

How Domestic Firms Absorb Spillovers: A Routine-Based Model of Absorptive Capacity View

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ABSTRACT Extant spillover literature explains domestic firms' productivity change mainly by the presence and attributes of foreign direct investment. In contrary, this paper, by adopting a routine-based model of absorptive capacity, intends to explore how domestic firms absorb spillovers over time. Based on a qualitative study of a domestic firm in China's silicone adhesive industry, the findings show that unbounded by geographical constraints, domestic firms enact their external absorptive capacity routines to actively search for spillovers from multinational enterprises (MNEs) at both national and international levels. Moreover, rather than searching for what is available, domestic firms are selective for spillovers that are coherent with their business strategies. The most unexpected finding is that domestic firms diligently acquire spillovers from MNEs and from local competitors in combination. Spillovers acquired from local competitors are used to increase the inferential accuracy of spillovers acquired from MNEs about strategic successes. Further, instead of absorbing spillovers from MNEs which pose moderate technology gaps, domestic firms target at MNEs which exhibit wider technology gaps, and undertake organizational learning and develop complementary assets to enhance their internal absorptive capacity routines. Socially enabling mechanisms are found to facilitate domestic firms' absorption of spillovers by employee turnover.

KEYWORDS absorptive capacity, case study method, foreign direct investment, international management, private-owned enterprises, qualitative methods, spillovers

INTRODUCTION

Spillovers from foreign direct investment (FDI) are important to the growth of domestic firms (Blomström & Kokko, 1998; Spencer, 2008). Because before domestic firms develop capabilities to a certain level to attract multinational enterprises (MNEs) to build international joint ventures for knowledge transfer (Inkpen & Tsang, 2007), spillovers present valuable 'opportunities to learn' for domestic firms (Zhang, Li, Li, & Zhou, 2010: 970).

Early research by economists attempted to link FDI level to domestic firms' aggregate productivity change (Caves, 1974). With the intention of 'looking into the MNE' (Meyer, 2004: 260), subsequent empirical research investigates how FDI's attributes, such as MNEs' country origins (Zhang et al., 2010), entry processes, and

asset composition (Zhang, Li, & Li, 2014), influence spillover effects. Though with more complicated methods to examine this issue, few definitive answers are offered.

Several studies have criticized the above research for treating domestic firms as ‘passive recipients of spillovers’ (Meyer, 2004: 267), and suggest adopting a domestic firm-centered perspective. Taking into account domestic firms’ attributes, particularly the roles of absorptive capacity, researchers argue that despite MNEs’ advanced knowledge, domestic firms without adequate absorptive capacity cannot benefit from FDI spillovers (Eapen, 2012; Li, Zhang, & Lyles, 2013).

Nevertheless, because most studies tend to consider the complex construct of absorptive capacity as a static and fixed attribute (Zhang et al., 2010), the dynamic behavioral patterns of domestic firms’ absorption of spillovers are empirically little known. Therefore, this paper intends to address the following critical question to fill this gap: *How do domestic firms absorb spillovers?*

To address this question, the present article conducts a case study of AdhesiveCo, a domestic firm in China’s silicone adhesive industry. Adopting a routine-based model of absorptive capacity (Lewin, Massini, & Peeters, 2011), this article tracks its enactment of external absorptive capacity routines and enhancement of internal absorptive capacity routines for absorbing spillovers in the period 1996–2010.

Extending prior FDI spillover studies that gauge ‘the observed improvements in productivity’ of domestic firms (Meyer, 2004: 262), this study investigates in detail how spillovers benefited AdhesiveCo in business strategies, marketing capabilities, and manufacturing capabilities. As one of the first systemic treatments for this topic, this study reveals dynamic behavioral patterns of AdhesiveCo’s absorption of spillovers seldom addressed before and makes several valuable contributions.

First, this article shows that in enacting external absorptive capacity routines, domestic firms actively search for MNEs’ spillovers at both national and international levels. This finding is contrary to the conventional wisdom that spillovers occur in geographical proximity (Spencer, 2008). Second, contrary to Zhang et al. (2010), who indicated that domestic firms search for spillovers available to them, this study shows that spillovers to be absorbed are those coherent with domestic firms’ business strategies. The evidence that domestic firms are selective in searching for spillovers challenges a basic assumption that domestic firms are passive recipients of spillovers.

Third, this article calls into question one of the premises in the extant literature that MNEs are the exclusive source of spillovers. Following Chang and Xu (2008), this study broadens this premise to consider that domestic firms acquire spillovers from local competitors. However, Chang and Xu (2008) failed to illustrate that spillovers from MNEs and from local competitors would be used in combination. The results show that spillovers from local competitors are used to increase the inferential accuracy (Terlaak & Gong, 2008) of spillovers from MNEs about strategic successes.

Finally, contrary to prior studies that indicate that technology gaps between foreign and domestic firms should not be too wide beyond the latter’s absorptive

capacity (Meyer, 2004), this paper finds that domestic firms, irrespective of the greater technology gaps, intend to absorb spillovers from large and established MNEs rather than from those of similar scale and age. Drawing on Cohen and Levinthal (1990: 129), the data show how domestic firms can dynamically enhance their internal absorptive capacity routines by ‘send[ing] personnel for advanced technical training’.

THEORETICAL BACKGROUND

FDI Spillovers

The FDI spillover literature serves the point of departure for this study, and the objective here is to investigate how domestic firms absorb spillovers. Unlike knowledge transfer that occurs in contexts in which source firms and recipient firms are in formal and cooperative relationships, such as equity joint ventures or nonequity contractual arrangements (Inkpen & Tsang, 2007), spillovers are ‘informal flows of technological knowledge from foreign to local firms’ (Perri & Peruffo, 2016: 3).

Spillovers are informal in the sense that they are ‘knowledge spread without a contractual relationship’ (Meyer, 2004: 260). Put differently, spillovers occur in arms-length relationships between MNEs and domestic firms, both of which are not in strategic alliance or other formal collaborative relationships. Hence, spillovers to domestic firms are ‘free lunch – something useful that is received without full compensation having to be paid’ to MNEs (Eden, 2009: 1066).

Though economists argue that ‘spillovers...occur involuntarily’ (Eden, Levitas, & Martinez, 1997: 58), management scholars propose that spillovers may be voluntary or intentional by MNEs, and ‘some amount of cooperation from foreign firms...crucial to effective spillovers’ would happen, if domestic firms could deliver ‘future reciprocal benefits’ to MNEs (Eapen, 2012: 246, 253) and are not considered as substantial threats to them (Spencer, 2008).

Knowledge consists of information and know-how, and firms are viewed as repositories of knowledge (Grant, 1996). Research indicates that firms’ knowledge configurations are idiosyncratic and reflect the coherent alignment of their business strategies, technologies, and practices (Kogut & Zander, 1992). Therefore, firms need to ‘connect new knowledge with existing knowledge’ (Meyer & Sinani, 2009: 1078).

Spillovers from MNEs to domestic firms occur through the following mechanisms. The first is demonstration effects. By observing MNEs’ operations, domestic firms could gain information about some latest technology and may adopt it (Blomström & Kokko, 1998). The second is employee turnover. When MNEs’ employees migrate to domestic firms, they bring foreign knowledge to new jobs (Balsvik, 2011).

The third is common local linkages. If MNEs use the same suppliers, distributors, and/or join the same trade associations as domestic firms do, the former's knowledge may inadvertently flow to the latter (Spencer, 2008). The fourth is competition effects. Confronting MNEs which bring 'fresh winds of competition' (Eden, 2009: 1066), domestic firms are forced to upgrade their technologies to avoid being crowded out.

One of the perennial issues in existing research is, where do spillovers occur (Meyer & Sinani, 2009)? Based on the cluster literature (Krugman, 1991), many researchers find that spillover effects are more significant in geographical proximity (Audretsch & Feldman, 2004). However, an increasing number of papers find no or little spillover effects at the local but at the national level (Aitken & Harrison, 1999; Chang & Xu, 2008). Conflicting findings encourage efforts to open up the black box of MNEs by studying how attributes of FDI, such as MNEs' country origins (Zhang et al., 2010), entry processes, and asset composition (Zhang et al., 2014), may affect spillover effects. Yet, a large literature on this issue still does not reach any conclusions.

Domestic Firms' Absorptive Capacity in FDI Spillovers

Scholars also intend to open up the black box of domestic firms. As FDI spillovers do not benefit all domestic firms equally (Görg & Strobl, 2001), past research suggests that a critical factor moderating the FDI level and domestic firms' productivity change is the latter's absorptive capacity (Girma, 2005), which refers to 'an ability to recognize the value of new information, assimilate it, and apply it to commercial ends' (Cohen & Levinthal, 1990: 128).

The construct of absorptive capacity in the context of spillovers implies that domestic firms 'do not automatically benefit from MNC knowledge' (Perri & Peruffo, 2016: 16); therefore, they have to develop absorptive capacity by investing in research and development (R&D) and human capital (Meyer & Sinani, 2009). Widely applied proxies for absorptive capacity in FDI spillover empirical studies include firm size and R&D expenditures (Sinani & Meyer, 2004; Zhang et al., 2010).

Focus on domestic firms' absorptive capacity helps highlight the technology gaps between MNEs and domestic firms, and unveils an inverted U-shaped relation (Smeets, 2008). Though large technology gaps between MNEs and domestic firms may provide 'the potential for productivity improvements' (Meyer & Sinani, 2009: 1077), yet with low absorptive capacity, domestic firms may find it not easy to gain from MNEs' spillovers that contain more advanced knowledge.

Alternatively, when small technology gaps are present, domestic firms with high absorptive capacity may not find spillovers particularly valuable (Meyer, 2004). Only when facing moderate technology gaps, domestic firms' absorptive capacity could enable them to profit from spillovers (Zhang et al., 2010). Research thus suggests that domestic firms absorb spillovers from MNEs with moderate technology gaps.

A Routine-Based Model of Absorptive Capacity

Though R&D expenditures as proxies for measuring domestic firms' absorptive capacity have gained increasing traction in the FDI spillover research, Lane, Koka, and Pathak (2006: 838, 844), after scrutinizing 289 absorptive capacity articles in top journals, criticized such approach as 'problematic, since it treats absorptive capacity as a static resource and not as a process', and concluded that 'the appropriateness and validity of such proxies for absorptive capacity are...questionable'. Volberda, Foss, and Lyles (2010: 939) indicated that researchers who use proxy measures may view absorptive capacity 'merely as a capacity without discussing the actual processes'.

To remedy the above problems associated with indirect and static proxy measures of absorptive capacity, Lewin et al. (2011), building on Cohen and Levinthal's notions (1990: 149, 133) that absorptive capacity is 'likely to be developed and maintained as...routine activity' and has 'outward- and inward-looking components', attempted to conceptualize this notion as encompassing two key sets of processes: internal and external absorptive capacity routines.

Following Lewin et al. (2011) and drawing on previous spillover studies (Li et al., 2013), particularly Eapen (2012: 247), who argued that 'there has not been much discussion around the search stage' in the FDI spillover process, this paper defines external absorptive capacity routines as including search and acquisition activities.

Search is a problem-solving activity by which firms try to solve problems by looking for solutions in the external environment (Cyert & March, 1992; Katila & Ahuja, 2002). Zhang et al. (2010) found that the diversity of knowledge in FDI spillovers available would increase the variety of solutions that domestic firms could search for.

Acquisition activity refers to 'a firm's capability to identify and acquire externally generated knowledge' (Zahra & George, 2002: 189). Though Chang and Xu (2008) have shown that domestic firms also acquire spillovers from other local competitors, FDI spillover scholars still regard MNEs as the exclusive source of spillovers.

This study further theorizes internal absorptive capacity routines as composed of activities to transform and exploit spillovers (Zahra & George, 2002), which are critical to 'generating new knowledge internally' (Lewin et al., 2011: 85) to improve firms' performances. Prior research indicates that improving firms' performances through internal absorptive capacity routines is associated with socially enabling mechanisms (Lewin et al., 2011; Todorova & Durisin, 2007; Zahra & George, 2002).

Socially enabling mechanisms are 'the shared values, norms, and other social mechanisms that build the necessary connectedness' (Lewin et al., 2011: 86) between knowledge providers and receivers to lead to ultimate exploitation of spillovers. Without them, firms can't tap into the full potential of spillovers they acquired.

It is worth noting that internal absorptive capacity routines ought to work jointly with external absorptive capacity routines, because the latter ‘does not guarantee the exploitation of [external] knowledge’ (Zahra & George, 2002: 190). Lewin et al. (2011) further underscored the necessity of balancing the development of both sets of routines if firms intend to achieve the optimal absorptive capacity.

In an empirical study of global sourcing of business services, Peeters, Massini, and Lewin (2014) showed that it takes managerial attention to appropriately develop the distinct but interrelated external and internal absorptive capacity routines in tandem. Without receiving managerial attention, either set of routines would lack organizational legitimacy to attract the necessary support to continue its development, and as a result, firms’ absorption of external knowledge would be compromised.

In sum, an emerging agreement is that adopting a routine-based model of absorptive capacity could help ‘overcome some limitations of the extant literature, which tends to focus on indirect proxy measures of absorptive capacity’ (Lewin et al., 2011: 85; see also Lane et al., 2006; Zahra & George, 2002).

Enhancing Absorptive Capacity

Though firms initially may have lower absorptive capacity, especially manifested in their internal absorptive capacity routines to fully transform and exploit external knowledge, prior theorizing suggests that organizational learning and complementary assets may help address this issue.

Admittedly an organization’s absorptive capacity is not simply the sum of its employees’ absorptive capacity, Cohen and Levinthal (1990: 131, 129) nevertheless underlined that ‘an organization’s absorptive capacity will depend on the absorptive capacity of its individual members’, and ‘firms...invest in absorptive capacity directly, as when they send personnel for advanced technical training’. Volberda et al. (2010: 944) also stressed that ‘the learning behavior of individuals and the choices they make with respect to training, education...are important foundations of organization level absorptive capacity’. Following this logic, one would expect that absorptive capacity ‘builds over time with learning’ (Sun & Anderson, 2010: 132).

Relatedly, firms could enhance their absorptive capacity by building complementary assets, which refer to ‘resources that are required to capture the benefits associated with a strategy, a technology, or an innovation’ (Christmann, 2000: 664). Cohen and Levinthal (1990: 135) pointed out that ‘complementary knowledge domains [are] necessary to put an effective absorptive capacity in place’. Zahra and George (2002) argued that greater the firms’ complementary assets, the higher absorptive capacity.

In the area of FDI spillovers, Eden (2009: 1067) developed a theoretical argument, suggesting that ‘complementary capabilities increase local firms’ ability to benefit from FDI’. Empirically, Zhang et al. (2010) discovered that larger

domestic firms possess more complementary assets than smaller firms to better absorb spillovers.

To conclude, though FDI spillover research has yielded many valuable insights over the past decades, those insights were mainly built on using static proxies like R&D spending to measure firms' absorptive capacity indirectly. To move this field forward, FDI spillover scholars should pay heed to absorptive capacity scholars' calls for studying the actual process by which domestic firms absorb external knowledge. Adopting a routine-based model of absorptive capacity, this study answers this call.

METHODS

Case Overview

This article is a case study (Glaser & Strauss, 2009; Yin, 2013) of AdhesiveCo, a domestic firm in China. It was founded in 1996 with a starting capital of 500,000 RMB in a second-tier city in an eastern coastal province, 200 kilometers away from Shanghai. Originally producing silicone sealant and adhesive products mainly for curtain-wall companies, after years of development, it delivered high-quality products for a wide variety of clients. In 2014, at the time of this research, it was still privately held and was one of top three domestic players. It hired 500 employees with annual revenue of 1.2 billion RMB and growth rate of more than 20% since 2000.

AdhesiveCo is suitable for addressing the research question. Many employees mentioned that the CEO and managers often visited MNEs in Europe, the United States, and other foreign countries to gain new knowledge. AdhesiveCo actively engaged in trade associations and hired one marketing executive from an MNE. As China was the largest FDI recipient country in the world, AdhesiveCo faced fierce competitive pressures from MNEs. One manager said: 'The number of foreign and domestic competitors increased from a handful to more than hundreds in ten years'.

Moreover, Zhang et al. (2010: 970) stressed that 'knowledge transfer in foreign-domestic joint ventures involves mechanisms that are different from those of spillovers'. Empirically, to separate spillover effects from joint venture effects, MNEs should be 100% foreign ownership, and domestic firms, 100% domestic ownership (Zhang et al., 2014). In this study, both MNEs and AdhesiveCo met these criteria.

Data Collection

The CEO, managers, and employees from different positions and departments were interviewed. A total of 32 interviews based on 25 interviewees were conducted, all of which were tape recorded and professionally transcribed. On average one hour and a half to two hours was spent on each interview, and the

Table 1. Interviewee list

<i>Interviewee (number of interviews)</i>	<i>Start working at AdhesiveCo since:</i>
CEO (3)	1996
Factory Director (1)	1996
Sales Department Director (1)	1996
Logistics and Purchasing Director (1)	1996
Marketing Director (1)	1996
Internal Advisor (3)	1996
Finance Director (1)	1998
Quality Inspection Director (1)	1998
Technology Development Director (1)	1998
Factory Foreman (1)	1998
Sales Manager (1)	1999
Internal Affairs Director (1)	2000
Senior Vice General Manager (1)	2000
Vice General Manager (1)	2000
Manager in the Overseas Department (1)	2003
Manager in the Technology Center (1)	2003
Vice Director of the Sales Department (1)	2004
Human Resources Manager (4)	2008
Employee A in the Overseas Department (1)	2009
Employee B in the Overseas Department (1)	2010
Secretary in the Technology Center (1)	2010
Employee C in the Overseas Department (1)	2011
Director of the Overseas Department (1)	2012
Post-Doc Researcher A in the Technology Center (1)	2012
Post-Doc Researcher B in the Technology Center (1)	2012

total interview transcription was more than 1,000 pages. To protect confidentiality, names of the sample company and employees were anonymized. Table 1 provides the list of interviewees.

Most interviewees joined AdhesiveCo in its first four years, and those joining it after the early 2000s were asked to evaluate the outcomes of the spillovers AdhesiveCo absorbed, because ‘benefits stemming from access to [MNEs’] knowledge are likely to take a substantial period of time to accrue’ (Spencer, 2008: 347). 218 newspaper articles reporting on AdhesiveCo as well as company documents about the details of key events were collected. Attending AdhesiveCo’s annual meetings and visiting its factories also aided appreciation and comprehension of its organizational contexts.

Data Analysis

As Zhang et al. (2014: 719) found that ‘10-12 years are a reasonable time frame for FDI spillovers’ to benefit domestic firms, the time frame for analysis in this study is a 15-year window from 1996 when AdhesiveCo was founded towards 2010 when it built international joint ventures. I followed established processes of grounded-theory building to analyze data.

Step 1. Glaser and Strauss (2009) suggested that grounded theorizing begins with a detailed examination of data collected, a practice called ‘microanalysis’. I used interviews, company documents, and news reports to write a case of AdhesiveCo in order to code its external and internal absorptive capacity routines for spillovers.

Two important findings emerged from this step. First, it was found that AdhesiveCo regularly absorbed spillovers to benefit its growth in three areas: business strategies, marketing capabilities, and manufacturing capabilities, all of which then serve as unit of analysis for this study. Second, though I initially intended to study how AdhesiveCo absorbed spillovers from FDI as suggested by prior research, it was surprisingly found that AdhesiveCo also absorbed spillovers from local competitors by recruiting a manufacturing executive and from MNEs by visiting them abroad.

Step 2. In accordance with MacKay and Chia (2013: 208) to analyze the qualitative data, I aimed to explain the outcomes of spillovers in AdhesiveCo’s business strategies, marketing capabilities, and manufacturing capabilities that emerged several years later by investigating ‘the timely and decisive interventions of identifiable individuals in crucially shaping the course of events and in bringing about a desired state of affairs’ in its external and internal absorptive capacity routines.

In this step, I examined codes across interviews, news, and archival data that could be collapsed into higher-level nodes to form the first-order categories. For example, data about AdhesiveCo’s activities of meeting MNEs’ managers abroad were grouped into a node labelled ‘searching knowledge about MNEs’ operations’.

Step 3. I generated possible links among first-order categories to subsume them into second-order themes. Iteration between the first-order categories and rough second-order themes was conducted until adequate conceptual themes emerged (Eisenhardt, 1989). For instance, categories including instances in which AdhesiveCo searched and acquired information about local competitors’ strategies and performances through industry associations were collapsed into a theme labelled ‘participating in industry associations’.

Step 4. I combined the second-order themes into four aggregate dimensions: ‘enacting external absorptive capacity routines for spillovers at the international level’, ‘enacting external absorptive capacity routines for spillovers at the national level’, ‘enhancing internal absorptive capacity routines’, and ‘outcomes of transforming and exploiting spillovers’. The data structure in Figure 1 illustrates the outcomes of this step. Supporting quotes are shown in Table 2.

Multiple perspectives were solicited to enhance the reliability of data analysis (Yin, 2013). One colleague with no prior exposure to this research was asked to

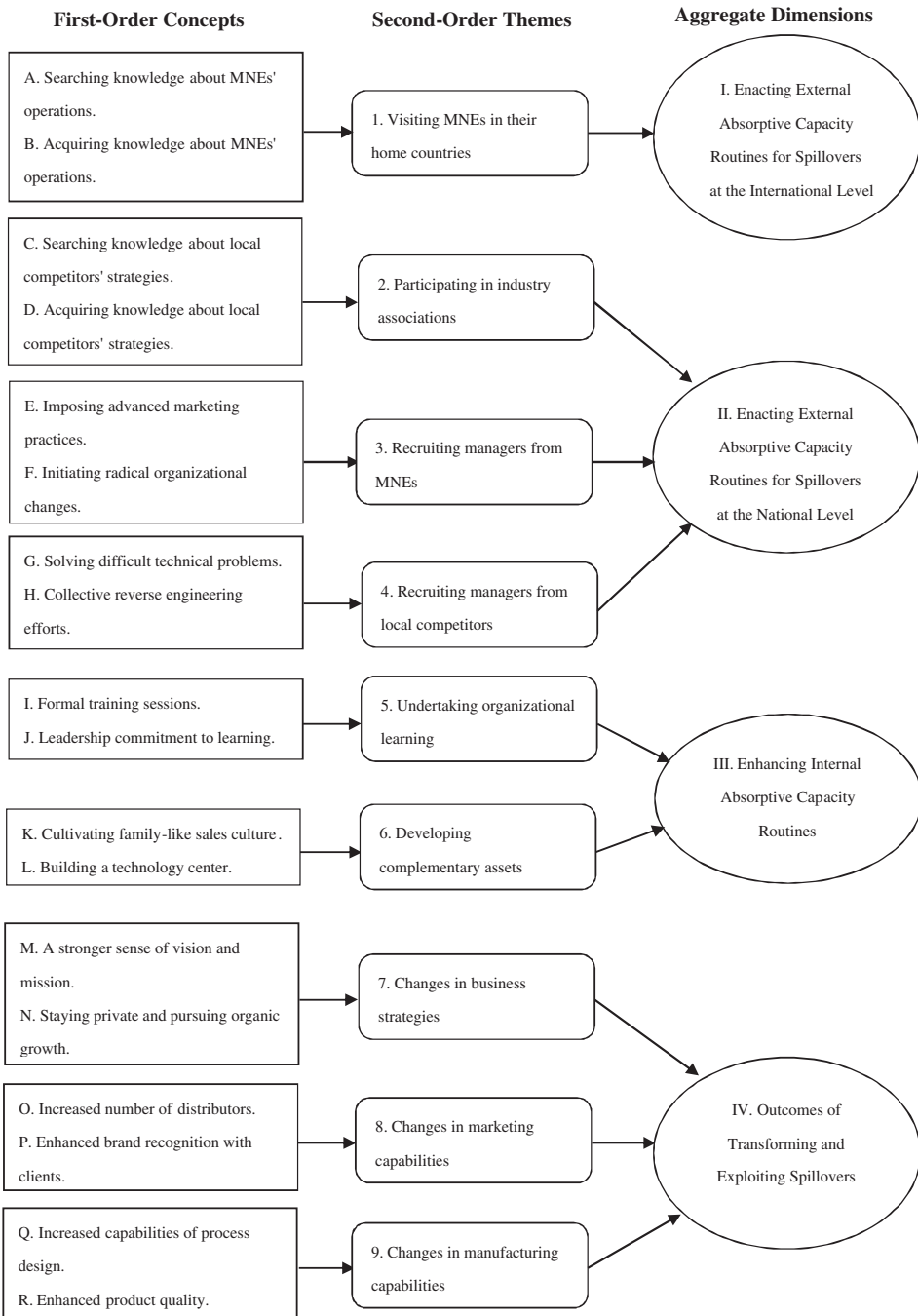


Figure 1. Data structure

provide independent views on the coding of data after reading some of original interviews. Provisional and interpretations were also submitted to some informants for feedback.

Table 2. Dimensions, themes, categories, and data

<i>Second-Order Themes and First-Order Categories</i>	<i>Representative Data</i>
Overarching dimension: I. Enacting External Absorptive Capacity Routines for Spillovers at the International Level	A1. 'Since the beginning of our founding, we actively reached out to visit high-performing companies in the United States, Europe, and Japan to understand their development'. (factory director)
1. Visiting MNEs in their home countries	A2. 'The purpose of such visits is to identify differences between MNEs and us. We will not make progress if we just stay and learn in China'. (manager in the overseas department)
A. Searching knowledge about MNEs' operations	
B. Acquiring knowledge about MNEs' operations	B1. 'I noticed that one MNE developed long and trustworthy relationships with clients like General Motors by offering not just general silicone adhesive products but also highly customized systems of solutions to meet their clients' specific demands'. (sales department director)
	B2. 'In developing new products, MNEs' focus strategies would not allow them to enter areas that would yield profit margins of less than 10%'. (technology development director)
Overarching dimension: II. Enacting External Absorptive Capacity Routines for Spillovers at the National Level	C1. 'We maintain close relationships with regional and national business associations in related industries by actively participating in their exhibitions and conferences'. (sales manager)
2. Participating in industry associations	C2. 'Our CEO was elected by the China Construction Metal Structure Association as the vice director of aluminum windows and doors committee. He also was one of the executive members of the council of the China Building Decoration Industry Association. Meanwhile, my professional roles on behalf of AdhesiveCo in trade associations included the secretary of the Zhejiang Provincial Metal Building Manufacturers Association, and the vice president of the material committee of the Zhejiang Provincial Construction and Decoration Association'. (marketing director)
C. Searching knowledge about local competitors' strategies	
D. Acquiring knowledge about local competitors' strategies	D1. 'Chinese firms cannot resist the temptation to invest in lucrative industries that were unrelated to their core businesses'. (CEO)
	D2. 'Chinese firms' development was aimless, with proliferation of unnecessary product lines'. (CEO)
3. Recruiting managers from MNEs	E1. 'Gol introduced many advanced marketing practices. Though useful, they were different from ours, and thus it was hard for us to accept them'. (marketing director)
E. Imposing advanced marketing practices	E2. 'Mr. Gol worked at Dow Corning and he wanted to transplant its marketing practices to here; but our people were reluctant to implement them'. (human resources manager)
F. Initiating radical organizational changes	F1. 'Gol unilaterally moved our sales office originally located in the factory to downtown. It then became laborious for us to communicate directly with engineers'. (vice director of the sales department)

Table 2. Continued

<i>Second-Order Themes and First-Order Categories</i>	<i>Representative Data</i>
	F2. 'Mr. Gol further built up the marketing department on the basis of the sales department to promote AdhesiveCo's brand image to clients. It was a good intention; however, we strongly felt that the status of our sales department was lowered'. (sales department director)
4. Recruiting managers from local competitors	G1. 'It was good to recruit Mr. Li because he had deep knowledge of more advanced machines at his former employer and he brought those experiences to us'. (technology development director)
G. Solving difficult technical problems	G2. 'Before he joined us, we tried to solve complex technical problems of the imported machine but often failed. Only after Li joined us, could we solve those problems successfully'. (factory director)
H. Collective reverse engineering efforts	H1. 'In reverse engineering the imported machines, I told engineers that this was an trial-and-error process; mistakes were inevitable and acceptable'. (senior vice general manager)
	H2. 'My supervisor gave me a more relaxing atmosphere to learn. And if I ran into tough technical problems that I really could not solve, he would offer useful advice to help me make progress'. (factory foreman)
Overarching dimension: III. Enhancing Internal Absorptive Capacity Routines	I1. 'We want to increase our marketing employees' knowledge of products, marketing techniques, and service skills to promote products professionally'. (marketing director)
5. Undertaking organizational learning	I2. 'Formal training is very helpful to our factory employees, because most of them just graduated from high schools'. (factory foreman)
I. Formal training sessions	
J. Leadership commitment to learning	J1. 'Our CEO likes to learn and he reads a lot. Since visiting MNEs in foreign countries, he has read many books in an attempt to explain their successes. If he came across practical books, he would buy one copy for us and shared his ideas at meetings'. (internal affair director)
	J2. 'I also obtained a better picture of local competitors that diversified into unrelated industries. Most of them failed, mainly because they did not arm themselves with in-depth knowledge of target industries'. (CEO)
6. Developing complementary assets	K1. 'Many competitors provide only material rewards to their distributors, like luxury cars, flat-screen TV, etc. On top of that, we foster greater emotional attachment with our distributors. For instance, we bring them and their family members for trips every year. It is a very effective way to build affective commitment'. (the sales department director)
K. Cultivating family-like sales culture	K2. 'Once our warehouses caught fire, many distributors called us immediately and asked if we needed help. One wired money to us without being asked to do so'. (the marketing director)
L. Building a technology center	L1. 'One of our technology center's main purposes was to enhance quality of the products manufactured by the imported assembly machines'. (vice general manager)

Table 2. Continued

<i>Second-Order Themes and First-Order Categories</i>	<i>Representative Data</i>
	L2. 'The technology center was praised by a Zhejiang University professor as one of the most advanced in industry'. (vice general manager)
Overarching dimension: IV. Outcomes of Transforming and Exploiting Spillovers	M1. 'Our vision is to be the best silicone adhesive company in China and one of the leading silicone adhesive companies in the world. Our mission is to become a systematic solution provider by superior technological and marketing capabilities'. (CEO)
7. Changes in business strategies	M2. 'When we had a clear sense of vision and mission, I started to feel that our company has soul and vitality'. (logistics and purchasing director)
M. A stronger sense of vision and mission	
N. Staying private and pursuing organic growth	N1. 'Going public cannot solve the problems now we are facing; instead, it may bring new problems to us, like the short-term financial pressures from shareholders'. (CEO)
	N2. 'Though mergers and acquisitions could enrich our product portfolios quickly; however, it will be problematic to integrate the acquired companies. Therefore we prefer to grow by our own resources'. (CEO)
8. Changes in marketing capabilities	O1. 'Based on marketing practices brought by Mr. Gol, our efforts of training marketing employees, and cultivating a family-like sales culture to develop the vast distributor networks, we has developed better marketing capabilities than previously'. (marketing director)
O. Increased number of distributors	O2. 'Distributors exclusively sold our products and on average each had annual revenue of several million RMB'. (sales manager)
P. Enhanced brand recognition with clients	P1. 'We won several times the 'Top Choice of Clients' from the China Silicone Adhesive Association and many similar awards from other regional and national trade associations'. (employee B in the overseas department)
	P2. 'Our annual growth rate has been more than 20% since 2000 in part due to the fact that our clients increasingly trust our brand'. (employee C in the overseas department)
9. Changes in manufacturing capabilities	Q1. 'After discovering the operating principles of the imported assembly machines, we were able to design some parts of our production processes to flexibly respond clients' specific and diverse demands'. (manager in the technology center)
Q. Increased capabilities of process design	Q2. 'Being able to design assembly machines and to modify specific operational activities for customized production processes gave us better manufacturing capabilities'. (technology development director)
R. Enhanced product quality	R1. 'All of our products meet China quality standards and several products won quality awards from the China Association for Quality Inspection. We are also on the trade association committee which sets national quality standards'. (post-doc researcher A)
	R2. 'Many of our products also meet American and European quality standards, which are much higher than China's standards'. (post-doc researcher B)

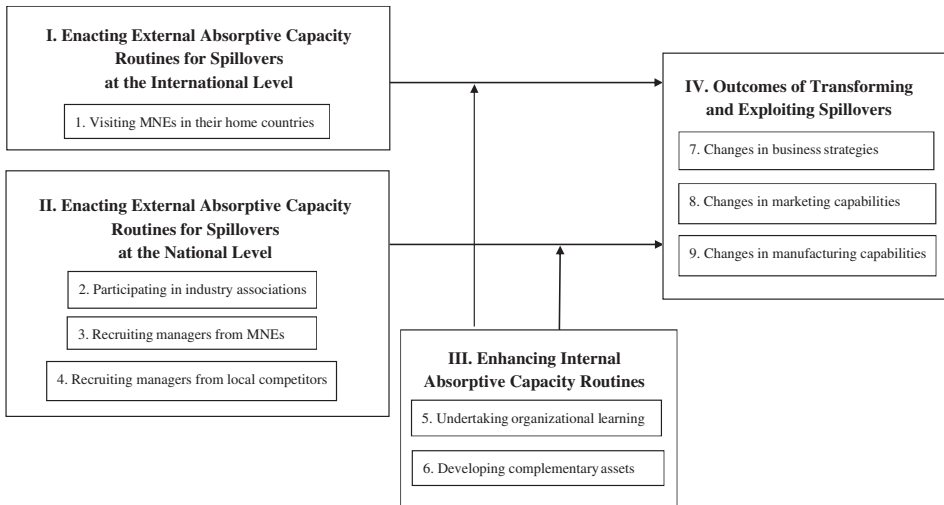


Figure 2. A grounded model of how domestic firms absorb spillovers: A routine-based model of absorptive capacity view

RESULTS

This study purports to address how domestic firms absorb spillovers. The findings show that at the international level, AdhesiveCo enacted external absorptive capacity routines to search and acquire spillovers by visiting MNEs abroad to understand their operations in areas of strategies, manufacturing, and marketing. At the national level, it enacted external absorptive capacity routines to search and acquire spillovers about local competitors’ strategies and performances by participating in industry associations, as well as spillovers about marketing practices and manufacturing knowledge by recruiting managers from an MNE and from a local competitor.

AdhesiveCo enhanced its internal absorptive capacity routines by undertaking organizational learning, supported by leadership commitment to learning, to train manufacturing employees and marketing employees, and by developing complementary assets, such as a family-like sales culture and a technology center, thus moderating the relationship between its absorption of spillovers and the outcomes of spillovers. The outcomes of transforming and exploiting spillovers are manifested in changes in AdhesiveCo’s business strategies, marketing capabilities, and marketing capabilities. Figure 2 summarizes these findings.

Enacting External Absorptive Capacity Routines for Spillovers at the International Level

This section describes that in enacting its external absorptive capacity routines for spillovers at the international level by visiting MNEs in their home countries, AdhesiveCo searched and acquired knowledge about MNEs’ business strategies, novel manufacturing technologies, and advanced marketing practices.

Visiting MNEs in their home countries. To survive and avoid being crowded out by MNEs, which brought ‘fresh winds of competition’ (Eden, 2009: 1066), AdhesiveCo often visited large, established MNEs in foreign countries to search knowledge to raise its competitive advantages. The factory director recalled, ‘Since the beginning of our founding, we actively reached out to visit high-performing companies in the United States, Europe, and Japan to understand their development’ (A1). (A1–R2 indicate each quote in Table 2.)

Such visiting MNEs abroad with which AdhesiveCo had no formal relationships was facilitated by China’s State Economic and Trade Commission, whose goals were to help build up the competitiveness of domestic firms in the adhesive industry. This situation echoes Eapen’s (2012: 257) depiction of the roles of governments: ‘an awareness of the conditions wherein spillovers are more likely enables governments to better prepare and support domestic firms in extracting these spillovers’.

Because MNEs did not install their latest technologies and practices in China in the early days of local silicone adhesive industry, AdhesiveCo visited their headquarters abroad. One manager in the overseas department stated, ‘The purpose of such visits is to identify differences between MNEs and us. We will not make progress if we just stay and learn in China’ (A2). The CEO added, ‘The core idea of visiting foreign top players is that those MNEs of today will be AdhesiveCo of tomorrow. We need to learn what we could and should do in the future from the MNEs we visited’.

When asked why MNEs had incentives to permit AdhesiveCo’s visits, the senior vice general manager explained, ‘Many MNEs we visited were entering or planning to enter China’s market. By allowing Chinese companies like AdhesiveCo to visit their factories, they hoped to gain information about Chinese market and to find future partners for joint ventures’. This is in line with Eapen’s (2012: 253) argument that because ‘the foreign firm anticipates future reciprocal benefits’ from domestic firms, it is willing to provide ‘some amount of cooperation... [for] effective spillovers’.

Moreover, the vice general manager noted, ‘Due to huge differences in manufacturing capabilities and target markets between MNEs and us, most of them did not consider us as their major competitor’. Spencer (2008: 342) maintained that ‘many [MNEs] tolerate such spillovers and refrain from imposing strong barriers to exclude [local] firms from appropriating these positive externalities’, because ‘major differences in capabilities and market scope between an MNE and local firms make it unlikely that MNE managers will perceive local firms as a major threat’.

By visiting MNEs in their home countries, AdhesiveCo acquired new knowledge about their manufacturing technologies. The technology development director gained a helpful inspiration from MNEs’ advanced factories: ‘I realized that the inconsistent quality of our products was in great part due to our heavy reliance on human labor, which gave rise to fluctuations in product quality’. Thereafter,

as the finance director described, ‘We spent a lot of money purchasing the same expensive assembly machines we observed in MNEs’ factories to replace most of our workers’.

Another focal area that AdhesiveCo paid close attention to was marketing practices, particularly how MNEs developed professional relationships with clients to build global brand reputation. The marketing director reflected on what he learned: ‘By co-developing innovative products with clients, these MNEs attained deep understandings of clients’ highly differentiated demands and obtained their trust’.

The sales department director also said, ‘I noticed that one MNE developed long and trustworthy relationships with clients like General Motors by offering not just general silicone adhesive products but also highly customized systems of solutions to meet their clients’ specific demands’ (B1).

Of particular interest to the CEO during the visits were MNEs’ business strategies for sustainable growth. Choices between focus and diversification strategies were the main strategic issue for AdhesiveCo. The CEO noted:

In the late 1990s, diversification strategies were popular among Chinese companies because the government encouraged us to diversify so as to become one of the Fortune 500 companies. Many local competitors entered numerous unrelated yet seemingly profitable businesses. I was concerned about which direction to pursue.

After engaging in several in-depth conversations with his foreign counterparts, AdhesiveCo CEO learned: ‘Many MNEs, some of which were founded hundred years ago, have been executing focus strategies rather than entering unrelated businesses since their inception’. MNEs’ focus strategies were not only concerning new areas to enter but also assuring a certain level of profit margin. The technology development director observed, ‘In developing new products, MNEs’ focus strategies would not allow them to enter areas that would yield profit margins of less than 10%’ (B2).

Enacting External Absorptive Capacity Routines for Spillovers at the National Level

This section describes that in enacting external absorptive capacity routines for spillovers at the national level, AdhesiveCo participated in industry associations to search and acquire spillovers about local competitors’ strategies and performances. It also recruited managers from an MNE and a local competitor to respectively acquire spillovers about marketing practices and manufacturing knowledge.

Participating in industry associations. In addition to visiting MNEs in their home countries, AdhesiveCo searched knowledge about local competitors’ business strategies by participating in industry associations. The sales manager said, ‘We maintain

close relationships with regional and national business associations in related industries by actively participating in their exhibitions and conferences' (C1).

AdhesiveCo's solid relationships with industry associations were manifested in the following described by the marketing director:

Our CEO was elected by the China Construction Metal Structure Association as the vice director of aluminum windows and doors committee. He also was one of the executive members of the council of the China Building Decoration Industry Association. Meanwhile, my professional roles on behalf of AdhesiveCo in trade associations included the secretary of the Zhejiang Provincial Metal Building Manufacturers Association, and the vice president of the material committee of the Zhejiang Provincial Construction and Decoration Association (C2).

By participating in industry associations, AdhesiveCo acquired more knowledge about local firms' business strategies and resulting performances. The CEO witnessed, 'Many local competitors which entered unrelated industries such as the real estate industry later were in debt of several hundred million RMB. Some of them even turned to loan sharks for help and eventually went bankrupt'.

Over the years, the CEO gained two precious lessons from observing local competitors. First, 'Chinese firms cannot resist the temptation to invest in lucrative industries that were unrelated to their core businesses' (D1). Second, 'Chinese firms' development was aimless, with proliferation of unnecessary product lines' (D2).

Recruiting managers from MNEs. AdhesiveCo found it rather hard to observe MNEs' marketing practices because such know-how was tacit and mostly resided in the heads of marketing executives. Görg and Strobl (2001) suggested that to learn MNEs' sophisticated practices, domestic firms resort to employee turnover. To acquire MNEs' marketing knowledge, AdhesiveCo in the early 2000s recruited Mr. Gol, who previously worked as a marketing executive at an MNE in Hong Kong. The data show that there were two major patterns during his short tenure: (1) imposing advanced marketing practices, and (2) initiating radical organizational changes.

As the main reason for recruiting him was to acquire MNEs' marketing practices, Mr. Gol seemed to immediately impose new practices on AdhesiveCo to prove his value. As new practices were more advanced than AdhesiveCo's existing opportunistic guerrilla tactics, it was difficult for front-line employees to embrace them in a short time. One sales manager described what happened, 'We were required to fill a lot of formal documents to report our daily activities. Yet, we were not comfortable doing it because we were very entrepreneurial; we didn't like documenting; we liked actions'.

Other staff also held the same opinion. The marketing director complained, 'Gol introduced many advanced marketing practices. Though useful, they were different from ours, and thus it was hard for us to accept them' (E1). The human resources manager lamented, 'Mr. Gol worked at Dow Corning and he wanted

to transplant its marketing practices to here; but our people were reluctant to implement them' (E2).

For example, one of the advanced marketing practices was to sell products to architecture firms, a new category of high-end clients that AdhesiveCo had no experience dealing with. One manager in the overseas department who worked with Mr. Gol recalled: 'We didn't know how to effectively persuade and convert professional designers in architecture firms who usually preferred to purchase MNEs' products to be our clients. This new practice therefore met with strong resistance and was soon abandoned'.

Mr. Gol also initiated radical organizational changes to support his new marketing practices. The vice director of the sales department remembered vividly, 'Gol unilaterally moved our sales office originally located in the factory to downtown. It then became laborious for us to communicate directly with engineers' (F1).

The vice director of the sales department continued, 'Mr. Gol further built up the marketing department on the basis of the sales department to promote AdhesiveCo's brand image to clients. It was a good intention; however, we strongly felt that the status of our sales department was lowered' (F2). As a result, many of Gol's initiatives were not well received by sales employees. Due to the continual opposition, he quit his job after working less than two years at AdhesiveCo.

Recruiting managers from local competitors. As noted, AdhesiveCo started to use imported machines after visiting MNEs' factories abroad. Soon after, it hired a manufacturing executive from one local competitor. The data reveal two major related patterns when this executive joined the company: (1) solving technical problems of imported assembly machines, and (2) initiating collective reverse engineering efforts.

With imported assembly machines installed in the factories, AdhesiveCo's engineers could simplify production processes to enhance production efficiency and further product quality. However, one factory foreman realized that it was not as easy as he thought it would be: 'Difficult technical glitches from imported assembly machines arose at times. Yet, due to our relatively low level of training, none of us knew how to fix those problems. We often had to contact the German supplier for help'.

In consequence, AdhesiveCo recruited Mr. Li (now senior vice general manager), an executive from one local competitor based in central China about 1,000 kilometers away to acquire his advanced manufacturing knowledge in hopes of solving those technical problems. The technology development director praised, 'It was good to recruit Mr. Li because he had deep knowledge of more advanced machines at his former employer and he brought those experiences to us' (G1).

The factory director detailed Mr. Li's efforts of solving thorny technical problems in AdhesiveCo's factories:

He first diagnosed inferior quality by dissecting defect products to examine the density of chemical compounds inside. He then observed closely how we

operated the imported assembly machines from the beginning to the end. After brainstorming sessions, he correctly pinpointed where we went wrong and offered solutions.

The factory director was grateful to Mr. Li's efforts, 'Before he joined us, we tried to solve complex technical problems of the imported machine but often failed. Only after Li joined us, could we solve those problems successfully' (G2). In addition, Mr. Li worked with AdhesiveCo's employees to collectively reverse engineer the imported machines to further improve product quality. Li provided an account of this process:

We used the same inputs for imported machines and our local machines to garner different outputs. Drawing on our prior understandings of the local machines, we then successfully inferred the internal operating principles of imported machines after carefully comparing the varying outputs from these two kinds of machines.

Mr. Li continued, 'In reverse engineering the imported machines, I told engineers that this was an trial-and-error process; mistakes were inevitable and acceptable' (H1). A factory foreman who was subordinate to Li echoed, 'My supervisor gave me a more relaxing atmosphere to learn. And if I ran into tough technical problems that I really could not solve, he would offer useful advice to help me make progress' (H2).

Enhancing Internal Absorptive Capacity Routines

This section describes that to better transform and exploit spillovers it absorbed from MNEs and local firms, AdhesiveCo enhanced its internal absorptive capacity routines by undertaking organizational learning and developing complementary assets.

Undertaking organizational learning. Shortly after Mr. Gol left, AdhesiveCo felt the need to provide formal training sessions to its marketing employees for better employing the advanced marketing practices brought by Mr. Gol. The marketing director said, 'We want to increase our marketing employees' knowledge of products, marketing techniques, and service skills to promote products professionally' (I1). He added, 'After attending training sessions, our marketing employees could answer questions such as, What are the major technical differences between our products and competitors? How could we provide more customized products to high-end clients?'

Similarly, after Mr. Li's working with colleagues to reverse engineer imported assembly machines, formal training sessions were offered to factory workers to enhance their capabilities to better operate and utilize those machines. The factory

foreman emphasized: ‘Formal training is very helpful to our factory employees, because most of them just graduated from high schools’ (I2).

The factory director then detailed the content of the formal training sessions taken by workers: ‘It includes the modern production management, safety training, technical quality inspection, etc. It is crucial to teach our workers the principles of imported machines; therefore, they could run those machines more effectively’.

The above formal training sessions were supported by a leadership commitment to learning (Inkpen & Tsang, 2007). The internal affair director stated, ‘Our CEO likes to learn and he reads a lot. Since visiting MNEs in foreign countries, he has read many books in an attempt to explain their successes. If he came across practical books, he would buy one copy for us and shared his ideas at meetings’ (J1). The CEO added, ‘In addition to reading books, I also talked to professors and experts in conferences held by trade associations to have their insights about business strategies’.

Asked what he learned from reading books and exchanging ideas with professors and experts over the years, the CEO said:

Now I have a better understanding of MNEs’ strategic successes. It is due to their determination to concentrate resources on the things that clients care most. They strived to be world-class players in highly selected niche markets. They also preferred to stay private and held a long-term perspective on serving clients.

The CEO continued, ‘I also obtained a better picture of local competitors that diversified into unrelated industries. Most of them failed, mainly because they did not arm themselves with in-depth knowledge of target industries’ (J2). Such leadership commitment to learning was in contrast with competitors. The internal advisor said, ‘The CEOs of our major competitors were more conservative and not open to new ideas. They did not visit MNEs, for example. Their lack of commitment to learning perhaps due to their military backgrounds and locations in inner provinces’.

Developing complementary assets. To complement and elevate the functioning of the marketing department founded by Mr. Gol, AdhesiveCo cultivated a family-like sales culture to strengthen its relationships and bonds with distributors, which were increasingly critical to simulating sales and contacting clients. The marketing director elaborated on the rationales behind this culture:

Early on, we relied on sales employees to contact all clients across China. Yet, due to the vastness of Chinese market, such effort did not pay off. After the marketing department was founded, we switched most of our sales volumes to independent distributors and leveraged their networks to sell products and promote our brand.

The essence of family-like sales culture was that sales employees would treat distributors like family members. The sales department director described one example of how AdhesiveCo fostered family-like relationships with distributors:

Many competitors provide only material rewards to their distributors, like luxury cars, flat-screen TV, etc. On top of that, we foster greater emotional attachment with our distributors. For instance, we bring them and their family members for trips every year. It is a very effective way to build affective commitment (K1).

The marketing director revealed how such relationships with distributors looked: 'Once our warehouses caught fire, many distributors called us immediately and asked if we needed help. One wired money to us without being asked to do so' (K2).

Separately, a technology center in charge of R&D was built to support and refine the operations of the imported machines AdhesiveCo purchased from Germany. The vice general manager, who used to be the vice director of that center, noted, 'One of our technology center's main purposes was to enhance quality of the products manufactured by the imported assembly machines' (L1).

The secretary in the technology center noted, 'The center focused on shop-floor projects. Its budget accounted for 3% of annual revenue and many equipments have been bought, each worth several million RMB'. With such dedication to R&D, the vice general manager said with pride, 'The technology center was praised by a Zhejiang University professor as one of the most advanced in industry' (L2).

Outcomes of Transforming and Exploiting Spillovers

This section describes the outcomes of transforming and exploiting the spillovers AdhesiveCo searched and acquired. Outcomes were reflected in changes in its business strategies, marketing capabilities, and manufacturing capabilities.

First, one can observe AdhesiveCo's business strategies changed. It no longer only strived to make ends meet and survive opportunistically. Instead, it now had a stronger sense of vision and mission. It ceased to contemplate an initial public offering, diversification strategies, and mergers and acquisition; rather, it was committed to implementing focus strategies by organic growth as a private company.

Second, marketing capabilities were changed so that AdhesiveCo became one of domestic firms that had the most distributors in China. Its relationships with loyal clients were recognized in several awards conferred by trade associations.

Finally, one can see changes in AdhesiveCo's manufacturing capabilities. Several state-of-the-art imported assembly machines, not present in its early stages, now entered factories. Its capabilities to systematically design the whole production processes were built up from scratch. Product quality, which before was low, now was superior and enabled AdhesiveCo to become one of the committee members

Table 3. Changes in AdhesiveCo

	<i>Circa mid 1990s</i>	<i>Circa 2010</i>
Business strategies	Trying to make ends meet; no clear sense of direction for growth Considering going public Planning diversifying into real estate industry and other unrelated yet profitable industries Contemplating mergers and acquisitions for faster growth	Determined vision and mission Conscious choice of staying private Deliberate execution of focus strategies Intentionally pursuing organic growth without mergers and acquisitions
Marketing capabilities	No distributor to work with; totally relying on its sales force Low brand recognition; client base is small and not stable	AdhesiveCo is one of the domestic firms that have the most distributors and have the highest market share Enhanced brand recognition expressed in winning awards of 'Top Choice for Client Award', 'Excellent Supplier Award', and the likes from regional and national trade associations
Manufacturing capabilities	Labor-intensive production processes; low level of automation Low level of knowledge of the production processes Product quality is low and inconsistent	Installment of several state-of-the-art assembly machines imported from Germany Able to systematically design the whole production processes Product quality is consistently the best among domestic firms AdhesiveCo is one of members to set the national quality standards

to set national quality standards. Table 3 summarizes how AdhesiveCo changed over time.

Changes in business strategies. With its leadership commitment to learning, AdhesiveCo, by carefully thinking over the spillovers it acquired about local competitors' diversification strategies and MNEs' focus strategies, changed from a start-up just hoping to survive competition towards a company with a strong vision and mission.

The data show that the CEO articulated the vision and mission more often: 'Our vision is to be the best silicone adhesive company in China and one of the leading silicone adhesive companies in the world. Our mission is to become a systematic solution provider by superior technological and marketing capabilities' (M1).

The logistics and purchasing director asserted: 'When we had a clear sense of vision and mission, I started to feel that our company has soul and vitality' (M2). Also, though going public was one of the management practices commonly seen among MNEs, the CEO made a conscious choice of staying private. He explained:

We have our growth rhythm and we did not lack financial resources to fuel our strategic development. Though by going public we may gain more recognition

in the industry and more cash from the stock market; however, in order to satisfy shareholders, we may be required to invest in many more profitable businesses that may not be in line with our vision and mission. I don't want that to happen.

The CEO repeated, 'Going public cannot solve the problems now we are facing; instead, it may bring new problems to us, like the short-term financial pressures from shareholders' (N1). Furthermore, the CEO preferred organic growth to mergers and acquisitions, because 'though we could achieve faster growth and increase our product lines by acquiring other local competitors; however, our core value might be diluted and we may be distracted from our strategic direction'.

Ruling out the strategic choice of mergers and acquisitions was also grounded on concerns of integration. The CEO explained, 'Though mergers and acquisitions could enrich our product portfolios quickly; however, it will be problematic to integrate the acquired companies. Therefore, we prefer to grow by our own resources' (N2).

Changes in marketing capabilities. Talking about AdhesiveCo's marketing capabilities nowadays, the marketing director summarized the course of development, 'Based on marketing practices brought by Mr. Gol, our efforts of training marketing employees, and cultivating a family-like sales culture to develop the vast distributor networks, we has developed better marketing capabilities than previously' (O1).

For example, AdhesiveCo became one of domestic silicone adhesive companies that had the most distributors across China, the vast majority of which had worked for AdhesiveCo for many years. The sales manager said, 'Distributors exclusively sold our products and on average each had annual revenue of several million RMB' (O2).

Furthermore, AdhesiveCo's increased brand recognition, according to employee B in the overseas department, was reflected in the fact that 'we won several times the "Top Choice of Clients" from the China Silicone Adhesive Association and many similar awards from other regional and national trade associations' (P1). The sales department director stated, 'Those recognitions show that we had superior marketing capabilities to build trustworthy and long-term relationships with high-end clients'.

Employee C in the overseas department added, 'Our annual growth rate has been more than 20% since 2000 in part due to the fact that our clients increasingly trust our brand' (P2). As a result, some MNEs approached AdhesiveCo for joint ventures to tap into its strong marketing capabilities and brand recognition in China.

Changes in manufacturing capabilities. Thanks to the provision of multiple training sessions and the building of the technology center, AdhesiveCo's manufacturing staff became more knowledgeable about the operating principles of imported

machines. They now could solve tough technical problems independently and were able to better utilize the imported machines to enhance product quality.

As one manager in the technology center described, ‘After discovering the operating principles of the imported assembly machines, we were able to design some parts of our production processes to flexibly respond clients’ specific and diverse demands’ (Q1). The technology development director added, ‘Being able to design assembly machines and to modify specific operational activities for customized production processes gave us better manufacturing capabilities’ (Q2).

The quality inspection director elaborated on how AdhesiveCo subsequently further sustained and increased its competitive advantages based on its better manufacturing capabilities to operate more sophisticated and advanced production processes:

As we accumulated considerable manufacturing capabilities to solve all mechanical problems of imported machines, we continued to purchase more foreign assembly machines ahead of our local competitors. We eventually were able to design the whole production processes to increase product quality and to fulfill clients’ wider variety of demands. By comparison, our local competitors were slow to follow suit due to their scant knowledge and little experiences in this area.

Post-doc researcher A noted that ‘all of our products meet China quality standards and several products won quality awards from the China Association for Quality Inspection. We are also on the trade association committee which sets national quality standards’ (R1). Moreover, post-doc researcher B proudly stated that ‘many of our products also meet American and European quality standards, which are much higher than China’s standards’ (R2). Consequently, as the director of the overseas department mentioned, ‘By the late 2000s, AdhesiveCo’s reputation as excellent manufacturer increased and many MNEs contacted us for contract manufacturing services’.

DISCUSSION

This section presents the dynamic behavioral patterns of domestic firms’ absorption of spillovers, and discusses their theoretical contributions to the FDI spillover literature, implications for future research, boundary conditions, and generalizability of findings.

Dynamic Behavioral Patterns of Domestic Firms’ Absorption of Spillovers

This study is motivated by the research question: How do domestic firms absorb spillovers? Armed with a routine-based model of absorptive capacity (Lewin et al., 2011), this study specifies a process in which domestic firms enact

external absorptive capacity routines for spillovers at the national and international levels. Domestic firms further enhance internal absorptive capacity routines, thus positively moderating the relationship between their external absorptive capacity routines for spillovers and the outcomes of their transforming and exploiting spillovers.

This article contributes to the FDI spillover literature by offering a new perspective on domestic firms' behaviors of absorbing spillovers in terms of how they enact their external absorptive capacity routines and how they enhance their internal absorptive capacity routines. It also highlights the roles of socially enabling mechanisms at the interface between the external and internal absorptive capacity routines when domestic firms absorb spillovers by employee turnover. Owing to these unique contributions, which are detailed below, this study calls on scholars to employ a routine-based model of absorptive capacity (Lewin et al., 2011) to examine spillovers.

Enacting External Absorptive Capacity Routines

The first contribution to the FDI spillover theory concerns shifting scholars' analytical focus, which has been largely fixated on MNEs, to investigate domestic firms in the spillover process. Examining domestic firms' external absorptive capacity routines, this paper provides direct evidence on search and acquisition activities that are rarely mentioned by prior literature: active search, selective search, and diligent acquisition.

Active search. The first behavioral pattern emerging from the findings is that domestic firms actively search for spillovers when enacting their external absorptive capacity routines. One of the major issues in the literature is: Where do FDI spillovers occur (Meyer & Sinani, 2009)? Past research assumes the viewpoint of MNEs and investigates whether or not their spillovers are bounded by geographical locations. Though spillover effects could be found at the local, regional, and national levels, the existing consensus is that geographical proximity is more relevant to FDI spillovers with the assumption that domestic firms are passive recipients (Spencer, 2008).

In contrast, espousing the viewpoint of domestic firms, this paper raises a different question: How do domestic firms absorb spillovers? And it tracks domestic firms' search activities in enacting their external absorptive capacity routines over time. Consistent with Ahuja and Katila (2004: 889) that 'firms search across geographical boundaries to expand their technology base', this paper finds that domestic firms' search for spillovers is active and the range spanned by their external absorptive capacity routines seems rather broad and not impeded by geographical distance.

For example, AdhesiveCo actively searched for MNEs' spillovers at the national level (when hiring a marketing executive from Hong Kong) and at the international

level (when visiting MNEs abroad). Though geographical proximity may facilitate spillovers, spillovers are not necessarily limited within geographical boundaries, depending on how actively domestic firms intend to search for desired spillovers.

In particular, the findings of AdhesiveCo's active search at the international level resonate with Cui, Li, Meyer, and Li (2015), who discovered that to advance internationalization strategies, domestic firms recruit managers from MNEs in foreign countries (i.e. spillovers by employee turnover across national borders). The Wall Street Journal also reported a similar story: 'Midea, which claims 43% of sales in China's rice-cooker market, has hired technicians from Korea' (Chen, 2016). The above two works thus point to the field data that AdhesiveCo searched for spillovers by demonstration effects across national borders via visiting MNEs abroad.

Selective search. The second behavioral pattern under-recognized in the literature but revealed by this study is that domestic firms are selective when enacting their external absorptive capacity routines to search for spillovers. Zhang et al. (2010: 972) maintained that 'the greater the diversity of technologies and management practices brought by foreign firms, the greater the combination potentials' for domestic firms. However, in this regard, they failed to take into account that domestic firms have to 'connect new knowledge with existing knowledge' (Meyer & Sinani, 2009: 1078).

Spencer (2008: 344) argued that 'each organization reflects a unique configuration of knowledge'. Hence, spillovers to be absorbed should fit with recipient firms' unique configurations of knowledge, which are composed of coherent components. Echoing Lane et al. (2006: 857) that 'a firm's strategy plays a role in determining which areas of knowledge are valuable', the findings here extend Meyer and Sinani (2009) and Spencer (2008) by showing that coherence with business strategies is a principal criterion for domestic firms to search for spillovers when enacting their external absorptive capacity routines. Only spillovers coherent with AdhesiveCo's focus strategies would be considered. Examples include its purchases of imported machines from Germany and its recruitment of executives from an MNE and a local competitor.

Conversely, AdhesiveCo deliberately screened out popular MNEs' business practices, like going public and mergers and acquisitions, which were deemed incoherent with its long-term strategy. Based on this finding, future studies may test the following hypothesis regarding domestic firms' external absorptive capacity routines: search activities for spillovers over time may be path dependent (Lewin et al., 2011) rather than be blindly attracted by available spillover opportunities (Zhang et al., 2010).

The evidence of domestic firms as active and selective when enacting their external absorptive capacity routines to search MNEs' spillovers may help address a long-held puzzle in the FDI spillover literature: Why is 'there...no empirical support for the hypothesis that technology is [disseminated] locally from [foreign

owned firms] to domestically owned firms' (Aitken & Harrison, 1999: 614)? In part, it is because domestic firms, being selective, may find local spillovers incoherent with business strategies. Rather, they may actively search at national and international levels for spillovers that better fit with business strategies. As a result, spillover effects may turn out to 'go beyond narrowly defined local boundaries' (Chang & Xu, 2008: 499).

Finally, one may ask, what propels and sustains the active search and selective search observed in AdhesiveCo's external absorptive capacity routines? In the language of a routine-based model of absorptive capacity (Peters et al., 2014), AdhesiveCo's active search at national and international levels was propelled by its managerial intentionality of surviving the intensifying market competition from MNEs.

In addition, the fact that the CEO in company meetings regularly discussed the main ideas of AdhesiveCo's focus strategies and shared the valuable insights about strategy he gained from books and experts, powerfully directed its top-level managers' attention towards learning the best practices of MNEs in foreign countries. In other words, AdhesiveCo's leadership commitment to learning (Inkpen & Tsang, 2007) served as a forceful vehicle for attention direction; and this attention direction further drove its active search across geographical boundaries and reinforced its selective search for spillovers that would fit its focus strategies.

As a consequence, spillovers not only at the national level but especially at international level increasingly drew attention from AdhesiveCo's top-level managers. Such managerial attention was also devoted to critical areas AdhesiveCo intended to absorb from spillovers, including strategy, manufacturing, and marketing. Hence, active search and selective search gained organizational legitimacy to make constant claims on the firm's resources to sustain themselves going over time.

Diligent acquisition. The third behavioral pattern surprisingly found in this paper is that domestic firms are diligent when enacting their external absorptive capacity routines to acquire spillovers, that is, they acquire spillovers from MNEs together with those from local competitors. According to Chang and Xu (2008: 495), FDI spillover scholars 'paid little attention to local firms' and 'neglected host countries' competitive environments', thus ignoring that domestic firms would also acquire spillovers from local competitors. Though Chang and Xu (2008: 497) were the first to notice the fact that 'spillovers...can occur among local firms', they were short on discussing the theoretical implications of absorbing spillovers from local competitors.

As 'drawing inferences from...multiple samples allows for cross-checking...conclusions and uncovering mistakes' (Terlaak & Gong, 2008: 862), this paper finds that besides acquiring MNEs' spillovers, AdhesiveCo, by participating in industry associations, acquired information from another sample, which comprised local competitors, about their business strategies and performances in

order to avoid biased information and false beliefs (Denrell, 2003) about MNEs' strategies and successes.

AdhesiveCo then found that most local competitors implementing diversification strategies later delivered worse-than-expected performances. Hence, spillovers about the failures of local competitors' diversification strategies helped increase inferential accuracy (Terlaak & Gong, 2008) of AdhesiveCo's drawing conclusions from the successes of MNEs' focus strategies. Put differently, spillovers about MNEs' focus strategies and local competitors' diversification strategies acquired in combination through enacting external absorptive capacity routines helped AdhesiveCo raise its understandings of their respective strategies with greater precision and confidence.

To conclude the foregoing discussions of active search, selective search, and diligent acquisition, this article, by building on previous studies that show that domestic firms search and acquire spillovers from MNEs in foreign countries (Cui et al., 2015) and from other local competitors (Chang & Xu, 2008), and by responding to calls for considering domestic firms as 'competent learning organizations' (Chang & Xu, 2008: 514) rather than as 'passive recipients of FDI spillovers' (Zhang et al., 2010: 983), extends the FDI spillover literature from investigating domestic firms' search and acquisition of spillovers exclusively from FDI towards including their additional search and acquisition of spillovers from MNEs abroad and from local competitors.

By doing so, it is hoped that, this paper could encourage FDI spillover scholars to keep pace with the current development of domestic firms and of host countries' environments in which MNEs operate (Chang & Xu, 2008), and thus to paint a more complete picture of domestic firms' search and acquisition of spillovers, and to deliver a more theoretically rich understanding of their external absorptive capacity routines.

Enhancing Internal Absorptive Capacity Routines

The second contribution to the FDI spillover theory is to provide a rare glimpse into the black box of domestic firms, by unveiling how domestic firms could enhance their internal absorptive capacity routines to better transform and exploit spillovers through undertaking organizational learning and developing complementary assets.

Organizational learning. Prior studies have suggested that constrained by their absorptive capacity, domestic firms aim at spillovers from MNEs when the technology gaps between them are moderate rather than large (Meyer, 2004). This article augments this view by suggesting that, if domestic firms could undertake organizational learning to enhance their internal absorptive capacity routines, they may target at spillovers from MNEs which pose relatively wider technology gaps.

Though organizational learning (Sun & Anderson, 2010; Volberda et al., 2010), particularly ‘send[ing] personnel for advanced technical training’ (Cohen & Levinthal, 1990: 135), could enhance absorptive capacity, it receives little attention from spillover scholars, in part because they tend to use static proxies such as firm size or R&D expenditures to measure absorptive capacity (Zhang et al., 2010), and thus treat ‘absorptive capacity as a static resource and not as a process’ (Lane et al., 2006: 852).

In contrast, by adopting a routine-based model of absorptive capacity (Lewin et al., 2011), this article probes AdhesiveCo’s internal absorptive capacity routines and depicts a process in which formal training sessions were provided to employees so as to improve the transformation and exploitation of spillovers about manufacturing and marketing. This finding is in keeping with Lane et al. (2006: 848), who have long argued that ‘increased learning in a particular area enhances the organization’s knowledge base in that area, which further increases its absorptive capacity’.

Complementary assets. Similarly, despite the value of complementary assets in the transformation and exploitation of spillovers (Eapen, 2012; Fu, 2012), past research on FDI spillovers (Sinani & Meyer, 2004; Zhang et al., 2010) held a static view of absorptive capacity, thus overlooking the process in which domestic firms could develop complementary assets to enhance their internal absorptive capacity routines.

In contrast, this article reports that Adhesive Co cultivated a family-like sales culture and built a technology center to respectively complement the spillovers about marketing and manufacturing absorbed from MNEs and local competitors. Such finding is consistent with Schildt, Keil, and Maula’s (2012) study, which showed that firms would expand their complementary assets to better absorb external knowledge.

In sum, to fully appreciate how domestic firms profit from spillovers over time, FDI spillover scholars may take a dynamic approach to examining ‘the time-varying ability of firms to absorb knowledge’ (Schildt et al., 2012: 1154). Indeed, ‘Cohen and Levinthal (1989, 1990) introduced the term absorptive capacity...[as] dynamic’ rather than static (Todorova & Durisin, 2007: 774). Based on findings here, future studies may be better guided by adopting a routine-based model of absorptive capacity (Lewin et al., 2011) to investigate how organizational learning and complementary assets can enhance domestic firms’ internal absorptive capacity routines.

Socially Enabling Mechanisms at the External-Internal Interface

The third contribution is to infuse the previously neglected social dimension into the FDI spillover theory, which has been dominated by economic thinking, by offering important insights into how socially enabling mechanisms at the

interface between external and internal absorptive capacity routines could facilitate absorbing spillovers.

The data show that the idea of hiring Mr. Li was to acquire advanced manufacturing knowledge from a local competitor. Upon joining AdhesiveCo, Mr. Li was a ‘boundary spanner who serves as the interface between an organization and its external environment’ (Lewin et al., 2011: 89) and between AdhesiveCo’s knowledge repositories and external knowledge. His solving difficult technical problems and initiating collective reverse engineering efforts offered the crucial socially enabling mechanisms to facilitate understanding and sharing of his knowledge by and among manufacturing employees. Consequently, AdhesiveCo was able to reap substantial gains from transforming and exploiting the manufacturing spillovers brought by him.

By contrast, Mr. Gol, recruited from an MNE for acquiring his foreign marketing knowledge, adopted a different approach. Instead of ‘build[ing] connectedness and shared meanings’ (Todorova & Durisin, 2007: 781) between him and others to facilitate understanding and sharing of his advanced knowledge, Gol imposed foreign practices on and initiated radical changes at AdhesiveCo. He thus triggered resistance and alienated others instead of creating socially enabling mechanisms to fully transform and exploit the marketing spillovers brought by him. One staff member recalled, ‘We felt that Mr. Gol had problems integrating into our culture and communities’.

These contrasting findings of absorbing spillovers by employee turnover support Cohen and Levinthal’s (1990: 132) argument that ‘the firm’s absorptive capacity depends on the individuals who stand at the interface of...the firm and the external environment’. This paper also further extends Lewin et al. (2011: 86), who held that socially enabling mechanisms ‘transcend internal and external’ absorptive capacity routines, by showing that, when recruiting employees from other firms for spillovers, it is the interface between the external and internal absorptive capacity routines that requires a significant amount of effort to build socially enabling mechanisms.

The reasons being, compared to employee turnover, other spillover mechanisms, like demonstration effects, common local linkages, and competition effects, involve no outsiders to bring in new knowledge. When new hires walk into a new firm in which they are outsiders and no social relationships exist, they would not be able to get familiar with ‘tacit nature of a firm’s idiosyncratic prior related knowledge’ (Volberda et al., 2010: 941); yet, ‘some overlap of knowledge across individuals is necessary’ for firms to absorb external knowledge (Cohen & Levinthal, 1990: 133). Accordingly, socially enabling mechanisms in this situation are particularly important, because they can ‘generate trust, respect, and commitment necessary for continuing interaction and knowledge sharing’ (Lewin et al., 2011: 88) between new hires and other employees.

Taken together, these findings of socially enabling mechanisms in employee turnover for spillovers bring much-needed attention to the social dimension in

the FDI spillover process, because, according to Eapen (2012: 246), the extant FDI spillover literature is ‘characterized largely by economic arguments (Eden, 2009; Meyer, 2004) and an under-socialized view of spillovers’. More pointedly, the evidence here highlights a major shortcoming in existing FDI spillover studies: it involves utilizing economic-oriented proxies, like R&D spending, to measure absorptive capacity (Sinani & Meyer, 2004; Zhang et al., 2010), while giving little consideration to the social aspects of absorptive capacity. Critical issues discussed here, like how socially enabling mechanisms (Lewin et al., 2011) facilitate domestic firms’ absorption of spillovers, have been largely ignored. Future research may incorporate the notion of socially enabling mechanism to offer a socially informed account of spillover process.

Boundary Conditions and Generalizability of Findings

The analysis of how AdhesiveCo absorbed spillovers hints at the boundary conditions. Enacting external absorptive capacity routines for spillovers by visiting MNEs in their home countries is more likely to be observed in host economies in which MNEs have motivations to build social ties with and to learn from domestic firms, due to MNEs’ liability of foreignness (Hymer, 1976), for example, in understanding local customers. Therefore, MNEs are willing to seek ‘the potential for reciprocal information sharing’ (Eapen, 2012: 253) with domestic firms.

Enacting external absorptive capacity routines for spillovers by recruiting managers from other firms would more likely to be prevalent in economies in which employee turnover rate is high, due to the talent war triggered by rapid economic development (Ready, Hill, & Conger, 2008). Conversely, the above two patterns of external absorptive capacity routines may not be found respectively in economies where ‘MNEs...have less need to learn...from local firms’ (Fu, 2012: 675) after overcoming their liability of foreignness, and in economies that practice lifetime employment and thus have low employee turnover rate, like Japan (Sullivan & Peterson, 1991).

One may raise questions about the empirical generalizability (Tsang, 2014) of these findings to domestic firms in other countries. Though patterns of enacting external absorptive capacity routines and enhancing internal absorptive capacity routines observed at domestic firms like AdhesiveCo may be ‘idiosyncratic and firm specific’ (Lewin et al., 2011: 81), similar behaviors have been documented elsewhere. For example, Rhee, Ross-Larson, and Pursell (1984:16) reported that assisted by the government, which had ‘the commitment of the country’s political leadership to economic growth’, Korean firms benefited from visiting factories in Japan.

To cope with heightened competitive pressures, domestic firms are willing to pay wage premium to attract better trained employees from MNEs (Fosfuri, Motta, & Rønne, 2001). Patibandla and Petersen (2002) observed that FDI spillovers through employee turnover helped grow Indian software firms’ productivity improvements

and technological developments. Chen (2009) depicted that in order to catch up with MNEs, Taiwanese firms in the machinery tool industry engaged in a variety of technological learning to increase their utilization of external knowledge. The above research on domestic firms in countries like South Korea, India, and Taiwan support the argument that the findings of this study are more widely applicable across settings.

CONCLUSION

A routine-based model of absorptive capacity adopted in this paper is useful for studying how domestic firms absorb spillovers. Prior studies focus on the presence and attributes of FDI; in contrast, this article points to the importance of domestic firms' external and internal absorptive capacity routines for absorbing spillovers. By active search, selective search, and diligent acquisition in their external absorptive capacity routines, domestic firms absorb spillovers not only from FDI but also from local firms and MNEs abroad. Domestic firms undertake organizational learning and develop complementary assets to enhance their internal absorptive capacity routines. Socially enabling mechanisms facilitate domestic firms' absorbing spillovers by employee turnover. It is hoped that these findings can set groundwork for this field.

NOTES

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