



# Demand Heterogeneity, Learning Diversity and Innovation in an Emerging Economy



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## ABSTRACT

Prior research has shown mixed findings about the relationship between exporting and a firm's innovation performance. This study applied organizational learning theory with a demand-side perspective to explore whether the mixed findings could be due to confounding a positive effect of knowledge variety with a negative effect arising from market separation. Compared with firms with only domestic or foreign customers, firms with both types of customers have more opportunities to acquire diverse knowledge and form innovative combinations, but serving disparate customers tends to inhibit knowledge transfer, sharing and integration. Data on 8529 Chinese automobile and component manufacturers were analyzed to test these arguments, and firms competing in less separated domestic and overseas markets were found to demonstrate the best innovation performance. Firms with greater absorptive capacity were found better able to overcome the difficulties caused by market separation and enjoy more benefits from market variety.

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## 1. Introduction

Does demand heterogeneity influence firms' innovativeness? The organizational learning literature suggests that firms can learn from their customers (De Loecker, 2011; Lederman, 2010; Liu et al., 2009; Salomon, 2006; Salomon and Jin, 2008; Salomon and Shaver, 2005) and that knowledge acquired from diverse geographic locations can be a richer resource for generating novel knowledge combinations and can lead to more innovation (Hitt et al., 1997; Lahiri, 2010; Penner-Hahn and Shaver, 2005; Singh, 2008; Wang et al., 2011; Wilson and Doz, 2011). This is consistent with the demand-side perspective, which suggests that, "Strategies based on consumer heterogeneity can result in competitive advantage even if the firm holds only obsolete or mundane resources. ...successful innovations can be consumer driven rather than resource or technology driven, and consumer knowledge can play a key role in entrepreneurial idea discovery" (Priem et al., 2012: 346). However, no consistent relationship between customer location heterogeneity and innovation has been found in previous empirical studies. Some found positive effects (e.g. Li et al., 2010; Salomon and Jin, 2008, 2010; Salomon and Shaver, 2005), while some others found negative ones (e.g. Navas-Aleman, 2011).

Combining theories of organizational learning with a demand-side perspective, this study addressed this inconsistency by proposing three factors that may jointly influence a firm's effectiveness in learning from customers in heterogeneous geographic markets: market variety, market separation, and the firm's absorptive capacity. Market variety is defined by the composition of qualitatively different geographical markets, such as domestic and overseas markets. Firms with both domestic and overseas customers have

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greater market variety than firms selling only domestically or overseas. They tend to be exposed to a variety of knowledge, to build a more diverse knowledge base and to be more innovative. Geographic markets are dissimilar to different degrees. The degree of dissimilarity will be termed market separation. When a firm's domestic and overseas markets are widely separated it is exposed to highly dissimilar knowledge, but it then may suffer from difficulties in knowledge transfer, sharing and integration (Anderson and Gatignon, 1986; Lavié and Miller, 2008). Greater absorptive capacity, defined as "the ability of a firm to recognize the value of new, external information, assimilate it, and apply it to commercial ends" (Cohen and Levinthal, 1990: 128), may help a firm overcome the difficulties arising from separation and enjoy more benefits from market variety.

Empirical work on 8529 manufacturers in the automobile and component industries in China during 2005–2007 supports the above arguments. Compared with Chinese manufacturers selling only domestically or only overseas, those with both domestic and overseas customers file more patent applications, and make more new product introductions and sales. In the industry sectors where domestic and overseas markets are less separated, the positive effect of learning from market variety is further enhanced. Firms' absorptive capacity enhances the positive effect of market variety and weakens the negative moderating effect of market separation.

These results make three contributions to the literature. First, they extend the research on "learning diversity" by drawing on the demand-side perspective. In recent years organizational learning scholars have started to investigate the effect of diversity in external knowledge sources (e.g. network dispersion, alliance portfolios) and internal knowledge bases (e.g. technological diversity, R&D dispersion) on the innovativeness of organizations (Frenz and Ietto-Gillies, 2009; Lahiri, 2010; Quintana-García and Benavides-Velasco, 2008; Singh, 2008; Srivastava and Gnyawali, 2011). The demand-side perspective, emphasizing the benefits of consumer heterogeneity and consumer-driven innovations, can further add to this work (Priem et al., 2012). In this paper we argue that 1) variety in a firm's customer groups (i.e. the geographic distribution of customers) is good for innovation as they can provide diverse information and knowledge benefits, but 2) separation between the customer groups may reduce the benefits of variety, as knowledge gained from highly separated customers may be too difficult to transfer or integrate.

This paper also aims to make contributions to the international strategy literature. Prior research on international diversification has focused primarily on predicting firms' overall performance (e.g. Delios and Beamish, 1999; Wan and Hoskisson, 2003). A few studies have examined the relationship between international diversification and innovation (Hitt et al., 1997; Wang et al., 2011), but they focused on the geographic dispersion of foreign direct investment, not on geographic diversification of customers through exporting. This study has shown the value of knowledge held by both domestic and overseas customers, and the results may help to disentangle the mixed findings about the relationship between exporting and innovation.

This analysis of Chinese data also contributes to development economics. The substantial difference between domestic and overseas markets makes it difficult for firms to take the first step in international expansion (Pederson and Shaver, 2011). This is especially true for firms from emerging economies, as they typically lack global experience, managerial competence, and professional expertise (Luo and Tung, 2007). Compared with foreign direct investment, exporting to an overseas market usually involves a lot less commitment and risk (Cassiman and Golovko, 2011), and is a key first step in the international expansion of emerging economy firms. Such firms typically lag global technology leaders, so they may need to leverage the knowledge that they gain through exporting to develop indigenous technological capabilities (Li and Kozhikode, 2009; Pack and Saggi, 1997). A few emerging economy governments have adopted more open-door policies hoping that trade and foreign direct investment (FDI) can promote indigenous technological progress (Chittoor et al., 2008; Pack and Saggi, 1997; Pamukcu, 2000). The results of this study suggest that 1) having both domestic and overseas customers helps firms build their own innovative capabilities, 2) governments can facilitate that by decreasing the separation between domestic and overseas markets, but 3) emerging economy firms must also build up their absorptive capacity to make the best use of learning from a diverse set of customers.

## 2. Theoretical background and hypotheses

### 2.1. Organizational learning diversity and demand-side knowledge

Firms have become increasingly active in organizing complex knowledge-seeking activities in recent years (Chesbrough, 2003; Faems et al., 2010), and the organizational learning literature has paid more attention to the effect of diverse knowledge sources on a firm's innovation performance. Innovation scholars suggest that innovation often arises from novel combinations of existing knowledge (Cohen and Malerba, 2001; Fleming et al., 2007; Hargadon and Sutton, 1997; Schumpeter, 1934). Firms with access to a diverse set of knowledge sources tend to have more opportunities for innovation involving combining and recombining their knowledge, and tend to generate higher quality and more valuable innovations (Bonner and Walker, 2004; Faems et al., 2010; Frenz and Ietto-Gillies, 2009; Wang et al., 2011). But exploiting diverse knowledge sources effectively requires explicit cognitive investment from management to avoid inappropriate generalization. That effort stimulates deliberate learning and the development of dynamic capabilities (Zollo and Winter, 2002). This is how a firm can enhance its innovative capability by learning from diverse knowledge sources.

One important way of tapping into diverse sources of knowledge is international diversification (e.g. Bonner and Walker, 2004; Faems et al., 2010; Frenz and Ietto-Gillies, 2009; Singh, 2008; Wang et al., 2011). Unfortunately, prior research has focused on the geographic dispersion of foreign direct investment rather than on diversity in the customer groups involved (Hitt et al., 1997; Lahiri, 2010; Wang et al., 2011). Research from the demand-side perspective shows the importance of customer knowledge in cultivating a firm's competitive advantages (Priem et al., 2013). As one form of international diversification (Shaver, 2011), exporting to overseas markets exposes firms to multiple customer groups with diverse market knowledge (e.g. customer preferences, demand and

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