

Does Traditional *Guanxi* Matter for Smallholders in Modern Markets? A Structural Equation Modeling

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Executive Summary

In a fast developing vegetable market environment in China, a hot debate is that how small-scale vegetable producers are able to more successfully integrate into modern markets. Build on social network theory and relationship marketing theory, this paper develops an integrated model to investigate the effects of Chinese traditional *guanxi* (personal relationships) on buyer-seller relationships and ultimately, smallholders' market behavior in terms of transaction conditions and modern market participation. A survey with 167 vegetable farmers in Jiangsu Province provides the data for empirical study using structural equation modeling approach.

This study shows that *guanxi* networks have a direct and significant impact on buyer-seller relationships regarding interpersonal trust and transaction specific investments for vegetable farmers. *Guanxi* networks also show direct effects on farmers' marketing behavior. Business transactions are more likely relationship-based rather than formal contract-based when the business relationships are supported by farmers' *guanxi* networks. Furthermore, small-scale farmers' *guanxi* networks increase the opportunities for smallholders participating in modern market outlets, such as supermarkets and international markets. Smallholders' participation in modern market outlet will be further enhanced by trusted buyer-seller relationships. Transaction specific investments and interpersonal trust both show positive effects on contractual governance in vegetable transactions. Based on the results, we suggest that smallholders should further develop their personal networks and build trusting buyer-seller relationships in order to be able to be integrated into modern high-value market outlets. Policy therefore should be directed to improve farmers' market power by being organized together. Organizations like farmer cooperatives and professional associations are therefore should be energetically developed.

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Abstract

The aim of this study is to investigate the role smallholders' personal relationships on their market behavior in China. A survey with 167 vegetable farmers showed that *guanxi* networks have significant effects on interpersonal trust and transaction specific investments for smallholders. *Guanxi* networks also help smallholders to get access to modern high-value market outlets (such as supermarkets and international markets) and encourage relationship-based transactions. Furthermore, smallholders' high-value market participation will be further enhanced by trust buyer-seller relationships. Integrated buyer-seller relationships increase the contracts application in vegetables business in China.

Keywords: *Guanxi* networks, interpersonal trust, transaction specific investment, smallholders, China

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Introduction

China is one of the biggest vegetable producers in the world today. It supplies more than one-third of the world's total vegetable production (FAO 2004). China's vegetable sector, however, faces stringent challenges with fast development of vegetable markets (inter)nationally and consumers' quality and safety preference (Liu et al. 2004). The enlargement of the production scale leads to over-supply of low-quality vegetables to the markets. The quality and safety become the major constraints for the further development of the Chinese vegetable sector. Chinese vegetable producers (mainly small-scale farmers) have been proved difficult to implement high quality standards due to technical, managerial and financial constraints. Therefore, they are largely excluded by most of modern high-value market outlets, such as supermarkets and international markets, since they are not able to deliver high- and stable-quality vegetables in a consistent manner. Small-scale vegetable farmers incur high transaction costs and perform poorly at domestic markets (Ruben, Lu, and Kuiper 2007). Constructing efficient and effective integrated vegetable supply chains becomes the prior task of the Chinese government in achieving the national strategy of increasing farmers' income and improving food safety. The integration in vegetable supply chains requires information sharing and collaboration between the sellers and buyers, between production and marketing stages. The participation of smallholders in modern markets requires improved quality standards, trusting buyer-seller relationships and cooperation in vegetable supply chains (World Bank 2006). In Chinese business environment, personal relationships, called *guanxi*¹, are advantageous to information sharing and communication, trusting relationships building and collaboration in vegetable supply chains. Therefore, *guanxi* deserves more attention in Chinese vegetable business.

Guanxi is translated as personal connections or relationships on which an individual can secure resources or draw benefits in business as well as in social life (Davies 1995). *Guanxi* is the lifeblood of the Chinese business community, extending into society and politics (Wong and Leung 2001). It is the hierarchically structured network of social relations in which people are embedded in. Three types of *guanxi* are generally classified: family *guanxi*, friend *guanxi* and business *guanxi* (Fan 2002). Family *guanxi* is a relatively permanent and stable social relationship. Family *guanxi* exists among family members and is governed by the need rule. Friend *guanxi* is a rather stable and long-term relationship, and is usually used as an instrument to attain material and/or mutual goals. Friend *guanxi* follows the reciprocity rule. Business *guanxi* is defined as the process of finding business solutions through personal connections. Business *guanxi* is governed by the equity rule. *Guanxi* is transferable from one person to another. Both direct and indirect family, friend, and business *guanxi* weave a multilayer *guanxi* network.

Studies on Chinese *guanxi* started from business writings in the West that advised foreign businessmen about the cultural factors that affecting doing business in China (Pye 1992; Alston 1989). Researchers identified several benefits of Chinese *guanxi* networks. *Guanxi*-based transactions show transaction cost advantages in business (Standifird and Marshall 2000); *guanxi* networks help to access to and expand markets (Tai 1988), enhance

¹ The word *guanxi* in Chinese refers to the social networks of personal relationships. It is composed of two Chinese characters, *guan* (gate) and *xi* (connection). One must pass the gate to get connected to networks (Wang 2007).

competitive advantage (Thorelli 1986), contribute to sales growth (Kao 1993), improve firms' performance (Luo and Chen 1997), and eventually attain long-term business success in China (Yeung and Tung 1996). Researchers studied *guanxi* in different aspects, such as marketing and negotiation (Lee and Lo 1988), consumer studies (Yau 1994) and relationship marketing (Wong and Leung 2001). However, little research has been done on Chinese agri-food sector (Cunningham 2001) and to advise Chinese businessmen how to use *guanxi* in doing business.

Previous research on business relationships has addressed several determinants of relational governance, such as trust (Anderson and Narus 1990; Zaheer and Venkatraman 1995) and transaction specific investments (TSI, Klein, Frazier, and Roth 1990), but few systematic attempts have been made to investigate the direction and magnitude of the impacts of *guanxi* networks, trust and TSI in vegetable supply chains. With this study, we try to fill this gap with the Chinese vegetable sector as an illustration. The objective of this paper is to explore how Chinese *guanxi* networks affect buyer-seller relationships (interpersonal trust and transaction specific investments) and, therefore, smallholder's market behavior regarding modern high-value markets participation and governance arrangements in vegetable transactions.

The remainder of this paper is structured as follows. The next section develops the structural model for the interaction of *guanxi* networks, buyer-seller relationships and smallholder's marketing behavior. Thereafter, we discuss the research design and methodology, followed by the empirical results. This paper ends with the major conclusions and discussions.

***Guanxi* networks, buyer-seller relationships and market behavior**

Guanxi networks and interpersonal trust

Guanxi is first and foremost about the cultivation of long-term personal relationships (Standifird and Marshall 2000). In Chinese society, *guanxi* is ubiquitous and plays a central role in daily social and business life. *Guanxi* networks provide assurance in exchange behavior. In a *guanxi* network, the loss of exchange opportunities with one network participant can easily result in the banishment from the network altogether. So the cost of opportunism is the potential loss of exchange opportunities with all members of the network. Therefore, *guanxi* networks lead to the creation of relationship-sustaining factors such as trust and commitment (Standifird and Marshall 2000). The larger and more richly connected the *guanxi* networks, the greater the assurance that an individual exchange partner within the network will not show opportunistic behavior. When a transaction is made with a firm of known reputation and capabilities, there is an associated implication that possible problems will be guarded against through social bonds (Thorelli 1986). Previous empirical research showed that *guanxi* networks encourage interpersonal trust (Farh et al. 1998), and promote trust-based exchanges (Hill 1995). For the same reason, if business relationships are built based on *guanxi* networks or supported by *guanxi* networks, then such relationships will be safeguarded by *guanxi* networks. Thus farmers are more willing to engage in interpersonal trust. So we propose that:

H1: Farmers are more willing to trust their buyers when the business relationships are supported by their guanxi networks.

Guanxi networks and transaction specific investments

TSI made by farmers may support long-term relationships with buyers. Such investments promote relational exchanges and increase the commitment between partners. Higher levels of TSI lead to increased costs of replacing an exchange partner (Barney and Ouchi 1986). This means that TSI also create dependency and increase the risk of high costs in case of opportunism which is also known as lock-in effects. Farmers in business relationships in which there is high level of information asymmetry, find it difficult to estimate the true value of their TSI. In that case farmers are subject to significant threats of opportunism and dependency.

Guanxi is more than the exchange of gifts in order to achieve favorable business exchange. The flexible and socially-based nature of *guanxi* permits members of a *guanxi* network to deal with unforeseen contingencies arising after the agreements are reached. *Guanxi* networks thus possess the capacity to reduce transaction costs associated with environmental and behavioral uncertainties, and opportunism (Standifird and Marshall 2000). As a result, *guanxi* networks may handle an increased level of asset specificity. Under the safeguarding of *guanxi* networks, business relationships with transactions with specific investments become tighter and stable. Therefore, we expect that farmers are more willing to invest when buyer-seller relationships are supported by their *guanxi* networks.

H2: Farmers are more willing to invest transactional specific assets when the business relationships are supported by their guanxi networks.

Farmers' TSI behavior may also be influenced by the level of trust farmer dedicates to their buyers. Once trust is established, the opportunistic behavior and the uncertainty (risk) will be much lower in transactions for farmers. As a result, farmers are more willing to invest transaction specific assets to adhere to specific requirements of their buyers. Then we also propose the following hypothesis:

H3: Farmers are more willing to invest transactional specific assets when they trust their vegetable buyers.

Interpersonal trust and farmers' market participation and governance choice

Interpersonal trust is an important lubricant of relationships, which binds the sellers and buyers and has an important future orientation (Ganesan 1994). If farmers trust their buyers, then they will be more willing to react flexible to changing conditions or requirements from their buyers. Trusting relationships are especially important in modern market outlets. When farmers and their buyers build up trusting buyer-seller relationships, buyers are more willing to treat farmers as long-term business partners. Therefore, both farmers and buyers are able to achieve mutual benefits. Thus the following hypothesis is posited:

H4: There is a positive relationship between the interpersonal trust in buyer-seller relationships and the farmers' access to modern market outlets.

Trust in buyer-seller relationships significantly reduces the perception of risk associated with opportunistic behavior by a partner. Trust increases the confidence that short-term inequities will be resolved over time and reduces transaction costs in exchange relationships (Ganesan 1994). Thus trust counterbalances the need for a costly safeguard mechanism against opportunism because of the expectancy held by a supplier that the buyer's word or written statement can be relied on. In considering the role of trust in business transactions, we

highlight the personal structure, processes and routines that create a context within which interpersonal trust can develop and persist (Rotter 1980). This consideration is consistent with the characteristics of Confucian society where *guanxi* is a dominant social phenomenon. Under a high level of interpersonal trust, farmers are less inclined to rely on elaborated safeguards for specifying, monitoring, and enforcing agreements (Ganesan 1994). When there is a high level of interpersonal trust in buyer-seller relationships, it is less likely that the farmers and their buyers will use formal contracts in doing business. Thus the following proposition is defined:

H5: There is a negative relationship between interpersonal trust and farmers conduct transactions based on formal contract.

Transaction specific investments and farmers' market participation and governance choice

TSI is an important mechanism for achieving closeness in a buyer-seller relationship which is highly required in modern high-value market outlets. TSI reassures the counterpart about the intentions and integrity of the investor. Creating specific assets is known as creating credible commitments (Heide and John 1988) or pledges (Anderson and Weitz 1989). Thus the existence of the TSI largely restricts the channel access for new actors.

Two dimensions of TSI were identified in literature, namely human and physical TSI. Certain dedicated physical equipments may serve partner's quality requirements. New production techniques or managerial skill may be acquired to handle products properly. Both types of TSI may contribute to the quality improvement for operated products and the capacity for farmers to comply with their buyers' requirements regarding delivery conditions and product quality which are required in modern market outlets. Therefore, farmers have more chance to build business relationships in buyers in modern market outlets.

H6: Farmers are more able to access to modern markets when they invest in transaction specific assets.

Transaction cost economics (TCE) is rooted in organizational economics to explain the choice of governance structure. In Williamson's pioneering work (1979), the characteristics of transactions (e.g. asset specificity) were linked to the governance structure from "classical contracting" (spot markets) at one end of the spectrum, to unified governance (vertical integration) at the other. The level of transaction costs incurred in the transactions encourages sellers and buyers to build up closer business relationships.

Contracts are considered as a hybrid form of coordination (Peterson, Wysocki, and Harsh 2001). Contracts are the preferred means of coordination under conditions of high risks and uncertainty. Vertical and contractual arrangements provide the possibility to reduce the effects of uncertainty and opportunism. Transaction specific investments (TSI) pose a contractual hazard for any investor, either the sellers or buyers. The exchange partner can exploit such assets because they are not re-deployable, or at least they have a reduced value in an alternative exchange relationship. Williamson (1985) argued that in transactions with more one-sided, specific investments, the partners need more formal management due to the increased dependency of the investing partner on the other actor's cooperative behavior. The formal governance consists of the agreements of the transaction conditions, such as the price, volume, quality, payments, and punishment in case of the violation. When the transactions

involve a high level of transaction specific investments, detailed transaction conditions should be negotiated and agreed upon to reduce risk and uncertainty for the exchange partners. Therefore, a (complex) formal contract is applied. Thus we expect a positive relationship between TSI and contract based transactions.

H7: Farmers are more willing to conduct transactions based on formal contracts when transaction specific assets are involved.

Guanxi networks and farmers' market participation and governance choice

Due to the high level of opportunistic behavior, small-scale farmers have relatively low reputation to keep their promise. Farmers also have problems to apply high-level quality standards in vegetable production. Small-scale vegetable production usually leads to low yields and unstable supply which constraints farmers to access to modern high-value market outlets, such as supermarkets and international markets where require high-quality vegetables and for large volumes.

With the support of their *guanxi* networks, small-scale farmers can access reliable information for market price, vegetable demand and buyers' preference. *Guanxi* networks also enable farmers to find new buyers and get access to new markets. *Guanxi* networks can safeguard transactions to reduce transaction costs since buyers are able to know the trustworthiness of the farmers via their *guanxi* networks. Therefore buyers' in modern market outlets will incur less risk to buy vegetables from farmers who have high reputation and are trustworthy. Farmers' modern market participation will be further enhanced with extended *guanxi* networks by working together. Various organizations, such as cooperative and professional associations, enable farmers to deliver large quantities of vegetables at once, and implement high-quality standards in production and marketing stages to satisfy buyers' high requirements in modern market outlets. Thus we propose following hypothesis:

H8: Farmers are more able to participate in modern high-value market outlets when farmers are able to achieve support from their guanxi networks.

The nature of the relationship between relational and contractual governance has been widely disputed in the literature (Lazzarini, Miller, and Zenger 2004; Schramm and Taube 2003; Poppo and Zenger 2002; Ferguson, Paulin, and Bergeron 2005). Some argue that contractual governance complement relational governance in facilitating their self-enforcement, while others argue that contractual governance merely substitute for social norms that effectively support relational dealing. The complementarity view suggests that the joint use of contractual and relational governance provides more efficient outcomes than the use of either governance in isolation since (incomplete) contracts can facilitate the self-enforcement of relational agreements. They assert that formal contracts can reduce the gains from short-term defection, thereby increasing the value of honoring informal dealings (Poppo and Zenger 2002). The substitution view, however, considers that formal rules can take over the operation of social norms supporting informal dealings. Formal contracts damage the reciprocity norm embodied in informal agreements. As a consequence, incentives of punishments may damage the quality of exchange outcomes by discouraging an individual's voluntary willingness to cooperate, manifested through reciprocity norms (Lazzarini, Miller, and Zenger 2004).

Guanxi in China is recognized as an important part of the institutional environment (Guthrie 1998; Schramm and Taube 2003). The Chinese society and business life is confronted with

new laws and regulations on the one hand, as well as its deeply rooted cultural “law” of *guanxi* on the other. *Guanxi*, in some situations, can take precedence over legitimate decisions based on law or regulations (Braendle, Gasser, and Noll 2005). Guthrie (1998) studied *guanxi* as an institutionally defined system (i.e., a system that depends on the institutional structure of society rather than on culture). He concluded that *guanxi* occupies a diminishing role in China. Thus the legal system (formal governance) will take over the influence of *guanxi* in the economic transition. Schramm and Taube (2003), however, observed recently that *guanxi* networks still prevail and will co-exist with the legal system in China in the future. They called for the study of the complementary effects of *guanxi* networks on formal governance. Therefore, we can not expect the definite relationship between *guanxi* networks and contractual governance in this study.

H9: Either positive or negative relationship is possible between guanxi networks and contractual governance in the vegetable sector in China.

Figure 1 shows the integrated conceptual framework for this study with proposed hypotheses.

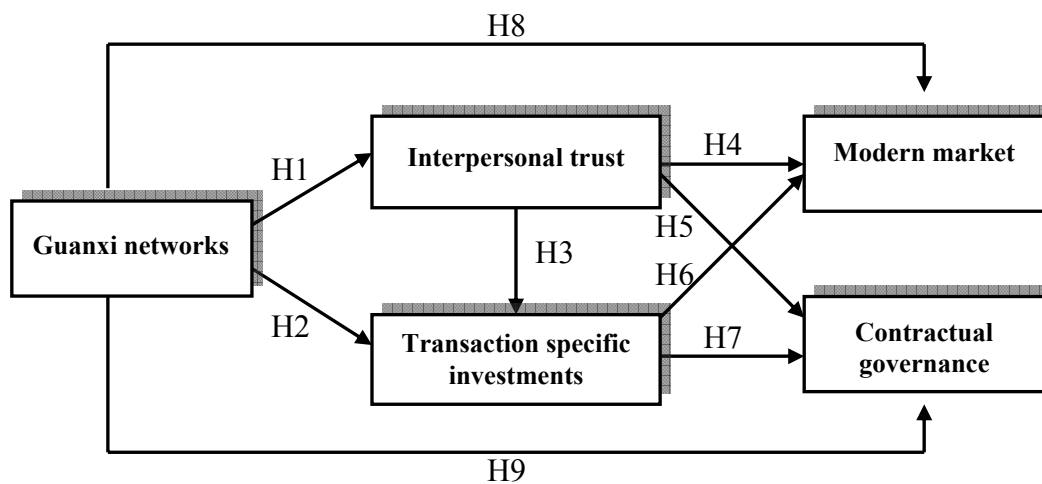


Figure 1 Conceptual framework with proposed hypotheses

Research design and methodology

Data

Data were collected based on a semi-structured questionnaires survey based on personal interviews in Jiangsu Province, P. R. China. The initial questionnaire was developed for a master study in the field (Lu 2003). To optimize the questionnaire items, valuable insights were obtained through eight case studies (Lu, Trienekens, and Omta 2006). These case studies were employed in the research in two ways. First, they were used to discuss the research topics. The discussions with the interviewees helped to identify the major concepts. Second, the case studies were important for formulating the questions. The interviewees were asked to raise suggestions regarding the questions and layout of the questionnaires. All these provided useful suggestions in improving the content validity of the constructs. Samples were selected following stratified random selection process. Based on the economic level, we group all the farmers into three different groups (less developed area, average and developed area) in Jiangsu Province. Within each group, we randomly select three to four villages based on the farmers’ population. The interviews were carried out in the field at the selected villages. We

interview farmers who are working in the field to minimize response bias because those farmers have full knowledge about their vegetable production and marketing. In total 167 farmers were interviewed. Farmer interviews were completed by filling in the questionnaires. All variables included in the analyses are operationalized by multiple-item measures based on prior research.

Methods

After the data were collected, the measures were subjected to a purification process involving a series of reliability and validity assessment using SPSS (Field 2005) and Lisrel (Jöreskog and Sörbom 2004). First, exploratory factor analysis was carried out in SPSS to determine the best multiple item for each latent variable (constructs of *guanxi* network, interpersonal trust and transaction specific investments). Second, confirmatory factor analysis and unidimensionality of each construct were assessed in a series of two factor models in Lisrel. All possible combinations of constructs were tested. This approach ensures that each construct is tested in relation to every other relevant construct in the study. After eliminating items that had very low loadings (<0.2) or loaded on more than one factor, all loadings were significant at 5% ($t > 1.96$). The item-to-total correlations, composite reliability and the Cronbach alpha of each construct were calculated to show the reliability.

Structural equation modeling (SEM) techniques were used to test the conceptual model. SEM has the unique ability to simultaneously examine a series of dependence relationships (where a dependent variable becomes an independent variable in subsequent relationships within the same analysis) while also simultaneously analyzing multiple dependent variables (Jöreskog and Sörbom 2004). So it is a powerful analytical technique for testing causal models because it enables the simultaneous evaluation of the individual paths constituting the model, total effects (i.e., direct and indirect effects) and the complete model's goodness of fit (Hair et al. 1998).

Measurements

Except the variables of marketing behavior, all constructs are measured by multiple items: *guanxi* networks (*guanxi*), interpersonal trust and transaction specific investments. The variable of modern market and contractual governance are measured by single item. We use five-point scale ranging from 1 = not agree at all to 5 = totally agree².

Guanxi networks ($\alpha=0.93$)³ imply how vegetable farmers use their *guanxi* networks to facilitate transactions. As a kind of China-specific social capital, we focus on the support that *guanxi* networks provide for business transactions. Nine items are used to measure the construct of *guanxi* networks. The major questions asked in the questions are: to what extent your *guanxi* networks support you to find new buyers, to access to (new) markets, to improve production technology, to get high quality seeds, and to build trust with buyers. These items were developed based on previous research (Wong and Leung 2001).

Interpersonal trust ($\alpha=0.87$) refers to the belief that the other party is honest and sincere and in no circumstances will deliberately do anything to damage the relationships. Literature

² The description of the measures and items are listed in Appendix 1.

³ The numbers in the parentheses are the Cronbach alpha.

measures trust based on several cognitive processes: calculative, prediction, capacity, intentionality, and transference process (Doney and Cannon 1997). As discussed previously, interpersonal rather than interorganizational trust is the main focus in this study. Previous transaction experience, fairness, reputation, and trustworthiness are the major reflective perspectives for interpersonal trust. These, in turn, are used to define interpersonal trust in the current research. Seven items were used to measure interpersonal trust. These items were developed based on the studies of Claro et al. (2003) and Doney and Cannon (1997).

Transaction specific investments (TSI, $\alpha=0.92$) refer to the farmers' perception of the extent to which an investment was made specifically for transactions with particular buyers. These investments can be physical or human specific. The physical TSI refers to investments such as machineries. The human TSI refers to human resource investments, such as staff training in terms of the knowledge and the methods to deal with business counterparts and other business practices. This construct, developed based on Heide and John (1988), was measured by five items.

Farmers' market behavior in this study is investigated by their participation at certain market outlet and the transaction conditions. With the fast development of the vegetable markets and the rise of modern high-value market outlets such as supermarkets and processing companies, it is of most interesting to see how small-scale farmers are able to be integrated into such modern markets such as supermarkets and international markets. In this study, we measure modern market participation by asking farmers to response the statement of "My vegetables are sold to modern markets". Transaction conditions in this study are measured by the use of formal contracts in business transactions. We asked farmers to response the statement of "My transactions are based on formal contracts".

Empirical results

Constructs reliability and validity test and model fit

The reliability and validity of the constructs used in the model are evaluated by factor loadings, average variance extracted, composite reliability and Cronbach alpha respectively. The acceptability of the measurement model was assessed by first looking at the reliability of the individual items. Individual item reliability was determined by examining the loadings of measures on their corresponding constructs. Only individual factor loadings are greater than 0.6 were retained. Factor loadings for all questions in this study are greater than 0.7 indicating a high degree of individual item reliability (see Appendix 1).

Construct validity was measured by internal consistency (composite reliability and Cronbach alpha) and discriminant validity (average variance extracted) for each construct. Composite reliability and Cronbach alpha measure the proportion of the total variance was captured by the items correspond to a construct. Common practice is to accept Cronbach alpha or composite reliability with a value of 0.7 or greater (Nunnally and Bernstein 1994). In this study, Cronbach alpha and composite reliability are above 0.87 for all constructs which indicate the variables are reliable (see Table 1). Variance extracted reflects the overall amount of variance in the indicators accounted for by the latent construct. It is the complementary measure to the internal consistency. The threshold for variance extracted is 0.5 (Fornell and Bookstein 1982). For proper discriminant validity, the square root the average variance extracted should be greater than construct correlation, as is the case here (see Table 1).

Following common practice, the model fits were evaluated using the comparative fit index (CFI), goodness of fit index (GFI), normed fit index (NFI), root mean square residual (RMSR), and the Chi-Squares index (χ^2) with appropriate degrees of freedom. For our model, all index are greater than or very close to 0.90 (RMSR are 0.04), indicating a good model fit (see Figure 2).

Table 1: Summary statistics of the measurement analysis

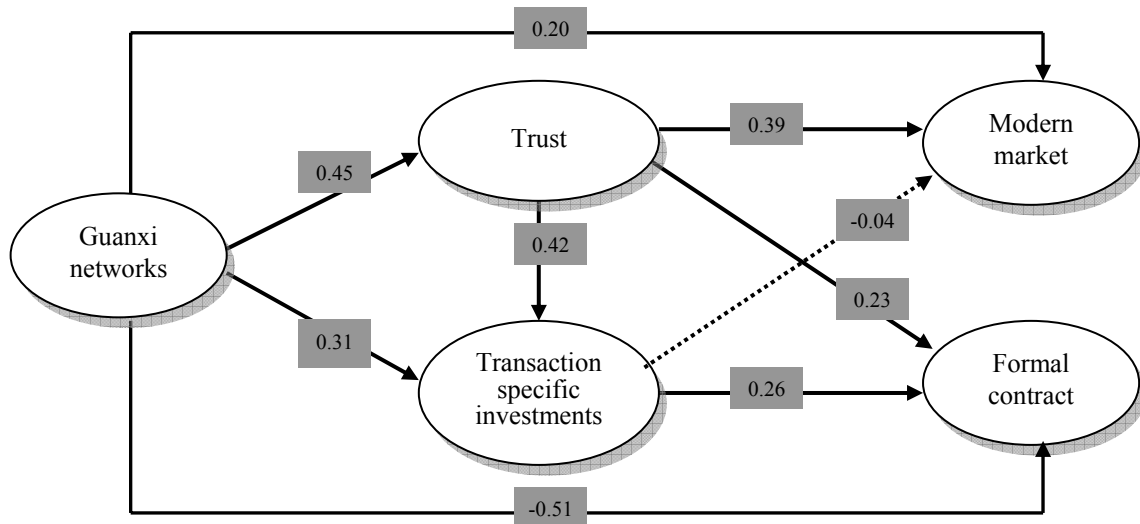
Constructs	Composite reliability	Cronbach α	<i>Guanxi</i> networks	Interpersonal trust	TSI	Modern market	Formal contract
<i>Guanxi</i> networks	0.93	0.93	0.76				
Interpersonal trust	0.88	0.87	0.45	0.71			
TSI	0.91	0.92	0.50	0.56	0.83		
Modern market	1.00	1.00	0.36	0.45	0.27	1.00	
Formal contract	1.00	1.00	-0.28	0.15	0.14	-0.01	1.00

Note: The **bold** numbers on the diagonal are the square root of the average variance extracted.

Empirical results from small-scale vegetable farmers

The estimated results are shown in Figure 2. The solid line indicates the path coefficients are significant at 5% level. Only one path coefficient is not significant at 5% level (dashed line). Results show that farmers' *guanxi* networks are positively related to interpersonal trust and transaction specific investments in relationships with vegetable buyers. Interpersonal trust is positively related to farmers' modern markets participation and contractual transaction arrangements. The positive effects of trust on contractual governance are opposite to our expectation. This may be because in modern market outlets, formal contracts are commonly used mechanism to regulate vegetable transactions to reduce risk. In trusting buyer-seller relationships, farmers are able to keep their promise to deliver products according to the contract agreements. Therefore the contracts are able to be completed and business relationships will become longer and solid. Transaction specific investments, on the other hand, show a positive effect on the use of formal contracts in vegetable transactions, while no direct influence on farmers' market outlet choice. Results also reveal a significant interaction effect between interpersonal trust and transaction specific investments. This demonstrates that small farmers are more willing to invest in vegetable production and marketing facilities if they trust their vegetable buyers.

Results also show a strong evidence for the direct effects of *guanxi* networks on farmers' marketing behavior. *Guanxi* networks is positively related to farmers' modern market outlets participation and negatively associated with formal contract arrangements. This means that with the support from *guanxi* networks, such as production and marketing knowledge, financial and managerial assistance, small-scale farmers are able to sell more vegetables to modern high-value market outlets such as supermarkets and international markets. Farmers are also more willing to sell vegetable with informal contracts when the transactions are supported by their *guanxi* networks.



$\chi^2=276.16$ (P=0.005); df=218; GFI=0.87; CFI=0.99; MSEA=0.04; NFI=0.95; NNFI=0.99

Figure 2: Structure equation model results

To further evaluate the results of the estimated model, the total effects (i.e. indirect + direct effects) are also examined. The total effects coefficients corresponding to Figure 2 are listed in Table 2. The total effects further confirm that guanxi networks play a significant role in farmers' participating in modern market outlets and their choice for informal governance. Although the direct effect of interpersonal trust on modern market participation are much larger than the effects of guanxi networks (see Figure 1), the total effects show that *guanxi* network and interpersonal trust are equally important for smallholders' modern market participation (total effects 0.36 for guanxi networks, 0.37 for interpersonal trust). Total effects further confirm that transactions specific investments do not contribute to smallholders' participating in modern market outlets.

Table 2: Standardized total (direct and indirect) effects

	Interpersonal trust	Transaction specific investments	Modern market	Formal contract
Guanxi networks	0.45 (5.03)*	0.50 (6.31)*	0.36 (4.51)*	-0.28 (-3.53)*
Interpersonal trust		0.42 (4.92)*	0.37 (4.12)*	0.34 (3.64)*
Transaction specific investments			-0.04 (-0.47)	0.26 (2.79)*

Note: t values are in the parentheses; *: significant at 1% level (two tailed test).

The total effect equals to the direct effect plus indirect effect based on estimated solutions.

Guanxi networks show a strong negative effect on formal governance choice, but this negative effect was partially compensated by positive effects from interpersonal trust and TSI. The total effects of interpersonal trust on the use of formal contracts are stronger than the effects of TSI. This implies that interpersonal trust is a critical factor for farmers to maintain contractual buyer-seller relationships. Due to the high level of opportunistic behavior, farmers have low reputation to keep their promise. Therefore, it is very difficult for farmers to find

buyers to build contractual long-term business relationships. This, in turn, becomes a significant constraint for smallholders to be integrated into modern markets⁴.

Conclusions and discussions

The vegetable sector in China is known for its huge production, increasing international orientation and the prominent role played by small-scale producers. Finding a better solution for small-scale farmers in modern market environment is a priori task for the farmers, businessmen and policy makers. Achieving business success in long-term buyer-seller relationships depends not only on high quality products and stable delivery, but also on trust and collaboration in buyer-seller relationships. In this study, we examined the effects of *guanxi* networks and buyer-seller relationships on smallholders' market participation and transactions conditions.

Most of the theoretical discussions in this study are confirmed with the empirical evidence. This study shows that *guanxi* networks positively contribute to buyer-seller relationships and substantially increase the market participation in modern high-value market outlets for small-scale vegetable farmers in Jiangsu Province. In terms of transaction conditions, *guanxi* networks and buyer-seller relationships show different effects on contract-based vegetable transactions in Jiangsu Province. In a highly developed *guanxi* networks, farmers tend to conduct transactions based on informal relationships; while integration buyer-seller relationships increase contract applications in vegetable transactions for smallholders. Therefore, it may be a feasible solution for smallholders to combine informal (relationship) and formal (contract) governances to improve their market performance in modern marketing environment.

Given the prevalence of small-scale vegetable farmers and the poor quality products they produce, the findings in this study imply that using *guanxi* networks and initiating organizations are very important for vegetable farmers. Researchers revealed that organizations can facilitate smallholder accession to markets (Shen, Rozelle, and Zhang 2005; Hu et al. 2004) with improved negotiation power and offer more chances to build long-term business relationships (World Bank 2001). Additionally, organizations can further expand and enhance farmers' *guanxi* networks and trust, increase farmers' capacity to invest in specific transactional assets. Policies aimed at developing organizations (e.g. cooperatives, farmer-volunteered or government-initiated farmers' professional associations) to facilitate the implementation of high quality standards in vegetable production and the integration of vegetable farmers into newly developed markets, such as supermarkets and international markets may therefore play an important role.

Acknowledgements

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⁴ One report in *Xinhua* news (03-23-2004) titled "Contract farming call for trusting farmers". It was a story about the contract buyer-seller relationships were violated due to the farmers selling produces to other buyers for a higher price during product deficient season. Therefore, processing companies and other big buyers do not trust farmers and are not willing to sign contracts with them.

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Appendix 1: Description of the measures and items (N=167)

	Factor loadings
Guanxi network ($\alpha=0.93$)	
My <i>guanxi</i> networks support me to get high quality seeds	0.78
My <i>guanxi</i> networks support me to building trust with my input suppliers	0.81
My <i>guanxi</i> networks support me to improve product quality	0.83
My <i>guanxi</i> networks support me to access to this market	0.78
My <i>guanxi</i> networks support me to find new buyers in this market	0.83
My <i>guanxi</i> networks support me to access to new markets	0.76
My <i>guanxi</i> networks support me to build trust with my buyers	0.79
My <i>guanxi</i> networks support me to get payment more quickly	0.72
My <i>guanxi</i> networks support me to improve my production technology	0.74
Interpersonal trust ($\alpha=0.87$)	
The buyers I trade with have a good reputation	0.73
We should not hesitate to make important selling decisions based on my buyers' suggestions	0.72
My previous relationships with my buyers are satisfactory	0.73
We expect the buyers to be working with us for a long time	0.76
The buyers have been fair in their negotiations with us	0.75
Based on experience, we can with complete confidence rely on the buyers to keep their promises to us	0.79
The buyers are trustworthy.	0.85
Transaction specific investment ($\alpha=0.92$)	
We have made large investments for tomato production in the last three years	0.91
We have made a large investment for tomato quality upgrade in the last three years	0.91
We have made significant investments to deliver products	0.89
If we switch to another market we would lose a lot of investments that we have made to sell to this market	0.84
If we decided to stop working in this market, we would waste a lot of knowledge regarding the method of operation for this market	0.81
Modern market (single item)	
My vegetables are sold to modern markets (supermarkets and international markets)	1.00
Formal contract (single item)	
My transactions are based on formal contract	1.00

Note: all constructs are measured with 5 point Likert-scale (not at all – very much)