# The Role of Guanxi Networks in Vegetable Supply Chains: Empirical Evidence from Jiangsu Province, P.R. China

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## Abstract

This study attempts to empirically investigate the effect of guanxi networks on buyer-seller relationships and on firm performance in vegetable industry in P.R. China. We interviewed 167 vegetable producers and 84 companies to test our conceptual relationship model. Results demonstrate that guanxi networks significantly improve buyer-seller relationships regarding interpersonal trust and transaction specific investments. Buyer-seller relationships show significant impacts on chain performance. Results imply that the effects of guanxi networks differ for producers and companies in the chains. Study also revealed that transaction related attributes (risk, channel requirements and transaction conditions) also influence buyer-seller relationships and chain performance jointly with guanxi networks. Paper ends with several managerial implications regarding the use of guanxi networks in business practices.

**Keywords:** Guanxi Network, Buyer- Seller Relationship, Performance, Vegetable, China

## 1. Introduction

Relationship marketing, start from the 1990s, has attracted much attention from academics and practitioners, especially in the business-to-business marketing. In contrast to transactional marketing, relationship marketing focuses more on establishing, developing and maintaining successful relational exchanges and good customer relationship. In relational exchange, the choice behavior is constrained through the trust and commitment that develop between the two parties. Following this shift in the marketing paradigm, there is a growing

research interest in guanxi[1], which has been considered as the Chinese version of relationship marketing or business networking.

Guanxi can be generally classified into three categories: family, friend and business. Family guanxi is a relatively permanent and stable social relationship. It occurs mostly among family members and it is governed by the need rule for the social exchange and resource distribution within a family. Friend guanxi is stable and long term relationship as a means or an instrument with other people outside the family to attain material goals. Friend guanxi follows the reciprocity rule. Business guanxi is defined as the process of finding business (rather than personal) solutions through personal connections. Business guanxi is governed by equity rule for business transactions. The combination of different guanxi constructs a multilayer guanxi networks.

The theoretical literatures suggested that building strong guanxi with the right person is crucial to the attainment of long-term business success in China. Guanxi based transactions show transaction cost advantages. Guanxi has a direct impact on the market expansion and sales growth. Guanxi also can help to enhance marketing and negotiation in china, and improve firm performance .

Previous research on guanxi was mainly qualitative design and focus on cultural factors affecting foreign companies doing business in China. We hardly can see any empirical research on guanxi networks and the buyer-seller relationships in agri-food sector. So we would like to fill this gap in this study to ask what are the effects of guanxi networks in vegetable supply chains. In doing this, we are going to study the importance and the impacts of guanxi networks on buyer-seller relationships and on chain performance in vegetable sector in P.R. China.

The rest of the paper is structured as following: the next section provides the literature review and hypotheses. Section 3 is the research design. The empirical results are discussed in section 4. Conclusion and discussions are drawn in section 5. The limitations of this study are discussed in Section 6. Managerial implications are at the end of this paper.

[1] The word *guanxi* in Chinese refers to the social networks of personal relationships.

## 2. Literature review and hypotheses

### 2.1. Guanxi networks and trust

Guanxi is first and foremost about the cultivation of long-term personal relationships. Chinese society is distinct because guanxi is ubiquitous and plays a central role in daily social and business life. Guanxi networks provide certain assurance of exchange partner behavior. In a guanxi network, the loss of exchange opportunity with one network participant can easily result the banishment from the network altogether. So the cost of opportunism in a guanxi network is loss potential exchange opportunities with all members of the network. Thus guanxi networks lead to the generation of relationship-sustaining factors such as trust and commitment. When a transaction is made with a firm of known reputation and capabilities, there is an associated implication that social bonds will guard against trouble. Previous empirical research showed that guanxi network encourages interpersonal trust, promotes trust-based exchanges. Thus we propose that:

*H1: People are more willing to engage in trust when their guanxi networks can support business relationships.*

### 2.2. Guanxi networks and transaction specific investments

Transaction specific investments (TSIs) made by producers stimulate fasten long-term relationships with buyers. Such investments promote relational exchanges and increase the commitment between partners. TSIs are positively related to the channel members' dependence. However, TSIs also creates the risk of opportunism. Parties in a business relationship in which there is information asymmetry are difficult to estimate the true value of TSIs. This subjects a firm to significant threats of opportunism and dependency underlines high levels of TSI.

Contrary to common perception, guanxi is more than the exchanging of gifts in order to procure favourable 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 the possible costs associated with environmental and behavioural uncertainties. As a result, guanxi networks can handle an increased level of asset specificity. Thus, we formulate following hypothesis:

*H2: People are willing to engage in transaction specific investments when their guanxi networks can support their business relationships.*

### 2.3. Trust and chain performance

Trust is an important lubricant of relationships, which binds parties and has an important future orientation. Trust is specially required in buyer-seller relationships to reduce complex realities in a more quick and economic way. If one trusts his/her counterpart, then he/she will be more willing to react flexibly to changing conditions or requirements of their counterpart. If trust is high, he/she will have the feeling that the behavior of the partner is in the interest of the relationship as a whole and not only in the interest of the partner him/herself. So they are more willing to treat them as long term business partners. Since product quality is the promise and guarantee for good buyer-seller relationships and relationship duration. Sellers will offer the best quality products with cautious handling process to their trusted buyers. Buyers, on the other hand, can confidentially rely on their trusted suppliers who will deliver agreed products and will not cheat them. So both sides of a buyer-seller relationship will gain a good image for product quality. The expected positive influence of trust on performance is also based on the reduction of transaction costs to achieve a high level of profitability and achievement of mutual expectations regarding quality. Considering the above discussion, the following hypotheses are posited:

*H3: The more the partners trust each other, the higher the level of quality satisfaction.*

*H4: The more the partners trust each other, the higher the level of profitability.*

### 2.4. Transaction specific investments and chain performance

To create specific transactional assets is one of the focuses of transaction cost economics. Bounded rationality and opportunism are two key assumptions of transaction cost analysis. Bounded rationality implies that human actors as well as firms are incapable of perfect contracting. As such, certain environmental and behavioural uncertainties inevitably arise. Opportunism is the assumption that, given the occasion, decision-makers may seek for their own interests, and that is difficult to know in advance who is trustworthy and who is not.

TSI is an important mechanism for achieving closeness in a buyer-seller

relationship. Creating specific assets is known as creating credible commitments or pledges. Thus the existence of the TSIs largely restricts the marketing channel and governance access for chain actors. Two dimensions of TSI were commonly defined: human and physical TSI. Certain dedicated physical equipments may serve partner's quality requirements. Recalling the characteristics of freshness and hygiene, the vegetable industry requires highly invested cooling storage and transportation facilities as well as standardized handling and processing process. Advanced production techniques or managerial skills also improve handling processes. Good agricultural practice and good manufacture practices facilitated by the higher level of specific investments eventually lead to the costs reduction and waste elimination. Thus both types of TSIs may contribute to the quality improvement for operated products and economy solution. Thus we proposed that:

*H5: The profitability will be higher in the situation of the higher level of transaction specific investments.*

*H6: The quality satisfaction will be higher in the situation of the higher level of transaction specific investments.*

### 2.5. Control variables

Case study and previous research also suggested that buyer-seller relationships and firm performance might vary by personal characteristics and resource endowment for vegetable producers, scale and total sales for companies. Business relationships and chain performance also differ cross channels and transaction conditions. Thus, Transaction related attributes (risk, channel requirements and transaction conditions) are also included as control variables. However, no hypotheses are developed for these control variables. The integrated framework and proposed hypotheses are showed in Figure 1.

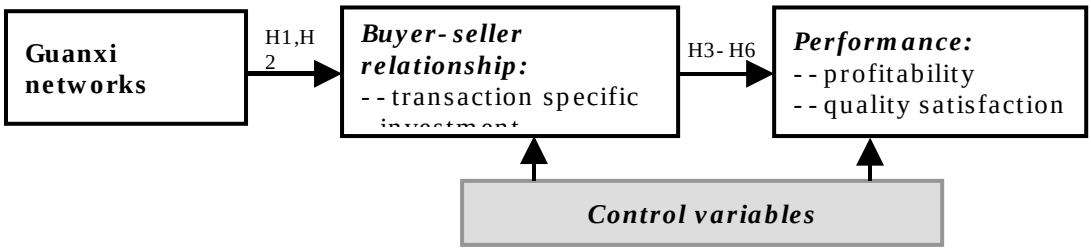


Figure 1. Conceptual research framework

## 3. Research design

### 3.1. Data

Data were collected from two major groups of chain participants in vegetable supply chains in Jiangsu Province, P.R. China, vegetable sellers (producers) and vegetable buyers (processing companies, exporters, and supermarkets etc.). We developed a questionnaire on the basis of literature review and previous case studies. Except some control variables, such as sex, farmland for sellers, works and total sales for buyers, which are measured with true values, the rest of the variables are measured by multiple items based on extant research.

In order to minimize response bias, we chose the producers in the field and the owner of the company as our informants. Samples were selected following stratified random selection process in several areas in Jiangsu province. All data were collected based on personal interviews. 167 sellers and 84 buyers were finally used for empirical analysis.

### 3.2. Methods

The data purifying process was carried out in SPSS. First, exploratory factor analysis was carried out to determine the best multiple items for each variable. Second, item-to-total correlations and the Cronbach alpha of each variable are calculated to show the reliability and validity.

According to the review of Malhorta, Peterson, and Kleiser, the use of ordinary least squares (OLS) to test hypotheses is a common practice among marketing researchers. But OLS can not handle properly with endogenous variables. Trust and TSI are both endogenous variables in our conceptual model. To solve this problem, we follow a two-stages least squares (2SLS) procedures to test our hypotheses. 2SLS is a method of extending regression to cover models which violate OLS regression's assumption of recursivity. The empirical models are tested in Eviews (version 5.0).

### 3.3. Measurements

Multiple items were used to measure the variables of guanxi networks, interpersonal trust, transaction specific investments, quality satisfaction and the control variables of channel requirements and transaction conditions. All items for each construct were measured by Likert-scale ranging from 1 to 5. The completed items for each construct

measurement are listed in Appendix 1.

*Guanxi networks* refer to what extent, vegetable sellers and buyers use their guanxi networks to help them in their marketing activities. Five and four items[2] are used to measure the construct of guanxi networks for vegetable sellers and buyers respectively. Items such as to what extent their guanxi networks support them to find new buyers, to access (new) markets, to improve production techniques, to get high quality seeds (for producers), to building trust with counterparts are used in this study. The measurement instruments of guanxi networks are developed based on previous research.

*Interpersonal trust* in operational terms refers to the belief that the partner is honest and sincere, and will not deliberately do anything to damage the relationships. Previous transaction experience, reputation and trustworthiness are the major reflective perspectives for trust. Interpersonal trust while not organizational trust is the main focus in this study because the previous case study showed that vegetable transactions in the research area are personal based activities. The choice of interpersonal trust is also consistent with the personal based relationships in China. Seven and six items with Likert scales are used to assess interpersonal trust for seller and buyer samples respectively. This measurement instrument was developed based on the study of Claro et al. and Zaheer et al.

*Transaction specific investments* refer to the investment which was made specifically for the transactions with the selected counterparts. TSIs can be physical or managerial investments. Physical TSIs refer to investments such as equipment machineries, such as cooling facilities; while human TSIs refer to human resource management investments, such as training of staffs in terms of marketing and customer knowledge. This construct was measured with five and two items for seller sample and buyer sample respectively that were developed based on previous studies.

Research on performance of business has generally focused on two kinds of indicators, objective and affective ones. In our research framework for relationship management, we use both objective and affective indicator. As the objective indicator, we use profitability; while quality satisfaction is an affective performance indicator.

*Profitability* refers to what extent, firms achieve their profit aims.

[2] Originally we had same items for buyers, but we filtered the others during the exploratory factor analysis.

Profitability is a most commonly used financial (objective) indicator for performance measurement. Profitability is also used in this study to measure the vegetable operation performance for vegetable sellers and buyers. Profitability construct in operationalization was measured by single item.

*Quality satisfaction* refers to the satisfaction level of the buyer's or seller's product quality. It is measured by if the vegetable can pass quality inspection, the satisfaction with the price get (paid), and the satisfaction for the products delivery and quality. This four-item measurement instrument was developed based on the previous research.

In terms of the control variables, *risk* in this research is measured by single item to ask whether the farmers can sell all their vegetables/whether the companies can buy all vegetables they needed. For the variables related to channel requirements and transaction conditions were measured by multiple items.

## 4. Empirical results

### 4.1. Reliability and validity of the variables

The reliability and validity of the variables are evaluated by Cronbach alpha and item-to-total correlations. Cronbach alpha measures the proportion of the total variance was captured by the items correspond to a construct. Common practice is to accept scales with Cronbach alpha value of 0.7 or greater. Cronbach alpha for all variables in this study are greater or close to 0.7 which indicates the variables in this study are reliable (Appendix 1). Item-to-total correlation refers to the correlation of one item of the variable with the sum of all of the other items for each respondent. The threshold for item-to-total correlation was 0.6. For most of the variables, item-to-total correlations are greater than or close to 0.5 (Appendix 1). So the variables used in this study are valid.

### 4.2 Regression results for buyer-seller relationships

Following a 2SLS procedures, we first measure the effects of guanxi networks on buyer-seller relationships using OLS regressions. Then we predict the value for each dependent variable (interpersonal trust, and TSIs). The predicted values then are used as independent variables at the second stage.

Table 1 summarizes the results of the ordinary least square regression

for the first stage to test the hypotheses 1 and 2 of the research framework in Figure 1. Interpersonal trust and TSIs are dependent variables, while guanxi network was the independent variable at this stage. Both interpersonal trust and transaction specific investment regression models achieved a good level of predictive accuracy for both seller and buyer samples ($R^2$ are 0.39, 0.33 for interpersonal trust regressions, and 0.45, 0.11 for TSIs regressions).

Table 1. Results of the regression of the guanxi networks and buyer-seller relationships

| | **Interpersonal trust** | | **Transaction specific investment** | |
|---|---|---|---|---|
| | **Sellers** | **Buyers** | **Sellers** | **Buyers** |
| Guanxi network | 0.29(4.30)*** | 0.15(1.66)* | 0.35(5.00)*** | 0.19(1.70)* |
| Sex of interviewee | -0.09(-0.72) | -- | 0.05(0.40) | -- |
| Total farmland of the interviewee own | -0.03(-0.90) | -- | 0.02(0.51) | -- |
| Workers in the company | -- | 0.001(1.93)* | -- | 0.001(0.96) |
| Total sales | -- | -0.08(-0.84) | -- | 0.11(0.92) |
| Risk | -0.09(-0.72) | -0.03(-0.18) | -0.06(-0.50) | -0.60(-2.72)*** |
| Predetermined transaction conditions | 0.36(4.99)*** | 0.27(2.84)*** | 0.22(2.92)*** | -0.03(-0.22) |
| Channel requirements | 0.20(2.64)*** | 0.48(5.17)*** | 0.20(2.62)*** | -0.03(-0.23) |
| Constant | 0.32(1.21) | 0.28(0.63) | -0.05(-0.17) | 0.22(0.40) |
| Adjusted $R^2$ | 0.39*** | 0.45*** | 0.33*** | 0.11** |

t values are in the parentheses

*: significant at 10%level; **: significant at 5% level; ***: significant at 1% level.

Empirical results for vegetable producers showed that the support from guanxi networks positively influence business relationships with vegetable buyers ($\beta$=0.29 and 0.35 for trust and TSI respectively, $p<0.01$). It implies that with the more supports from guanxi network, farmers tend to more willing to trust their buyers. Farmers are also more willing to invest for TSIs in case they can get support from their guanxi networks. Same conclusions can be drawn for vegetable buyers. The support from guanxi networks positively influence buyers' behavior in terms of interpersonal trust with vegetable suppliers and TSIs ($\beta$=0.15 and 0.19 for trust and TSI respectively, $p<0.05$). These findings support the proposed hypotheses 1 and 2 for both samples.

The channel and transaction attributes also show significant influences to buyer-seller relationships. The pre-determined transaction conditions (deliver time, volume, price etc.) and explicitly channel requirements in

business practice significantly improve interpersonal trust both for vegetable farmers and companies, and increase the willingness to engage in TSIs for vegetable farmers. Company scale also shows a positive impact on building trust with vegetable suppliers. Furthermore, the risk related to vegetable supply negatively influences buyers' investment behavior.

### 4.3. Regression results for performance

At the second stage, we estimated the effects of buyer-seller relationships on chain performance. At this stage, the predicted values of interpersonal trust and TSIs at the first stage are independent variables, while performance indicators of profitability and quality satisfaction are dependent variables. The results of ordinary least square regression test for H3 to H6 in Figure 1 are listed in Table 2. Both profitability and quality satisfaction regression models achieved good levels of predictive accuracy ($R^2$ are 0.33, 0.78 and 0.17, 0.15 for quality satisfaction and profitability respectively) both for seller and buyer sample.

Table 2. Results of the regression of the buyer-seller relationships and performance

| | **Quality satisfaction** | | **Profitability** | |
|---|---|---|---|---|
| | Sellers | Buyers | Sellers | Buyers |
| Interpersonal trust | 0.06(0.72) | 0.17(2.37)** | -0.10(-1.08) | -0.06(-0.41) |
| Transaction specific investment | 0.28(3.53)*** | 0.03(0.45) | 0.44(5.02)*** | 0.32(2.71)*** |
| Sex of interviewee | 0.18(1.36) | -- | 0.07(0.47) | -- |
| Total farmland of the interviewee own | -0.06(-2.15)*** | -- | -0.01(-0.20) | -- |
| Workers in the company | -- | -0.001(-0.54) | -- | -0.001(-0.64) |
| Total sales | -- | -0.13(-2.16)** | -- | 0.22(1.79)* |
| Risk | 0.27(2.13)** | -0.01(-0.05) | 0.03(0.20) | -0.14(-0.64) |
| Predetermined transaction conditions | 0.10(1.25) | -0.01(-0.09) | 0.10(1.12) | -0.07(-0.52) |
| Channel requirements | 0.27(3.45)*** | 0.80(12.13)*** | 0.03(0.30) | 0.24(1.81)* |
| constant | -0.38(-1.37) | 0.59(2.15)*** | 4.38(21.71)*** | -0.72(-1.28) |
| Adjusted $R^2$ | 0.33*** | 0.78*** | 0.17*** | 0.12** |

t values are in the parentheses

*: significant at 10%level; **: significant at 5% level; ***: significant at 1% level.

Empirical results show diversified impacts of business relationships on chain performance. TSIs significantly contribute to the improvement of profitability both for vegetable producers and buyers as hypothesized. TSIs associated with transactions also show positive contribution to quality satisfaction for vegetable producers. Surprisingly, interpersonal

trust shows limited influence for chain performance. It only shows a positive impact on quality satisfaction for vegetable buyers.

When we investigate the effects of the control variables, we found that the production scale decreases quality satisfaction for vegetable farmers. This is probably because the farmers can not handle vegetables properly with a large yield. Vegetable buyers, on the other hand, can achieve economy of scale. They gain a higher profitability with a large production scale. But quality satisfaction will be lower in case of mass production due to less processing capability.

Explicit channel requirements indicate a positive impact on chain performance. Consistent channel requirements positively influence quality satisfaction both for vegetable sellers and buyers. Consistent channel requirements also improve the profitability for vegetable buyers.

## 5. Conclusion and discussions

In this study, we examined the effects of guanxi networks in Chinese agribusiness sector, to show how Chinese vegetable sellers and buyers can use their guanxi networks to help them in their business practices. The interrelations of the theoretical framework which was tested using a large sample survey are to a great extent in line with the pattern founded in the case studies in the same research area. Most of the theoretical hypotheses in this study are supported both for vegetable producer and buyer samples.

Although there are several similarities between two samples in the results of our estimated models, buyers and sellers show distinct patterns in their approach to achieving performance. By isolating the performance measures and examining the chain of causal relations, there is a clear distinction between the sellers' and buyers' approaches. The sellers tend to focus on "*hard*" elements; while the buyers tend to focus on both "*soft*" and "*hard*" conceptual elements of the relationships (Figure 2 and 3).

Figure 2 shows the sellers' approach to performance. Sellers are oriented to the *hard* routine. Their performance is influenced by TSIs, which is influenced by their guanxi networks. The guanxi networks play a central role since it also influences trust. In order to achieve a good performance, vegetable farmers tend to invest more in production and marketing activities. The investments benefit for quality improvement and transaction efficiency. While the guanxi networks support the willingness for such investments. So farmers followed the *hard* side of the

relationship are likely to be successful.

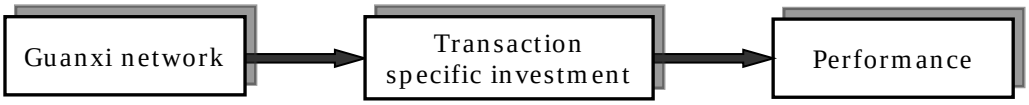


Figure 2. The sellers' approach to performance

Vegetable buyers' approach to performance is listed in Figure 3. Buyers tend to combine *hard* and *soft* elements as performance approaches. Buyers engage in interpersonal trust, invest for transactions to achieve good performance. The profitability is closely related to TSIs. Such investments are largely influenced by buyers' guanxi networks. TSI is also a critical criteria in selecting preferred partnership which is a focus of close buyer-seller relationships. Therefore, buyers that have followed the hard side of the relationship are likely to achieve good performance.

Quality satisfaction is closely related to companies' trust with vegetable suppliers. Interpersonal trust is also largely influenced by companies' guanxi networks. The approach that buyers take to deal with sellers is also in line with the framework of customer relationship management. Buyers are concerned about a supplier's performance in areas that extend beyond the supplier's price or the quality of its product. Long-term benefits and ease of working in the relationship are expected for both sides of a relationship. This buyer-seller relationship is unlikely to be a one-shot, stand-alone transaction. Rather, the relationship is complex and requires a combination of external supports (i.e., from guanxi network), fluid exchange of information in a dyadic (i.e., interpersonal trust) and a flexible attitude. Companies that take these elements into account are also likely to be successful in their business.

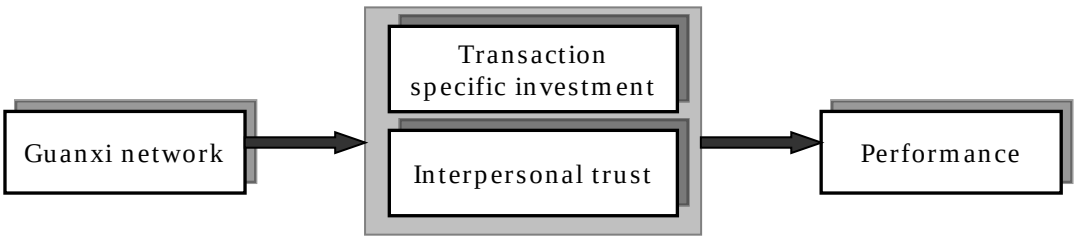


Figure 3. The buyers' approach to performance

## 6. Limitations and further research

The interpretation of the results for this study should take in account the following limitations.

First, both vegetable sellers and buyers have diversified market outlets in the research area. We studied both sides of buyer-seller relationships in this research, but the selling behavior and the buying behavior does not exactly describing the same buyer-seller relationship. This leads a problem when we measure bilateral variables (e.g., trust, quality satisfaction). For example, when the company indicate they trust their company suppliers or trader suppliers, this did not match the trust what vegetable producer responded. To avoid this limitation, we should measure our conceptual model based on the samples (seller and buyers) that in the same marketing channel.

Second, buyer-seller relationships had been studied as a form of relational exchange. Since guanxi network in China showed importance in business activities both for vegetable producers and buyers in vegetable sector, we are interesting to see if the guanxi networks also influence marketing channel choices and relational transactions. So we would like to add this stage in our conceptual research model for further analysis.

## 7. Managerial implications

The results of this study suggested that the guanxi network showed positive contribution to buyer-seller relationships and may substantially enhance the chain performance in vegetable sector in China. Managers then may use this study and its empirical evidence as a check on the adequacy of their existing guanxi networks and type of benefits their networks might provide. Guanxi networks increase the success possibility to access new markets and to maintain long term relationships. So it is important for the companies putting more efforts to build up strong guanxi networks to expand their markets and to develop their business. Companies should then increase face-to-face encounters, frequent contracts, information sharing and showing honesty and sincerity to each person in their guanxi networks. But they also should be aware of the contingency of the costs to build and maintain such guanxi networks. Since the obligation to personal attachments and ties sometimes obstructs business changes that are necessary to improve firm profit, thus managers either under- or overestimated the negative/positive effects of guanxi networks, their efforts would be misguided with which would eventually lead to performance decrease, even ethical problems

and corruption.

Vegetable producers also can use this study to improve their marketing positions. Results showed that personal guanxi networks and transaction specific investment can eventually improve performance in their vegetable business. This may benefit from the reduction of opportunistic behavior with the safeguarding mechanism from guanxi network or reputation building which leads to a higher level of compliance with quality requirements for the farmers. Vegetable producers can achieve an even stronger position in the negotiations process when they are being organized. Organizations also show accessibility for vegetable producers to newly developed markets in the research area such as supermarket and international markets, with better prices and more stable transactions. Organisations also extend in a large sense the guanxi networks of vegetable producers and increase the capacity to invest for TSIs. Thus farmers can ever improve their marketing performance and get better marketing chances to achieve better income in situations of being organized. Besides cooperatives, farmers' professional associations should be developed with efforts.

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## Reference

## Appendix 1. Constructs and items used in the model (Cronbach alpha is in the parentheses)

| **Sellers** (N=167) | **Reliability** | **Buyers** (N=84) | **Reliability** |
|---|---|---|---|
| **Guanxi network (α=0.89)** | | **Guanxi network (α=0.69)** | |
| My guanxi network supports me to build trust with my input suppliers | 0.74 | My guanxi network supports me to build trust with my suppliers | 0.52 |
| My guanxi network supports me to access to this market | 0.74 | My guanxi network supports me for specific investments | 0.61 |
| My guanxi network supports me to find new buyers in this market | 0.78 | My guanxi network supports me for less conflict regarding payment | 0.52 |
| My guanxi network supports me to build trust with my buyers | 0.75 | My guanxi network supports me to order through telephone with our suppliers | 0.43 |
| My guanxi network supports me to improve my production technology | 0.67 | | |
| **Interpersonal trust (α=0.87)** | | **Interpersonal trust (α=0.85)** | |
| The buyers I trade with have a good reputation | 0.66 | The suppliers we trade with in this market have a good reputation | 0.68 |
| I should not hesitate to make important selling decisions based on my buyers' suggestions | 0.64 | We should not hesitate to make important purchasing decisions based on our suppliers' suggestions | 0.66 |
| My previous relationships with my buyers are satisfactory | 0.69 | We expect the suppliers to be working with us for a long time | 0.58 |
| I expect the buyers to be working with me for a long time | 0.76 | The suppliers have been fair in their negotiations with us | 0.62 |
| The buyers have been fair in their negotiations with me | 0.63 | Based on experience, we can with complete confidence rely on the suppliers to keep their promises to us | 0.66 |
| Based on experience, I can with complete confidence rely on the buyers to keep their promises to me | 0.64 | The suppliers are trustworthy. | 0.76 |
| The buyers are trustworthy | 0.61 | | |
| **Transaction specific investment (α=0.92)** | | **Transaction specific investment (α=0.79)** | |
| I have made large investments for vegetable production in the last three years | 0.85 | We have made large investments for vegetable procurement in the last three years | 0.65 |
| I have made a large investment for vegetable quality upgrade in the last three years | 0.84 | We have made a large investment for vegetable quality control in the last three years | 0.65 |
| I have made significant investments to deliver products | 0.81 | | |
| If I switch to another market we would lose a lot of investments that I have made to sell to this market | 0.77 | | |
| If I decided to stop working in this market, I would waste a lot of knowledge regarding the method of operation for this market | 0.72 | | |
| **Profitability (single item)** | | **Profitability (single item)** | |
| To what extent did you achieve the expected profitability with your vegetables selling to this market | 1.00 | To what extent did you achieve the expected profitability with your vegetables buying from this market | 1.00 |
| **Quality satisfaction (α=0.63)** | | **Quality satisfaction (α=0.71)** | |
| My buyers are satisfied with the quality of my vegetables | 0.48 | My buyers are satisfied with the quality of my vegetables | 0.56 |
| I am happy with the price I get from my buyers | 0.48 | I am happy with the price I get from my buyers | 0.56 |
| **Risk (single item)** | | **Risk (single item)** | |
| I am able to sell all my vegetables | 1.00 | Our company is able to buy all vegetables we needed | 1.00 |
| **Predetermined transaction conditions (α=0.87)** | | **Predetermined transaction conditions (α=0.76)** | |
| Price is preagreed with my buyers | 0.81 | Our transactions are based on written contracts | 0.50 |
| Quality is preagreed with my buyers | 0.72 | Price is preagreed with our suppliers | 0.62 |
| Transaction volumes are preagreed with my buyers | 0.83 | Quality is preagreed with our suppliers | 0.54 |
| Delivery time and delivery places are preagreed with my buyers | 0.63 | Transaction volumes are preagreed with our suppliers | 0.64 |
| I prefer to do business with my buyers with one type of | 0.54 | Delivery time and places are preagreed with | 0.61 |

| | | | |
|---|---|---|---|
| agreement | | our suppliers | |
| **Explicit channel requirements (α=0.69)** | | **Explicit channel requirements (α=0.75)** | |
| Vegetable quality is important for this market | 0.63 | Reliable quality is important for this market | 0.59 |
| Consistent delivery is important for this market | 0.43 | Consistent quality are important for this market | 0.63 |
| Accurate delivery time and place are important for this market | 0.45 | Accurate delivery time and delivery place are important for this market | 0.55 |
| Value-added activities (such as washing, sorting, grading, etc.) are required for this market | 0.40 | | |

Note: Reliability is measured by the item–to-total correlation between the item and the correspond construct