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## Guanxi, IT Systems, and Innovation Capability: The Moderating Role of Proactiveness

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## **Guanxi, IT Systems, and Innovation Capability: The Moderating Role of Proactiveness**

### **Abstract**

In Chinese exporting, small and medium-sized companies (SMEs) need to be innovative to develop a competitive advantage. This research explored how these organizations can use two resources: 1) guanxi with customers, distributors, suppliers, and government officials; and 2) IT systems to enhance their innovation capabilities and new product performance. The moderating role of an organization's proactiveness with respect to new product development is also examined. The resource-based view provides the theoretical support for the research. A conceptual model is developed and tested using survey data gathered from 210 Chinese SMEs in manufacturing industries that were analyzed using SmartPLS 2.0. Results show that IT systems are positively related to innovation capability. The relationship between guanxi and innovation capability is significant for firms that exhibit high levels of proactiveness but not when proactiveness is low.

**Keywords:** guanxi, innovation capability, IT systems, proactiveness, new product development

# **Guanxi, IT Systems, and Innovation Capability: The Moderating Role of Proactiveness**

## **1. Introduction**

With rapidly changing technology and market environments, exporting SMEs face intense global competition (Paul et al., 2017). Because of rising costs, many Chinese SMEs must transition from competing primarily on the lowest price to developing new products that offer the best total value to their foreign customers (Zhou, 2012). To be successful in the long run, SMEs must develop the capabilities to be innovative. Rogers and Shoemaker (1971) define innovation as the degree to which individuals adopt something new relatively early compared with others in a social system. At an organizational level, Kim (1997) defines innovation as the skills and knowledge needed for a firm to absorb, control and improve existing and create new technologies, products, and processes effectively. Innovation capability is the organization's ability to gather information and create the knowledge needed to develop and implement new products, processes, and services (Adler & Shenbar, 1990; Akman & Yilmaz, 2008; Schoenherr & Swink, 2015; Machikita & Ueki, 2015; Wang & Dass, 2017). As organizations gather information and develop more knowledge about customers and competitors, their innovation capabilities increase (Schoenherr & Swink, 2015).

Because of barriers such as limited financial resources, the lack of internal technical expertise, and technical and market information, many SMEs struggle to develop innovation capabilities (Xie et al., 2013). SMEs in many industries, have limited resources and capabilities, which prevent them from conducting in-house research and development activities. Moreover, China's central planning legacy and diverse levels of regional development make innovation by SMEs even more challenging. Thus, historically, SMEs' innovations have been mostly based on

off-the-shelf technologies, concepts, and /or resources offered by supplying industries (Verhees & Meulenber, 2004). With increased competition, it is likely that this low level of innovation will not be sufficient.

Product innovation involves both social and technical resources (Nonaka, 1994; Zhang et al., 2018). Using the resource-based view (RBV) (Barney, 1991) as theoretical support, this research explores whether Chinese SMEs can use two organizational resources, one social and one technical, to increase innovation capabilities and new product performance: 1) *guanxi* with customers, distributors, suppliers, and government officials; and 2) IT systems. Access to outside knowledge is essential for innovation (Cohen & Levinthal, 1990; Song et al., 2006). *Guanxi* is a culturally-based, informal resource involving the building and use of interpersonal relationships (e.g. Cui et al., 2013; Gu et al., 2008; Lovett et al., 1999; Park & Luo, 2001; Sheng et al., 2011). With limited internal resources, in China, SMEs turn to external sources using *guanxi* to gather information and knowledge for innovation (Fu et al., 2013).

Once gathered, information must be shared, analyzed, and used for decision-making. Because new product development involves gathering and processing different types of complex information, IT systems have become increasingly important to new product development success (Zahay et al., 2011). IT systems are formal resources that standardize the process of gathering, analyzing, storing, sharing information, and enhancing collaboration (Blili & Raymond, 1993; Nambisan, 2003; Rehm et al., 2017). During product development, IT systems can efficiently process large amounts of information that contribute to the creation of tacit knowledge (Nonaka, 1994; Zhang et al., 2018).

SMEs must be willing to deploy their *guanxi* and IT systems to develop innovative products as opposed to alternative uses such as increasing sales or improving the profitability of

existing products. Thus, in this research we examine the moderating role of proactiveness as an indicator of willingness to innovate. Proactiveness is defined as developing and introducing new products or services before the competition to capitalize on market opportunities and influence demand (Joshi et al., 2015; Lumpkin & Dess, 1996; Lumpkin & Dess, 2001; Shan et al., 2016; Wang, 2008).

This research makes several contributions. Case studies of new product development projects by European countries suggest that interpersonal relationships and information systems are key resources used to gather and process information during product development (Rehm et al., , 2017). However, these two resources have not been empirically examined together in survey research focusing on innovative capabilities. We address this gap by using survey data to empirically test the effect of guanxi and IT systems on innovation capabilities and new product performance. In addition, we examine these relationships in a new context, exporting SMEs in China. Fu et al. (2013) show that Chinese electronics companies use guanxi as one component of interactive learning and that high levels of interaction are related to high levels of product change. However, Fu et al. (2013) did not measure the relationship between the use of guanxi, innovative capabilities, and new product performance.

IT systems facilitate communication, coordination, knowledge management, and decision-making during product development (Nambisan, 2003; Ozer, 2000). Empirical studies have confirmed a positive relationship between IT systems and new product development performance (e.g., Durmuşoğlu & Barczak, 2011; Ettlie & Pavlou, 2006; Kawakami et al., 2015; Zahay et al., 2011). However, investing in IT assets, implementation, training, and maintenance can be costly. Building innovation capability by leveraging relationships through guanxi is likely to be less expensive than investing in, implementing, and maintaining IT systems.

However, guanxi and IT systems may complement each other, with guanxi being a source of information and IT systems enabling storage, sharing, and analysis so the information can be effectively used to make decisions during product development.

A second contribution is that we examine the moderating role of proactiveness. Several studies conclude that guanxi is positively related to overall firm performance (e.g. Gu et al., 2008; Luo et al., 2012; Park & Luo, 2001). Others show that too much guanxi reduces firm performance (Nie et al., 2011) and new product innovativeness (Cui et al., 2013). These results suggest the need to examine moderating relationships to identify the conditions under which guanxi is the most beneficial or when organizations must find other ways of increasing their innovation capabilities. Although the direct relationship between proactiveness and innovation capability has been confirmed (Joshi et al., 2015), we examine the moderating role of proactiveness. The results can be used to provide guidance to managers on the effectiveness of guanxi as a tool to support innovation and product development depending on their organization's level of proactiveness.

In the next section of the paper, the conceptual model is presented and hypotheses are developed. Then the survey research method used to gather the data is described along with the analysis which was completed using Smart PLS. The results are presented and discussed followed by limitations and opportunities for future research.

## **2. Theory, conceptual model and hypotheses development**

According to RBV, resources that are rare, valuable, imperfectly imitable and difficult for other firms to substitute contribute to a competitive advantage (Barney, 1991). The way that firms deploy resources to create capabilities rather than the resources themselves can lead to a

competitive advantage (Teece et al., 1997). Capabilities should be included in models that draw on RBV because capabilities capture a firm's ability to deploy resources to attain a competitive advantage (Newbert, 2007). The capability to develop and introduce technological innovations has long been considered as a source of competitive advantage (Schumpeter, 1934). Innovation capability is an organization's ability to develop new solutions to satisfy customers' current and future needs (Adler & Shenhar, 1990; Akman & Yilmaz, 2008; Schoenherr & Swink, 2015; Wang & Dass, 2017). Innovation capability accumulates and changes over time as organizational learning occurs (Chen 2009) and, thus, is a dynamic capability (Teece et al., 1997).

In this research, we examine how exporting SMEs can deploy two resources, *guanxi* with customers, distributors, suppliers, and government officials, and IT systems to enhance their innovation capabilities. The proposed research model is shown in Figure 1.

[INSERT FIGURE 1 ABOUT HERE]

### 2.1. *Guanxi*

*Guanxi*, a Chinese concept, is defined as a close and pervasive interpersonal relationship based on high-quality social interactions and the reciprocal exchange of mutual benefits. (Ou et al., 2014; Fu et al., 2013). *Guanxi* is a complex concept that encompasses emotions and feelings toward others, trust and trustworthiness, social exchange and reciprocity, and social status (e. g. Hwang, 1987; Kipnis, 1997; Ramasamy et al., 2006; Wang et al., 2014; Yen et al., 2011). Individuals develop *guanxi* with family, friends, business partners, and government officials (Chen & Wu, 2011). Wiegel and Bamford (2015) argue that *guanxi* is a source of competitive advantage, especially for SMEs because *guanxi* can help facilitate commerce by lubricating business relationships with personal social connections (Ou et al., 2014). *Guanxi* with

government officials allows access to financial resources (Chen & Wu, 2011) and information that is not available to others (Gu et al., 2008).

To understand the use of guanxi in China, according to Peng (2002), an institutional-based view is needed in addition to the traditional management theories such as RBV (Barney, 1991) and five forces (Porter, 1980). Despite market-oriented reform, institutions in China govern societal transactions in the areas of politics, law, and society (Peng, 2003; Peng et al., 2008; Zhang et al., 2017). Often organizations can only gain access to this information through personal connections, such as guanxi (Sheng et al., 2011). Guanxi may help SMEs promote adaptation and collaboration between firms in immature institutional environments (Xin & Pearce, 1996).

During innovation, an organization must be willing to share information with others such as government officials, suppliers and customers must be willing to share information with the organization. A challenge facing innovation in China is that the institutional environment is still characterized by legal inadequacy and enforcement inefficiency (Sheng et al., 2013; Wang et al., 2015). Organizations doing business in China experience problems such as breach of contract, patent and copyright violations, and appropriation of intellectual property (Zhang et al., 2017). Managers' decisions are also constrained by the institutional environment (Peng et al., 2008). Such institutional environment leads to dysfunctional competition (Zhang et al., 2017) in which it is difficult to protect intellectual property rights and product and process innovations can be easily imitated by competitors (Li & Atuahene-Gima, 2001).

Guanxi can be used to overcome inadequacies in the regulatory environment and facilitate information sharing. Social interaction and perceived trustworthiness are positively related to an organization's ability to deploy and combine resources when developing new



products (Tsai & Ghoshal, 1998). Trust and commitment in guanxi relationships are positively related to knowledge transfer between firms (Ramasamy et al., 2006). The emotional attachment and trust/trustworthiness aspects of guanxi are also likely to increase information sharing between the firm and its customers, distributors, suppliers, and government officials. Empirical studies show that relationship quality, customer network ties, and social interaction are positively related to the acquisition of external knowledge (Yli-Renko et al., 2001). Further, when suppliers trust the buyer they share more information (Dyer & Chu, 2003). Trust and personal relationships are positively related to both the quantity and the credibility of knowledge exchanged between buyers and suppliers (Lui et al., 2017). However, the lack of guanxi with key information sources can limit SMEs' access to information. This can lead to "collective blindness" in which members of the network miss changes in the market environment (Wellman, 1988; Gu et al., 2008).

The social exchange dimension of guanxi may also provide access to external information and knowledge. To build and maintain good guanxi, "favors" are given and received following culturally-based rules (Hwang, 1987; Kipnis, 1997; Park & Luo, 2001; Wang et al., 2014; Yen et al., 2011). To continue the guanxi relationship with another person, favors given create an obligation that they are to be repaid in the future, when needed, with something that is perceived to be of higher value (Hwang, 1987; Lovett et al., 1999; Yen et al., 2011). Thus, those with good guanxi should be able to use favors to access needed information and resources from those in their networks. However, Gu et al. (2008) suggest that reciprocal obligations can take up a large amount of an organization's time and resources without getting equal value in return.

Based on the RBV framework, differences in firm performance result from idiosyncratic and path-dependent resources that cannot be imitated (e.g., Barney, 1991; Bharadwaj, 2000; Powell & Dent-Micallef, 1997). Park and Luo (2001) find that guanxi utilization is heterogeneous across firms and depends on the institutional, strategic and organizational settings of each organization. The unique nature of networks formed using guanxi restricts access to those outside the network (Luk et al., 2008), suggesting guanxi is unique and difficult to imitate. Guanxi affects the access to and flow of information and resources into a firm (Gu et al., 2008; Park & Luo, 2001; Tsang, 1998; Zhou et al., 2007), which should enhance innovation capability. Guanxi can facilitate the flow of market, process, and strategic information that is useful when developing and introducing new products (Cui et al., 2013; Ramasamy et al., 2006).

Thus, we propose:

**H1: There is a positive relationship between guanxi and innovation capability.**

In addition to enhancing an organization's innovation capability, we propose that guanxi is directly related to new product performance as measured by quality, delivery, and price. A product's quality is affected by how well the product's design meets the customer's expectations. Guanxi with customers and distributors may help the organization to better understand their needs and to incorporate these into the product's design to ensure that customer expectations are met. Firms must communicate with customers to fully understand their needs to ensure the design of products have the features, quality, and price their customers want (Wang et al., 2015).

Guanxi with suppliers is also important for new product performance. A large body of research describes the performance benefits to buyers from close supplier relationships (e.g. Dyer & Chu, 2003; Goffin et al., 2006; Heide & Stump, 1995; Paulraj et al., 2008). The quality of inputs from suppliers such as materials and services, the ability of the process to consistently

attain product specifications, and control of the process are essential for new product performance. Guanxi increases the confidence that their suppliers are trustworthy and will perform as expected. Further, with guanxi, companies are more likely to share technical and commercial information, such as production plans as needed when developing new products. If the organization has guanxi with the supplier, the supplier is more likely to consider the organization as a preferred customer, providing favorable prices and putting a priority on delivery above other customers (Ellis et al., 2012).

Guanxi with government officials is also important. Given the legal environment, SMEs in China find it difficult to use legal processes to gain protection (McMillan & Woodruff, 1999). Thus, managers develop guanxi with government officials to enforce business contracts or stop unlawful behaviors such as patent infringement. Firms with close political connections, and government involvement may have more access than those who don't (Ambler & Witzel, 2004), to technical and market information that will improve product performance. However, the use of guanxi with government officials can also create risks. Guanxi with government officials has been shown to have a negative relationship with resources, capabilities and the ability to adapt when technology is changing (Chen & Wu, 2011). Strong political ties may hurt a firm's ability to generate creative ideas and implement innovative products. Power conflicts and government interventions associated with political ties may reduce inter-functional coordination and inhibit innovation.

Thus, we propose:

**H2: There is a positive relationship between guanxi and new product performance.**

## 2.2. *IT Systems*

While guanxi is a social resource that is an informal source of information that contributes to innovation capability, IT systems are a formal, technical resource. IT systems encompass a firm's technological assets, software, and skills that are related to the use of IT (Bharadwaj, 2000). According to RBV, it is not the IT assets themselves, but how they are deployed and used to develop organizational capabilities that create a competitive advantage (Bhatt & Grover, 2005; Kawakami et al., 2015; Mata et al., 1995; Prasad et al., 2001). IT systems are valuable because they can enhance the performance of business processes and are rare because not all firms possess these resources.

Research shows that IT systems are positively related to knowledge generation (Nonaka, 1994; Song et al., 2006; Zhang et al., 2018), which is essential for innovation capability. IT systems support knowledge gathering, storage, retrieval, integration, transformation, and exploitation; thus they should enhance an organization's capabilities for improving its products and processes (Joshi et al., 2010; Subramaniam & Youndt, 2005). For example, the use of decision-support systems and file transfer protocols are positively related to new product development performance across all development phases (Durmuşoğlu & Barczak, 2011). IT use frequency and replacement frequency are positively related to new product capabilities (Kawakami et al., 2015). IT systems may also facilitate communication and information sharing with customers, distributors, and suppliers. Ettlie and Pavlou (2006) find that IT support is positively related to interfirm partnership capabilities during new product development.

Thus, we propose:

**H3: There is a positive relationship between IT systems and innovation capability.**

### *2.3. Innovation Capability and New Product Performance*

Innovation is concerned with the process of commercializing or extracting value from new ideas (Guan et al., 2006). Empirical research shows that innovation capability is positively related to firm performance (e.g., Sher & Yang, 2005; Sulistyo & Siyamtinah, 2016, Zaheer & Bell, 2005; Kirchner, 2016). Further, researchers have examined the relationship between innovation capability and some product development outcomes (Letonja et al., 2016). For example, Archibugi and Coco (2005) argue that the capability to access and use external knowledge to create unique skills or knowledge helps firms to develop and launch new products. In the same vein, Schoenherr and Swink (2015) find a positive relationship between innovation capability and successful new product launch but they do not explore product performance.

Moorman (1996) shows that use of market information during product development is positively related to new product performance. Gathering, analyzing, and effectively using market information to design new products is an important aspect of innovative capability. Based on survey research, Ngo and O' Cass (2012) show that innovation capability is positively related to the quantity of products developed, product quality and uniqueness, and customer related performance. Thus, we propose:

**H4: There is a positive relationship between innovation capability and new product performance.**

#### *2.4. Moderating Effect of Proactiveness*

Proactiveness is a future-looking focus that is a dimension of entrepreneurial orientation (EO) along with innovativeness and risk-taking (Lumpkin & Dess, 1996; Lumpkin & Dess, 2001; Wang, 2008). Proactive organizations anticipate future customer needs, identify new opportunities, and introduce new products before their competition (Keh et al., 2007; Lumpkin & Dess, 1996; Venkatraman, 1989). Rather than simply reacting to change, proactive organizations

drive and shape their business environments (Dai et al., 2014). Studies show that proactiveness is directly related to the extent to which firms incrementally improve existing products, develop new products, and enter into new markets (Joshi et al., 2015; Lumpkin & Dess, 2001; Wang, 2008; Yeniaras & Unver, 2016).

To identify and capitalize on new opportunities, proactive firms must gather and process new and more information than less proactive firms (Joshi et al., 2015). Research shows that highly proactive firms devote more resources to scanning the external environment to identify new opportunities than less proactive firms (Dai et al., 2014; Tang, et al., 2010). Research also suggests that proactive firms develop a more accurate understanding of the business environment than less-proactive firms (Tang et al, 2010). Through the process of gathering and processing information, firms enhance their capabilities to gather and effectively analyze environmental information (Tang et al., 2010).

Guanxi is often the conduit for information exchange. Research suggests that the level of trust and commitment in guanxi between firms influences inter-organizational information sharing and knowledge transfer (Ramasamy et al., 2006). The more trust between the firm and its customers, distributors, suppliers, and government officials, the more likely for them to share information. Existing research also shows that the quality of guanxi is positively related to the acquisition of external information for new ideas (Yli-Renko et al., 2001). Firms that are proactive are more likely to strengthen existing guanxi or cultivate new guanxi networks to help them obtain useful information. This is especially likely to be the case for companies that are exporting products to different countries. When introducing new products or entering new markets, SMEs may need to develop more guanxi with new suppliers, distributors, and customers. Thus, guanxi networks that are useful for companies to obtain relevant information

for new ideas or new product development will be emphasized and developed by proactive organizations.

Thus, we propose,

**H5a: The higher the level of proactiveness, the stronger the relationship between guanxi and innovation capability.**

**H5b: The higher the level of proactiveness, the stronger the relationship between guanxi and new product performance.**

### **3. Methodology**

#### *3.1. Survey Development*

A survey method was used to gather the data in this research. As recommended by Gerbing and Anderson (1988), the survey was developed based on interviews and an extensive literature review. Eight Chinese SME executives were interviewed using a structured interview format, to learn about factors they believed were influencing their firm's performance. The interviews were one to two hours in length. Based on a content analysis, institutional factors such as government support, organizational factors including information systems and proactiveness, and guanxi emerged from the interviews (See Appendix 2 for the structured interview questions). Existing measurement scales for these items were then identified based on a literature review.

The survey instrument, developed in English, was based on the literature and interview results. All measures were adapted from existing measure scales (see Appendix I), all using 7-point Likert scales. The four-item *guanxi* scale was adapted from Luk, et al. (2008). This scale measures guanxi with customers, distributors, suppliers, and government officials ranging from "not much" to "extensively." *Innovation capability* addresses the use of knowledge and ideas from different sources and encouragement to participate in innovation and was measured using

three items adapted from Akman and Yilmaz (2008) ranging from “not much” to “extensively.” The four-item *IT systems* scale, adapted from Song et al. (2008), addresses knowledge management, integration, and product development IT systems ranging from “much worse than the competition” to “much better than the competition.” *New product performance* was assessed using the scale developed by Acur et al. (2012), which has four items addressing quality, price, and delivery with scales ranging from “much worse than the competition” to “much better than the competition.” *Proactiveness* was adapted from Zhang et al. (2009) and ranges from “strongly disagree” to “strongly agree.” We also used firm age, measured by the number of years the firm has been in business, and technology intensity as control variables. A single item measured technology intensity, “How would you evaluate the industry technology of your enterprise?” (1=labor intensive; 6=technology intensive).

On the survey, dependent variables were listed first, followed by the independent variables to minimize common method bias (Podsakoff et al., 2003). The survey was reviewed for face validity by the executives and four academicians. Based on their feedback, a few minor changes were made to increase clarity. The last step involved translation and back translation. Three Chinese-English bilingual speakers translated the survey from English into Chinese and then three different bilingual Chinese-English speakers translated the Chinese version into English to confirm conceptual equivalence. Finally, a pretest was done using 38 MBA students in China and showed that all scales have good reliability (all Cronbach’s alphas >0.70) (Nunnally, 1978).

### 3.2. *Data collection*

The data were collected in a survey administered to a sample of exporting Chinese SMEs in manufacturing industries in two provinces: Anhui in Southeast China and Shandong in East



China. The selection criteria used to select the sample required SMEs to manufacture and export their own products to foreign markets. These provinces were selected because they are major industrialized regions with many SMEs developing, manufacturing, and exporting their own products.

Located between Beijing and Shanghai, Shandong is the second most populous province in China (Statista, 2017). Shandong represents the more developed regions, which account for 54% of national GDP and 86% of imports and 89% of exports (Cardoza et al., 2013). Shandong is investing in incubation centers to assist new start-up businesses with a goal of two million SMEs in the province by 2020 (Tsoi, 2015). Anhui is also included in the sample to represent the less-developed regions, mainly the central and western regions. The Central region has never attracted much attention for high economic growth, but it has benefited from being in the middle of the rich east and the resource-rich west. Owing to investment by the Chinese government since 2009, the Anhui province rapidly industrialized and has experienced high growth (Fornes et al., 2012).

There was not an existing list of exporting SMEs that could be used as a statistical sampling frame. The sample was created using lists of organizations provided by Anhui Import/Export Chamber of Commerce and Dongying Municipal Bureau of Commerce in the Shandong province. From these lists, 350 companies were randomly selected for the study based on the following criteria: 1) in a manufacturing industry; and 2) have some international customers. The sample covered a broad spectrum of manufacturing industries (Table 1).

[INSERT TABLE 1 ABOUT HERE]

A single senior manager from each company was used as a key informant. Each was mailed a survey and an official letter from the regional government to encourage participation.

Because SMEs in China rely on local governments for resources they tend respond to governmental requests (Sheng et al., 2011; Zhou et al., 2007). A total of 240 questionnaires were returned after three rounds of follow-up phone calls. Of these, 210 were usable, for a response rate of 60% of those who agreed to participate. To examine non-response bias, firms that participated were compared to those who were contacted but that did not. No significant differences were found in annual sales, number of employees, or firm age. There were also no significant differences in these characteristics between the respondents from the two provinces suggesting that nonresponse bias is not a concern (Sheng et al., 2011). In addition, early and late respondents were compared on key variables and these characteristics and no significant differences were found ( $p < .05$ ) further supporting that non-response bias is not a problem (Armstrong & Overton, 1977).

On average, the key informants have 6.9 years of experience in their industries. Titles include sales manager (30.8%), department manager (25.4%), business manager (13.5%), general manager (8.1%), vice president (8.1%), and supervisor (6.5%) as shown in Table 1. In a post-survey stage, phone calls were made to 35 randomly-selected original respondents to check their response accuracy in both provinces. The results showed high consistency between their telephone interview responses and their survey answers suggesting that common-method bias is not a concern.

Harman's one-factor test was also applied to assess potential common-method variance (CMV) not minimized by the survey design. No single factor accounts for most of the variance in the measures, suggesting that CMV is not a problem (Podsakoff & Organ, 1986). In addition, a scale theoretically unrelated to at least one scale, an MV marker, was included in the analysis as a proxy for CMV (Lindell & Whitney, 2001). The CMV-adjusted correlation between the

variables was calculated as recommended by Malhotra et al. (2006). The significance levels did not change (Table 5), suggesting that common method bias is not a problem.

### 3.3. *Measurement model*

SmartPLS 2.0, a variance-based structural equation modeling (SEM) technique was used to test the measurement and research models (Hair et al., 2012). PLS can estimate complex predictive path models when the sample size is small relative to the number of indicators (Chin et al., 2003; Garthwaite, 1994; Ringle et al., 2005). The validity and reliability of the measurement scales were tested using the procedure recommended by Kleijnen et al. (2007). Item validities (including significance and magnitude of factor loadings) were assessed first, followed by estimation of the average variance explained, assessment of construct reliability, and evaluation of discriminant validity. For all constructs, the items loaded significantly as expected (Gefen & Straub, 2005), with all loadings above .70 (Hulland, 1999). The composite reliabilities of each item are above .70 as shown in Table 2, (Hulland, 1999) and the average variance extracted (AVEs) of the constructs exceed the threshold value of .50 (Table 3). As shown in Table 4, the square-root of the AVE for each construct is greater than all correlations between that factor and any other construct supporting discriminant validity (Gefen and Straub, 2005).

[INSERT TABLES 2, 3 and 4 HERE]

## 4. **Analysis and results**

Table 5 displays the means, standard deviations, variance inflation factor values and correlations. There is no evidence of multicollinearity because the absolute value of each correlation is less than 0.7 (Dormann et al., 2013) and all the variance inflation factors (VIF) are less than 2.5 (Allison, 1999).

[INSERT TABLE 5 HERE]

Figure 2 and Table 6 show the results of the hypotheses testing done using SmartPLS 2.0. The relationship between guanxi and innovation capability is not statistically significant. Thus, H1 is not supported. The results show that guanxi is significantly positively related to new product performance ( $p < 0.05$ ) supporting H2. IT systems has a significantly positive relationship with innovation capability ( $p < 0.000$ ), supporting H3. Innovation capability is positively related to new product performance ( $p < 0.000$ ), thus supporting H4.

[INSERT TABLE 6, and FIGURE 2, ABOUT HERE]

#### 4.1 *Moderating role of proactiveness*

To test the moderation effect of proactiveness between guanxi and innovation capability, we split the data into two groups using the average mean value of 5.3 with one group consisting of firms with high proactiveness (102) and one consisting of firms with low proactiveness (110). Regression analysis was repeated with each group and the results are shown in Figure 3 and Table 7. The result shows there is a significant relationship between guanxi and innovation capability when the firm's proactiveness is high ( $p < 0.001$ ); but the relationship is non-significant when the firm's proactiveness is low. Thus, H5a, which proposed that guanxi would be more strongly related to innovation capability when proactiveness is high than low was supported. A multigroup analysis result (Table 7) shows there is a significant difference between the two path coefficients ( $p < 0.05$ ).

The same approach was used to test the moderation effect of proactiveness on the relationship between guanxi and new product performance. A multigroup analysis result shows there is no significant difference between the two path coefficients ( $p < 0.1$ ). Thus, H5b is not supported and this relationship is not modified by proactiveness. We next discuss the implications of these findings.

[INSERT TABLE 7 and FIGURE 3 HERE]

## **5. Discussion**

### **5.1 Research Contributions**

Drawing primarily on RBV (Barney, 1991), this research makes two major contributions. First, this study extends RBV literature by investigating two organizational resources, namely guanxi and IT systems, and their relationships with innovation capability and new product performance of exporting SMEs in China. The results show that for SMEs, innovation capability is significantly related to new product performance. This is consistent with the results of previous research that suggest innovation capability can improve aspects of product development and firm performance (e.g., Sher & Yang, 2005; Schoenherr & Swink, 2015; Zaheer & Bell, 2005). Thus, increasing innovation capability can help SMEs to be more competitive.

The results also show that IT systems are significantly positively related to innovation capability. IT systems provide a formal structure for gathering, analyzing, storing, and sharing data during the innovation process. Because they have limited resources, SMEs may be concerned about investing in IT systems for knowledge management. However, our results suggest that SMEs can use IT systems to increase innovation capability.

Although guanxi is positively related to new product performance as measured by price, delivery, and quality, guanxi's relationship with innovation capability depends on the level of the firm's proactiveness. Thus, the study also contributes to the literature by empirically testing the moderating role of proactiveness. As hypothesized in H5a, the relationship between guanxi and innovation capability is moderated by proactiveness. Proactiveness does not moderate the relationship between guanxi and new product performance as measured by price, delivery, and quality (H5b).

There are several possible explanations for the moderating effect of proactiveness on the relationship between guanxi and innovation capability that should be explored in future research. For SMEs that are less proactive, their networks may be less useful to innovation capability. Dai et al. (2014) suggest that firms with low proactiveness are “pulled” into international markets by their existing networks. Thus, there is little need for these firms to develop innovation capability. Further, the information needed to develop innovation capabilities may not be available in their existing networks as was suggested by the concept of “collective blindness” (Wellman, 1988, Gu et al., 2008). It is likely that guanxi must be developed with new customers, distributors, or suppliers to assess the information needed for innovation capability. Proactive firms may develop guanxi with new organizations beyond their existing network to gain access to new information and increase innovation capability.

Another factor may be that the motivation to search out and use new information depends on the level of proactiveness. Motivation to gather information is most likely affected by the firm’s desire to develop and introduce new products and enter new markets faster than the competition. Thus, firms that are more proactive, may seek out more information from their networks than those that are less proactive.

The organizational structure and processes within less proactive SMEs may be a barrier to effective use of information to generate knowledge that leads to innovation. Perhaps less proactive firms are not able to process the information gathered from their networks effectively. Innovation capability in SMEs in China is likely to be strongly affected by the entrepreneurs’ educational background, managerial expertise, training, and experience with innovation. It may be that managers in less-proactive SMEs do not have higher education or have a limited understanding of the innovation process. Thus, although they might have developed good

guanxi with government officials, their customers, suppliers and other key players, they may not have the ability to use such network resources effectively to develop innovation capabilities.

One question raised by the findings is why is the relationship between guanxi and new product performance not moderated by proactiveness? Guanxi is a complex concept that encompasses trust and trustworthiness, feelings toward others, social exchange and reciprocity, and social status (e. g. Hwang, 1987; Kipnis, 1997; Ramasamy et al., 2006; Wang et al., 2014; Yen et al., 2011). Our findings suggest that components of guanxi other than access to information to use for innovation may affect new product performance. The reciprocal nature of guanxi in giving and trading favors may be related to a product's price, quality, and delivery performance. For example, the owner of an SME may give a customer a favorable price to win more business in the future. SMEs may use their networks to gain favorable prices or better delivery performance from suppliers or better service for customers from distributors thus increasing new product performance. More research is needed to explore the possible differing influences of the components of guanxi.

## **5.2 Managerial Implications**

These findings provide several managerial implications for SMEs exporting to foreign markets. First of all, our findings suggest that IT systems and guanxi are resources that can help SMEs in China develop a competitive advantage; however these resources contribute in different ways. Investment in IT systems enhances innovation capability which in-turn improves new product performance. Second, SMEs need to cultivate more proactiveness. The willingness of exporting SMEs to proactively seek out information about their external environment helps the firms to improve the necessary skills and capabilities for collecting and processing information that is needed for innovation (Tang et al., 2010). Firms that are more proactive gain a more

accurate understanding of the competitive environment and opportunities and make better strategic decisions (Tang et al., 2010). Thus, proactiveness is an important organizational characteristic that can help SMEs form a more comprehensive vision when expanding in international markets. Third, guanxi can be used to directly improve new product performance. Proactive SMEs can use guanxi as a tool to develop innovation capabilities that can increase new product performance. However, for those SMEs that are not proactive, guanxi is not related to the development of innovation capabilities. Less proactive SMEs can still benefit from guanxi because of its direct relationship with product performance but this may not be sustainable over the long run if customers expect product innovation.

## **5.2. Limitations and future research**

There are several limitations of our survey research methodology. The data were gathered from manufacturing SMEs in two provinces in China using available lists of businesses which are not a statistical representation of exporting SMEs. Thus, caution should be used when generalizing the results beyond this sample and into other locations. For example, other provinces such as Guangdong and Zhejiang also have many exporting SMEs. Thus, future research can explore if there are differences in the development of innovation capabilities of SMEs located in different regions in China. We did not specifically ask if the companies design and develop their own products or make products using customer-provided design specifications. Future research should examine if these types of firms use information technology and guanxi in different ways.

Although we tried to minimize the bias that can occur from using a common method and single respondent, these are limitations. Although we used an official government letter to help increase participation this may have also influenced how individuals participated and the way



that the participants responded to the survey questions. For example, it is possible that those with higher levels of guanxi with government officials were more likely to respond than those firms with lower levels of guanxi. The research also used self-reported measures creating the opportunity for bias. Future survey research should gather objective as well as survey data and use multiple respondents. Quantitative measures such as R&D expenses, R&D personnel, and number of introduced innovations within a certain period could be measured in future research.

There are many opportunities for future research. The results suggest that the relationship between guanxi and innovation capability deserves a deeper look beyond what can be done with survey research. Using in-depth case studies, the role that IT systems and guanxi play in the innovation processes used by SMEs and the relationship with product performance should be further examined. These case studies can explore the types of information gathered, the sources used, how information is accessed and how it is processed and used to develop new products. Further, research should examine which dimensions of guanxi are most useful for developing innovation capability. Variables such as education, skills, experience, and motivation can be explored as well for potential differences in information processing between incremental and radical innovation. Longitudinal studies would allow for the exploration of how SMEs use their resources to develop innovation capability over time. Given that SMEs in different industries are likely to have different levels of innovation needs, future research should focus on and compare SMEs in specific industries, such as in electronics, machinery, textiles or construction. Finally, the structure of networks of proactive and less proactive SMEs can be explored to identify differences. For example, Ma et al. (2009) suggest that composition and diversity of an organization's social network can affect adaptability.

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**Appendix 1 Items measuring innovative capability, IT systems, Guanxi and new product performance of export-focused SMEs**

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***Innovation Capability (1-Not much, 7-Extensively)***

- a Our firm uses knowledge from different resources for product development activities efficiently and rapidly.
- b Our firm supports and encourages workers to participate in activities such as product development, innovation process improvement, and idea generations.
- c Our firm continuously evaluates new ideas that come from customers, suppliers, etc. and include them into product development activities

***IT Systems (1-Much worse, 7-Much better)***

- a IT systems for new product development projects
- b IT systems for facilitating cross-functional integration
- c IT systems for facilitating technology knowledge creation
- d IT systems for facilitating market knowledge creation

***Guanxi (1-Strongly disagree, 7-Strongly agree)***

- I and our company managers have good personal *Guanxi* with...
- a ... the managers of key suppliers
  - b ... the mangers of key buyer/customers
  - c ... the managers of key distributors
  - d ... relevant key government officials

***New Product Performance (1-Much Worse, 7-Much better)***

- a Our new products' quality is good.
- b Our new products' price is reasonable.
- c Our new products are delivered on time.
- d Our new products meet customer requirements.

***Proactiveness (1-Strongly disagree, 7-Strongly agree)***

- a Our company generally favors a strong emphasis on Research & Development, technological leadership, and innovations.
  - b Our company has marketed a large variety of new lines of products or services in the past 5 years.
  - c Our company has mostly made minor changes in our products or service lines in the past 5 years (Reverse-coded).
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## **Appendix 2 Questions used in the structured interviews**

- 1) Could you please tell me what prompted your firm to get into international markets at such a young age?
- 2) How would you describe your firm's corporate culture? Did this kind of culture develop over time or did it originate with the founder?
- 3) What do you consider as the most challenging factors when entering into foreign markets?
- 4) How do you compete with your competitors to obtain limited resources?
- 5) What strategies have you adopted to obtain resources and market information?
- 6) Have you adopted any interpersonal influence strategies (e.g. using Guanxi)? How did such strategies benefit or hurt your company in the long run?
- 7) How would the strategies you adopted help you with development of the international entrepreneurial capability of your firm?