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International Business Review

journal homepage: www.elsevier.com/locate/ibusrev

Outward foreign direct investment and domestic innovation performance: Evidence from China



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ARTICLE INFO

Article history:

Received 11 July 2014

Received in revised form 9 September 2015

Accepted 15 January 2016

Available online 3 February 2016

Keywords:

Outward FDI

Regional innovation

Absorptive capacity

Foreign presence

Competition intensity

ABSTRACT

Recent years have witnessed substantial outward foreign direct investment (OFDI) from many emerging economies. Should the governments of these economies encourage OFDI in order to promote domestic innovation? Much OFDI by emerging economy multinational enterprises (EMNEs) has been undertaken to acquire strategic assets overseas, but do these acquisitions bring innovation benefits at home? The empirical analysis presented in this paper considers the effects of OFDI on regional innovation performance, using a panel of Chinese provinces, and finds that OFDI has a very significant impact on domestic innovation. Furthermore, we also identify three contingent factors – absorptive capacity, foreign presence, and the competition intensity of the local market – that moderate the impact of OFDI on innovation performance.

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1. Introduction

Much has been written about the positive impact of inward foreign direct investment (IFDI) on the innovation performance of host economies (Ben Hamida, 2013; Ben Hamida & Gugler, 2009; Buckley, Clegg, & Wang, 2002; Dunning & Lundan, 2008; Fu, 2012; García et al., 2013; Iwasaki & Tokunaga, 2014; Ouyang & Fu, 2012; Xu & Sheng, 2012). In contrast, very few studies have considered the impact of outward foreign direct investment (OFDI) on the innovation performance of home economies, especially in the context of investments made by multinational enterprises based in emerging economies (EMNEs) (Deng, 2007; Liu, Buck, & Shu, 2005; Xia, Ma, Lu, & Yiu, 2014). Yet OFDI flows from emerging economies have risen considerably since the turn of the millennium, and now account for more than one third of global FDI flows (UNCTAD, 2014). Furthermore, there is an extensive literature suggesting that a reasonably large proportion of this OFDI is motivated by strategic asset-seeking (Gammeltoft, Pradhan, & Goldstein, 2010; Luo & Tung, 2007; Mathews, 2006), in which case it is reasonable to suppose that this OFDI may have a significant impact upon the innovation performance of the home regions in which EMNEs are based.

This paper considers the impact of OFDI on regional innovation in the context of China. By the end of 2011, China accounted for more OFDI than any other emerging economy and was the third largest source of outward investment in the world (UNCTAD, 2014). Nearly 13,500 Chinese firms had together invested US\$ 425 billion in 178 foreign countries (Commerce, 2012)—and cumulative OFDI from China is predicted to exceed US\$ 5 trillion US dollars by 2020 (He, Cheung, Zhang, & Wu, 2012). Furthermore, there is considerable evidence to suggest that many Chinese MNEs are active seekers of strategic assets (Chen & Young, 2010; Deng, 2012; Edamura, Haneda, Inui, Tan, & Todo, 2014; Ning & Sutherland, 2012; Ramasamy, Yeung, & Laforet, 2012; Rugman & Li, 2007; Williamson & Yin, 2012) and technology (Chen & Tang, 2014) overseas. China therefore provides an appropriate context to explore the link between OFDI and innovation performance.

The paper draws upon international business (IB) theory and regional innovation systems (RIS) theory. It focuses on the reverse knowledge transfers associated with Chinese OFDI, specifically exploring how domestic Chinese regional innovation performance is affected by OFDI and the factors that moderate this relationship. We contribute to the existing literature in three ways. Firstly, we provide evidence for potential reverse knowledge transfers derived from OFDI by EMNEs, highlighting the positive influence of overseas investment on domestic innovation performance. Secondly, we attempt to understand the vital role of domestic absorptive capacity in facilitating the assimilation of the

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knowledge latent in Chinese OFDI. Thirdly, we unravel the interactive relationship between inward and outward FDI as well as the importance of competition intensity in the local market in affecting reverse technology transfers effected through OFDI.

The paper is organised as follows. In Section 2, we review the relevant literature, and develop seven hypotheses for empirical testing. In Section 3, we describe the dataset and the regression model specification, explain the estimation methodology, summarise how the dependent and explanatory variables are operationalised, and present some descriptive statistics. The regression results are presented and discussed in Section 4. The final section summarises the findings of the study, outlines the practical implications, and highlights the limitations.

2. Literature review & hypothesis development

There is a considerable literature suggesting that innovation performance varies not just between nations, but also between sub-national regions, such as states or provinces (see, for example, Acs, Anselin, & Varga, 2002; Evangelista, Iammarino, Mastrostefano, & Silvani, 2001; Fritsch, 2002). This is because knowledge generation and new technology development tend to be spatially-clustered or centralized (Li, 2009) and knowledge and technical capabilities geographically-bounded, meaning knowledge spillovers tend to be localised (Breschi & Malerba, 1996; Cantwell & Iammarino, 2000; Cooke, Gomez Uranga, & Etxebarria, 1997; Cooke, Heidenreich, & Braczyk, 1998; Howells, 1999; Jaffe, Trajtenberg, & Henderson, 1993; Meyer-Krahmer, 1985). This is particularly the case in the circulating of tacit knowledge (Breschi & Lissoni, 2001; Cantwell & Iammarino, 2003; Howells, 2002; Krugman, 1991; Paci & Usai, 1999). The uneven distribution of innovative activity, moreover, is particularly apparent in many emerging economies, such as China (Sun & Liu, 2010; Wang & Lin, 2013; Yang & Lin, 2012).

The underlying reasons for the regional nature of innovation activities are the subject of RIS theory. Cooke, Uranga, and Etxebarria (1998: 1564) define RIS as systems “in which firms and other organizations are systematically engaged in interactive learning through an institutional milieu characterized by embeddedness”. Iammarino (2005: 499) adds that RIS constitute “the localised network of various actors and institutions in different sectors whose activities and interactions generate, absorb, and diffuse new technologies within and outside the region”. RIS theory is particularly appropriate when examining the determinants of innovation performance in the context of countries which cover huge geographical areas and where, commonly, there are substantial regional disparities in terms of economic and/or innovative capabilities (Fu, 2008; Yang & Lin, 2012).

The extant literature has identified several drivers of regional innovation performance. For example, the amount of investment in R&D is recognised as the main input in the knowledge production process (Griliches, 1990). Others have also found that regional intelligence (measured in terms of knowledge workers) is a strong direct and indirect driver of regional innovation (Sleuwaegen & Boiardi, 2014). Cornett (2009) argued that organizational and functional aspects of a knowledge-based regional development policy are worthy of consideration, since they can be conducive to stimulating innovative behaviour in local industrial sectors.

In the context of China, innovation performance has increased dramatically since the mid-1990s. Patent figures published by the World Intellectual Property Organization (WIPO), for example, show that per capita patent applications in China increased nearly 13 times between 1995 and 2007 (Li, 2012). This dramatic increase helped China become the third-ranked nation worldwide (behind the United States and Japan) for global patenting and surpassing Korea as Asia's largest patenting force. Hu and Jefferson (2009) suggested that R&D intensity accounted for part of this improvement in innovative

performance. They also found that inward FDI, ownership reform and a stronger legal system also contributed to the surge of patent applications. More recent research has focused on explaining not just the very rapid development of national patenting activity in China, but also the growing regional disparities (Li, 2009; Sun & Liu, 2010; Yang & Lin, 2012). Li (2009), for example, points to regional subsidy programmes¹ implemented by Chinese provinces and municipalities as a critical facilitator for the growth of regional patenting activity. Despite this growing interest in China's RIS, few studies have yet considered the effects of Chinese OFDI on regional innovation performance through reverse knowledge transfers or how OFDI interacts with regional factors, such as domestic absorptive capabilities, inward FDI and local competition

2.1. Outward foreign direct investment from the domestic economy

It is customary in the IB literature to classify OFDI as either natural resource seeking, market seeking, efficiency seeking, or strategic asset² seeking (Dunning & Lundan, 2008). Numerous authors have suggested that strategic asset seeking is an important motivation for many EMNEs, and more particularly for Chinese MNEs (Child & Rodrigues, 2005; Deng, 2009; Luo & Tung, 2007; Mathews, 2006). Child and Rodrigues (2005) and Mathews (2006) argue that Chinese firms may not be exploiting existing competitive advantages when undertaking OFDI, but may rather be trying to address their own competitive disadvantages. Furthermore, Rui & Yip (2008) assert that cross-border acquisitions are often used by Chinese firms to acquire strategic assets to compensate for their competitive disadvantages, while simultaneously leveraging their own distinctive ownership advantages.

Indeed it has been suggested that many Chinese MNEs pursue developed market acquisitions primarily to repatriate intangible strategic assets to their home markets. In other words, Chinese MNEs do not primarily look to compete directly in other foreign markets. Rather, they undertake OFDI to exploit acquired intangible strategic assets (technologies, brands etc.) in their large but increasingly competitive domestic market (Child & Rodrigues, 2005; Luo & Tung, 2007; Ramamurti, 2012; Rui & Yip, 2008). Ramamurti (2012), for example, notes the potential importance of foreign acquisitions for the purposes of domestic market exploitation. There is also a considerable literature, albeit mainly concerned with MNEs from advanced economies, testifying to the reverse knowledge transfer effects associated with OFDI (e.g. Ambos, Ambos, & Schlegelmilch, 2006; Yang, Mudambi, & Meyer, 2008; Rabbiosi, 2011). Our first hypothesis is thus:

H1. OFDI has a positive impact upon domestic innovation performance.

2.2. Absorptive capacity in the domestic economy

The concept of *absorptive capacity* refers to the ability of a firm/economy to recognise the value of external information, assimilate it, and apply it to commercial ends. The concept has been applied not only to firms, but also to national/regional economies (Bhagat, Kedia, Harveston, & Triandis, 2002; Cohen & Levinthal, 1990; Cooke et al., 1997; Mowery, Oxley, & Silverman, 1998; Roper & Love, 2006). Borensztein et al. (1998) suggest the incidence of

¹ Since 1998, an increasing number of provincial governments began to launch and implement pro-patent policies that encourage patenting through deductions and reimbursements of patent application fees.

² Strategic assets are defined as “the set of difficult to trade and imitable, scarce, appropriable and specialized resources and capabilities”. Such assets are often intangible (Amit & Schoemaker, 1993).

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