust, especially trust in a salesperson, has been found to enhance business outcomes in channel relationships (Crosby, Evans and Cowles, 1990; Doney and Cannon, 1997). An exchange partner who has developed a social bond with the other partner tends to view others as less attractive alternatives because a strong interpersonal bond serves as an exit barrier (Wathne, Biong and Heide, 2001). Crosby et al. (1990) suggest that trust in a salesperson increases the anticipation of future interactions. Morgan and Hunt (1994) also demonstrate that trust is

negatively related to propensity leave, but it is positively related to commitment to the exchange partner. When a buyer trusts a supplier, the buyer is more likely to demonstrate high levels of loyalty to the supplier (Caceres & Paparoidamis, 2007; Christian Homburg, Steiner, & Totzek, 2009).

Personal trust (*xinyong*) means more than just functional, economic value since mutual trust that two individuals share ensures security and certainty in transactions (Kiong and Kee, 1998). Since *guanxi* networks give high importance to reputation and trust between individuals, transaction costs are reduced due to lower monitoring costs (Lovett et al., 1999). Thus, a *xinyong*-based transaction is more flexible and efficient than a contract-based one since it is slower and more costly to alter the terms in the contract to respond to possible uncertainties of both economic and political situations in China (Leung et al., 2005). Hence the following hypothesis has been formulated:

H₄: Xinyong is positively related to (a) the supplier's loyalty to the buyer and (b) the supplier's financial performance.

In order to enjoy benefits that collaboration brings, channel partners must consider how to leverage complementary resources and competencies. There are several ways that collaboration can manifest into coordination efforts within inter-organisational relationships. Coordination efforts can range from the formation of joint projects, ongoing efforts to exploit existing synergies and idiosyncratic opportunities between firms (Jap, 1999). In terms of vegetable industry, coordination efforts can range from joint efforts to improve the quality of their produce and promote food safety to jointly design the supply chain management program to reduce waste. Therefore, we posit that when the supplier perceives that the buyer

has participated in joint product development, provided continuous support and solved problems jointly, then the supplier is more likely to develop a positive attachment such as loyalty to the buyer. Homburg et al. (2003) demonstrate that a buyer who is working jointly with a supplier is more likely to develop loyalty since joint working ensures that the buyer gets a sense of co-ownership of the process which strengthens the bond between two parties (Anderson & Narus, 1990; Mohr & Spekman, 1994).

Jap (1999) demonstrated that coordination efforts between the buyer and the supplier enhance the dyadic profit performance and competitive advantage because collaborative activities enable the dyad to compete more effectively. Malhotra, Gosain and ElSawy (2005) also maintain that through interlinked processes, supply chain partners are able to share and build information technology infrastructure and thus allow partners to develop knowledge creation capabilities. Such collaborative activities are found to increase operational flexibility to cope with high demand uncertainties, reduce costs and enhance revenue (Bowersox, 1990; Horvarth, 2001). Organisations which engage in collaboration are also found to reduce purchasing costs by lowering contracting costs (Cannon & Perreault, 1999) and increase financial performance through innovation and product improvement (Corsten & Felde, 2005). Hence the following has been hypothesised:

H₅: Buyer's collaboration is positively related to (a) the supplier's loyalty and (b) the supplier's financial performance.

2.4 Xinyong and Buyer's collaboration as mediators

Evidences suggest that guanxi networks have a direct effect on the financial outcomes of exchange partners. Guanxi networks can add value to channel relationships through the effective use of social capital (Redding, 1990). An individual draws some sort of resources or

advantage from guanxi networks when doing business as well as engaging in social interactions (Davies, 1995). Such resources can be in the form of information, scarce resources or knowledge (Lou, 2002; Standifird and Marshall, 2000). Zhou, Wu and Lu (2007) found that guanxi networks enhance export performance and profitability performance, but not sales performance. Uzzi (1996, 1997) suggests that social capital embodied by managerial ties provides benefits such as price harmonisation and distribution effectiveness as well as it facilitates information sharing and joint problem solving for channel partners.

Although previous studies have demonstrated that guanxi has a direct relationship with loyalty and financial performance, some of them suggest that xinyong and buyer collaboration can act as mediators between guanxi and the two outcome variables (loyalty and financial performance). Trust is found to be a key mediator in the context of relational exchanges (Morgan and Hunt, 1994). Su et al. (2009) suggest that channel managers may socialise to demonstrate their competence and benevolence in order to gain personal trust for enhancing their social capital. Such personal attachment enables channel partners to avoid moral hazards and reduce information ambiguity (Low, 2001) in order to bring about the full benefits of guanxi networks. Leung et al. (2005) also illustrate that a supplier needs to have good guanxi with the buyer in order to strengthen the buyer's perception of the supplier's xinyong which results in partnership relationship. Buyers and sellers in the cooperative system cluster, a cluster with the highest level of trust, work closely on operational matters (i.e. they aim to increase the speed of the flow and accuracy of orders) (Cannon and Perreault, 1999). Such coordination efforts strengthen the profit performance and competitive advantage of both parties (Jap, 1999). Based on the above discussion and the proposed model in Figure 1, we hypothesise the following:

H₆: Xinyong mediates the relationships between guanxi networks and

(a) the supplier's loyalty to the buyer and (b) the supplier's financial

performance.

H7: *A buyer's collaboration mediates the relationships between guanxi networks and (a) the supplier's loyalty to the buyer and (b) the supplier's financial performance.*

3. Method

3.1 Data collection

We collected data from a stratified random sample of Chinese farmers in three provinces, i.e. Hubei, Jiangsu and Shandong. Essentially, we intended these farmers (suppliers) to evaluate relationships with their buyers (co-operatives, wholesalers and retailers). The samples were selected from a variety of pre-determined socio-economic counties in these provinces. A single key informant approach was used (Kumar, Stern, and Anderson, 1993). A single response was received from each respondent farm. Most respondents were in upper management positions such as proprietor (71.2%), high level leader (2.7%), middle-level manager (12.2%) and low-level manager (13.9%). The positions held by the respondents are consistent with the key informant literature in that respondents with high-level roles make them knowledgeable about organisational relationships and performance (Kumar et al., 1993). Data was collected through structured intercept interviews with farmers by university students who were trained and instructed on how to administer the survey instrument. The data collection was conducted during a two month period which coincided with the university break.

The survey instrument was developed based on previously validated scales. Some wordings of the various items had to be modified to suit the Chinese context. This survey instrument originally in English was translated into Chinese by a bilingual researcher. Two

focus groups, each consisting of six representatives from the academic and farming community were organised in China to provide feedback on the survey instrument, which was subsequently modified. This survey instrument was translated back into English to verify the reliability of the translation. The translated versions were cross-checked by two other bilingual researchers to ensure content and face validity. Eventually, 520 usable responses of the survey were collected and used for further analysis.

3.2 Measures

All the items in the survey instrument were measured by a five-point Likert type scale anchored at 1 (strongly disagree) and 5 (strongly agree).

Guanxi can be defined as “personal relationship networks of social bond where individuals carry expectations and obligations to facilitate exchange of favours among them (Leung et al., 2005). The five item scale was adapted from Leung et al. (2005) and Lu, Feng, Trienekens and Omta (2008). This scale captures the extent to which a supplier’s network maintains harmony, does favours for one another, has many social interactions, supports the supplier firm to build trust with the buyer, and is flexible in managing terms of negotiation.

Xinyong simply means personal trust and can be defined as “the integrity, credibility, trustworthiness, or the reputation and character of a person” (Leung et al., 2005; Tong & Yong, 1998). The four item scale was adapted from Leung et al. (2005) which captures the extent to which suppliers and buyers tend to avoid opportunistic behaviour, carry out what was promised, have social credit rating and know the contact person well and have xinyong in the field.

Buyer collaboration is a four item scale adapted from Hutt and Speh (1995). This scale captures the extent to which the buyer frequently participates in joint product development,

provides continuous technical support, and has effective contingency plan in solving problems and a long term cooperative attitude.

Supplier's loyalty is measured by a two item scale adapted from Eggert and Ulaga (2002) and Lam et al. (2004). This scale assesses the extent to which the supplier firm will continue to do business with the buyer in the future (essentially repurchase intention) and would recommend the buyer to other friends, colleagues and other suppliers (word-of-mouth advocacy).

Financial performance scale is a three item scale adapted from (Wu, Yeniyurt, Kim and Cavusgil, 2006). This scale assesses the extent to which the supplier firm performs much better than competitors in profitability, return on investment and cash flow from operation. The scale is a subjective measure of firm performance and captures the supplier's financial outcomes derived from its relationship with the buyer.

4. Results

Following Anderson and Gerbing's (1988) two-step approach, we developed a measurement model before testing hypothesised relationships between constructs. Firstly, preliminary data analysis examined construct validity and reliability. Then, structural equation modelling (SEM) was employed to test the hypothesised relationships among constructs.

4.1 Preliminary analysis

The data were first subjected to confirmatory factor analysis (CFA) using LISREL 8.71. We followed a measurement model validation approach recommended by Hair, Black, Babin, Anderson and Tatham (2006). Item correlations were examined to identify items that did not reflect the essence of the specific construct domain. Items were eliminated sequentially on the

basis of diagnostic output and by evaluating the impact of deleting items on the definition of the construct. The results presented in Appendix 1 show that the measurement model provides acceptable fit to the data [$\chi^2_{(67)} = 157.56$ ($p < 0.01$); CFI = 0.98, NNFI = 0.94; RMSEA = 0.05]. The RMSEA value is in line with the acceptable range of .05 to .08 for a close fitting model (Brown & Cudeck, 1993). Appendix 1 provides a summary of the remaining items of the scale including the standardised factor loading, t-values, Cronbach's alpha, construct reliability (CN) and the average variance extracted (AVE). Table 1 provides the descriptive statistics (means, standard deviation, and correlations) for each purified scale.

-- Insert Table 1 about here --

Convergence validity was supported for all constructs since the factor loadings were all significant (the lowest t-value was 10.11) (Anderson and Gerbing, 1988). Each construct's reliability was evaluated using composite reliability (CN) and Cronbach's alpha. As shown, all constructs demonstrated acceptable level of construct reliability and Cronbach's alpha (ranging from 0.70 to 0.78). All constructs meet an acceptable level of construct reliability at 0.70 (Nunnally & Bernstein, 1994). The AVE ranges from 0.50 to 0.55. To satisfy the requirement for discriminant validity, we followed an approach recommended by Fornell and Larcker (1981). From Table 1, we found that the AVEs for any two constructs exceed the squared correlation between them. To further ensure the discriminant validity, we conducted χ^2 difference test (a unity test) for all possible pairs of constructs, constraining the correlation between the constructs to one and another freeing the correlation. All χ^2 differences were greater than 3.84 at one degree of freedom, thus indicating that the two possible pairs of constructs are different (Bagozzi, Yi and Phillips, 1991).

4.2 Hypothesis tests

After confirming the appropriateness of the measurement model, we used structural equation modelling to test the hypotheses. Maximum likelihood estimation was used. We employed the nested SEM model and followed the three step approach recommended by Baron and Kenny (1986) to test the mediating effect of xinyong and collaboration. To test the mediation, the following three regression equations are estimated (Baron & Kenny, 1986):

1. Regressing the mediators on the independent variable (Model 1)
2. Regressing the dependent variables on the independent variable (Model 2)
3. Regressing the dependent variable on both the independent variable and the mediators (Model 3)

To meet the first mediation condition (Model 1), we found that the guanxi network is significantly related to xinyong ($\beta = 0.78$; $p < 0.01$) and collaboration ($\beta = 0.45$, $p < 0.01$). The model fits the data reasonably well [$\chi^2_{(25)} = 67.20$ ($p < 0.01$); CFI = 0.98, NNFI = 0.97; RMSEA = 0.06]. Thus, the model satisfies the first condition of mediation (Baron and Kenny, 1986). To test the second mediation condition (Model 2), we estimated a model that specifies only the direct paths between guanxi network and two outcome variables (loyalty and financial performance). It was found that guanxi network is significantly related to loyalty ($\beta = 0.33$, $p < 0.01$) and financial performance ($\beta = 0.41$, $p < 0.01$). The model fits the data well [$\chi^2_{(18)} = 27.37$ ($p > 0.05$); CFI = 0.99, NNFI = 0.99; RMSEA = 0.03]. The result satisfies the second condition of mediation.

Finally, after entering the mediator (xinyong and collaboration), the results of the final model (Model 3) indicated that guanxi is positively related to xinyong ($\beta = .73$; $p < 0.01$) and

thus, hypothesis 1 is supported. Guanxi is also positively related to buyer collaboration ($\beta = .24$; $p < 0.05$) and thus hypothesis 2 is supported. Xinyong is found to be positively related to buyer collaboration ($\beta = .27$; $p < 0.05$). Thus, hypothesis 3 is supported. The results also show that xinyong is significantly related to both loyalty ($\beta = .67$; $p < 0.01$) and financial performance ($\beta = .29$; $p < 0.05$). Thus, hypothesis 4a and 4b are supported. Collaboration is also significantly related to financial performance ($\beta = .51$; $p < 0.01$), but not significantly related to loyalty. Thus, hypothesis 5b is supported while hypothesis 5a is not. More importantly, we found that guanxi network no longer significantly affects loyalty ($p > 0.10$) and financial performance ($p > 0.10$) in the presence of the two mediators (xinyong and collaboration). Thus, hypothesis 6 and 7b are supported. This final model (Model 3) provides reasonable fit to the data [$\chi^2_{(68)} = 202.65$ ($p < 0.01$); CFI = 0.97, NNFI = 0.96; RMSEA = 0.06]. The results of hypothesis testing in the final model are shown in Table 2.

-- Insert Table 2 about here --

5. Discussion and implications

China produces almost half of the entire world's vegetables. The Chinese vegetable farmers predominantly run small and medium size enterprises, and their business success depends, inter-alia, on relationships with their buyers, who are co-operatives, wholesalers and retailers. The main purpose of this study was to examine the role of two Chinese cultural constructs, guanxi and xinyong in the vegetable industry in China. Data for this study were collected from three major vegetable producing provinces of China; hence the findings are relevant to

the Chinese vegetable sector in general. There are several managerial and theoretical implications of this study.

Firstly, the findings demonstrate that guanxi and xinyong positively contribute to buyer-seller relationships. The results of this study demonstrate that Chinese vegetable farmers tend to trust and collaborate with the buyers who share the same guanxi network. More importantly, the results show that Chinese vegetable growers emphasise strongly on xinyong at a personal level to generate collaboration from the buyers. As a result, supply chain partners operating in China can ensure collaboration by initiating and developing guanxi and building xinyong. Vegetable growers can effectively use guanxi and xinyong to reduce wastage which is huge in this industry and also to improve the quality of their produce and promote food safety. This would pave the way for production of high quality vegetables and reduction in wastage. They can also access new clients like supermarkets and international buyers using their pool of current buyers. Since an establishment of guanxi networks often take time and effort (Arias, 1998), supply chain partners need to be aware of the costs and undertake a thorough cost-benefit analysis. As long as the supply chain partners carry out guanxi appropriately, they are more likely to enjoy benefits that xinyong and collaboration bring.

In particular, this study developed and tested the mediating role of xinyong and buyer's collaboration in the relationships between guanxi and two outcome variables (the supplier's loyalty to the buyer and the supplier's financial performance). The findings of this study suggest that xinyong is the key mediator between guanxi and the supplier's loyalty to the buyer and the supplier's financial performance. As explained previously, guanxi refers to personal relationship networks of social bond where members carry expectations and obligations to facilitate exchange of favours (Leung et al., 2005). To fully appreciate the benefits (loyalty and improved financial outcomes) of the exchanges, supply chain members

should develop informal social bonding (xinyong) that is flexible to manage unexpected contingencies that can occur in business environment in China. Mutual exchange of favours must be underpinned by gentleman agreements on terms between vegetable farmers and their buyers to generate loyalty and promote financial performance of the farmers. As a result, being a member of guanxi is necessary, but that is insufficient to reap economic and noneconomic benefits that networks bring. Vegetable farmers must be prepared to uphold their promises and refrain from opportunistic behaviours by using guanxi to their advantage.

In addition, the findings of this study also demonstrate that buyer's collaboration mediates the relationship between guanxi and the supplier's financial performance, but not to the supplier's loyalty. These results suggest that vegetable farmers can utilise benefits of guanxi as long as they collaborate with buyers on projects such as product development or they jointly solve problems to promote the supplier's financial performance. The insignificant path between collaboration and loyalty is surprising, but not unexpected. Given that establishing guanxi can be costly and time-consuming, vegetable farmers need to be selective in choosing their exchange partners to build long term relationships and to recommend these partners to other members in their guanxi networks. Perhaps, vegetable growers should only seek to foster serious relationships with partners whom they believe have xinyong.

Whilst endeavouring to critically evaluate the beta coefficients of hypothesis testing using results depicted in Table 2, two strategies were apparent. The first strategy is to promote loyalty by following the path from guanxi to xinyong to loyalty. This strategy is essentially supplier-focused and based on informal, psychological bonding between exchange partners in guanxi networks. Using this strategy, the suppliers must refrain themselves from self-seeking opportunism (Coleman, 1990). Such a practice enhances affection and personal trust and promotes loyalty with the buyers within the guanxi network. The second strategy is to enhance the supplier's financial performance, which can be achieved by guanxi networks

using three pathways. However, when we investigate the magnitude of the beta coefficients, the key construct in this second strategy seems to be the buyer's collaboration. In this regard, we recommend that suppliers should seek their buyers' collaborative efforts in areas like joint product development or technical support in the supply chain. These dual strategies which entail both psychological attachment as well as concrete collaborative efforts, might promote both noneconomic and economic benefits of relational exchanges in the Chinese context.

6. Limitations and future research

There are several limitations to this study. Firstly, we obtained the perceptions of farmers and not those of the buyers. In order to investigate thoroughly the effects of guanxi, perceptions of both buyers and sellers should be sought and analysed. Secondly, we did not investigate the impact of guanxi and xinyong on the market performance of the farmers. In particular, this study uses only a narrow definition of financial measures. Future studies can use both non-financial measures as well as a broader financial measure proposed by O'Toole and Donaldson (2002). In addition, prior studies have given support to the fact that loyalty is a relational construct which can have positive impact on non-financial as well as financial performance (Boniface, Gyau, Stringer, et al., 2010). Hence, it might be prudent for future researchers to investigate these relationships. Thirdly, we did not investigate the influence of government officials in guanxi networks. Government policies obviously play an important role at enhancing the buyer-seller relationship in this industry. Thus, further research can investigate the role of guanxi with the government in assisting farmer organisations like co-operatives and farmers' professional associations. Finally, a longitudinal research design might be beneficial to evaluate the impact of guanxi and xinyong between buyers and sellers in the vegetable industry of China.

7. Conclusion

This research investigated the interrelationships between guanxi, xinyong and buyer's collaboration and their influence on loyalty and financial performance of vegetable farmers in China. We found that guanxi and xinyong positively contribute to buyer-seller relationships. Vegetable growers in China can effectively use guanxi and xinyong to reduce wastage and perishability, which is huge in this industry. We also tested the mediating role of xinyong and buyer's collaboration in the relationships between guanxi and the two outcome variables of supplier's loyalty to the buyer and the supplier's financial performance. The findings suggest that xinyong is the key mediator between guanxi and the supplier's loyalty to the buyer and also the supplier's financial performance. Finally, we found that buyer's collaboration mediates the relationship between guanxi and the supplier's financial performance, but not to the supplier's loyalty. Critical evaluation of the beta coefficients of hypotheses tests revealed that farmers could possibly use one of two strategies. The first one is to follow the path from guanxi to xinyong to loyalty. The second strategy is to follow the path from guanxi to buyer's collaboration which then leads to their financial performance.

Although the results provide new insights, this study is only beginning to develop a unified theoretical framework for understanding the impact of guanxi, xinyong and buyer's collaboration on the loyalty and financial performance of the Chinese vegetable farmers. Hence, a continued research effort is essential to comprehend the various relational resources and their impact on the performance of stakeholders in this important agricultural industry.

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Figure 1 Proposed model of guanxi, xinyong, buyers' collaboration and outcomes

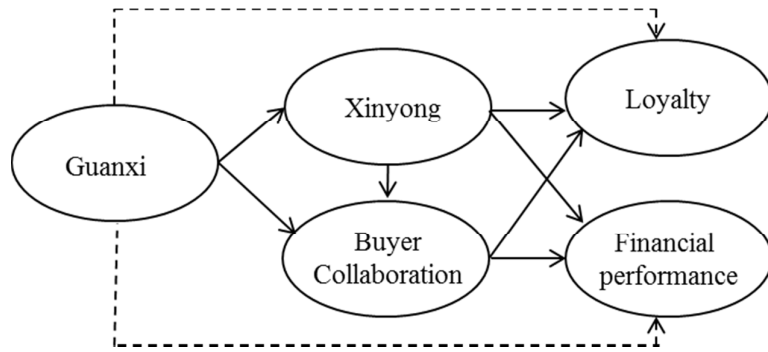


Table 1 Descriptive statistics and intercorrelations

Constructs	Mean	SD	1	2	3	4	5
1. Guanxi	3.80	.77	.50	.30	.14	.14	.16
2. Xinyong	3.83	.68	.55	.52	.13	.09	.20
3. Buyer collaboration	3.33	.83	.38	.36	.55	.19	.07
4. Financial performance	3.48	.66	.37	.30	.44	.52	.07
5. Loyalty	3.82	.71	.40	.45	.27	.27	.54

Note: The diagonal elements are the AVEs (italicised and bolded). The lower-left triangle elements are correlations among the composite measures (unweighted mean of the items for each construct). The upper-right triangle elements are the squared correlations among constructs. All correlations are significant at the 0.01 level (2-tailed).

Table 2 Hypothesis testing results: three step mediating approach (Baron and Kenny (1986))

Paths	Model 1	Model 2	Model 3
	Estimate ^{a)}	Estimate	Estimate
Guanxi → Xinyong	0.78**		0.73**
Guanxi → Buyer collaboration	0.45**		0.24*
Guanxi → Loyalty		0.33**	0.17
Guanxi → Financial performance		0.41**	0.04
Xinyong → Buyer collaboration			0.27*
Xinyong → Loyalty			0.67**
Xinyong → Financial performance			0.29*
Buyer collaboration → Loyalty			0.00
Buyer collaboration → Financial performance			0.51**
$\chi^2_{(df)}$	67.20 (25)	27.37 (18)	202.65 (68)
CFI	0.98	0.99	0.97
NNFI	0.97	0.99	0.96
RMSEA	0.06	0.03	0.06

Note: ^{a)} Values represent standardized beta coefficient. * $\rho < 0.05$ and ** $\rho < 0.01$

Appendix 1

Construct	Std. coefficient	t-value
Guanxi ($\alpha = 0.74$, CN = 0.70, AVE=0.50) ^a		
My guanxi network helps me to build trust with my buyer.	.80	18.38
My guanxi network is flexible in managing terms in negotiation situation.	.72	17.21
My guanxi network maintains harmony.	.57	13.04
Xinyong ($\alpha = 0.77$, CN = 0.77, AVE=0.52)		
I and my buyer always tend to avoid opportunist behaviour	.71	15.91
I know the buyer contact person so long and s/he has xinyong in the business.	.75	19.47
My buyer will carry out what the contact person promises.	.71	16.27
Buyer collaboration ($\alpha = 0.78$, CN = 0.78, AVE=0.55)		
My buyer frequently participates in joint product development projects.	.67	17.03
My buyer provides continuous technical support.	.80	20.81
My buyer have effective contingency plan in solving problems	.75	18.71
Financial performance ($\alpha = 0.74$, CN = 0.76, AVE=0.52)		
My farm performs much better than competitors in profitability.	.78	17.28
My farm performs much better than competitors in return on investment.	.81	19.75
My farm performs much better than competitors in cash flow from operation.	.53	10.11
Loyalty ($\alpha = 0.70$, CN = 0.70, AVE=0.54)		
I will continue to do business with my buyer in the future.	.80	15.59
I often recommend my buyer for doing business with my friends, colleagues and other farmers.	.67	13.66

Fit indices: $\chi^2_{(67)} = 157.56$ ($p < 0.01$); CFI = 0.98, NNFI = 0.94; RMSEA = 0.05

^a α = Cronbach's alpha, CN = Construct validity and AVE = Average variance extracted.