



# Guanxi, IT systems, and innovation capability: The moderating role of proactiveness

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## 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.

## 1. Introduction

With rapidly changing technology and market environments, exporting SMEs face intense global competition (Paul, Parthasarathy, & Gupta, 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 Schoemaker (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 & Shenhar, 1990; Akman & Yilmaz, 2008; Machikita & Ueki, 2015; Schoenherr & Swink, 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, Zeng, Peng, & Tam, 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 & Meulenbergh, 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, Zhao, & Lyles, 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, va der Bij, & Weggeman, 2006). Guanxi is a culturally-based, informal resource involving the building and use of interpersonal relationships (e.g. Cui, Wen, & Quin, 2013; Gu, Hung, & Tse, 2008; Lovett, Simmons, & Kali, 1999; Park & Luo, 2001; Sheng, Zhou, & Li, 2011). With limited internal resources, in China, SMEs turn to external sources using guanxi to gather information and knowledge for innovation (Fu, Revilla, & Schiller, 2013).

Once gathered, information must be shared, analyzed, and used for decision-making. Because new product development involves gathering

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and processing different types of complex information, IT systems have become increasingly important to new product development success (Zahay, Griffin, & Frederick, 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, Goel, & Junglas, 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, Das, & Mouri, 2015; Lumpkin & Dess, 1996; Lumpkin & Dess, 2001; Shan, Song, & Ju, 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; Etlie & Pavlou, 2006; Kawakami, Barczak, & Durmuşoğlu, 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, Huang, & Wang, 2012; Park & Luo, 2001). Others show that too much guanxi reduces firm performance (Nie, Zhong, Zhou, Jiang, & Wang, 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, Pisano, & Shuen, 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 & Doss, 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 Fig. 1.

### 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. (Fu et al., 2013; Ou, Pavlou, & Davison, 2014). 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, Goh, & Yeung, 2006; Wang, Wang, & Zheng, 2014; Yen, Barnes, & Wang, 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, Wang, & Jiang, 2008; Zhang, Wang, Zhao, & Zhang, 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, Zhou, & Lessassy, 2013; Wang, Huo, Tian, & Hua, 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).

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