Institution, Internationalization and Innovation: Three Papers on Penetration of Emerging-Market Multinational Enterprises into Developed Markets

by

Victor Zitian Chen

M.A. (Economics), University of Ottawa, 2007
B.A., Beijing Technology and Business University, 2005

Thesis Submitted in Partial Fulfillment
of the Requirements for the Degree of
Doctor of Philosophy

in the
Segal Graduate School
Beedie School of Business Faculty

SIMON FRASER UNIVERSITY

Spring 2012

Approval

Name: Victor Zitian Chen
Degree: Doctor of Philosophy
Title of Thesis: Institution, Internationalization and Innovation: Three Papers on Penetration of Emerging-Market Multinational Enterprises into Developed Markets

Examining Committee:

Chair: **Dr. Thomas Lawrence**
Professor, Beedie School of Business

Dr. Daniel Shapiro
Senior Supervisor
Dean, Beedie School of Business

Dr. Jing Li
Supervisor
Associate Professor, Beedie School of Business

Dr. Steven Globerman
Internal Examiner
Adjunct Professor, Beedie School of Business
Professor, Western Washington University

Dr. Rajneesh Narula
External Examiner
Professor, University of Reading

Date Defended/Approved: February 27, 2012

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Abstract

Three papers are presented on the emerging phenomenon of penetration by emerging-market multinational enterprises (EMNEs) into developed markets (DMs) through outward foreign direct investment (OFDI). Paper 1 examines the roles played by home market-supporting institutional development, at sub-national levels, in OFDI decisions from emerging markets (EMs) into DMs. Paper 2 focuses on the next stage of EMNEs' investment in DMs – going in, or choosing a mode of entry. It extends the first paper by investigating the effects of home market-supporting institutional development, at the sub-national level, on a local EM firm's choice of ownership (partial vs. full) when entering into a DM. In Papers 1 and 2, I argue that the home institutional effect, measured at the sub-national level, is twofold. First, there is a positive direct effect on both the propensity to enter DMs and the propensity to choose full-ownership entry. Second, there is a positive indirect effect on both factors through the mediation of market-related firm capabilities such as technological capability. Papers 1 and 2 are among the first attempts to investigate the roles of home institutions, particularly at sub-national levels, in global strategy and to explore the mediation roles of firm capabilities. Paper 3 focuses on a later stage for those EMNEs that are sourcing knowledge in DMs – going back. It examines whether and to what extent EMNEs use OFDI in a DM to capture knowledge spillovers so as to improve their technological capabilities at home, an effect termed "reverse spillover." This is one of the first studies to examine spillover effects in this direction (from foreign subsidiaries to home parent firms), and among the first EMNE studies to examine after-entry issues. In all three papers, I find supportive empirical evidence using regression methods. Overall, my thesis provides new insights: EMNEs are home-related, and this relationship is bidirectional, in that their international activities are shaped by their home institutional environment while their overseas activities can affect their technological capabilities at home.

Keywords: internationalization; foreign direct investment; emerging market; institutions; innovation

Dedication

FOR THE LOVE OF MY LIFE,
AND MY CONSTANT SUPPORTER,
LU ZHOU

Acknowledgements

Like most theses, this was more of a team effort than the author byline suggests. I've been blessed with the opportunity to work with a group of very supportive people throughout my PhD. First and foremost, my deepest thanks go to my senior supervisor, Dr. Daniel M. Shapiro, and supervisor, Dr. Jing Li. I could not have hoped for better advisors. I will draw on your guidance for the rest of my career, and aspire to become as wise, kind, and generous as you are.

Next I would like to thank Dr. Aiden Vining and Dr. Steven Globerman. Dr. Vining served as my internal examiner for my comprehensive exams, and Dr. Globerman served as my committee member for my thesis proposals. Both have offered important suggestions. And thanks to Dr. David C. Thomas and Dr. Thomas Lawrence, doctoral program chairs, for their helpful navigation. I am also indebted to Joanne Kim, doctoral program coordinator, for her constant help in looking out for me.

And thanks to Dr. Rajneesh Narula for acting as my external examiner.

Special thanks to my colleagues at the journal *Transnational Corporations Review*, particularly founding advisors Dr. Someshwar Rao, Dr. Karl P. Sauvant, Dr. Anne Miroux, Dr. Yongding Yu, Dr. Yanzhong Zhang, and Drs. Vincent and Elinor Ostrom, and founding editorial committee members Dr. Jianmin Tang, Dr. Weiming Wang, and Mr. Hugh Deng. Since the journal's birth in 2006, we have been a close family discussing and practising ideas on foreign direct investment, institutional development, innovation, and emerging markets.

Next, thanks to my external financial supporters during my PhD, notably the Social Sciences and Humanities Research Council of Canada (SSHRC) (Scholarship No. 752-2009-1880 05), the Province of British Columbia, and the Asia Pacific Foundation of Canada. Their generous support helps me concentrate on my study and research.

Also thanks to my copyeditor Ms. Sylvia Hunter for helping polish the language.

Lastly, incredible thanks to my family – my wife Lulu, Mom and Dad – for their continual encouragement and support.

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List of Abbreviations

APF	Asia Pacific Foundation of Canada
BvD	Bureau van Dijk
CCPIT	China Council for Promotion of International Trade
CEPII	Centre d'Etudes Prospectives et d'Informations Internationales
CSA	Country-Specific Advantage
DM	Developed Market
EM	Emerging Market
EMNE	Emerging-Market Multinational Enterprise
FDI	Foreign Direct Investment
FTSE	Financial Times Stock Exchange
GDP	Gross Domestic Product
IB	International Business
IFC	International Finance Corporation
IV	Instrumental Variable
M&A	Merger and Acquisition
MNE	Multinational Enterprise
MSCI	Morgan Stanley Capital International
OECD	Organisation for Economic Co-operation and Development
OFDI	Outward Foreign Direct Investment
OLI	Ownership, Location, and Internalization
OLS	Ordinary Least Squares
R&D	Research and Development
RBV	Resource-Based View
SEZ	Special Economic Zone
SIC	Standard Industrial Classification
TC	Transaction Cost
UNCTAD	United Nations Conference on Trade and Development
WDI	World Development Indicators
WB	World Bank

1. Introduction

The term "emerging market" (EM) defines an economy with the following two characteristics: first, relatively low income with rapid growth; and, second, the development of market-supporting institutions (Arnold and Quelch, 1998; Hoskisson, Eden, Lau, and Wright, 2000). EMs include two broad groups of economies: "developing countries in Asia, Latin America, Africa, and the Middle East and transition economies in the former Soviet Union and China" (Hoskisson et al., 2000: 249).

Markets, to work effectively, need institutions to support them. Market-supporting institutions are rules of the game that "serve to limit transaction costs: the time and money spent locating trading partners, comparing their prices, evaluating the quality of the goods for sale, negotiating agreements, monitoring performance and settling disputes" (McMillan, 2007: 1). As the second characteristic implies, EMs have adopted a number of measures for developing market-supporting institutions. In China, for example, since the planned economy was abandoned in 1979, a market system has expanded massively: in only about a decade, the number of planned commodities was reduced from 256 categories to 19 categories; industrial production subject to planning declined from 95% to less than 10%; and market pricing replaced administered pricing for 90% of retail products, 80% of agricultural products, and 70% of resource products (Chen and Yang, 2012). In Mexico, between 1982 and 1992, the government privatized 361 of its roughly 1200 state-owned enterprises (SOEs), and the need for policy subsidies was virtually eliminated (La Porta and Lopez-de-Silanes, 1999).

A marketized and liberal domestic economy not only opens EMs to foreign multinational enterprises (MNEs) from developed markets (DMs) but also spawns many MNEs originating from EMs (hereafter EMNEs)[1]. Although most EMNEs concentrate their overseas investment in other EMs and poor countries (e.g., Sauvant, McAllister, and Maschek, 2010), their penetration into developed markets (DMs) through outward foreign direct investment (OFDI) is a significant and growing phenomenon (Cuervo-Cazurra and

[1] For national ranking lists and company profiles, see the Emerging Market Global Players (EMGP) project at Columbia University: http://www.vcc.columbia.edu/content/emerging-market-global-players-project.

Genc, 2009; Yamakawa, Peng, and Deeds, 2008). China, the largest EM, is a good example: it is estimated that from 2005 to 2008, Chinese non-financial-sector OFDI into Organisation for Economic Co-operation and Development (OECD) countries enjoyed an average annual growth rate of 50%, from US$3.71 billion in 2005 to US$11.74 billion in 2008 (NBSC, 2009; MOFCOM, 2010; also see Figure 1).

Insert Figure 1 here

Although there is an extensive literature on OFDI by EMNEs (e.g., Luo and Tung, 2007; Globerman and Shapiro, 2008; for a review, see Ramamurti, 2008), recent penetration of EMNEs into DMs remains a relatively under-studied phenomenon (Bertoni, Elia, and Rabbiosi, 2008; Buckley, Elia, and Kafouros, 2010; Xu and Meyer, 2012; Yamakawa, Peng, and Deeds, 2008). Buckley et al. (2010: 31), for instance, point out that "this research gap limits not only academic conceptualisations, but also the effectiveness of the strategic plans of EMNCs [emerging-market multinational corporations] and the government policies of advanced countries."

This emerging phenomenon presents two unique questions that have not been well explained by existing international business (IB) and global strategy literatures. The first question is why and how these EMNEs, coming from a relatively early stage of market institutional development, enter into such a different institutional environment, with strong market institutions, given that they usually do not possess leading advantages such as technology and brand to overcome the liability of foreignness caused by institutional dissimilarity (e.g., Eden and Miller, 2004). Some studies attempt to explain by arguing that EMNEs are proactively geared toward exploring knowledge assets, such as brands and technology, in a DM (e.g., Ivarsson and Jonsson, 2003; Mathews, 2006a, 2006b). However, these studies ignore the fact that in order to absorb such new knowledge, firms still need to have relevant prior experiences and resources (Chen, 2012; Narula and Nguyen, 2011). The second, and related, question is whether such investment in DMs can actually generate positive spillover effects that augment the technological capabilities of EMNEs back home. To my knowledge, however, no studies have investigated the latter topic (see literature surveys, see Blomström and Kokko, 1998; Globerman and Chen, 2010).

My thesis, which consists of three papers, aims to answer these questions.

Because the first question concerns degrees of development of market-supporting institutions at EMs, I explore answers by adopting an institution-based view (Hoskisson et al., 2000; North, 1990; Scott, 1995; Wright, Filatotchev, Hoskisson, and Peng, 2005), which brings context with respect to institutions into the analysis of firm-level phenomena (Meyer and Peng, 2005), where institutions define the rules of game of a society such as regulations, policies, cultures, and norms (North, 1990). In general, I offer an alternative explanation that those EMNEs entering into DMs and those adopting full ownership come from sub-national regions where market-supporting institutions are better developed. In other words, sub-national institutional environment shapes EMNEs' international behaviours with respect to entry decision and entry ownership, and therefore firms from the same EM may adopt different global strategies about entry into DMs. Papers 1 and 2, respectively, examine how entry decision and entry ownership into DMs are determined by the development of home, sub-national market-supporting institutions. A focus on market-supporting institutions in EMs is in line with the second characteristic of EMs, as defined earlier, that is, the adoption of a market system and economic liberalization.

More specifically, Paper 1 proposes a twofold institutional effect of home market-supporting institutional development on an EMNE's propensity of entry into a DM. First, there is a direct effect, as home institutional development of a sub-national region reduces the uncertainty facing EM firms as a result of institutional differences between the EM and DMs, and thus encourages these firms to invest into DMs. Second, there is an indirect effect through the mediation of market-related firm capability; that is, home market-supporting institutional development provides the conditions that induce local firms to create market-related firm capabilities in, for example, technology, branding and marketing, and managerial skills. Using a 2010 firm-level survey of 553 Chinese firms headquartered in 68 different cities and measures of home institutional quality at the city level (and, as a robustness check, at the provincial level), and adopting a causal mediation analysis method, I find very supportive empirical results for the arguments outlined.

Paper 2 extends Paper 1 by discussing the effects of home market-supporting institutional development at the sub-national level on an EMNE's choice of ownership (partial vs. full) when entering into a DM. It is among the first attempts to study home institutional effects, particularly at the sub-national level, on entry mode of OFDI. I follow a similar theoretical structure as in Paper 1 to develop my arguments. First, I argue that, all else being equal, the direct effect on the choice of full-ownership entry is positive, because

institutional development at home will reduce uncertainty with respect to getting local adaptation and legitimacy, as well as the need for a local partner to help the EMNE obtain local legitimacy, and will therefore increase the EMNE's propensity to choose full-ownership entry. Second, market-supporting institutional development at home induces EMNEs to create market-related firm capabilities, such as technological capabilities, that reduce the need for a local provider of these capabilities and increase the need for full ownership of foreign subsidiaries to protect their proprietary capabilities. Using a cross-country (Mexico, India, and China) firm-level sample of 492 entries into triad DMs (i.e., North America [USA and Canada], Western Europe, and Japan) between 2007 and 2010, and adopting state-/province-level measures of institutional quality, I find very supportive empirical results for my theory outlined.

The first contribution that Papers 1 and 2 make is their focus on home institutions. Although the institution-based view has been current for some years, notably by scholars focusing on EMs (Peng, Wang, and Jiang, 2008), the existing literature focuses only on host institutions or on the distance or similarity in institutions between home and host regions (Cuervo-Cazurra, 2011), with very few studies analyzing the roles of home institutions in international activities of firms (Xu and Meyer, 2012; Voss, Buckley, and Cross, 2010). Xu and Meyer (2012), for instance, review published papers focusing on EMs in "A" management journals (impact factor >3.5), and find that very few have examined the impacts of home institutions on strategies of EMNEs, none with discussions on how home institutions affect EMNEs' presence and activities in a different, market-supporting environment, that is, in DMs (Xu and Meyer, 2012).

The second contribution of Papers 1 and 2 is the introduction of market-related firm capability as a mediator on home institutional effects. Specifically, in addition to analyzing the direct effects of home institutions of EMNEs on entry decision and entry ownership into DMs, Papers 1 and 2 also explore whether and to what extent such effects are mediated by firms' capabilities, which may be shaped by their home environment (e.g., Cuervo-Cazurra and Genc, 2009; Luo and Tung, 2007; Rugman and Collinson, 2008; Wei, 2010). To my knowledge, my studies are among the only attempts to introduce the mediation of firm-specific resources and capabilities into analyses of institutional effects. This approach is in line with some scholars' observation that in different institutions, local firms may compete by building different firm capabilities that best adapt to their environment characteristics (e.g., Cuervo-Cazurra and Genc, 2009; Cuervo-Cazurra,

2011; Henisz, 2003; Holburn, 2001). Henisz (2003) and Holburn (2001), for instance, find that firms in politically risky institutions tend to develop political resources, both to safeguard sunk investments against the potentially adverse policy consequences of rival groups' political rent-seeking efforts and to shape the policy environment to their own benefit. As another example, Figure 2 plots the largest 20 firms from EMs and DMs in non-service and non-regulated industries; the result suggests that these national industry leaders in DMs generally have high-technology-based firm capabilities, as measured by research and development (R&D) intensity, but low political capabilities, as measured by state ownership, whereas their counterparts in EMs generally show the opposite pattern.

Insert Figure 2 here

The third contribution made by Papers 1 and 2 is their recognition of sub-national institutional heterogeneity in large-scale EMs. With a developed national network of physical infrastructures in large-scale DMs such as US, it is relatively easy for companies there to engage in national competition and, if necessary, to relocate their legal headquarters where institutional quality becomes more favourable while maintaining access to timely information through good telecommunications infrastructures and an efficient national supply-chain system of transport and logistics. Such ease of headquarters mobility and national competition will encourage local administrations to pursue market institutions (e.g., taxes and fees, efficiency in starting and closing a business, contract enforcement, etc.) of as good quality as their domestic counterparts, so as to attract inbound investment and retain business headquarters, leading to convergence of market-oriented institutions.

In contrast, in large-scale EMs such as China, India, and Mexico, most domestic firms compete regionally, because their domestic economies are relatively disconnected and disintegrated across sub-national regions, a context much different from DMs (e.g., Chang and Xu, 2008). As a consequence, local sub-national institutional environments create pivotal conditions that shape firm-specific resources and capabilities and, in turn, firms' business behaviours (Meyer and Nguyen, 2005). Therefore, it is important to investigate the impacts of home environment of EMs at sub-national levels on local firms' strategies, such as entry decision and entry mode of OFDI.

Furthermore, a directional focus on OFDI from EMs into DMs – that is, from weak

to strong market-supporting institutions – resonates with the rising recognition in institutional studies that institutional distance or similarity is neither direction-free nor symmetrical (e.g., Shenkar, 2001). Therefore, the relatively large existing literature applying the institution-based view to study DM MNEs investing into EMs (e.g., Delios and Henisz, 2000; Meyer, Estrin, Bhaumik, and Peng, 2009; Uhlenbruck and De Castro, 2000) does not fully fill the gap in our understanding of internationalization activities in a cross-institutional situation between DMs and EMs.

My Paper 3 aims to answer the second unique question presented by EM OFDI into DMs, that is, whether EM OFDI in DM can indeed augment the technological capabilities of EM parent firms. Specifically, it examines whether and to what extent EMNEs use OFDI in a DM to capture knowledge spillovers so as to improve their technological capabilities at home. I refer to this as a "reverse spillover effect" on parent firms, and develop this idea based on the knowledge-seeking motive for FDI by EMNEs. Extending previous studies that have identified the knowledge-seeking motive and provided some evidence for its validity (e.g., Makino, Lau, and Yeh, 2002; Mathews and Zander, 2007; Luo and Tung, 2007; Rui and Yip, 2008; Deng, 2009), my study focuses on the effects of such FDI on the technological capabilities of EMNEs at home. Using a panel dataset of 493 EMNEs over the period between 2000 and 2008, and controlling for possible endogeneity, I find evidence supporting the reverse spillover effect: EMNEs with subsidiaries in host DMs that are richer in technological resources (as measured by R&D investment and R&D employment) exhibit stronger technological capabilities at home. While it is critical to investigate the impact of knowledge seeking on EMNEs' entry decisions and location choices (e.g., Bertoni et al., 2008), it is equally important to understand whether investment in DMs can actually generate positive spillover effects that augment the technological capabilities of EMNEs back home. To my knowledge, however, no studies have investigated the latter topic (for literature surveys, see Blomström and Kokko, 1998; Globerman and Chen, 2010), and my Paper 3 is among the first to do so.

Together, these three papers offer new insights in support of the view that international activities of EMNEs are home-related (Luo & Tung, 2007; Rugman & Collinson, 2008), and find that this relationship is bidirectional. First, in the context of EM OFDI into DMs, home markets provide the conditions for EMNEs to develop certain market-related firm capabilities that are relevant to DMs. Second, EMNEs recursively transfer knowledge found in DMs back home to augment the market-related firm

capabilities of their parent firms. In addition, findings from the three papers provide an initial framework to integrate the factors of home institutions, firm resources and capabilities (both proprietary capabilities, such as firm technological capability, and external resources, such as knowledge in a host DM), and OFDI of EMNEs.

2. Paper 1 on Going Out: Sub-National Institutional Heterogeneity and Outward FDI

2.1. Introduction[2]

An institution-based view has evolved as one of the leading perspectives for theorizing IB and global strategy questions such as why and how firms conduct FDI (Peng et al., 2008; Xu and Meyer, 2012). This view captures the complex and rapidly changing relationships between organizations and their surrounding environmental context with respect to institutions, both formal ones, such as laws and regulations, and informal ones, such as norms, cultures, and ethics (Peng et al., 2008).

Two groups of literature dominate the application of the institution-based view in studying FDI issues. The first group, focusing on host-region institutions, argues that more efficient institutions generally reduce uncertainties of doing business in the region, and thus encourage inward FDI and entry by MNEs (e.g., Bevan, Estrin, and Meyer, 2004; Globerman and Shapiro, 2002; Holbum and Zelner, 2010; Meyer and Nguyen, 2005; Mishra and Daly, 2007). The second group focuses on the relationship between the distance or similarity in regulatory, normative, and cognitive institutions between home and host regions, on the one hand, and the legitimacy of an operation under multiple (home and host) institutional pressures, on the other (e.g., Bénassy-Quéré, Coupet, and Mayer, 2007; Kostova and Zaheer, 1999). This literature suggests that larger institutional differences between two regions may discourage FDI between them by creating greater liability of foreignness through potential conflicts between local adaption and internal consistency (e.g., Bénassy-Quéré et al., 2007). Neither group of studies, however, has paid much attention to how home-region institutions influence OFDI decisions.

The neglect of home-region institutions in these studies is unfortunate, because

[2] I thank participants at the Fifth Harvard China Goes Global Conference for their comments on this paper. I also thank the Asia Pacific Foundation of Canada (APF) and the China Council for Promotion of International Trade (CCPIT) for proving full access to the database of Chinese OFDI survey. I participated in the process of gathering and cleaning data during my tenure as a Research Fellow at APF between 2008 and 2009.

the studies thus fail to provide valuable insights into how particular characteristics of the home country affect a firm's foreign expansion (e.g., Aharoni, 2011; Cuervo-Cazurra, 2011; Ramamurti, 2008). Cuervo-Cazurra (2011), for example, indicates that a firm's global strategy may be influenced by the home country in two ways: a direct influence whereby the home country serves as an asset or liability through its image as perceived by people in the host country, and an indirect influence whereby the home country induces the firm to create particular adaptive resources and capabilities, which in turn affect the firm's global strategy.

This paper aims to fill the gap by examining whether and how home market-supporting institutional development affects OFDI decisions from EMs into DMs. I choose this particular empirical context not only because it is, as indicated earlier, an under-explored area in FDI literatures (Bertoni et al., 2008; Buckley et al., 2010; Xu and Meyer, 2012; Yamakawa et al., 2008) but also, and more importantly, because it is a way in which the effects of home institutions can be theorized in a more rigorous way. By excluding other EMs and including only DMs as a host region, it is possible to control a relatively stable and similar market-supporting institutional framework of host markets (McMillan, 2007; Peng et al., 2008), ensuring that investing MNEs are mainly concerned with variations in home-region institutions and relatively unexposed to those of host-region institutions in terms of a strong market economy.

Theoretically, I propose a twofold effect of the development of home market-supporting institutions in a sub-national region on an EM firm's propensity for OFDI into DMs. First, there is a direct effect, as the development of market-supporting institutions at home reduces the institutional differences between home and host regions, encouraging EM firms to invest overseas into DMs. Second, there is an indirect effect through the mediation of market-related firm capabilities: home institutional development creates the conditions that induce an EM firm to build skills in technology, branding and marketing, and management, which in turn enable the firm to invest into DMs. Empirically, I test my hypotheses in the context of the largest EM, China. My analyses are based on a firm-level survey of 553 Chinese firms from 68 different Chinese cities. Using causal mediation analysis (Hicks and Tingley, 2011; Imai, Keele, and Tingley, 2010; Imai, Keele, Tingley, and Yamamoto, 2010), I find strong support for my hypotheses.

This study contributes to IB and global strategy research in three important ways.

First, it is among the first attempts to build a conceptual framework to explain the roles played by home-region institutions (focusing on market-supporting institutional development) in OFDI decision making. Prior institutional studies on FDI merely focus on host regions (e.g., Bevan, Estrin, and Meyer, 2004; Meyer and Nguyen, 2005) and institutional distance between home and host regions (e.g., Xu and Shenkar, 2002), while discussions on home-market institutions have been very limited, as suggested by Aharoni, (2011),Ramamurti (2008), and Voss et al. (2010) (for a review, see Globerman and Chen, 2010). Whereas previous studies have usually assumed a direct relationship between institutions and FDI (e.g., Globerman and Shapiro, 2002; Mishra and Daly, 2007), my study argues that part of this relationship is mediated through market-related firm capabilities.

Second, in line with some scholars' observations of sub-national institutional heterogeneity in EMs (e.g., Chan, Makino, and Isobe, 2010; Meyer, Mudambi, and Narula, 2011), this study is among the very few attempts to explain the reasons for the existence of sub-national institutional heterogeneity and to analyze its impacts on global strategies in terms of entry decision. It suggests that the conventional way of using nations as boundaries for institutions may be inappropriate for studying EMs (Chen, 2012). My empirical results in both Papers 1 and 2 suggest very significant effects of sub-national variations in institutional quality. Previous research studying institutions at the national level (e.g., Bénassy-Quéré et al., 2007; Globerman and Shapiro, 2002; Holbum and Zelner, 2010; Mishra and Daly, 2007) disguises the possibility that changes in institutions within the same country over time affect local business activities, and therefore underestimates heterogeneity among firms from the same country when choosing their global strategies (e.g., Aldashev, 2009). Revisiting locational factors at the sub-national level is in line with suggestions by some of the leading IB and global strategy journals. Although traditional literature has tended to view locational factors, including institutions, in terms of national borders, more and more scholars have suggested that the country is not always an appropriate unit of analysis (e.g., Anderson, Beugelsdijk, Mudambi, and Zaheer, 2011; Meyer and Nguyen, 2005). In a recent call for papers for the *Journal of International Business Studies (JIBS)*, for instance, Anderson et al. (2011: 1) suggest that "at the most fundamental level, this [revisiting locational factors at the sub-national level] involves incorporating the impact of sub-national locations on decision-making and performance of multinational enterprises (MNEs)."

Third, this study also adds valuable insights for a better understanding of global expansion of EMNEs. Previous studies, building on the literature relating to the liability of foreignness (e.g., Eden and Miller, 2004), suggest that large institutional differences between home and host regions discourage FDI between them (e.g., Kostova and Zaheer, 1999). Unlike DM MNEs, EMNEs usually do not possess superior resources and capabilities, such as leading-edge technology and global brands, that would allow them to overcome their liability of foreignness arising from institutional differences (e.g., Eden and Miller, 2004). Therefore, these studies would not have predicted the current large increase in OFDI by EMNEs into DMs.

Some research attempts to explain this phenomenon by arguing that EMNEs are entrepreneurially geared toward exploring strategic assets, such as brands and technology, in a DM, an approach formally termed "asset seeking" (Ivarsson and Jonsson, 2003), "asset sourcing" (Shan and Song, 1997), or "asset augmentation" (Mathews, 2006a, 2006b). Mathews (2006a: 18), for instance, argues that an EMNE "is focused not on its own advantages, but on the advantages which can be acquired externally, i.e. on resources which can be accessed outside of itself." However, these studies ignore the fact that in order to absorb these strategic assets found abroad and therefore stay sustainable, EMNEs may still need to have existing relevant capacity and experience in advance; that is, there may be a mediating role of relevant firm resources and capabilities (Chen, 2012; Narula and Nguyen, 2011). My study offers another, more nuanced explanation for the rise in EM OFDI to DMs. I argue that sub-national heterogeneity in market institutional development in an EM may lead firms from different regions of the same country to make their decisions about entry into DMs differently. Active EMNEs investing into DMs are those that come from relatively stronger market-supporting sub-national regions and that possess greater market-related firm capabilities such as technology and global brands.

The rest of the paper proceeds as follows: Section 2 reviews the literature and develops hypotheses; Section 3 discusses methods and analyzes the results; and Section 4 concludes by discussing the implications of my findings and suggesting potential extensions.

2.2. Theory Development

2.2.1. Institutions and Sub-National Heterogeneity

North (1990: 3-4) defines institutions as the "rules of the game" of a society, including "any form of constraint that human beings devise to shape human interaction." Unlike some earlier work (e.g., Selznick, 1957), North (1990) emphasizes a crucial distinction between an institution and an organization, which, as Polski and Ostrom (1999) explain, can be thought of as a set of institutional arrangements and participants with a common set of goals and purposes (e.g., a government, trade union, church, or university). North (1990) explains that institutions include formal rules, such as constitutions, laws, and regulations; informal constraints, such as culture, social norms, and custom, which extend, elaborate, and qualify formal rules; and enforcement characteristics carried by institutional agents such as lawyers and government administrators. Similarly, Scott (1995) explains that institutions may be regulative, normative, or cultural-cognitive, defining *regulative institutions* as regulative-rule-based orders subject to legal sanctions; *normative institutions* as binding-expectation-based orders subject to moral governance; and *cultural-cognitive institutions* as constitutive-scheme-based orders subject to comprehensible recognition and cultural support. Both North (1990) and Scott (1995) argue that the combination of formal and informal institutions and their enforcement structures the choice set and results in economic and social outcomes.

Countries with a large geographic area and multiple administrative regions are likely to have heterogeneous institutions across sub-national regions. There are three major causes for this heterogeneity. First, according to the resource-based view (RBV) (e.g., Baron, 1995; Barney, 1991; Penrose, 1959) and the environmental contingency argument in biology (Ostrom, 2010; Pfennig and Ledón-Rettig, 2009), organizing systems, like organisms, are initially structured and developed partially as a way to adapt to the available resource endowment of a region. Even when certain formal rules are intentionally designed to be common nationally, the initial institutional framework of informal institutions (e.g., measurement and standards) and enforcement characteristics diverges as different local institutional carriers (e.g., local administrators) confront different problems with different geographic assets (e.g., proximity to raw materials and seaports), with different human capital, and in different climates (North, 1990). A large geographic area will exaggerate the regional differences in these resources. In China, for instance,

although development of export capacity and competitiveness was introduced as a nation-wide policy by the central government in the early 1980s, immediate implementation of the policy occurred only in several populous eastern coastal areas through the building of large-scale export processing zones, because they are closer to labour pool and to the seaports (Wang and Fan, 2004). Second, according to the path-dependence theory of institutional change (North, 1990), once an initial institutional framework is chosen by local administrators, increasing returns characteristic of initial institutionalization will tend to maintain the directions of their divergent paths. Third, because of the imperfect nature of markets (e.g., incomplete information), local administrators tend to have varying perceptions of common formal rules set by a higher hierarchical body, as their decision choice models and the resulting enforcement characteristics are influenced by their local historical experiences and their cultures and beliefs (Ostrom, 1998, 2005).

2.2.2. *Market-Supporting Institutional Development and Sub-National Variations*

Markets, to work effectively, need institutions to support them. Market-supporting institutions are rules of the game that "serve to limit transaction costs: the time and money spent locating trading partners, comparing their prices, evaluating the quality of the goods for sale, negotiating agreements, monitoring performance and settling disputes" (McMillan, 2007: 1). Market-supporting institutions are important because they are a fundamental cause of long-term growth in a country (Acemoglu, Johnson, and Robinson, 2005; Rodrick, 2000): they ensure that property rights are respected and protected, promises are trusted and enforced, that competition is fostered, and that information flows smoothly (McMillan, 2007; Peng, 2002; Tan, 2002). As noted above, development of market-supporting institutions is a major characteristic of EMs (Hoskisson et al., 2000; Wright et al., 2005) and continually fuels rapid economic growth in these markets (Beck and Levine, 2005; Dunning and Lundan, 2008; Globerman and Shapiro, 2003; Llewellyn, 1925; Seyoum, 2009). Tan (2002), for example, conducted a quasi-experimental design to isolate the role of cultural and national differences among mainland Chinese, Chinese Americans, and Caucasian Americans, and found that it is the development of market-supporting institutions that has freed the growth of entrepreneurship in China.

Although there has yet to be a conclusive list of all detailed dimensions of market

institutions, existing studies have provided evidence as to which market institutions are most important for economic and business activities (e.g., Acemoglu and Johnson, 2003; Bevan et al., 2004; McMillan, 2007). They generally include three key components: respect for and protection of private property rights, notably control and ownership (e.g., Acemoglu and Johnson, 2003; Rodrik, 2000); an effective and stable regulatory system (e.g., Rodrik, 2000); and the liberalization of domestic and international markets (e.g., Bevan et al., 2004). First, respect for and protection of private property rights supports markets by providing adequate private control over return on assets and thus inducing entrepreneurs to accumulate and innovate. In EMs, strong protection of private property rights is usually reflected (and proxied) by the strong presence of a private-sector economy (Bevan et al., 2004). Second, an effective and stable regulatory system supports markets by preventing fraudulent or anti-competitive behaviours and formalizing procedures to reduce transaction uncertainty (Rodrik, 2000). Third, the liberalization of domestic and international economies supports markets by reducing government-imposed transaction costs and ensures competition (Bevan et al., 2004). In practice, these institutional qualities are interdependent and correlated (e.g., Aldashev, 2009). Aldashev (2009), for example, suggests that countries that score high on property-rights protection usually also score high on legal enforcement of contracts. Largely because of such general correlations, this study does not try to disentangle market-supporting institutions into specific independent and uncorrelated domains. Instead, I study the joint effects of all the three components.

As I have argued above, sub-national variations in market-supporting and other institutions exist in large EMs. For example, in China, the largest EM, since the adoption of market-oriented institutional reform in 1979, different regions have developed market-supporting institutions to varying degrees (e.g., Boisot and Meyer, 2008; Li and Yao, 2011; Lu, Liu, and Wang, 2011). First, the national strategy of market liberalization, a formal rule, initially favoured selective coastal regions such as Shenzhen, Zhuhai, Xiamen, Shantou, and Hainan by setting up special economic zones (SEZs) in these regions to promote export processing (Fujita and Hu, 2001; Sauvant, Zhao, and Huo, 2012). Second, governments at different sub-national levels have considerable authority to formulate their own follow-up formal rules, such as reform policies in the areas of fiscal systems (Jin and Zou, 2005), education, health, agriculture, and social welfare (Caulfield, 2006). Third, informal constraints such as customs for doing business are historically and culturally

different across regions in China (Du, Lu, and Tao, 2008), which has led to different degrees of support for a legal and market system. Du et al. (2008), for instance, find that in Beijing and Tianjin regions, which historically have had a higher social respect for and trust in authorities, people facing business disputes are more likely to resort to local government officials for intervention, as opposed to independent market arbitrators, than are those in Shanghai and Guangdong, although all these cities are at about the same level of economic development. Fourth, although some formal rules, such as business laws and regulations, are enacted nationally, it is the local administrators – usually at the provincial level – who enforce or circumvent them (Amit, Ding, Villalonga, and Zhang, 2010; Cole, Elliott, and Zhang, 2009; Qian and Stiglitz, 1996; for China's levels of administration, see Figure 3). Cole et al. (2009), for instance, found that during the period 1998-2003, the rate of investigation of economic corruption cases such as bribery was about two times as high in Tianjin and Heilongjiang as in western provinces such as Gansu and Sichuan.

Insert Figure 3 here

2.2.3. *Direct Institutional Effect*

Home institutions are important because headquarters play an important role for managing MNEs (e.g., Andersson and Holm, 2010). Scholars observe that most MNEs from EMs such as China adopt a global strategy with high integration with home markets, as opposed to a multi-domestic strategy; that is, they largely concentrate their production and management in their home location while expanding abroad (Luo and Tung, 2007; Wei, 2010). Luo and Tung (2007), for instance, argue that OFDI activities by EMNEs are recursive, involving both recurrent activities (acquisitions of foreign assets to overcome disadvantages in brand awareness and international reputation, followed by acquisition of a foreign logistics or distribution company to overcome disadvantages in accessing a foreign market) and revolving activities (outward investments are strongly integrated with activities back home). Wei (2010: 79) adds that "particularly in terms of revolving activities, home countries *of Chinese* MNEs still serve as the manufacturing centres (component, semi-products, and products) for their worldwide operations" (italics added).

Building on the literature on the liability of foreignness (e.g., Hymer, 1976; Kindleberger, 1969; Zaheer, 1995; for a review, see Eden and Miller, 2004) and an

organizational legitimacy perspective (Dowling and Pfeffer, 1975; Scott, 1987, 1995), scholars argue that MNEs are discouraged from entering an institutionally different host region (Kostova, 1999; Xu and Shenkar, 2002; Boisot and Meyer, 2008; Yeung, 2006). The reason for this is that in a different institutional environment, it is difficult for firms to achieve organizational legitimacy, defined as "the acceptance of the organization by its environment" (Kostova and Zaheer, 1999: 64). Foreign affiliates highly integrated with MNEs' home business are largely "subject to institutional pressures from the parent firms" (Xu and Shenkar, 2002: 611). Meanwhile, MNEs doing business abroad face costs arising from unfamiliarity with a host market's institutional profile (Ionascu, Meyer, and Estrin, 2004; Gaur and Lu, 2007; Phillips, Tracey, and Karra, 2009; Xu, Pan, and Beamish, 2004), which in turn challenge the viability of their foreign subsidiaries because of "conflicting demands for external legitimacy (or local responsiveness) in the host country and international consistency (or global integration) within the MNE system" (Xu and Shenkar, 2002: 210). Therefore, more environmental differences between home and host regions, in terms of institutions, will lead to less OFDI. This notion is consistent with some empirical findings based on country-level observations. Using a panel sample of annual bilateral FDI among 123 countries from 1985 through 2000, for example, Bénassy-Quéré et al. (2007) measure institutional difference as the absolute difference between home and host countries in the first principal component index of nine institutional measures (1. political institutions; 2. safety, law and order, control of violence; 3. functioning of public administrations; 3. free operation of markets; 5. condition of actors, strategic vision, innovation; 6. security of transactions and contracts; 7. market regulations, social dialogue; 8. openness to the outside world; 9. social cohesion and mobility), and find that institutional difference has a negative effect on bilateral FDI.

Specifically, from a parent firm's perspective, differences in market-supporting institutions between home and host regions create difficulty in understanding and correctly interpreting market-related requirements, as well as the extent of adjustment required, which results in high external environmental uncertainties. I explain this following the three key components of market-supporting institutions, as identified earlier. First, strong protection of private property punishes business misconduct such as piracy of intellectual property, which may be prevalent and even socially legitimate in many regions of EMs (Chow, 2005; Swike, Thompson, and Vasquez, 2008). Swike et al. (2008), for instance, in a study of intellectual property rights protection (IPR) in China, suggest that true IPR

protection requires that companies rely on local courts and officials to enforce IPR laws. However, these laws are not always taken seriously by local officials (at least, not in all regions), as local governments often have connections with and receive lucrative tax revenues from counterfeiters. In contrast, in DMs such as the United States, companies have to follow strict rules and procedures to register and protect their property rights, and protection of these rights is effectively enforced. This suggests that firms from a region with weak property-rights protection will face at least two kinds of difficulty when entering into a DM, where property-rights-protection institutions are strong. First, they face the difficulty of understanding and interpreting codes and procedures for registering and maintaining their property rights, such as trademarks, patents, and copyrights; second, they face the difficulty of adjusting to not relying on counterfeit goods to make profits.

Second, an effective and stable regulatory system requires that participants possess tacit knowledge of local applicable laws and regulations and a good understanding of the rule of law in general (e.g., Inkpen and Beamish, 1997). In the absence of an effective and stable regulatory system in many regions in EMs, firms may not seriously resort to lawyers and courts to resolve conflicts, but must instead interact with and lobby local bureaucrats, who have privileged powers to interpret and act on certain regulations, for political support (Swike et al. 2008). Their trust in courts and lawyers and their understanding of the rule of law are relatively lacking. All these factors will create difficulty for these firms in adapting to DMs, where corporate affairs and conflicts are governed by the rule of law and by strong regulatory mechanisms.

Third, the degree of economic liberalization suggests how much a local legitimating environment supports competition. Firms from sub-national regions in EMs where local economies are protected, and where local firms are generally supported by local governments with special incentives, are less well adapted to a legitimating environment in which production and transactions are directed by market signals such as competitive price, high quality, and differentiation. Firms from sub-national regions already exposed to competition are more likely to be able to follow market signals.

In summary, firms from different sub-national regions of an EM may face different degrees of difficulty in understanding and interpreting market requirements and in adjusting to a market-supporting environment. Firms from generally more market-supporting sub-national regions are more likely to be able to understand, interpret,

and adjust to the environment of DMs, where market-supporting institutions are strong (Brouthers, O'Donnell, and Hadjimarcou, 2005; Djankov, La Porta, Lopez-de-Silanes, and Shleifer, 2002).

One might draw a contradictory conclusion following the institutional escapism view, which argues for OFDI as a means of escape from weak institutions at home (e.g., Witt and Lewin, 2007). Following this view, EM firms' internationalization into DMs might be seen as pushed by inefficient institutions such as corruption, regulatory slack, ineffective government, and underdeveloped property-rights protection, which create significant opportunity losses (Yamakawa et al., 2008; Yeung, 2006). If these opportunity losses exceed the liability of foreignness in a DM, where transaction costs are relatively low (Boisot and Meyer, 2008), EM capital may be driven to relocate into DMs (Boisot and Meyer, 2008; Yeung, 2006).

This institutional escapism view seems to indicate that market-supporting institutional development at the home region will gradually solve the problems that otherwise drive the escape of capital into DMs, and thus retain capital at home. I argue, however, that such escapist motivations are relatively irrelevant in the context of OFDI into DMs. First, firms escaping due to high socio-political costs in the home region, with no other strategic motivations (e.g., market seeking, resource seeking, etc.), can choose to relocate their corporate headquarters in another domestic sub-national region where institutions are strong, or in a tax haven such as the Cayman Islands or the British Virgin Islands, where legal systems are sound and financial markets are free and well developed (e.g., Giovannini and Hines, 1990; McLure, 1988). Second, international institutional escapes do not have to take the form of OFDI, which incurs a sunk cost, but may take other forms, such as listing overseas (Yamakawa et al., 2008). In some EMs (including China), for example, financial markets favour government-connected companies, such as large-scale state-owned enterprises (SOEs), and thus drive a few private firms to list themselves in DM exchanges, where they are not discriminated against (Yamakawa et al., 2008).

To summarize, I propose the following hypothesis:

Hypothesis 1: Ceteris paribus, the stronger the development of market-supporting institutions in a given sub-national location, the stronger the propensity of

emerging-market firms from that location to invest overseas in developed markets.

2.2.4. *Indirect Institutional Effect*

2.2.4.1. Market-supporting institutions and market-related firm capabilities

A firm's capabilities may be shaped by the characteristics of its home environment (Dunning, 1980; Porter, 1990; Tan and Meyer, 2010). Dunning (1980: 10), for example, notes that "the ability of enterprises to acquire ownership endowments is clearly not unrelated to the endowments specific to the countries in which they operate – and particularly their country of origin." Porter (1990) argues that firm capabilities are created by the interaction of firm factors with the home market's resource endowments and industry characteristics. Tan and Meyer (2010) add that EMNEs develop home-contextual resources, such as business groups, that internalize market failures and thus enable domestic growth. The argument that firm capabilities are contingent on home resources and industry characteristics has been supported by many empirical studies (e.g., Giddy and Young, 1982; Lecraw, 1993; for a review, see Erramilli, Agarwal, and Kim, 1997). For example, Giddy and Young (1982) and Lecraw (1993) find that Third World MNEs possess unique advantages, such as small-scale and labour-intensive technology and low costs, all resulting from the particular characteristics of home markets and customers.

However, very few of these efforts have emphasized the role of home institutions,[3] an important characteristic of the home market that may determine a domestic firm's resources and capabilities, and their relevance to a foreign location. Following the resource-based view (Penrose, 1959), one can classify a firm's resources into market-related and non-market-related types (Baron, 1995; Barney, 1991; Cuervo-Cazurra and Genc, 2011; Porter, 1987). A region's institutions form the conditions for doing business in that region and how resources are allocated (e.g., North, 1990; Globerman and Chen, 2010; Globerman and Shapiro, 2002), and in turn shape the ways in which firms develop their capabilities (Cuervo-Cazurra and Genc, 2008, 2009; Henisz, 2003; Holburn, 2001; Holburn and Zelner, 2010; Rugman, 2007). In weak market-supporting institutions (Tan and Peng, 2003), doing business depends largely on non-market mechanisms such as political orders and social relationships (Li and Zhang, 2007; Luo and Park, 2004; Luo and Tung, 2007; Rajan and Zingales, 1998). Domestically,

[3] Some notable exceptions are Erramilli et al. (1997) and Cuervo-Cazurra and Genc (2011). Neither of them however focuses on market-supporting institutions.

EMNEs compete partially by developing non-market-related firm capabilities, such as political and social capabilities to manage weak institutions at home (Cuervo-Cazurra, 2006; Cuervo-Cazurra and Genc, 2008, 2009; Henisz, 2003; Holburn, 2001; Holburn and Zelner, 2010; Khanna and Palepu, 2006). For example, Henisz and Zelner (2005) and Holburn and Zelner (2010) find that firms from politically risky environments (e.g., EMs) tend to develop political resources, both to safeguard sunk investments against the potentially adverse policy consequences of rival groups' political rent-seeking efforts and to shape the policy environment to their own benefit. In addition, firms develop social capabilities – for example, the ability to better identify common ground among stakeholder groups to which the firm has developed ties, and the ability to organize these groups into coalitions capable of exerting sufficient pressure on government officials to initiate or maintain favourable public policies (Aggarwal and Agmon, 1990; Henisz and Zelner, 2005; Holburn and Zelner, 2010).

However, these non-market-related capabilities may be less important or even irrelevant in DMs (e.g., Tan and Meyer, 2010), where opportunities for most industries are controlled by markets and, as a result, requirements for market-related capabilities are high (Baron, 1995). MNEs from EMs characterized by weak market-supporting institutions are usually less sophisticated in dealing with strong market-supporting institutions, and have fewer market-related firm capabilities, such as innovation and marketing skills, than DM local competitors (Cazurra and Genc, 2008, 2009; Holburn and Zelner, 2010). When entering the different (stronger market-based) institutional context of a DM, EMNEs need to explore market-related firm capabilities to survive in competition with local companies that have already established those capabilities (e.g., Ivarsson and Jonsson, 2003; Makino et al., 2002). As the existing literature suggests, a notable example of these market-related firm capabilities is technological capability (Baron, 2001; Ramaswami, Srivastava, Bhargava, 2009), a knowledge-based asset that ultimately enables firms to produce differentiated, cost-efficient, and customer-friendly products and services to win market share in a competitive market (Srivastava, Fahey, and Christensen, 2001). Among others, marketing and branding skills, local client loyalty (Barney, 1991; Porter, 1987, 1998; Srivastava et al., 2001), managerial capacity, and logistics and distribution channels (Srivastava et al., 1998) are also important market-related firm capabilities that can help firms gain better market position.

These market-related firm capabilities are largely embedded within a strong

market-supporting institutional setting (Meyer and Peng, 2005; Holburn and Zelner, 2010; Khanna and Palepu, 2006). As an example, Figure 2 shows that national industry leaders in DMs generally have high R&D intensity (a proxy for technological capability) but low state ownership (a proxy for political capability), while national industry leaders in EMs have relatively low R&D intensity but high state ownership. At sub-national levels, firms from regions where local institutions are more market-supporting are likely to possess greater market-related firm capabilities.

I elaborate on why home market-supporting institutions would induce EM firms to create market-related capabilities following the three key components of market-supporting institutions identified earlier. First, effectively enforced property-rights protection will stimulate innovation activities and induce local firms to build technological capabilities. Products of the intellect, such as technology, are typically non-rival, and registration and protection of property rights in these products can ensure that once such a product has been created, only its inventors can use it, and thus profit from inventing (Gould and Gruben, 1996). Therefore, there is a positive relationship between property-rights protection and innovation. Scholars have found supportive empirical evidence of this relationship in both DMs (e.g., Mansfield, 1986) and EMs (e.g., Chen and Puttitanun, 2005; Sherwood, 1990).

Second, strengthening of EM regulatory systems will ensure stable and fair market competition among local companies by, for instance, lowering transaction costs due to uncertainty and easing business barriers (Hill, 1995), and thus forcing local firms to build their competitive market-related capabilities, such as technology and brands, in order to seize market share (Rodrik, Subramanian, and Trebbi, 2004; Scully, 1988). Strong legal enforcement of contracts can also reduce the market risks of hold-ups, and thus encourage local companies to invest in specialization and differentiation, a firm capability that usually requires asset-specific sunk costs in R&D and branding (Klein, Crawford, and Alchain, 1978; Williamson, 1985).

Third, the liberalization of EM economies will intensify the degree of competition by allowing products and services made by established foreign MNEs, most of which come from DMs, to freely penetrate into the local market (e.g., Bevan et al., 2004). Local firms must develop both technological and branding competence to compete for clients with these foreign MNEs, which usually possess cutting-edge technology and popular global

brands (e.g., Luo and Tung, 2007). In addition, a competitive and open market system will lead to more international disputes, and therefore require local firms to build managerial skills to deal with international markets and laws by, for example, hiring managers with relevant professional (e.g., international law, global accounting standards, etc.) and international expertise (Dawar and Frost, 1999; Khanna, Palepu, and Sinha, 2005).

These mechanisms, however, are not independent. For example, only when property-rights protection and economic liberalization co-exist will firms be motivated to engage in R&D (Braga and Willmore, 1991; Gould and Gruben, 1996; Rivera-Batiz and Romer, 1991). Gould and Gruben (1996), for instance, suggest that when open trade opens local markets to competition from foreign producers that use the latest technology both in their production processes and in their products, weak local protection of property rights will discourage licensing, transfer, and joint production of competitive technologies by local producers. As another example, strong anti-trust regulations would ensure the motivating role of property-rights protection by preventing technology leaders from becoming monopolists and thus building barriers for other inventors and innovators.

2.2.4.2. Market-related firm capabilities and OFDI into DMs

Traditional FDI theories explain that MNEs are able to invest abroad because they possess competitive firm capabilities that can be utilized in a foreign location (e.g., Buckley and Casson, 1976; Dunning, 1988; Erramilli, Agarwal, and Kim, 1997; Hennart, 1982; Hymer, 1960; Rugman, 1981, 1985). Buckley and Casson (1976) and Rugman (1981, 1985), for example, suggest that MNEs possess efficiency-based resources, such as technology and managerial know-how, that are embodied within the organization of the firm. Similarly, Hymer (1960) and Dunning (1988) argue that MNEs have exclusive, privileged possession of or access to monopoly-type assets such as an internationally popular brand. This firm-asset-exploiting view is widely supported by extensive empirical literature (Agarwal and Ramaswami, 1992; Erramilli et al., 1997; Sethi, Guisinger, Phelan, and Berg, 2003; Terpstra and Yu, 1988; Trevino and Grosse, 2002; Kimura, 1989). Trevino and Grosse (2002), for example, studied 56 non-US subsidiaries in the US during the period from 1977 to 1996; they found that innovation, measured as the ratio of R&D expenditures to total sales, and international management skills, measured as number of senior US affiliate managers of foreign origin, positively determine a firm's total assets in the US.

While some researchers argue that EM firms can accelerate their internationalization process by investing in a foreign country to explore firm capabilities such as knowledge and brands, a perspective formally framed as asset-seeking (Ivarsson and Jonsson, 2003; Makino, Lau, and Yeh, 2002), asset-sourcing (Shan and Song, 1997), or asset-augmentation (Mathews, 2006a, 2006b), the literature has emphasized that this stream of arguments (i.e., exploring firm capabilities) does not contradict traditional theories (e.g., Makino and Inkpen, 2003; Makino et al., 2002; Mathews and Zander, 2007; Narula and Nguyen, 2011). To engage in firm capability-seeking OFDI, EMNEs still need to possess some degree of relevant firm capability that can be leveraged and exploited in a host market, so that they can absorb the new resources they find and thus stay sustainable. Makino and Inkpen (2003), for example, argue that firms engage in knowledge-seeking FDI when they possess absorptive capacity that involves related business activities and know-how. Similarly, Narula and Nguyen (2011) suggest that MNEs with greater initial relevant ownership advantages have the greater absorptive capacity needed to benefit from new resources found in foreign countries. Therefore, development of market-related firm capabilities such as technological, branding and marketing, and managerial capabilities will equip local firms to invest into a DM, where a new firm's survival and growth are based primarily on these kinds of capabilities (Anand and Delios, 1997, 2002; Erramilli et al., 1997).

In summary, I propose the following hypothesis:

Hypothesis 2: Ceteris paribus, the stronger the development of market-supporting institutions in a given sub-national location, the stronger the propensity of emerging-market firms from that location to invest overseas in developed markets, with the market-related firm capabilities mediating the relationship.

Figure 4 depicts both hypotheses as an institutional effect framework.

Insert Figure 4 here

2.3. Method

2.3.1. Data

My sample combines two surveys. First, I retrieved measures of Chinese

sub-national institutional quality from the World Bank's (2006) report *China, Governance, Investment Climate, and Harmonious Society: Competitiveness Enhancements for 120 Cities in China* (hereafter "WB survey"). To my knowledge, this is the latest official composite measure of China's institutional quality at the city level.

Second, following prior studies which suggest that survey is a widely used method of obtaining information on FDI intentions (e.g., Hood and Taggart, 1997; Kuo and Li, 2003), I obtained data on Chinese companies' intentions to engage in OFDI in DMs from Woo et al.'s (2011) China Goes Global 2010 Survey, conducted jointly by the Asia Pacific Foundation (APF) of Canada and the China Council for the Promotion of International Trade (CCPIT) (hereafter "APF survey"). The questionnaire was distributed in 2009 by CCPIT, one of the largest Chinese IB associations, to its 3,000 Chinese member firms. In total, 1,377 firms responded with endorsement and signature by C-level officers or other senior management equivalents. Techniques such as randomly repeated questions were deliberately designed into the questionnaire to ensure that respondents were carefully reading and answering the questions. The data were collected and coded by APF in 2010.

Data from the two surveys were merged by matching a firm's city of operation on one survey with that on the other (i.e., legal headquarters). According to the APF survey, all Chinese respondents reported that all operations related to, for example, legal and compliance issues were concentrated in their headquarters cities, although sourcing and sales activities were more diffused within their provinces of operation. I therefore used city-level institutional measures for the main estimation. After removal of missing observations, the final sample consists of 553 firms located in 68 different cities, with a relative concentration in Jining, Shenzhen, Jinan, and Zhengzhou (totaling 32.37%). Of these 553 firms, 81.56% were in the manufacturing sector; 13.92% in the finance, trade, or services sectors; and 4.52% in the transport, utility, or infrastructure sectors. These firms have a good representation in terms of firm size: 41.1% are small-scale (firm assets <RMB 40 million), 39.2% are medium-scale (firm assets RMB 40 million to 400 million), and 19.7% are large-scale (firm assets >RMB 400 million).[4] None of the responding firms is in the resource sector (e.g., energy and mining), which suggests that the sample is not much exposed to the natural-resource-seeking motivation.

[4] Based on National Bureau of Statistics of China classification.

2.3.2. *Variables and Measurement*

2.3.2.1. Dependent variable

Propensity for OFDI into DMs (hereafter OFDI-DM) is taken directly from the APF survey and recorded as 1 if yes and 0 otherwise. This variable measures responding firms' intention to engage in OFDI, as opposed to actual OFDI. This measure is consistent with my needs, as my theoretical argument focuses on an investing firm's managerial decision on OFDI-DM, whereas actual OFDI is an after-equilibrium measure that can be affected not only by such decisions but, more importantly, by such uncontrolled factors in a host market as protectionism and local contract default (Nordal, 2001). For example, after careful environmental, industry, and firm evaluations, China Minmetals Corporation announced a takeover of Canadian-based Noranda Inc. in 2006, but the deal was eventually blocked by Canadian government (Litvak, 2006).

2.3.2.2. Independent variable

Institutional quality is derived from the WB survey. This is a composite measure of sub-national institutional quality for 120 cities in China based on indices for taxes and fees, business entertainment costs, bureaucratic interaction, expected informal payment for loans, confidence in courts, percentage of private firms, and percentage of private small- and medium-sized enterprises (SMEs) with bank loans (for a detailed description of these indices, see Appendix 1). Although both cities and provinces have a certain amount of administrative autonomy in certain avenues, I use city-level measures for my main estimations because a more disaggregated measure can capture sub-national variations more precisely (Linnemann and van Beers, 1988); in other words, provincial averages will disguise intra-provincial locational variations.

These components comprehensively measure all three parts of market-supporting institutional development in EMs, as discussed earlier: a strong presence of private economy, as approximated by percentage of private firms and percentage of private SMEs with bank loans; an effective and stable regulatory system, as approximated by confidence in courts; and liberalization of domestic and international markets, as approximated by all else. As the original values of the first four sub-indices (taxes and fees, business entertainment costs, bureaucratic interaction, and expected informal payment for loans) actually measure the inefficiency (as opposed to efficiency) of local institutions, I first converted their values using the following formula: maximum value of the sub-index

minus a local region's original value. Another technical issue is that these sub-indices are highly correlated (see Appendix 1), and thus cannot be included simultaneously in regressions (Greene, 2008). To address this issue, I first divided all indices by their standard deviations to make them scale free, and thus inter-comparable, and then created a single index of institutional quality (WB survey, city-level) based on the normalized values using first principal component analysis.[5]

2.3.2.3. Mediation variable

The proposed mediating variable, market-related firm capability, is based on a company's responses to three questions in the APF survey: "Does your firm possess any international technologies?"; "Does your firm possess any internationally recognized brands?"; and "Does your firm possess any international management talents?" A follow-up discussion with the survey's joint providers, APF of Canada and CCIPT, regarding how these questions were explained to the respondents indicated that the question "Does your firm possess any international technologies?" asked whether a firm had at least one patent registered under its name at the US, Japan, or EU patent and trademark offices at the time of the survey;[6] "Does your firm possess any internationally recognized brands?" asked whether a firm had at least one product exported under its own brand into a DM; and "Does your firm possess any international management talents?" asked whether a firm had at least one senior management officer with prior working experience in a DM. A dummy variable was created to quantify the answer to each question (1 for yes, 0 for no). All these dummy variables adequately capture a firm's market-related firm capability in accordance with my theoretical definition and discussions. Because these three dummies are closely correlated (see Appendix 2) and thus cannot be included simultaneously in a regression, I calculate market-related firm capability as a single index using the first principal component method.

2.3.2.4. Control variables

At the regional level, following prior studies suggesting that FDI is largely a function

[5] Principal component analysis (PCA) analyzes a data table representing observations described by several dependent variables, which are, in general, inter-correlated. Its goal is to extract the important information from the data table and to express this information as a set of new orthogonal variables called principal components. The new index is a linear combination of the first principal components from the PCA (Abdi and Williams, 2010)

[6] This was confirmed by tracking each firm's registration record between 2006 and 2010 in the patent and trademark registration offices in the United States, Japan, and the European Union using English firm names.

of home-market factor endowments and level of economic development (e.g., Blonigen, 2005), I first control home market size of the home region, measured as the logarithm of provincial gross domestic product (GDP), and home income level, measured as the logarithm of provincial GDP per capita. In addition, following studies suggesting that the home region's economic openness to trade and foreign investment also determines OFDI (e.g., Globerman and Chen, 2010), I control two economic openness variables: provincial trade-to-GDP ratio and provincial ratio of foreign assets to total assets. Physical infrastructure (e.g., utilities and transport) also plays a large role in shaping commercial activities by determining the locational transaction costs of doing business (Globerman and Chen, 2010; Globerman and Shapiro, 2002, 2003); therefore, I further control physical infrastructure quality, measured as 1 minus the value of "percentage (%) of output losses from power or transport" of a city on the WB survey.

At the firm level, research suggests that several firm-specific characteristics such as size (Pradhan, 2004), relevant prior experience (Globerman and Chen, 2010), existing degree of internationalization (Ramaswamy, Kroeck, and Renforth, 1996; Sullivan, 1994), and ownership type (Voss et al., 2010) are explanatory factors in OFDI. Accordingly, I further control firm size, measured as the logarithm of gross revenue, and relevant prior experience as a dummy variable suggesting prior OFDI in a DM (1 for yes, 0 otherwise). Following Ramaswamy et al. (1996) and Sullivan (1994), I construct two measures to control for a firm's existing degree of internationalization: overseas assets as a percentage of total assets and exports as a percentage of sales. I also control state ownership, measured as 1 if the ultimate controlling shareholder is the government and 0 otherwise, to control for potential effects of ownership type. Lastly, I control a series of dummy variables for industry-specific heterogeneity, following China's broad industry classification (NBSC, 2003).

2.3.3. Regression Strategy

The first issue is that my dependent variable, OFDI-DM, is binary (0 or 1). Following Greene (2008), two non-linear econometric estimations– the Probit and Logit methods – are widely adopted to address this issue. Both methods are based on maximum likelihood estimation (MLE), and both allow dependent variables to be binary, albeit assuming different distribution functions: Probit assumes a probability function, while Logit assumes a logistic function. By adopting both methods and comparing their

results, I am able to test whether the estimation results are robust and consistent if the distribution assumptions change.

To test for both direct and mediation effects, I used causal mediation analysis, newly developed by Hicks and Tingley (2011) and Imai et al. (2010). This method builds on Baron and Kenny's (1986) mediation analysis method, which is widely used in social sciences research (Kline, 2010). Both methods estimate the role of causal mechanisms when the effect of an independent variable on an outcome is transmitted through a mediating variable, and both provide results for both direct and indirect effects (Hicks and Tingley, 2011). The advancement made by Hick and Tingley (2011) and Imai et al. (2010) is that their method allows non-linear estimations such as Probit and Logit, whereas Baron and Kenny's (1986) method can be applied only to continuous dependent variables.

In the first step, I adopted ordinary least squares (OLS) to regress the mediating variable market-related firm capability, which is continuous, on the independent variable institutional quality. In the second step, I adopted both Probit and Logit estimations to regress the dependent variable OFDI-DM, which is binary, on both the independent variable institutional quality and the mediating variable market-related firm capability. Results also show the distribution of the total effects of the independent variable on the dependent variable between indirect effects transmitted by the mediating variable and direct effects (MacKinnon and Dwyer, 1993; MacKinnon, Warsi, and Dwyer, 1995; Preacher and Hayes, 2004).

2.3.4. Results

Insert Table 1 here

Table 1 reports the summary statistics and correlation matrix for all variables, which suggest that my data do not have a severe multi-collinearity issue. Tables 2 and 3 present results for the first and second steps of my causal mediation analysis. Results suggest that both H1 and H2 are supported. Specifically, Table 2 reports that institutional quality, measured at the city level, has a significantly positive relationship with market-related firm capability (significant at the 99% level of confidence). As Table 3 shows, both market-related firm capability and institutional quality present significantly positive relationships with a firm's OFDI-DM (significant at the 90% and 99% levels of confidence respectively). Lastly, as indicated in Table 3, about 58% (reported by Probit) or

52% (reported by Logit) of institutional quality's effects on OFDI-DM are estimated to be transferred through the mediation of market-related firm capability, while about 42% (reported by Logit) or 48% (reported by Probit) are direct. Overall, both models are very robust (p=0.0000 for both F-test (step 1) and chi-square test (step 2).

Insert Table 2 here

Insert Table 3 here

Indeed, these findings are in line with prior empirical attempts to determine the effect of home institutions on OFDI using national-level measures (e.g., Globerman and Shapiro, 2002; Mishra and Daly, 2007). Globerman and Shapiro (2002) and Mishra and Daly (2007), for instance, using the Worldwide Governance Index (WGI), produced by Kaufman, Kraay, and Zoido-Lobatón (1999a, 1999b), and the International Country Risk Guide (ICRG), produced by PRS Group, as national average institutional measures, found that, in principle, higher institutional quality is positively related to a country's aggregate level of OFDI flows and stocks. However, both studies failed to find potential mediation transmission by firm capability, as they did not use firm-level measures of OFDI, an activity that is indeed decided at the firm level.

Some significant results for control variables are worth noting. As Table 2 shows, my results suggest that a firm's market-related capability is positively related to a few home-market indicators. In line with prior studies (e.g., Erramilli et al., 1997; Baron, 1995; Narula, 2011; Narula and Nguyen, 2011), a firm's market-related firm capability is fostered by domestic market size, economic development, and physical infrastructure as well as by the home region's openness to global trade. These findings lend empirical support to the view that market-related firm capabilities of EMNEs are home-market based (Rugman, 2007; Rugman and Li, 2007; Rugman and Oh, 2008) and home-market embedded (Buckley et al., 2007; Luo and Tung, 2007; Wei, 2010).

As Table 3 shows, first, a few domestic market condition variables have significant effects on OFDI (see, e.g., Buckley, Clegg, and Wang, 2002). Physical infrastructure quality is positively related to OFDI, which suggests that MNEs in locations with good utility and transport conditions are more likely to internationalize into a DM. However, provincial ratio of foreign assets to total assets negatively affects a firm's OFDI-DM. A potential explanation for this finding is the competition effect of the presence of foreign

entrants; that is, indigenous firms suffer more, and are therefore less able to invest abroad, as foreign MNEs depress OFDI through, for instance, market stealing and labour stealing (Gu and Lu, 2011). Second, at the firm level, a firm's exports as a percentage of sales have a significant positive impact on OFDI-DM; a potential explanation for this finding is that more foreign-trade-intensive firms are more likely to choose OFDI to internalize transaction costs (e.g., Rugman, 1980). Prior OFDI in a DM also has a significant positive effect, which suggests that relevant prior experience is positively related to OFDI activities (e.g., Chen and Chen, 1998; Lecraw, 1993). However, a firm's overseas assets as a percentage of total assets are negatively related to its OFDI-DM; a potential explanation for this finding is that an already large expansion overseas reduces marginal willingness to expand further. Other regional and firm-specific factors do not show significant effects.

The dummy control variable state ownership does not show any significant effects, which suggests that when all other factors are controlled, firms of different ownership types do not differ significantly in terms of OFDI-DM. This finding is in line with those of prior research (e.g., Wei, 2010; Deng, 2009; Rui and Yip, 2008; Schuller and Turner, 2005; Zhou and Schuller, 2009) arguing that "Chinese acquiring firms differ in ownership, but they all were supported by the state in their acquisition efforts" (Wei, 2010: 90). Lastly, dummy variables for sectors show no significant effects, which suggests that when all other factors are controlled, Chinese firms outside the resource sector do not tend to differ across sectors in with respect to OFDI-DM.

2.3.5. Robustness Check

I use the International Finance Corporation's (IFC) Doing Business in China 2008 Report, which provides indices of ease of doing business (hereafter "indices") for 30 Chinese provinces, as an alternative sub-national institutional measure to check the robustness of my results. These indices consist of three broad measures – starting a business, registering property, and enforcing contracts – each of which has two to four sub-dimensions (for a detailed description, see Appendix 3). They are very similar to the WB survey in terms of criteria, and can appropriately quantify the level of market-supporting institutional development at the provincial level (Berg and Cazes, 2007; Ménard and du Marais, 2008).

As the original values of these indices measure the inefficiency (as opposed to

efficiency) of local institutions, I first converted their values using the following formula: maximum value of the sub-index minus a local region's original value. As was true of city-level institutional measures from the WB survey, there is significant multi-collinearity among different sub-dimensions in the IFC indices (see Appendix 3). Therefore, it is not appropriate to include all measures simultaneously in the regression (Berg and Cazes, 2007; Greene, 2008). Instead, I divided all sub-indices by standard deviations to make them scale free and thus inter-comparable, and create a single index labeled "institutional quality (IFC survey, provincial-level)" using the first principal component method based on normalized values. As reported in Table 4 and Table 5, the results are consistent with my main findings, shown in Tables 2 and 3: institutional quality has an essentially positive effect on local firms' OFDI-DM, both directly and indirectly through the mediation of market-related firm capability.

Insert Table 4 here

Insert Table 5 here

2.4. Conclusion and Discussion

Focusing on Chinese firms' entry decisions about OFDI in DMs, this study is among the first to examine the roles played by home institutions, particularly at sub-national levels, on a firm's entry decision on outward FDI, which is a gap in the existing IB and global strategy literature (Aharoni, 2011; Cuervo-Cazurra, 2011; Globerman and Chen, 2010; Ramamurti, 2008). Specifically, I have argued for a twofold institutional effect. First, there is a direct effect, because development of market-supporting institutions in a sub-national region at home reduces institutional differences between home (EM) and host (DM) markets, encouraging EM firms to invest overseas in DMs. Second, there is an indirect effect through the mediation of market-related firm capabilities; that is, domestic market-supporting institutional development creates the conditions for building market-related firm capabilities such as technological, branding and marketing, and managerial skills.

Another important emphasis in the present study is the recognition of the importance of sub-national institutional heterogeneity in EMs, where domestic market segments are disconnected across sub-national regions and most domestic firms

compete sub-nationally. I first discussed theoretical explanations of institutional heterogeneity at the sub-national level, following the RBV (Baron, 1995; Barney, 1991; Penrose, 1959), the path-dependence theory of institutional change (North, 1990), market imperfection (e.g., North, 1998; 2005), and specific examples of administrative decentralization in China (e.g., Boisot and Meyer, 2008; Li and Yao, 2011; Lu, Liu, and Wang, 2011).

My empirical results, using a firm-level survey of 553 Chinese firms from 68 different cities, support the argument that sub-national institutional heterogeneity is an important and significant explanatory factor with respect to both firms' resources (market-related firm capability, in this study) and firms' international activities (OFDI intention, in this study). My findings with respect to Chinese firms significantly support the twofold institutional effect, suggesting that at the city level, direct and indirect effects each contribute about half of the total effect. My arguments and findings challenge the conventional wisdom that sees institutions such as rules and cultures as a nationally bounded and common factor, and highlight the need to develop new measures of different dimensions of institutions at sub-national levels.

My arguments in this study can be generalized to other EMs. First, because a major shared characteristic of EMs is the adoption of market-supporting institutional development, the arguments for a twofold institutional effect on OFDI into DMs are applicable to other EMs that are undertaking market reforms. Second, the existence and importance of sub-national institutional heterogeneity is applicable to some other large-scale EMs. Compared to China, where local law-making and elections are virtually nonexistent (Qian and Stiglitz, 1996), other large-scale and administratively divided EMs such as Mexico, Brazil, Russia, and India may present greater institutional variations across domestic sub-national regions, since local authorities in these countries have not only enforcement and administration powers (as is the case in China) but also law-making independence and local elections (e.g., Grindle, 2007; Rao, 2003). Firms from different sub-national regions of these countries, therefore, must have different propensities with respect to OFDI strategies.

However, this study is not without its limitations, and requires a few extensions for improvement. First, the present study has focused on how market institutions affect Chinese MNEs' decisions about entry into a DM. Because of data limitations, I have not

looked at sub-national variations in non-market institutions, such as political and social governance and cultural beliefs. A valuable extension, therefore, is to discuss and test whether and how home non-market institutions and the interplay of market and non-market institutions affect local firms' capabilities and their OFDI behaviours. For instance, Ostrom (1998) emphasizes that some informal, non-market institutions, such as trust, are crucial in facilitating the effectiveness of formal institutions, and thus in governing societies' collective actions. Although these informal institutions are relatively impervious to changing policies (North, 1990), and thus are less affected by sub-national heterogeneity in policy design and enforcement, they may also present significant sub-national differences for, for example, ethnic and historical reasons, particularly in large-scale, ethnically segmented nations such as China, India, and some Central and Eastern European countries (Becker and Woessmann, 2011; Hardgrave and Kochanek, 2008).

Another valuable extension is to identify firm-specific moderating variables. For example, firms with state ownership or politically tied management are usually argued to be less negatively affected by, and sometimes even to benefit from, underdeveloped market institutions (e.g., Alon, 2010; Boadman and Vining, 1989; Wang, Wong, and Xia, 2008). Alon (2010: 1), for instance, argues that "institutional discrimination creates relative advantages for state-owned firms at a cost to private enterprise." In addition, politically tied owners or CEOs may have privileged access to domestic financial resources under conditions of market dysfunction (Li, Yang, and Yue, 2007). As a consequence, these politically tied firms may behave differently from firms with no political ties in an environment of institutional development. However, because economic policies can be designed and enforced by local governments rather than by the central government (e.g., Amit et al., 2010), such an extension will require deliberate development of data indicating firms' connections to local governments (and to the central government). Using proxy measures such as state ownership (e.g., the APF survey data used in this study) or political ties to the central government will be ineffective and produce misleading results. This also partially explains why the coefficient for state ownership is insignificant in Tables 2 to 5.

Last but not least, it will be very valuable to use alternative samples to test the theory outlined in this study. One approach is to find longitudinal data, which can better control for causal direction by allowing longer and varying time lags between the

independent and dependent variables (Greene, 2008). For instance, it may take many years for local firms to respond to a new local competition policy and to build adaptive competitive market-related capabilities. Secondly, it will be very valuable to develop consistent and standard measures for sub-national institutions across countries. A cross-country study can control for country-specific factors, and thus make the arguments and findings more robust. A third valuable approach would be to revisit the widely discussed concepts of cultural distance (e.g., Agarwal, 1994; Brouthers and Brouthers, 2001; Kogut and Singh, 1988; Morosini, Shane, and Singh, 1998; Shenkar, 2001) and other institutional distance (e.g., Kostova, 1996, 1999; Kostova and Zaheer, 1999; Kostova and Roth, 2002; Ionascu et al., 2004; Xu and Shenkar, 2002), all of which assume that distance operates *between* nations and that intra-national distance virtually does not matter. Andersson et al. (2011: 1) point out that, "for example, the international cultural distance between two Scandinavian countries like Denmark and Sweden may well be smaller than that between two Indians, one from the Hindi-speaking North and the other from the Tamil-speaking South." Therefore, it would be valuable to explore new measures of distance based on sub-national units.

3. Paper 2 on Going In: Sub-National Institutional Heterogeneity and Ownership Decision in Outward FDI

3.1. Introduction

An institution-based view has been adopted as a leading perspective to study global strategies such as entry mode (Peng et al., 2008; Xu and Meyer, 2012). Like studies focusing on FDI issues, extant research applying the institution-based view has examined whether and how entry mode (e.g., joint versus full ownership) is determined by host-region institutions (e.g., Brouthers, 2002; Davis, Desai, and Francis, 2000; Dikova and Witteloostuijn, 2007; Meyer et al., 2009; Uhlenbruck, Rodriguez, Doh, and Eden, 2006; Meyer, 2001; Meyer and Nguyen, 2005; Rodriguez, Uhlenbruck, and Eden, 2005) and institutional distance or similarity between home and host regions (e.g., Davis et al., 2000; Gaur and Lu, 2007; Meyer, 2001; Xu and Shenkar, 2002; Yiu and Makino, 2002). The first group, focusing on host-country institutions, has produced mixed theoretical arguments and empirical findings (for reviews, see Meyer and Peng, 2005; Xu and Meyer, 2012). For instance, Meyer et al. (2009), Meyer and Nguyen (2005), and Uhlenbruck et al. (2006) have found that stronger institutions reduce the need for local knowledge and networks, and thus increase MNEs' propensity to choose full over joint ownership; on the other hand, Dikova and Witteloostuijin (2007) find that stronger institutions reduce legal enforcement costs, lowering the cost of resolving conflicts between joint owners, and thus make joint ownership more viable. Studies in the second group, based on the idea of institutional distance or similarity between host and home regions, argue that an MNE is more likely to choose majority or full ownership over minority joint ownership where institutional distance (e.g., regulatory and normative) is small, as the need for a local partner to provide information and knowledge for local adaptation is lower (Davis et al., 2000; Meyer, 2001; Xu and Shenkar, 2002; Yiu and Makino, 2002).

Both groups in the literature, however, have paid little attention to how home-region institutions influence MNEs' choice of entry mode in OFDI. This neglect is

unfortunate, because the studies thus fail to provide valuable insights into how particular characteristics of the home country affect a firm's foreign expansion (e.g., Aharoni, 2011; Cuervo-Cazurra, 2011; Ramamurti, 2008). Cuervo-Cazurra (2011), for example, indicates that a firm's global strategy may be influenced by the home country in two ways: a direct influence, whereby the home country represents an asset or a liability through its image as perceived by people in the host country, and an indirect influence whereby the home country induces the firm to create particular adaptive resources and capabilities, which in turn affect its global strategy.

My study aims to fill this gap by examining whether and how home-country market-supporting institutional development affects choice of entry ownership (between joint and full ownership) for EMNEs entering into DMs. I have chosen this empirical context for the same reasons enumerated in Paper 1. First, it is, as noted in the Introduction, an under-explored area in the FDI literature (Bertoni et al., 2008; Buckley et al., 2010; Xu and Meyer, 2012; Yamakawa et al., 2008). Second, and more importantly, by excluding other EMs and including only DMs as a host region, this approach ensures a relatively stable, strong market-supporting institutional framework among host markets (McMillan, 2007; Peng et al., 2008), so that investing MNEs are concerned mainly with variations in home-region institutions, and relatively unexposed to variations in host-region institutions with respect to a strong market system.

More specifically, this study extends the conceptual model of twofold home-country institutional effects developed in Paper 1 by further incorporating transaction cost (TC) theory (e.g., Beamish and Banks, 1987; Hennart 1988, 1991; Hennart and Larimo, 1998) to examine the effects of home market-supporting institutional development, at the sub-national level, on EMNEs' decisions on entry ownership into DMs, focusing on the choice between partial and full ownership. Theoretically, I first argue that, in the very unfamiliar institutional environment of DMs, EMNEs from sub-national regions with more dissimilar institutions tend to share ownership with a local partner in exchange for adaptation to the external environment (Rosenzweig and Nohria, 1994; Zaheer, 1995). Market-supporting institutional development in the home region reduces such environmental dissimilarity, reducing the need for joint ownership, and hence has a positive direct effect on EMNEs' likelihood of choosing full-ownership entry. Second, I argue that market-supporting institutional development provides a condition that induces firms to build market-related firm capabilities such as technological capability. These

capabilities meet double market failures following TC theory, and will in turn reduce the need for a DM joint owner to provide such capabilities, and increase the need for full ownership to safeguard the EMNE's proprietary capabilities from opportunism and involuntary leakages (e.g., Beamish and Banks, 1987; Hennart 1988, 1991; Hennart and Larimo, 1998; Williamson, 1985). In other words, home market-supporting institutional development in EMs has a positive indirect effect, through the mediation of market-related firm capabilities such as technology, on the choice of full-ownership entry into DMs.

Empirically, using a sample of 492 entries by Mexican, Indian, and Chinese MNEs into triad DMs (i.e., North America [USA and Canada], Western Europe, and Japan) between 2007 and 2010, using IFC state- or province-level[7] measures of institutional quality, and adopting causal mediation analysis (Hicks and Tingley, 2011; Imai, Keele, and Tingley, 2010; Imai, Keele, Tingley, and Yamamoto, 2010), I find very supportive evidence of my hypotheses. State-/province-level institutional quality at home shows a positive and significant direct relationship with likelihood of 100% ownership at DM market entry, as well as a positive indirect relationship through the mediation of technological capabilities, as measured by number of patents per employee, normalized by industry (2-digit Standard Industrial Classification or SIC), home country, and year. Following some prior studies (e.g., Hennart, 1991; Makino and Beamish, 1998), I replicate my tests using 80% and 95% cut-off points for full ownership as robustness checks, and achieve consistent findings.

This paper is an extension of Paper 1, which argues for and finds positive home, sub-national institutional effects, both direct and indirect, on Chinese OFDI in DMs. Like Paper 1, this study makes three important contributions to the IB and global strategy literatures. First, while previous studies have focused only on the roles played by host-region institutions (Brouthers, 2002; Davis et al., 2000; Dikova and Witteloostuijn, 2007; Meyer et al., 2009; Uhlenbruck et al., 2006; Meyer, 2001; Meyer and Nguyen, 2005; Rodriguez et al., 2005) and institutional distance (e.g., Gaur and Lu, 2007; Meyer, 2001; Xu and Shenkar, 2002; Yiu and Makino, 2002) in entry-mode selection, this study is among the first attempts to investigate the effects of home-region institutions. In addition, while previous studies have usually assumed a direct relationship between institutions and entry mode (Meyer and Nguyen, 2005; Meyer, 2001; Xu and Shenkar, 2002; Yiu and

[7] Because of different administration settings in these countries, I use state-level for India and Mexico, and province-level for China.

Makino, 2002), this paper suggests that firm resources and capabilities play an important mediating role.

Second, recognizing the importance of sub-national institutional heterogeneity (e.g., Anderson et al., 2011; Chan et al., 2010; Meyer et al., 2011), this study is to my knowledge the first attempt at examining the impact of institutions at a sub-national level on entry mode, and finds significant empirical supports. It suggests that the conventional approach of using nations as geographic boundaries for institutions might be inappropriate for studying EMs (Chen, 2012). Previous research studying institutions at the national level (e.g., Bénassy-Quéré et al., 2007; Globerman and Shapiro, 2002; Holbum and Zelner, 2010; Mishra and Daly, 2007) disguises that changes in institutions within the same country over time affect local business activities, and therefore underestimates heterogeneity among firms from the same country with respect to their global strategy (e.g., Aldashev, 2009).

Third, this study adds valuable insights that allow us to better understand global expansion of EMNEs. Studies on the literature of liability of foreignness (e.g., Eden and Miller, 2004) suggest that MNEs need to possess superior firm-specific or ownership advantages, such as technology and brands, to overcome their liability of foreignness arising from institutional differences. However, this research would not have predicted the rising penetration of EMNEs into DMs, many of them choosing aggressive modes such as full-ownership entry. Other studies attempt to explain this phenomenon by arguing that EMNEs are more entrepreneurially oriented than traditional MNEs (Ramamurti, 2008) and are geared toward acquiring strategic assets such as technology and brands in DMs (e.g., Ivarsson and Jonsson, 2003; Mathews, 2006a, 2006b; Shan and Song, 1997). These studies, however, ignore the fact that in order to absorb the strategic assets they find abroad, and thus stay sustainable, EMNEs may still need to have prior relevant resources and capabilities; that is, there may be a mediating role of relevant firm capabilities (Chen, 2012; Narula and Nguyen, 2011). They also fail to explain why some EMNEs choose joint ventures, while others choose wholly owned subsidiaries in DMs, if they are all geared toward strategic asset acquisition. My study offers another, more nuanced explanation of EMNEs' choice of entry mode into DMs. I argue that sub-national heterogeneity in market institutional development in an EM may lead firms from different regions of the same country to make their entry-mode selections differently: EMNEs that choose full-ownership entry into DMs are those that come from relatively stronger market-supporting institutional

regions of the home country and that possess greater market-related firm capabilities such as technology.

This study has two major differences from Paper 1. First, Paper 2 extends the focus from going out (i.e., OFDI intention) to the next phase, going in (i.e., entry mode). Paper 1 studies all EMNE firms that are deciding whether or not to enter DMs, whereas Paper 2 focuses only on those that have decided to do so. This more focused scope gives us a more nuanced view of the roles played by home institutions in EMNEs' global strategies. Second, Paper 2 expands the empirical context from a single home country (China) to multiple countries (Mexico, India, and China). In Paper 1, I suggested that cross-country institutional comparison at the sub-national level would be a valuable direction of extension so that country-specific factors can be controlled and therefore cross-country generalizability can be tested. The present study attempts to respond by adopting a series of standardized state-/province-level measures of market-supporting institutions provided by the IFC (number of days and GDP ratio cost for registration of a new business, registration of property rights, and contract enforcement) that can be quantitatively compared among the three countries studied.

The rest of the paper proceeds as follows: Section 2 develops theory and hypotheses; Section 3 is empirical method and result analysis; and Section 4 concludes by discussing the study's contributions and implications and suggesting future extensions.

3.2. Theory Development

3.2.1. Entry Mode Selection between Partial- and Full Ownership

A relatively large literature on entry mode has discussed MNEs' preferred level of ownership overseas: MNEs can choose between partial and full ownership of their subsidiaries (e.g., Anderson and Gatignon, 1986; Buckley and Casson, 1998; Chowdhury, 1992; Hennart, 1991; Hennart and Larimo, 1998; Yiu and Makino, 2002). In many studies, partially and fully owned subsidiaries are referred to as, respectively, joint ventures (JV) and wholly owned subsidiaries (WOS) (e.g., Chowdhury, 1992; Hennart and Larimo, 1998; Makino and Neupert, 2000; Yiu and Makino, 2002). The choice of mode of entry in a foreign environment is important in studies of internationalization, as it is an important determinant of post-entry viability and performance (e.g., Brouthers, 2002; Brouthers,

Brouthers, and Werner, 2003; Chowdhury, 1992; Nitsch, Beamish, and Makino, 1996; Shaver, 1998; Woodcock, Beamish, and Makino, 1994). Woodcock et al. (1994), for example, tested 321 Japanese entries in North America and found that partial ownership outperforms full ownership in terms of profitability. Nitsch et al. (1996) found similar results using a sample of 173 Japanese entries in Western Europe in 1994. Using a sample of more than 8,000 foreign subsidiaries of US-based MNEs, Chowdhury (1992) found that full ownership outperforms partial ownership with respect to stability of ownership structure, level of intra-system sales, and export, but underperforms partial ownership in terms of survival, longevity, and employment intensity.

Among the theories most commonly applied to explain the choice of entry mode are TC theory, RBV, institutional theory, and Dunning's eclectic paradigm, which in total account for "almost 90% of the published entry mode studies" (Brouthers and Hennart, 2007: 400). A review by Brouthers and Hennart (2007) finds that half of all studies reviewed use TC theory and argue that two major TC factors influence entry-mode decisions: asset specificity and uncertainty (both internal–behavioural and external–market specific) (Williamson, 1985; Zhao, Luo, and Suh, 2004). The argument is that full-ownership entry is generally favoured over joint ownership by parent firms that have high asset specificity, such as tacit know-how (e.g., Brouthers and Hennart, 2007), and low external uncertainty because of, for instance, rich international experience, low cultural dissimilarity, and a stable political environment in the host location (e.g., Zhao et al., 2004). Studies adopting RBV have found that firms that possess more advantageous capabilities (e.g., knowledge, experience) are more likely to choose more complex organizational structures, such as full control of foreign subsidiaries (e.g., Erramilli, 1991). Institutional theory studies, in general, find that firms choose modes of entry to conform to local legitimacy (i.e., rules of doing business) in host countries (e.g., Meyer and Nguyen, 2005; Uhlenbruck et al., 2006). Dunning's (1993) eclectic or OLI (ownership, location, internalization) paradigm is also widely used to explain the choice of entry mode; this framework conceptually "combines insights from resource-based (firm-specific), institutional (location), and transaction cost (internalization) theories" (Brouthers and Hennart, 2007: 407). Very few studies, however, focus on home-country institutional influences (Brouthers and Hennart, 2007).

In this study, I attempt to contribute to these literatures by synthesizing them in a more systematic way. Focusing on home market-supporting institutions, I argue that the

characteristics of home institutions (location factor) determine not only a firm's choice of entry mode for OFDI, following the institution-based view, but also its market-related firm capabilities (firm-specific or O factor), following RBV, which in turn will determine entry-mode selection because these capabilities meet the double market failure conditions of TC (or internalization) theory. I elaborate my arguments in the following sections.

3.2.2. *Market-Supporting Institutional Development and Sub-National Heterogeneity*[8]

Paper 1 suggests that in China, different regions have achieved different degrees of market-supporting institutional development for four reasons. For similar reasons, as I explain below, other large-scale and administratively divided EMs, such as Mexico and India, also present significant sub-national heterogeneity in market-supporting institutional development. First, historically, different regions started their market-supporting institutional reforms at different times. In India, for instance, SEZs had already spawned in Indore, Surat, Jaipur, Jodhpur, Moradabad, and Salt Lake many years before the formalization of the SEZ Act in June 2005 (Palit and Bhattacharjee, 2008); in Mexico the Maquiladora program, a Mexican version of the SEZ program launched in 1964, was applied only to areas along the Mexico–US border (Ferrante, 2009).

Second, governments at different sub-national levels in these large-scale EMs have considerable authority to formulate economic and market regulations and policies. In Mexico, a federal presidential constitutional republic, although the central government oversees the federal district and another 31 states (see Figure 5 for administrative organization in Mexico), governments are structured in such a way that important decisions are made by popularly elected local representatives, who report to the Cabildos, a type of local congress (Hernández-Trillo, and Jarillo-Rabling, 2008). Furthermore, since the early 1980s the central government has undertaken a series of cautious steps toward greater autonomy for state and local governments (Grindle, 2007; Hernández-Trillo and Jarillo-Rabling, 2008). In India, a federal parliamentary constitutional republic with 28 states under the central government (see Figure 6 for administrative organization in India),

[8] I have excluded a separate section introducing institutions, market-supporting institutions, and explaining why sub-national heterogeneity exists because they are well explained in Paper 1. For the same reason, I have also excluded the Chinese examples of sub-national heterogeneity in the development of market-supporting institutions.

the overall administrative regime is federally decentralized (Rao, 2003; Khemani, 2003). Rao (2003: 32), for instance, documents that "India, as a democratic polity, evolved as a two-tier classical federal polity with constitutional demarcation of functions and finances between the centre and the States with separate legislative, executive and judicial arms of government constituted at the two levels."

Third, informal constraints such as customs of doing business differ historically or culturally in different regions, leading to different levels of local support for a market system (Aldashev, 2009). In Mexico, for example, because of active historical immigration and inter-ethnic marriages in Mexico–US border areas relative to other regions, spillovers of Anglo-American cultural origin, such as liberalism and individualism, into the region are relatively more significant (McKinniss and Natella, Jr., 1994), suggesting that a more supportive attitude towards economic liberalization is likely.

Fourth, local administrators will usually implement national institutions such as regulations and policies in differing ways. In India, for example, although the states of Madhya Pradesh and Orissa started immediate implementation at about the same time after the state government's announcement of market reform in 1991, the former began by reforming its fundamental electoral system while the latter began by merely changing its power sector and industrial policies (Sachs, Bajpai, and Ramiah, 2002). Another example in India is the 73rd Constitutional Amendment, adopted by the federal government in 1993, which aimed to grant local rural bodies more powers and accountability but was left to the states to implement (Heller et al., 2007). Kalirajan and Otsuka (2010: 6) note that "over the years, in many of the States these (amended) institutions became inactive with elected councils being superseded for indefinite periods. In some States, notably in Andhra Pradesh, Karnataka and West Bengal there was an attempt at rejuvenating these local self governments at the village level by activating them politically."

Insert Figure 5 Here

Insert Figure 6 Here

3.2.3. *Direct Institutional Effect*

As I argued in Paper 1, from an EM parent firm's perspective, differences in market-supporting institutions between home and host regions create difficulty in

understanding and correctly interpreting market-related requirements, as well as the degree of adjustment required, resulting in high external environmental uncertainties. First, strong protections for private property punish business misconduct such as piracy of intellectual property, which may be prevalent and even socially legitimate in many regions of EMs (Chow, 2005; Swike et al., 2008). Second, an effective and stable regulatory system requires participants to possess tacit knowledge of local applicable laws and regulations and a good understanding of rule of law in general (e.g., Inkpen and Peamish, 1997). Third, the degree of liberalization of economies suggests how much a local legitimating environment supports competition. Firms from sub-national regions in EMs where the local economy is protected and local firms are generally supported by local governments with special incentives are less well adapted to a very competitive legitimating environment. For all these reasons, firms from different sub-national regions of an EM may face different degrees of difficulty in understanding and interpreting market requirements and in adjusting to a market-supporting environment. Firms from generally less market-supporting sub-national regions are less likely to correctly understand, interpret, and adjust to the environment of DMs, where market-supporting institutions are strongly developed (Brouthers et al., 2005; Djankov et al., 2002), and thus will face greater external environmental uncertainty with respect to market institutions.

In addition, after setting up foreign subsidiaries, an MNE also faces internal legitimacy pressures, a view formulated as the *organizational legitimacy perspective* to explain ownership policies with respect to foreign subsidiary management (Kostova, 1999; Kostova and Roth, 2002; Kostova and Zaheer, 1999; Xu and Shenkar, 2002). Kostova and Zaheer (1999: 72), for instance, argue that subsidiaries are first subject to the need for internal legitimacy, defined as "the acceptance and approval of an organizational unit by the other units within the firm and, primarily, by the parent company." Internal legitimacy is important to the survival and performance of an organizational subsidiary, which needs continuous access to intra-organizational resources such as capital and information (Pfeffer and Salancik, 1978). For an MNE parent, the different institutional environment surrounding its subsidiaries represents an impediment to the transfer of intra-organizational practices (Kostova, 1999; Kostova and Zaheer, 1999). To overcome this difficulty, MNEs must either transfer firm-specific competitive resources and capabilities, such as cutting-edge technology, to foreign subsidiaries (Kostova, 1999; Xu and Shenkar, 2002; Yan and Gray, 1994) or use the host-region-specific knowledge and

capabilities of an existing local subsidiary (Kogut, 1991; Porter, 1990; Xu and Shenkar, 2002).

The literature suggests that where there are huge institutional differences and the MNE does not possess superior firm-specific competitive resources such as technology, internal legitimacy is relatively less important than external adaptation and compliance to host-market characteristics (Rosenzweig and Nohria, 1994; Zaheer, 1995; Chan and Makino, 2007). Chan and Makino (2007), for instance, examined 4,451 subsidiaries of 898 Japanese parents in 39 countries between 1987 and 1999, and found that MNEs are likely to choose joint ownership over a WOS in exchange for external legitimacy under strong pressure to conform to local industrial regulations. For EM subsidiaries in DMs, EM parent firms are usually laggards relative to local competitors in monopolist-type resources, such as technology and brands, and must therefore grant local subsidiaries more political autonomy to partially compensate for difficulties in mobilizing local specific knowledge (Makino and Delios, 1996; Shan and Hamilton, 1991). In particular, local knowledge is highly embodied in local human resources (Chen, Li, and Shapiro, 2012), the management practices of which, in DMs, are by and large mandated by local regulation or shaped by strong local forces such as labour unions (Kobayashi, 1982). As a consequence, an EM subsidiary seeking sustainable existence and growth in a DM must achieve local adaptation by giving up the imposition of internal consistency if local adaptation and internal consistency conflict (Rosenzweig and Nohria, 1994).

As a consequence, firms will refrain from entering into markets where institutions are very different (a conclusion of Paper 1), because activities in those markets require conformity to institutional rules that differ from and even conflict with those of parent firms (Xu and Shenkar, 2002). When they do enter a distant legitimating environment, firms must initially choose lower levels of control and commitment through association with a local joint partner (Agarwal and Ramaswami, 1992; Anderson and Gatignon, 1986). Given that EMNEs from sub-national regions with weak market-supporting institutions usually have fewer firm competitive resources and capabilities to overcome the difficulties of external uncertainties (a conclusion suggested in Paper 1), they must rely on host-region-specific knowledge and capabilities as a substitute for transferring MNE practices internally (Xu and Shenkar, 2002). By committing ownership and control, local partners share their local knowledge of market-supporting institutions and the responsibility of ensuring that a subsidiary adapts to local environment and obtains local

legitimacy (Makino and Delios, 1996). A firm from a sub-national region that has stronger market-supporting institutions faces less difficulty in achieving local legitimacy in DMs, where market-supporting institutions are well developed, and thus is less likely to choose joint-ownership entry (in other words, more likely to choose full-ownership entry).

Formally stated,

Hypothesis 1: Ceteris paribus, the stronger the development of market-supporting institutions in a given sub-national location, the more likely the emerging-market firms from that location will choose full-ownership entry into developed markets.

3.2.4. Indirect Institutional Effect

As I argued in Paper 1, development of market-supporting institutions in a sub-national region of an EM will induce local firms to build market-related firm capabilities such as technological capability. Therefore, there is a positive relationship between the degree of market-supporting institutional development in a sub-national region at home and the level of market-related firm capabilities, such as technology capability, that a local firm possesses.[9] I argue that these market-related firm capabilities meet the conditions of double market failure suggested by TC theory, which is among the theories most widely used to study foreign subsidiary ownership policy (Makino and Neupert, 2000; Yiu and Makino, 2002; Zhao et al., 2004).

TC theory argues that the choice between partial and full ownership depends on the net benefits of sharing equity relative to those of retaining full ownership (Beamish and Banks, 1987; Globerman and Shapiro, 2009; Hennart 1988, 1991; Hennart and Larimo, 1998). Hennart (1991:484), more specifically, argues that partial ownership, which combines the provisions of assets held by two or more partners, is more efficient than full ownership if there is double market failure, that is, "when two conditions are simultaneously met: (1) markets for the intermediate goods held by each party are failing; (2) acquiring or replicating the assets yielding those goods is more expensive than obtaining a right to their use through a joint venture." Empirically, Hennart (1991) examined 158 US-based subsidiaries of Japanese firms and suggests that investing firms

[9] I have excluded arguments on whether and how development of market-supporting institutions within a sub-national region will induce local firms to build market-related firm capabilities, as these arguments have already been developed in Paper 1.

tend to choose joint ownership with a local partner over full ownership when they need continuous access to local firms' resources of, for example, industry- and market-specific knowledge and access to distribution networks and natural resources, which are subject to high market transaction costs (Makino and Neupert, 2000). Other studies generally support this theory and extend it to some non-transaction-cost factors, such as government ownership restrictions (Gomes-Casseres, 1990; Delios and Beamish, 1999); host-country risk and uncertainty (Hill, Hwang, and Kim, 1990); and strategic factors including global concentration, synergies, and strategic motivations (Kim and Hwang, 1992).

Empirical studies suggest that these arguments hold not only for JV formations (e.g., Brouthers, 2002; Chen and Hennart, 2002; Dikova and van Witteloostuijn, 2007; Pan and Tse, 2000) but also for partial-ownership acquisitions (e.g., Chiao, Lo, and Yu, 2010; Lopez-Duarte and Garcia-Canal, 2002; Fatica, 2010). Partial acquisition allows residual ownership by some important existing shareholders and senior managers, who can continue to provide needed resources, both external resources and internal know-how, to new ongoing concerns (Hennart, 1991). Some owners can provide certain unique and irreplaceable resources and skills (Chen, Li, Shapiro, and Zhang, 2011). For example, some old shareholders (including CEOs with management ownership), represented by board directors, have unique tacit managerial know-how in terms of creating and sustaining competitive advantages such as the technological capabilities of their companies (e.g., Baysinger, Kosnik, and Turk, 1991). Consequently, a partial acquisition, by keeping these shareholders, can also keep their unique and continuing contributions, thus enabling the maintenance and growth of the subsidiary's market-related firm capabilities.

Now I explain why market-related firm capabilities meet both conditions of market failure. The first condition is met because there is market imperfection for transferring these resources. Prior studies have argued that highly tacit, asset-specific, and system-dependent resources, such as know-how, cannot be priced and transferred in the market (e.g., Simonin, 1999; Griliches, 1984; Teece, 1988; Zander and Kogut, 1995). Although some market-based resources, such as a trademarked brand or a registered patent, can be priced (Griliches, 1984), and thus can be licensed or acquired (Cohen and Levin, 1989; Hurwitz and Caves, 1988; McCarthy, 1984), most others are tacit, asset-specific, and dependent on and embodied in the employees of a firm (Simonin,

1999; Dhanaraj, Lyles, Steensma, and Tihanyi, 2004), and thus cannot be codified, priced, and transferred through the market (Cummings and Teng, 2003; Minbaeva, 2007; Teece, 1988; Zander and Kogut, 1995). For example, with respect to technological capabilities, prior studies argue that technological input knowledge (e.g., the experience and skills of R&D personnel) is tacit and unobservable in nature (i.e., difficult for competitors to observe and learn) (Cummings and Teng, 2003; Minbaeva, 2007), and thus cannot be codified and purchased in the market (Zander and Kogut, 1995). Similarly, with respect to capabilities in marketing, branding, and building client loyalty, Simonin (1999: 469) suggests that "due to its socially complex nature, marketing know-how is generally characterized by a high degree of tacitness. It is rather difficult to think of an easily-codifiable advertising savoir-faire, explicit success formulas for product launches, or clear, replicable blueprints for international market expansions." With respect to logistics and distribution channels, studies argue that many of these resources (e.g., oil tanker, liquid container, etc.) tend to be asset-specific, as they depend on certain products and services (e.g., Zaheer and Venkatraman, 1995), and thus are associated with greater hazards in market-based exchanges than in internalized transactions (Simonin, 1999; Williamson, 1985).

The second condition is also met because, as discussed in Paper 1, all these capabilities and resources are determined by a strong market-supporting institutional environment (Meyer and Peng, 2005; Holburn and Zelner, 2010; Khanna and Palepu, 2006). Building these capabilities and resources requires established familiarity with market mechanisms, which is lacking in EMNEs from weak market-supporting sub-national regions ((as suggested in Paper 1)). As a consequence, it is easier for EMNEs to seek for joint ownership of these contextual resources with a local partner that already possesses them than to develop them proprietarily (e.g., Globerman and Shapiro, 2009).

EMNEs that have stronger market-related firm capabilities, therefore, have less need for a joint owner that can provide these resources. Moreover, TC theory also suggests that the more double-market-failure-meeting resources such as technological capabilities an MNE possesses, the more likely it is to want to safeguard these assets to avoid opportunism or involuntary spillovers, and therefore to pursue full ownership and control over its subsidiaries (e.g., Dunning, 1993; Hennart, 1991; Makino and Neupert, 2000; Williamson, 1985). Dunning (1993), for example, argues that most firm capabilities

are tacit in nature and subject to higher risks of dissemination, which generally makes a firm more prone to adopt a WOS approach to protect and fully exploit its advantages. Empirically, while tests of EMNEs abroad have been limited, Stopford and Wells (1972), Gatignon and Anderson (1988), and Gomes-Casseres (1989) have all found that a US parent with higher R&D intensity is more likely to have full ownership of its foreign subsidiaries (for a review, see Zhao et al., 2004).

Formally stated,

Hypothesis 2: Ceteris paribus, the stronger the development of market-supporting institutions in a given sub-national location, the more likely it is that emerging-market firms from that location will choose full-ownership entry into developed markets, with market-related firm capabilities such as technological capabilities mediating the relationship.

More straightforwardly, I summarize Hypotheses 1 and 2 as a twofold institutional effect framework in Figure 7.

Insert Figure 7 here

3.3. Method

3.3.1. Data

I put together a unique sample by merging two data sets using companies' state (province) of headquarters.[10] The first consists of firm- and deal-level information on international mergers and acquisitions (M&As) from Thomson SDC Platinum,[11] a database widely used in IB studies (e.g., Puranam, Singh, and Zollo, 2006; Puranam and Srikanth, 2007; Rossi and Volpin, 2004), especially studies of entry-mode selection (e.g., Moskalev and Swensen, 2007; Nielsen and Nielsen, 2011). The second is the database of state-/province-level institutional quality from IFC Surveys of Doing Business. With respect to DM host markets, following previous studies (e.g., Brouthers, O'Donnell, and Hadjimarcou, 2005; Li, 2005; Rugman and Collinson, 2008), I selected triad DM regions –

[10] For firms that did not report the state (province) in which their headquarters is located, I used various sources to find this information, including *Business Week*, *Fortune*, *Forbes*, BvD Orbis, and the Yellow Pages of each home country, as well as each firm's official website, if available.
[11] I kept only completed transactions, that is, M&As that have been actually completed.

North America (USA and Canada), Western Europe,[12] and Japan. With respect to EM home market, I initially selected the five largest EMs (China, India, Russia, Brazil, and Mexico) (United Nations Conference on Trade and Development or UNCTAD, 2011) (see Table 6). As Table 6 suggests, China and Russia are the most active markets in terms of OFDI flows; Russia and Mexico are the most active investors in terms of OFDI to GDP ratio; China and India are the dominant M&A purchasers; and in terms of number of top 100 MNEs by foreign revenue, China, Russia, and India are relatively more active than Mexico and Brazil. After merging effective data, I removed Russia and Brazil from the data set because IFC did not provide any standardized measures for these two countries that were comparable with those for other EMs. I then retrieved all M&As from China, India, and Mexico into triad regions since 1 January 2007, when IFC began doing sub-national surveys. Keeping the information on M&As (the proposed dependent variable) no earlier than institutional information (the proposed independent variable) can help to ensure correct identification of the direction of causation in empirical tests (Greene, 2008).

Insert Table 6 here

To ensure that each investment in the data set was a new entry, I further removed re-investment entries. The final sample thus contains 492 M&As by Mexican, Indian, and Chinese MNEs into triad regions between 1 January 2007 and 30 December 2010: 45 entries by Mexican MNEs, 318 entries by Indian MNEs, and 129 entries by Chinese MNEs, representing 384 different EMNEs (35 Mexican, 238 Indian, and 111 Chinese). These MNEs cover a broad range of sectors: mining (14 MNEs), construction (6), manufacturing (186), transport and utility (23), wholesale and retail trade (5), and finance and other services (150). The data set also includes firm-level information on the annual revenue of each EM acquirer and of its target. One characteristic of this sample is that each entry involved firms within the same industry (as measured by 2-digit SIC), which suggests that EMNEs are mostly investing in relevant industries in DMs.

3.3.2. Variables and Measurement

3.3.2.1. Dependent variable

Full-ownership entry is measured as a dummy variable, equal to 1 if 100%

[12] Austria, Belgium, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, and the United Kingdom.

ownership after entry and 0 otherwise. In section 3.3.5 below (the robustness check), I follow some prior empirical studies by using 95% (e.g., Brouthers, 2002; Hennart, 1991; Hennart, Kim, and Zeng, 1998; Makino and Beamish, 1998) and 80% (e.g., Makino and Beamish, 1998; Makino and Neupert, 2000) as cutoff points above which a firm is considered to be fully owned.

3.3.2.2. Independent variable

Institutional quality is based on IFC indices, including three indicators: starting a new business, private property registration, and contract enforcement, each of which further contains three to four sub-indices. Registering a new business is measured by number of procedures, time (days), cost (% of income per capita), and paid-in minimum capital (% of income per capita). Both property-right registration and contract enforcement are measured by number of procedures, time (days), and cost (% of property value) (for details, see Appendix 4).

These components comprehensively measure all three components of market-supporting institutional development in EMs, as discussed earlier: protection of property rights and an effective and stable regulatory system are measured by property protection index and contract enforcement index respectively, and liberalization of domestic and international markets are measured by ease of registering a business index. As the original values of these indices measure the inefficiency (as opposed to efficiency) of local institutions, I first converted their values using the following formula: maximum value of the sub-index minus a local region's original value. Because of severe multi-collinearity among the three sub-indices (see Appendix 4), I first divided all sub-indices by standard deviations to make them scale free and thus inter-comparable, and then created a single index to measure institutional quality using the first principal component based on the normalized values.

3.3.2.3. Mediation variable

I adopted technological capability to measure an EMNE parent's market-related firm capabilities. Following previous literature (e.g., Acs and Audretsch, 1988; Albert, Avery, Narin, and McAllister, 1991; Audretsch and Acs, 1991; Basberg, 1987; Brown and Gobeli, 1992; Crepon, Duguet, and Mairessec, 1998), I measured technological capability as number of patents per employee of an EMNE registered at the US Patent and

Trademark Office between 2005 and 2010, normalized by the mean value for the office's full sample by industry (1-digit SIC), year, and country of origin. Number of employees was determined by searching various sources (including *Business Week*, *Fortune*, *Forbes*, Bureau van Dijk (BvD) Orbis, and the Yellow Pages of each home country, as well as each firm's official website, if available) using each EMNE's full company name. This measure suggests an EMNE's market-related firm capabilities, that is, its ability to create technological knowledge that is relevant to a DM.

3.3.2.4. Control variables

Based on SDC data, firm size of the EMNE, measured as the logarithm of total revenue, is included as a control variable, since a parent firm's size (in terms of ongoing resources) determines its ability to assume the high risk of full ownership of a foreign subsidiary (e.g., Hennart, 1998); the impact of firm size on mode of entry can also be indirect, through its relationship with technological capabilities, although empirical findings have been mixed (for a review, see Cohen, 2010): some scholars argue that a larger scale of resources allows a company to afford riskier activities such as R&D (e.g., Ettlie and Rubensten, 1987; Nelson and Winter, 1982; Methe, 1992; Schumpeter, 1942), while others argue that smaller firms tend to be more innovative, thanks to smaller organizational and bureaucratic costs and higher efficiency (e.g., Scherer and Ross, 1990).

Prior experience is included because if an MNE has greater relevant experience in a similar environment, its need to join forces with a local partner in order to acquire contextual local knowledge is less (e.g., Hennart, 1991; Hennart and Larimo, 1998; Makino and Neupert, 2000). I measure an EMNE's relevant experience by the logarithm of numbers of previous entries in the same host country recorded in SDC. However, prior experience is relevant only for a certain number of years, and gradually becomes less and less useful over time; to address this potential issue, I exclude records earlier than 1 January 2001.

Relative firm size of the subsidiary is controlled because, as argued in prior studies (e.g., Hennart, 1991), all else being constant, the smaller the parent firm's size, the less likely it is to have the resources and negotiating power to fully take over a foreign subsidiary. Based on SDC data, this variable is measured as the logarithm of the ratio of a target subsidiary's total revenue to the investing EMNE's total revenue, or the logarithm of

a target subsidiary's total revenue minus firm size of the EMNE.

In addition, a higher level of economic development at home provides better educational and economic infrastructures, which will enable firms to innovate (e.g., Acemoglu and Linn, 2004), thus creating technological capabilities and, in turn, leading MNEs to seek full ownership; economic development at home will also provide rich resources, including information and financial resources, empowering firms with the confidence to take over full ownership in a DM. Accordingly, home market level of economic development, measured as per capita GDP of the home state/province (retrieved from each country's national statistics bureau), is included to control for these potential effects.

Meanwhile, strong market potential abroad can also justify high-risk and high-control modes, given the benefits of economies of scale and long-term market presence (Chen and Hu, 2002; Agarwal and Ramaswami, 1992), and thus may positively affect the likelihood of adopting a full-ownership mode of entry (Brouthers, 2002; Kwon and Konopa, 1993; Hennart, 1998). Host Market Growth, measured as annual growth rate of GDP of the host country, is therefore included to control for potential opportunities in the host market.

At the industry level, previous studies have found that different industrial structures may influence the choice of entry mode (Kogut and Singh, 1988; Hennart, 1991; 1998). In particular, it is argued that more technology-intensive industries tend to discourage joint ownership "in order to preserve proprietary [assets]" (Kogut and Singh, 1988: 421). Host-market industry R&D intensity (2-digit SIC), measured as industry-level (2-digit SIC) R&D expenditure per dollar of production in a host country, retrieved from OECD Stats, is included to control for this industry characteristic. As mentioned, all entries in my sample were within-industry (2-digit SIC), meaning that this measure controls for this characteristic of both an investing EMNE and its target subsidiary.

Cultural similarity between home and host countries is widely argued to be a determinant of entry-mode selection (Chang and Rosenzweig, 2001; Erramilli and Rao, 1993), although empirical findings have been mixed (Brouthers and Brouthers, 2001; for a review, see Tihanyi et al., 2005). I retrieved two dummy variables from the Centre d'Études Prospectives et d'Informations Internationales (CEPII), common language

between home and host markets and colonial relationship in history, to control for cultural similarity. The first variable is coded as 1 if two nations share at least one major ethnic language (spoken by more than 9% of the population), and as 0 otherwise. The second variable is coded as 1 if the host (or home) nation was at any time colonized by the home (or host) nation (e.g., Spain–Mexico, United Kingdom–India), and as 0 otherwise. Lastly, to control for any unobserved country-specific or time-specific factors, I included a series of dummies for home country, host country, and year of entry.

By including these control variables, my models can capture most measures commonly used in earlier studies following TC theory, RBV, institutional theory, and Dunning's eclectic framework, which, as mentioned, together represent about 90% of entry-mode studies (Brouthers and Hennart, 2007). Specifically, technological capabilities and prior experience are widely used to capture asset specificity (e.g., Davidson and McFetridge, 1984; Gatignon and Anderson, 1988) and firm resources and ownership advantages (e.g., Erramilli, 1991; Mutinelli and Piscitello, 1998). Common language and colonial relationship are used to capture institutional pressure due to cultural dissimilarity, as argued by institutional theory (e.g., Holburn and Zelner, 2010). Firm-size variables can generally capture firm-specific resources or ownership advantages created by size, other than technology and experience (e.g., Brouthers, Brouthers, and Werner, 2003). Industry-specific R&D intensity can capture industry-level asset specificity (e.g., Delios and Beamish, 1999) and know-how (e.g., Chang and Rosenzweig, 1998). In addition, home institutional quality and economic factors such as GDP per capita and growth can partially capture locational advantages (e.g., Agarwal and Ramaswami, 1992).

3.3.3. Regression Strategy

To test for both direct and mediation effects, I used causal mediation analysis, newly developed by Hicks and Tingley (2011) and Imai et al. (2010). This method builds on Baron and Kenny's (1986) mediation analysis method, which is widely used in social sciences research (Kline, 2010). Both methods estimate the causal mechanisms when the effect of an independent variable on an outcome is transmitted through a mediation variable, and both provide results for both direct and indirect effects (Hicks and Tingley, 2011). The advantage of causal mediation analysis is that it allows non-linear estimations such as Probit and Logit, whereas Baron and Kenny's (1986) method can be applied only when dependent variables are continuous (MacKinnon and Dwyer, 1993; MacKinnon,

Warsi, and Dwyer, 1995; Preacher and Hayes, 2004).

In the first step, the mediation variable (technological capability) is regressed on the independent variable (institutional quality) using OLS regression. In this step, as host-market- and subsidiary-related factors do not seem to play any role, I included only parent-firm and home-market variables: Firm size of the EMNE, prior experience, and home market level of economic development. In the second step, the dependent variable (full-ownership entry) is regressed on both the independent variable (institutional quality) and the mediation variable (technological capability). Because the dependent variable (full-ownership entry) is binary, in the second step I used both Probit and Logit methods, which allow binary dependent variables (Greene, 2008); both methods use maximum likelihood estimation (MLE), but the two assume different distributions of errors, and thus each can be used to cross-check the robustness of the other's result. Final results also show the magnitudes of direct and indirect effects respectively (Baron and Kenny, 1986; Hicks and Tingley, 2011).

3.3.4. Results

To examine potential multi-collinearity among all variables, I present the correlation matrix and summary statistics in Table 7. Results identify one pair of severely multi-collinear variables: firm size of the EMNE is perfectly correlated with relative firm size of the subsidiary, because firm size of the EMNE is a factor in the deduction calculation of relative firm size of the subsidiary. Therefore, these two variables cannot be simultaneously included in any regressions. Following some prior empirical efforts (e.g., Hennart, 1991; Yiu and Makino, 2002), therefore, I included only relative firm size of the subsidiary in Step 2.

*** Insert Table 7 Here ***

Table 8 and Table 9, respectively, report Step 1 and Step 2 regression results of the causal mediation analysis. The results of Step 1 suggest that an EMNE's technological capability (normalized) is positively determined by its sub-national region's degree of institutional development for a market economy, a finding consistent with my argument that EMNEs in stronger market-supporting institutional environments tend to have greater market-related firm capabilities. Among the control variables for Step 1 regression, home market level of economic development has significant positive effects, which suggests that

EMNEs in more developed home markets tend to be more innovative (e.g., Acemoglu and Linn, 2004). However, firm size of the EMNE is not a significant factor.

*** Insert Table 8 Here ***

*** Insert Table 9 Here ***

Step 2 results suggest that both H1 and H2 are supported. Specifically, both Logit and Probit estimations suggest that the technological capability of an EMNE is positively related to its likelihood of adopting a full-ownership mode of entry into DMs. With the significant finding in Step 1 that technological capability is positively related to institutional quality at home, H2 is fully supported. Specifically, parameters for average causal mediation effect (ACME) are significantly positive in both Logit and Probit estimations (P-values for both are 0.0007). Meanwhile, with technological capability controlled, results also report significant positive direct effects. This is consistent with my argument that EMNEs from weaker institutional environments are more likely to choose JV for local adaption in a very unfamiliar foreign location (Rosenzweig and Nohria, 1994; Zaheer, 1995). Apart from this, some control variables show significant, consistent results, as documented in prior studies. An EMNE's relevant prior experience shows a significant positive effect, a finding consistent with some arguments and findings of prior studies (Hennart, 1991; Hennart and Larimo, 1998; Makino and Neupert, 2000); the other significant control variable is host-market industry R&D intensity (2-digit SIC), supporting earlier arguments in the literature that more technology-intensive industries tend to discourage joint ownership "in order to preserve proprietary [assets]" (Kogut and Singh, 1988: 421). Other control variables – relative firm size of the subsidiary, home market level of economic development, host market growth, common language, and colonial relationship in history – show no significant findings.

Overall, both Logit and Probit estimations are very robust, with high chi-square values (53.51 and 57.49 respectively). Pseudo R-squared for both estimations suggests strong explanatory power for a cross-sectional sample (about 9% for both).

3.3.5. Robustness Check

Following prior studies, I used 95% (e.g., Brouthers, 2002; Hennart, 1991; Hennart, Kim, and Zeng, 1998; Makino and Beamish, 1998) and 80% (e.g., Makino and Beamish,

1998; Makino and Neupert, 2000) as alternative cut-off points for full ownership to replicate the tests. Because Step 1 does not involve the dependent variable (full-ownership entry) and thus is not affected by any change in the cut-off point, I show only Step 2 results in Table 10. Results show strong consistency with those shown in Table 9 with respect to the hypothesis tests: both direct and indirect effects are significantly positive. The effects of control variable have slightly changed: Prior experience shows no significant impact in either the Logit or the Probit model if an 80% cut-off point is used.

*** Insert Table 10 Here ***

3.4. Conclusion and Discussion

This study extends the twofold institutional effect framework developed in Paper 1 by further incorporating TC theory to examine the framework's efficacy in explaining entry ownership selection. The overall argument is that market-supporting institutional development at the sub-national level reduces the need for a local joint owner to achieve local legitimacy and induces EMNEs to create market-related firm capabilities such as technology, which in turn lead them to seek full-ownership entry into DMs. Using a cross-country (Mexico, India, and China) firm-level sample of 492 entries into triad DMs (US and Canada, Western Europe, and Japan) between 2007 and 2010 and state-/province-level market-supporting institutional measures, I find very supportive results.

This study contributes to our understanding of internationalization by combining the institution-based view and RBV with TC theory. Among the first attempts to synthesize these perspectives into a system, the study examines one specific aspect of the relationships among domestic (home) institutions, firm resources and capabilities, and strategic choices, that is, the relationships among market-supporting institutions, a firm's market-related firm capabilities, and a firm's entry mode of OFDI into a strong market institutional context. In addition, given the sub-national institutional heterogeneity in EMs, this study is among the first to call attention to the sub-national unit nature of institutional quality. This view is empirically supported, as the effects of sub-national institutional quality measures are significant.

Future studies can extend the twofold institutional effect framework developed in

Papers 1 and 2 in a few valuable ways. First, there are other non-market facets of this generic relationship among institutions, firm resources and capabilities, and a firm's strategic choices. For instance, non-market informal institutions (e.g., *blat* in Russia, *guanxi* in China) usually play an important role in EMs as substitutes for the missing market-supporting institutions (e.g., Puffer, McCarthy, and Boisot, 2009), which means that local firms may have to adapt to a weak market-supporting institutional environment in at least two ways in order to survive and grow. The first is to internalize the market and contract enforcement system into the organization in the form of, for example, an unrelated business group (Khanna and Palepu, 2006; Tan and Meyer, 2010); by doing this, companies avoid the high transaction costs of a dysfunctional market. The second is to build unique firm resources and capabilities that are adaptive in a non-market institutional context (Cuervo-Cazurra and Genc, 2008). Cuervo-Cazurra and Genc (2008), for example, argue that EM firms develop greater capabilities to deal with institutional voids (e.g., skill in dealing with corruption, experience in building relationships with dictators), and thus have advantages over their DM counterparts when both are competing in a context of inefficient formal market institutions. However, a detailed examination of non-market institutions and a firm's non-market firm resources and capabilities is missing from the current literature. Unexplored questions include, but are not limited to, how to define and quantify non-market institutions (e.g., the strength and enforcement of socio-political orders) and how to define and measure non-market resources and capabilities (e.g., political and lobbying skills, capacity to deal with corruption). The first step of future extension should include nuanced and thorough discussions of these questions. The next step will be how the interplay between non-market institutions and non-market firm resources and capabilities determines their global strategies (e.g., entry decisions and entry modes into a similar non-market institutional context).

Second, although this study initiates a more nuanced application of the institution-based view in EMs by raising the issue of sub-national institutional heterogeneity, a theoretical discussion on the boundaries of sub-national institutions is still very limited. Future studies should identify a more nuanced way of mapping these institutions at sub-national levels: For instance, which institutional dimensions are common nationally (e.g., rule of law)? Which economic policies are bounded by state or province? Are court efficacy and contract enforcement city-bounded? Which institutional measures are independent of geography but industry-specific? The detailed setting may

be different between, for instance, a one-party authoritarian regime such as China's and a constitutional federalist regime such as India's or Mexico's: The former may have a more centralized system of lawmaking and legal enforcement, and thus more institutional dimensions commonly defined and implemented at the national level. Efforts to look into very detailed legal and political documents for each country are required.

4. Paper 3 on Going Back: International Spillover Effects on Parent Firms

4.1. Introduction[13]

An important motivation for EM OFDI into DMs is to access advanced knowledge and capabilities available in DMs and to utilize them to improve the technological and innovative capabilities of the parent companies in emerging markets (Makino, Lau, and Yeh, 2002; Mathews and Zander, 2007; Luo and Tung, 2007; Rui and Yip, 2008; Deng, 2009). This "knowledge seeking" motivation of EMNEs has been supported by recent studies that have investigated EMNEs' entry decisions (e.g., location choice) as a function of technological endowments in host markets (Bertoni et al., 2008; Buckley, Clegg, Cross, Liu, Voss, and Zheng, 2007). While it is critical to investigate the impact of knowledge seeking on EMNEs' entry decisions, it is equally important to understand whether investments in DMs have actually generated positive spillover effects that augment technological capabilities of EMNEs at home. To my knowledge, however, no studies have investigated the latter topic. My study aims to fill this literature gap.

Specifically, I hypothesize that OFDI in knowledge intensive DMs will positively affect technological capabilities of EMNE parent firms, which I refer to as reverse spillover effects. With strong local linkages such as membership with innovation clusters and supply chains, positive reverse spillover effects are realized through knowledge spillovers to EM subsidiaries in a developed market and by the subsequent knowledge transfer from these subsidiaries to their parents in EMs, and in some cases through direct knowledge spillovers to EM parents from their DM subsidiaries' surrounding environment (see Figure 8). Based on the knowledge transfer literature, I highlight that EM parent firms tend to increase their R&D spending level in order to absorb knowledge transferred from the subsidiaries, as well as to combine it with their existing knowledge to innovate, and that increased R&D spending for these two purposes presumably enhances parent firm'

[13] I thank Peter Gammeltoft, Igor Filatotchev, Bersant Hobdari, Päivi Karhunen, and Weijie Chen at *the 2nd Copenhagen Conference on "Outward FDI from Emerging and Developing Markets"* for their helpful comments.

technological capabilities (Cohen and Levinthal, 1990; Szulanski, 1996; Tsai, 2001; see Michailova and Mustaffa, 2012, for a literature review). The reverse spillover effect proposed in my study contrasts with the more conventional approach to spillover benefits for firms in emerging markets which focuses on spillovers from DM MNEs investing in emerging markets to host market firms (for reviews, see Globerman and Chen, 2010; Meyer and Sinani, 2009).

Insert Figure 8 here

Empirically, I utilize a panel dataset consisting of 493 MNEs from 20 different EMs between 2000 and 2008. I use R&D expenditures of the parent firm in the home market to measure its technological capabilities. I employ three measures (R&D investment, R&D employment, and number of patents) to capture the level of technological resources in a host market, all adjusted for industry. My primary focus is on the relationship between parent-firm R&D expenditures and the level of technological resources in the host market. Because it is possible that firms more active in R&D are more like to locate in a technologically richer region (Goetz and Rupasingha, 2002), I am careful to control for possible endogeneity in my empirical work. I use instrumental variable methods and Hausman tests to ensure that host-market technological measures are exogenous. Using panel Tobit regressions (e.g., Tobin, 1985), with lagged independent variables to ensure causal direction and possible lagged effects, I find evidence supporting my main prediction that technological resources related to R&D investments and R&D employment in a host market-industry have a significant, positive effect on the R&D expenditures of the EM parent companies that have invested in the host market-industry.

My study adds values to the FDI literature in at least two important aspects. First, my study contributes to the literature that investigates FDI spillover effects on the technological capabilities of EM firms. The majority of this literature has focused on spillover effects of inward FDI in EMs on technological improvement of firms in the host markets (e.g., Aitken and Harrison, 1999; Girma, Gong, and Görg, 2009; Globerman, 1979; Haddad and Harrison, 1993; Li, Chen, and Shapiro, 2010; Zhang, Li, Li, and Zhou, 2010; for a review, see Meyer and Sinani, 2009). This literature has suggested that inward FDI tends to generate knowledge spillovers that benefit local firms in EMs as host markets by enhancing their technological capabilities (Cantwell, 1989; Caves, 1996). Although there have been studies of reverse spillover effects on foreign subsidiaries (Driffield and

Love, 2003), the FDI literature has yet to examine the potential reverse capability benefits of OFDI on the EMNE parent.

Second, my study contributes to the literature on OFDI of EMNEs. Previous studies have largely concentrated on the influence of technological resources in a host market on entry-related decisions (Bertoni et al., 2008; Buckley et al., 2007). For instance, Bertoni et al. (2008) suggested that firms from Brazil, Russia, India, and China use horizontal acquisitions in developed markets to access technological resources. Buckley et al. (2007) argued that Chinese MNEs are more likely to locate in a foreign market that has rich technological endowments. My study is among the first attempts to examine the post-entry consequences of EMNEs' investments in DMs.

I adopt three alternative measures for host-market technological resources, and find that EMNEs that have subsidiaries in host markets that are rich in R&D-based resources tend to benefit significantly from knowledge spillovers and knowledge transfer to the parent. However, EMNEs that have subsidiaries in patent-rich host markets do not benefit in the same way. These results suggest more nuanced conclusions regarding reverse spillovers. Specifically I argue that R&D input-related knowledge embedded in researchers, local universities and business networks is relatively tacit and location bound and can therefore be accessed only through locational choices. Patents, on the other hand, are not only codified and tradable but can also be accessed via market transactions (e.g., licenses) by EMNEs even when they have no presence in the host markets where the patents are invented.

The rest of the paper proceeds as follows. I review the literature and develop my main hypothesis in section two, discuss empirical methods in section three, and present the results in section four. I conclude the study by discussing its implications and potential future extensions.

4.2. Theory Development

4.2.1. Knowledge Seeking of EM Firms in DMs

Knowledge seeking FDI is geared less to exploiting an existing ownership advantage of an MNE, and more to augmenting firm specific advantages by the

acquisition of new knowledge (Cantwell, 1989; Dunning, 2001; Wesson, 1999). Consistent with the knowledge seeking motivation, research studies have found that firms from technologically lagging countries tend to invest in countries with stronger technological positions (Kogut and Chang, 1991; Kuemmerle, 1999; Florida, 1997; Serapio and Dalton, 1999). For instance, Kogut and Chang (1991) observed that Japanese firms entered industries in the United States that have stronger R&D capabilities than in Japan. Similarly, Kuemmerle (1999) found that MNEs are inclined to establish R&D laboratories in a host market when the country commits more to R&D activities and offers more qualified human resources than the MNE's home market.

The knowledge seeking motivation for OFDI is particularly emphasized by some literature on the internationalization of firms from emerging and developing markets. This literature suggests that firms use international expansion as a "springboard" to access knowledge overseas, to compensate for their competitive weaknesses, and to overcome their latecomer disadvantages (Luo and Tung, 2007; Makino et al., 2002; Mathews, 2002, 2006; Child and Rodrigues, 2005; Mathews and Zander, 2007). Empirically, using a survey on 328 Taiwanese firms that had invested or had the intention to invest overseas, Makino et al. (2002) observed that firms from Taiwan engage in FDI not only when they possess firm-specific advantages for asset exploitation but also when they intend to seek technology-based resources and skills that are not available in their home market. Similarly, based on a sample of 417 acquisitions in Western Europe, North America and Japan stemming from Brazil, Russia, India and China (BRICs) during 2000 to 2007, Bertoni et al. (2008) found evidence that EMNEs tend to choose host markets rich in technology.

Investing in developed markets is critical for EMNEs to obtain advanced technological knowledge for two reasons. First, the innovation cluster literature suggests that networks that are conducive to innovation (consisting of suppliers, customers, competitors, universities) are location bound and cannot be easily replicated in other locations (Almeida and Kogut, 1999; Audretsch and Feldman, 1996; Globerman, Shapiro, and Vining, 2005; Jaffe, Trajtenberg, and Henderson, 1993; Porter, 1990). For instance, innovation resources such as researchers, research labs, and technology-generating facilities are location-specific, and communications and turnovers of R&D workers are accommodated by local networks (Jaffe et al., 1993; Griliches, 1984, 1992; Globerman et al., 2005). Since knowledge is spatially bounded in nature, knowledge spillovers are also

spatially bounded. To benefit from knowledge spillovers, an EMNE needs to have a physical presence in these locations and embed itself in local networks that are rich in technological resources (Almeida and Kogut, 1999). Second, and related, since technological knowledge is often tacit in nature (i.e., difficult to codify and articulate), and exhibits high complexity (i.e., drawing upon distinct and multiple kinds of competencies) and high system dependence (i.e., high dependence on many different experienced people for knowledge production) (Simonin, 1999; Zander and Kogut, 1995), an EMNE therefore needs to be present in innovation networks with sophisticated knowledge systems in order to obtain technological knowledge it desires.

The ultimate objective for EMNEs' knowledge-seeking investments in DMs is to improve their technological capabilities in their home market (e.g., Child and Rodrigues, 2005). The reasons are least fourfold. First, EMNEs often wish to reduce reliance on foreign technologies, and to develop "indigenous knowledge" (Aubert, 2004: 13), and "indigenous innovation" (Fu, Pietrobelli, and Soete, 2010: 1). Second, governments in emerging markets have often encouraged and rewarded indigenous technological efforts and provided favorable policies such as tax incentives and financial assistance, which have further motivated EMNEs to pursue technological development in the home market (Chaminade and Vang, 2006; Peng, 2010). Third, most EMNEs still lack the capability to coordinate multiple R&D bases globally, and they instead centralize their R&D activities back home (Luo and Tung, 2007; Wei, 2010). Fourth, an indication of Papers 1 and 2 suggests that the ongoing market-oriented institutional development at home encourage EM firms to build their market-related firms capacities, of which innovation is an important one.

Therefore, a primary goal of seeking knowledge overseas is to transfer knowledge back to parent companies in order to improve parent companies' technological capabilities. I explore next the theoretical mechanisms through which OFDI in DMs can possibly affect technological capabilities of the parent companies of EMNEs at home.

4.2.2. Knowledge Spillovers on Subsidiaries of EM Firms in DMs

Following the knowledge spillover literature, I suggest that by presenting themselves in DMs, subsidiaries of EMNEs can benefit from knowledge spillovers (e.g., technology and knowhow spillovers) from local companies in the host markets (e.g.,

Atkinson and Stiglitz, 1969; Globerman, 1979; Koizumi and Kopecky, 1977). Knowledge can be spilled over to subsidiaries of EMNEs through several channels. First, the subsidiaries can acquire knowledge by participating in local supply chains in a developed market. Studies have shown that knowledge spillovers are associated with purchases and usage of high-technology intermediate products made by local suppliers (Javorcik, 2004). Second, the subsidiaries can access and assimilate advanced technologies and knowhow by interacting with local technological and innovative leaders such as scientists and engineers in local companies, research labs, and universities (Almeida and Kogut, 1999; Mansfield and Romeo, 1980). Last, by locating in a DM, the subsidiaries of EMNEs gain opportunities to hire high-quality graduates in local universities and R&D workers from local labor markets (Møen, 2005).

Although internal knowledge transfer mechanisms are necessary for EMNE parents to benefit from knowledge spillovers, they are not sufficient. For the parent to benefit, knowledge spillovers in the host markets must be accompanied by internal transfer mechanisms in order for there to be a positive reverse spillover effect is (e.g., Belderbos, Lykogianni, and Veugelers, 2008; Sanna-Randaccio and Veugelers, 2007).

4.2.3. *Knowledge Transfer from Subsidiaries in DMs to Parents in EMs*

When knowledge is obtained in the advanced host markets EMNEs must engage in knowledge transfer from subsidiaries to parent companies in order for the parent to benefit from the knowledge. Parent firms may engage in different types of activities to facilitate knowledge transfer. First, they may engage in personnel exchanges by sending parent-firm researchers to the subsidiaries on a regular basis, or transferring researchers in the subsidiaries to parent firms (Filatotchev, Liu, Buck, and Wright, 2009; Görg, Strobl and Walsh, 2005; Liu and Buck, 2007; Liu, Lu, Filatotchev, Buck, and Wright, 2010). Such direct, frequent interactions between employees in the subsidiaries and the parent companies contributes to development of shared language of communication, which is critical for transfer of tacit and complex knowledge (Grant, 1996; Kogut and Zander, 1993; Lyles and Salk, 1996). Second, parent firms may purchase products developed by the subsidiaries in order to obtain relevant knowhow in producing and improving the products (Cheung and Lin, 2004; Javorcik, 2004). The success of these initiatives will, however, depend on the ability of the home firm to absorb and deploy the knowledge gained. The

knowledge transfer/spillover literature suggests that knowledge is often "sticky" and difficult to spread (Szulanski, 1996; von Hippel, 1994), and that knowledge transfer is more likely to occur when knowledge recipients spend considerable R&D resources in absorbing and utilizing transferred knowledge (e.g., Cohen and Levinthal, 1990; Szulanski, 1996; Tsai, 2001; see Michailova and Mustaffa, 2012, for a literature review). R&D efforts are particularly important for those knowledge recipients who are technology laggards from developing countries (e.g., Bell and Pavitt, 1997; Lall, 1992; Lane, Koka, and Pathak, 2006). R&D spending therefore facilitates knowledge transfer in two ways: (1) it improves knowledge recipients' absorptive capacity, that is, their ability to "recognize the value of new, external information, assimilate it, and apply it to commercial ends", and (2) R&D spending transforms absorbed knowledge into innovation output (Cohen and Levinthal, 1990: 128). This is the dual-role of R&D activities (Cohen and Levinthal, 1990). I suggest therefore that parent firms, as knowledge recipients, tend to increase R&D spending in order to increase their ability to absorb transferred knowledge from their subsidiaries, and to combine it with their existing knowledge to innovate. Increased R&D spending for the two purposes will enhance firms' technological capabilities.

4.2.4. *Direct Knowledge Spillover from Subsidiaries' DM Networks to Parents in EMs*

Besides building connections with the subsidiaries, parent firms may also devote resources to creating an innovation network for absorbing and utilizing transferred knowledge from overseas subsidiaries by, for example, directly hiring overseas returnees with advanced knowledge and experiences (Filatotchev et al., 2009), collaborating with the best universities or firms in home countries, and developing first-class laboratories. For instance, Lenovo's North Carolina base, with strong connections with local universities and research laboratories, plays a role as a talent hunter for attracting Chinese returnees with advanced degrees in US back to its Chinese headquarter.

The above discussions suggest that OFDI in developed markets affects parent firms' technological capabilities can take at least two paths. The first path is through two sequential mechanisms: first, subsidiaries in developed markets benefit from knowledge spillovers from local innovation networks; second, knowledge transfer from subsidiaries in developed markets to parent firms in emerging markets increases technological capabilities of EMNEs through increased R&D spending levels by parent firms for

absorbing and leveraging transferred knowledge. The second path is directly through the knowledge spillovers from DMs to EM parents by capitalizing on their DM subsidiaries' local linkages and networks in DMs. These two paths usually occur simultaneously, and hence it is very difficult to disentangle them in practice.

I therefore reach the following hypothesis.

Hypothesis 1: Ceteris paribus, the richer the technological resources in a host developed market where an EMNE invests, the greater is the impact on the technological capabilities (R&D spending) of the EMNE parent.

4.3. Method

4.3.1. Data

The major data source for EMNE parent information is BvD Orbis, which records parent-affiliate relations and financial statements for over 60 million companies across the world. The data sources for industry- and country-level information include SourceOECD, World Bank World Development Indicators (WDI), and Klynveld Peat Marwick Goerdeler (KPMG). Data for distance measures between countries were collected from CEPII.

Based on the BvD Orbis database, I first selected parent companies from emerging markets. These companies were registered in an EM and their global ultimate owners are in the EM. I adopted EM classifications using three sources, including the literature survey by Hoskisson, Eden, Lau, and Wright (2000) on emerging economies, and two major financial indexing sources, Morgan Stanley Capital International (MSCI) Barra 2010 and Financial Times Stock Exchange (FTSE) Group 2010. I excluded economies that had joined the Organization for Economic Co-operation and Development (OECD) by 2010. The final EM list in my study includes 57 economies[14].

I further removed those firms that had persistently reported zero R&D expenditure

[14] Albania, Argentina, Armenia, Azerbaijan, Bangladesh, Belarus, Bosnia and Herzegovina, Botswana, Brazil, Bulgaria, Chile, China, Colombia, Cote d'Ivoire, Croatia, Czech Republic, Ecuador, Egypt, Estonia, Georgia, Ghana, Hungary, India, Indonesia, Israel, Jamaica, Jordan, Kazakhstan, Kenya, Kyrgyzstan, Latvia, Lithuania, Macedonia, Malaysia, Mauritius, Mexico, Moldova, Morocco, Nigeria, Pakistan, Peru, Philippines, Poland, Romania, Russia, Saudi Arabia, Slovenia, South Africa, South Korea, Sri Lanka, Taiwan, Tajikistan, Thailand, Trinidad and Tobago, Tunisia, Turkey, Turkmenistan, Ukraine, Uzbekistan, Venezuela, and Zimbabwe.

between 2000 and 2008 (the sample years) because technological capabilities are probably not critical for the performance of these companies (and also because they do not provide variation for the independent variable). As a result, the sample consists of 9,953 EM parents (hereafter referred to as the larger EM sample). As I will explain later, the larger EM sample was used to calculate a control variable. Last, I kept only those that have foreign subsidiaries in DMs, where DMs refer to high-income OECD countries as of 2010[15].

The final sample is a panel dataset with 493 EMNE parents from 2000 to 2008. These companies are from 20 different EMs, 43 different industries (based on 2-digit US SIC codes) and 27 different host DMs. Specifically, 75% of the companies are from India, Turkey, and Israel, 44% are in electronic and other electric equipment, industrial machinery and equipment, and chemicals and allied products, 62% invested in Germany, Netherlands, United Kingdom, and the United States.

4.3.2. Variables and Measurement

4.3.2.1. Dependent variable

I used firm-level R&D spending as a proxy for EMNEs' technological capability, following Baysinger and Hoskisson (1989), Markides and Ittner (1994), and Hundley, Jacobson, and Park (1996)[16]. Such information is available in company financial statements from BvD Orbis. I believe that using R&D spending is appropriate for my study for two reasons. First, as discussed earlier, the literature on knowledge transfer suggests that R&D spending of the parent firm is a good indicator of a firm's ability to absorb and utilize external knowledge transferred from overseas subsidiaries. Indeed, R&D spending may be better than any innovation output measure for capturing directly firms' reverse knowledge transfer activities. Second, the innovation literature suggests that innovation input measures such as R&D spending are appropriate for capturing firms' technological capabilities and innovation performance (e.g., Ahuja and Katila, 2001; Baysinger and Hoskisson, 1989; Markides and Ittner, 1994), and ample evidence has been found to

[15] Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Japan, Luxembourg, Netherlands, New Zealand, Norway, Portugal, Slovak Republic, Spain, Sweden, Switzerland, United Kingdom, and United States.

[16] Using innovation output as an alternative measure for the dependent variable would increase the robustness of my findings. However my dataset does not contain innovation output measures such as patents and new products, and so I encourage future studies to incorporate such measures (Makri, Hitt, and Lane, 2010).

support a positive relationship between innovation input and output (e.g., Griliches and Mairesse, 1981; Pakes and Grileches, 1980).

4.3.2.2. Independent variables

To capture level of technological resources in a host DM, I used three country-industry level measures. Country-industry level measures are preferred over country level measures because technological knowledge is specialized by industry (Griliches, 1984, 1992; Pater and Pavitt, 1997). I utilized 3-digit SIC codes to classify industries for these measures. Information for all three measures is available in SourceOECD.

Measure 1, host DM's number of R&D employment, is calculated as industry-level number of R&D workers including researchers and technicians in a host DM. This measure captures the host-market endowment in R&D expertise, skills, and specialized knowledge embodied in human resources (Song, Almeida, and Wu, 2003).

Measure 2, host DM's dollar value of R&D investments, is measured as industry-level dollar values of R&D investments in a host DM. This measure captures spending on R&D activities including, for example, salaries for R&D workers and investments in building technological networks with local research institutions and other companies. This measure reflects firms' total efforts in R&D activities, including those that fail to yield any registered patents and inventions (Gornik-Tomaszewski and Millan, 2005).

Measure 3, host DM's number of patents applied, is calculated as industry-level number of patents applied by both residents and non-residents in a DM. This measure in general suggests the regional assets of codified, published R&D knowledge (Comanor and Scherer, 1969; Keller, 2004).

In the cases where an EM parent company holds affiliates in multiple DMs, I used arithmetic means and summations to capture host countries' technological resources for the EM parent. For robustness checks, I used two composite measures: means of technological resources in host countries weighted by each host DM's market size, or weighted by the geographic distance to the home market.

4.3.2.3. Control variables

I first included four firm-level control variables. First, since larger firms will be more

capable of investing in R&D activities (Shefer and Frenkel, 2005), I controlled for firm size, measured as the logarithm of the dollar value of total assets. Second, prior studies suggested that young firms enjoy less inertia and commit more to innovation (Balasubramanian and Lee, 2008; Hansen, 1992), and therefore I controlled for firm age, measured as the logarithm of the number of years since incorporation. In addition, following the studies that a firm's R&D expenditure is sensitive to its financial stress (Hall and Mansfield, 1971; Ozkan, 2002), I included two firm-level variables reflecting a firm's financial situation: firm current ratio, calculated as the ratio of current assets to current liabilities, measuring short-term liquidity stress, and firm solvency ratio, calculated as the ratio of total assets to total liabilities, measuring long-term solvency stress. All the firm-level information is available in company financial statements from BvD Orbis.

Since an EMNE's R&D expenditure is also affected by technological resources in its home market (Branstetter, 2001; Thompson and Fox-Kean, 2005), I also included home R&D environment, calculated as the logarithm of industry-level R&D investments in a specific EM in a year normalized by the arithmetic mean of industry-level R&D investments in all EM s in that year[17]. I used the larger EM sample to calculate this measure.

Since the economic relations in, for example, bilateral trade and investment between countries may influence the rate of spillovers, because bilateral economic interactions provide and enhance channels for international technology diffusions (Saggi, 2002; Spencer, 1965). Since bilateral economic flows in trade and investment are largely determined by market sizes of both partners and the distance between the two following Gravity model in international economics (Bergstrand, 1989), I further controlled three variables: home market size and host market size, both measured as logarithms of real GDP compiled by the World Bank's WDI database, and weighted geographic distance between home and host markets, which is measured as the logarithm of a population-weighted[18] geographic distance between two markets' major metropolitan cities. The distance information is available at CEPII. By including host market size, I also

[17] Some observations report zero R&D investments as the base for the logarithm, so I add a positive amount to all observations to ensure all observations to be positive before taking the logarithm.

[18] Denoted as "distw" by CEPII, the population-weighted geographic distance between country *i* and *j* is calculated as $d_{i,j} = \left(\sum_{k \in i} (pop_k / pop_i) \sum_{l \in j} (pop_l / pop_j) d_{kl} \right)$, where pop_k designates the population of agglomeration *k* (*l*) belong to country *i* (*j*). For details, see Mayer and Zignago (2011).

controlled for market-seeking motives for EMNEs into DMs (Buckley et al., 2007).

Finally, I included a dummy variable common official language, which is 1 if both countries share the same official language and is 0 otherwise, to control for linguistic and cultural barriers that may hinder knowledge spillovers in a host country (Guellec and de la Potterie, 2001). I also included home tax burden, measured as effective corporate tax rate in home countries, to measure parent companies' taxation burdens, an institutional factor that can affect available funding for R&D activities (Hall, 1993). This information was collected from KPMG Global Tax Survey. To control for period- and country-specific effects, I included a series of dummies for year, home countries, and host countries.

4.3.3. Regression Strategy

I used panel lagged Tobit estimation model for the empirical analyses (e.g., Tobin, 1985). I adopted Tobit panel instead of linear panel estimation models because the dependent variable, EMNEs' R&D expenditures cannot be less than zero (in my sample 12% of the observations reported zero R&D expenditures[19]). Tobit models can be used to address this corner solution issue (McDonald and Moffitt, 1980). In the panel regressions, I adopted random effects rather than fixed effects models because fixed effects models are technically unavailable in non-linear models such as Tobit (Greene, 2004).

Most variables were measured in logarithmic form (the exceptions are current and solvency ratios, tax burden, and dummies), following the Cobb-Douglass logarithm-logarithm transformation of production resources (e.g., Either, 1986; Keller, 2002, 2004)[20]. The logarithmic transformation presents several advantages. First, taking the logarithm transformation of a value suggests relative change or growth of the value, and can thus reduce unit root concerns (i.e., EM parent's R&D expenditures and host-market technological resources are both expanding simply because of a general global growing trend in innovation) (e.g., Godfrey, McAleer, and McKenzie, 1988). Second, the Gravity model of international economics suggests that a logarithm-logarithm function of both home and host markets' sizes and their distance can capture potential economic relations between the two markets, which is an important control variable as shown above (Bergstrand, 1989). Third, results of a logarithm-logarithm econometric model show

[19] I removed all observations that had zero R&D expenditure in all years between 2000 and 2008 but kept those that reported zero values in some of the years only.
[20] For those measures with zero values, I added one to the values before taking the logarithm.

directly the scale-free marginal effects of an independent variable on the dependent variable (Greene, 2004).

Last, since knowledge transfer takes time, I used 4-year lagged values of the measurements for technological resources in host countries in the main regression models. I followed Mansfield (1985) and Mansfield and Romeo (1980), who found that knowledge spillovers of MNEs to local firms in a host market took on average four years. Other scholars have argued that time needed for technology diffusion varies depending on many factors (e.g., information barriers) and can even be "stochastic" (Keller, 2004: 755). Therefore, for robustness checks, I also used alternative lag values for technological resources in host markets (between 0 and 5).

4.3.3.1. Endogeneity

A potential concern of the empirical analyses is that firms' decisions to enter countries with rich technological resources may be endogenous (e.g., such decisions and their R&D spending at home may be determined by some common, unobservable factors). In this case, the Tobit estimator is biased and inconsistent (Greene, 2004). I dealt with the potential endogeneity issue in three ways. As mentioned earlier, I used logarithmic values for the dependent variable to measure the growth of R&D expenditures, which controls for the trend in R&D activities and reduces problems of endogeneity (Either, 1986; Keller, 2002, 2004). Second, I used lagged values of technological resources in developed markets to predict a firm's current R&D investment level, which ensures the direction of causality (Granger, 1969, 1980; Jung and Marshall, 1985). Third, I adopted Hausman tests to assess the extent to which endogeneity of host country resources is a serious problem and the necessity to resort to alternative methods (Baum, 2006; Hausman, 1978; Wooldridge, 2002). To implement the Hausman tests, I chose an instrumental variable (IV) – the effective corporate tax rate of the host market, which has no direct effects on the R&D activities of a parent firm that is registered in different taxation legislation but determines the systematic financial stress on host-market economic activities such as innovation. In Step One, I regressed each of the three measures for the independent variable on the IV. In Step Two, I included the residual term from Step One into the main econometric specification, and tested the null hypothesis that the parameter estimate for the residual is zero – if the estimate is significantly different from zero, there is endogeneity.

Table 11 reports the first step results which suggest that the effective corporate tax rate of the host market is a good IV because it is significantly correlated with all three measures for host country technological resources. Table 12 reports the second step results with the T-test for the significance of the residual's parameter estimate. Table 12 shows that the estimates for the residuals collected in Step One are not significantly different from zero, which suggests that endogeneity is not a problem, and allows us to use the original econometric specification. I also replicated the tests by using the summation measures for the host market's technological resources and by using different year lags, and found similar results.

Insert Table 11 here

Insert Table 12 here

4.3.4. Results

Table 13 presents summary statistics and the correlation matrix for all the variables, which suggest that multi-collinearity is not a concern for the study.

Insert Table 13 here

Table 14 reports regression results using three different measures for the independent variable. Results show supportive evidence for my hypothesis when technological resources in the host market are measured by R&D. Both R&D measures 1 (host-market number of R&D employment) and 2 (host-market dollar value of R&D investments) have statistically significant, positive effects on the R&D expenditures of EMNEs' parent companies in the home markets. For instance, Model 1 shows that when the number of industry-level R&D employment in a DM host market increased by 1% four years ago, the current R&D expenditures of the EM parent increase by 0.20%; Model 3 shows that when the dollar value of industry-level R&D investments in a DM host market increased by 1% four years ago, the current R&D expenditures of the EM parent increase by 0.10%. In addition, the overall explanatory power of the econometric specification is strong; Chi2 values (goodness of fit tests) for all models are high and P-values (probability to reject the significance of all variables) are consistently close to zeros for all models.

Insert Table 14 here

However, results using measure 3 (host-market number of patents applied) suggest that an EM parent with affiliates in a patent-rich DM is not significantly more active in R&D investments. I speculate that as patents represent codified, quantified knowledge and are tradable in the market, EMNEs can access such knowledge through market transactions (e.g., direct acquisitions of patents, licensing) (David, 1992; Grabowski, 1968; Griliches, 1984). Therefore, even if EMNEs have no direct presence in a patent-rich host market, they can still tap into patent resources in that market.

Some results for the control variables are worth noting. First, the positive and significant effects of home R&D environment suggest that a R&D-active environment at home encourages the parent companies to be more technologically active. Second, both home and host market sizes have positive effects on parent companies' R&D, which suggests that high fixed costs related to R&D activities require access to large markets. I also found that the geographic distance between home and host markets has a negative effect on parent firms' technological capabilities, confirming the idea that any international knowledge diffusion is likely to decay over distance (Conley and Ligon, 2002; Maurseth and Verspagen, 2002; Sjöholm, 1996; Keller, 2004). Last, the results that firm size has a positive effect and firm age has a negative effect on parent companies' R&D expenditure confirm prior findings that large firms are more capable of investing in R&D activities but old firms are less motivated to be innovative (e.g., Balasubramanian and Lee, 2008; Hansen, 1992; Shefer and Frenkel, 2005).

4.3.5. Robustness Checks

I conducted several sets of tests for robustness checks. First, I dropped Israeli companies from my sample because these companies are possibly more technologically advanced than firms from other emerging economies, and I found similar patterns of results. Second, I relaxed the assumption based on Mansfield (1985) and Mansfield and Romeo (1980) that a four-year time lag is needed for technology diffusion. Instead, I used a wider range of possible numbers of year lags (between 0 and 5). Table 15 shows the results using my first measure of technological resources in the host market. Specifically, I found that host country number of R&D employment in the current year or one to five years ago generates significant, positive spillover benefits that improve EMNEs' technological capabilities. These results are highly consistent with my main regression results in Table 14. I further replicated these robustness tests using measures 2 and 3,

and obtained similar results as those in Table 14, that is, host market R&D investments have significant, positive effects on EMNEs' technological capabilities, whereas host market patents have insignificant effects.

Insert Table 15 here

Finally, I adopted alternative composite measures for host market technological resources. I first used the mean values of the measures for technological resources weighted by host market real GDP. I chose host country market size GDP as the weight because according to the market-seeking view (e.g., Buckley et al., 2007), an EMNE tends to focus more on larger economies which present potentially more economic opportunities. The second alternative measure is the mean value of the measures for technological resources weighted by the home-host market geographic distance. Since it is relatively easy for an EM parent's employees to travel to a closer foreign market for R&D related collaborations and interactions (e.g., Sjöholm, 1996), there might be more opportunities for an EM parent to access R&D resources in a more proximate location. Table 16 shows the results for these alternative independent variables, which are again very similar to the previous regression results; that is, R&D-related measures have consistently positive and significant impacts, whereas the number of patents does not show any significant effect.

Insert Table 16 here

4.4. Conclusion and Discussion

This study focuses on the ability of emerging market MNEs to augment their technological capabilities by seeking and transferring knowledge from developed markets. Although it has been well recognized that OFDI in developed markets is in large part driven by knowledge seeking by EMNEs (Braconier, Ekholm, and Knarvik, 2001; Makino, Lau, and Yeh, 2002; Mathews and Zander, 2007; Luo and Tung, 2007; Rui and Yip, 2008; Deng, 2009), little is known about whether and to what extent such OFDI does in fact generate positive knowledge spillover effects that augment the technological capabilities of the EMNEs. My study contributes to this research topic. I argued that as EMNEs actively seek advanced knowledge overseas, they tend to increase their R&D investments at home in order to increase their ability to absorb and deploy overseas knowledge, as

well as to combine external with existing knowledge to innovate. Thus, the increased R&D spending level results in improved technological capabilities of EMNEs. Using a panel dataset of 493 EMNEs from 20 EMs over the period 2000-2008, and controlling for possible endogeneity, I found robust evidence that investing in host markets that are rich in technological resources contributes to the technological development of EMNEs. Specifically, I found that reverse knowledge transfer from subsidiaries in countries with rich R&D input resources (measured by R&D employment or R&D investments) leads to increased R&D spending by EM parent firms at home.

My results also suggest that although investing in host countries with rich R&D input knowledge improves technological capabilities of EM parent companies, investing in countries with rich patents does not. I offer several possible explanations for the results. First, R&D input is probably a more proper measure for technological knowledge than patents because R&D input may lead to innovation output beyond patents (Horstmann, MacDonald, and Slivinski, 1985).

Second, the literature on knowledge characteristics can shed light on my results. Relatively speaking, R&D input knowledge (e.g., experience and skills of R&D personnel) is more tacit (i.e., difficult to codify and articulate) and unobservable in nature (i.e., difficult for competitors to observe and learn), whereas patent knowledge is more explicit and observable (Cummings and Teng, 2003; Minbaeva, 2007; Zander and Kogut, 1995). Indeed, patents represent codified and standardized knowledge and can be traded in an open market (Cummings and Teng, 2003; Griliches, 1984; Minbaeva, 2007; Simonin, 1999; Teece, 1988; Zander and Kogut, 1995). EMNEs could therefore in principle rely on open markets to obtain patents and their presence in host countries is not required[21]. However, to obtain tacit and unobservable R&D input knowledge, EMNEs need to be present in the host countries and actively interact with knowledge holders in developed markets (Grant, 1996; Kogut and Zander, 1993; Lyles and Salk, 1996). I note as well that patents, by their nature, are designed to protect inventors, allow access only through licensing agreements or other forms of rights acquisition, and thus may prevent unwanted (albeit imperfectly) knowledge spillovers by, for instance, unpaid imitation and duplication of patent codes (e.g., Cohen, Goto, Nagata, Nelson, and Walsh, 2001; Owen-Smith and

[21] It is worth noting that acquiring patents and absorbing/utilizing patents are two different concepts; after acquiring the patents, EMNEs need to spend considerable resources in absorbing and leveraging knowledge embedded in the patents.

Powell, 2004; Schmidt, 2006).

My findings have three key implications for practices related to knowledge seeking through OFDI. First, EMNEs interested in knowledge acquisition should actively conduct FDI in markets that are rich in technological resources. Several real life examples (e.g., Geely's acquisition of Volvo) suggest that EMNEs pay attention to technological resources embedded in firms in developed markets (People's Daily, 2010). My study suggests that they should also attach importance to the richness of technological resources in a host market in general. Such market-industry level of knowledge resources in a host market can also generate significant spillovers on EMNEs at home.

The second implication of my study is that for EMNEs that seek knowledge to augment their technological capabilities, they should probably pay more attention to innovation input captured by R&D investment and R&D employment than innovation output reflected by number of patents in host countries.

The final and perhaps the most important conclusion is that EMNE can indeed augment their technological capabilities through a combination of reverse spillovers and knowledge transfer. However, in order to benefit from reverse knowledge spillovers EMNEs will have to invest in augmenting their absorptive and utilization capacities.

Future studies can extend my research in multiple ways. First, future studies can investigate factors that moderate the knowledge spillover effects of OFDI in developed markets. It will be a very valuable extension to investigate the detailed mechanisms how reverse spillover effects take place. For instance, a DM subsidiary's membership of and distance to an innovation cluster such as Silicon Valley may have moderating impact. Globerman et al. (2005), for instance, find that clusters have boundaries, and Canadian firms located within or less distant to greater Toronto area, home to the largest number of technology firms, benefit more from spillovers in terms of firm growth and survival. It will be valuable to identify whether one specific mechanism (e.g., membership of an innovative cluster) is more effective than another (e.g., position in local supply chain of technology-embodied intermediate products). Some other potential moderating factors include firm-level factors such as absorptive capacity (Cohen and Levinthal, 1990; Griffith, Redding, and Reenen, 2003), industry-level factors such as industry competition (Sakakibara, 2002), and country-level factors such as capacity of host-market innovation

networks (Muller and Zenker, 2001; Zhao, 2006).

Second, to more fully capture EMNEs' technological capabilities, I encourage future studies to adopt innovation output measures such as number of patents, patent citations, number of new products, and new product sales (Comanor and Scherer, 1969; Acs, Anselin, and Varga, 2001; Makri, Hitt, and Lane, 2010). Future studies might also examine how investments in developed countries affect innovation efficiency of EMNEs (i.e., efficiency in the transformation of innovation input into output). Since the knowledge levels of subsidiaries as well as effectiveness of knowledge transfer to parent companies are also determined by the operational modes of subsidiaries (e.g., majority- or minority ownership) (e.g., Blomström and Sjöholm, 1999), and the mode of entry (e.g., Greenfield or mergers and acquisitions) (e.g., Belderbos, 2003; Grünfeld and Sanna-Randaccio, 2005), the third potential extension is to address whether and how the degree of spillovers differs across different operational and entry modes.

Last, future studies can place more emphasis on the nature or categories of technological knowledge (e.g., tacit versus codified, simple versus complex, dependent versus independent of a system, and observable and unobservable in practice), and elaborate how the nature of knowledge affects effectiveness of reverse knowledge transfer (Minbaeva, 2007; Simonin, 1999; Teece, 1988; Winter, 1988; Zander and Kogut, 1995). Related, in this study, only intra-industry spillovers are tested. Future studies can replicate the tests by examining the effectiveness of inter-industry spillovers through OFDI, and comparing the efficacy between intra- and inter-industry spillovers.

5. General Conclusion

The three papers presented above contribute to our understanding of EMNEs, and of IB and global strategy in general. Papers 1 and 2 are among the first attempts to investigate the effects of domestic institutions, particularly at sub-national levels, on internationalization activities. Paper 3 is among the first studies to find reverse spillover effects (i.e., from foreign subsidiaries in a host location) on parent firms at home. Together, the three papers suggest that internationalization of EMNEs is very much home-related (Rugman and Collinson, 2008; Wei, 2010). This relationship is twofold. First, both entry decisions and choice of entry mode are influenced by an EMNE's home institutional environment, both directly and indirectly (through the mediation of market-related firm capabilities). Second, EMNEs are recursive after entry: through technology spillovers in DMs and transfers from DM subsidiaries to parent firms back home, EMNEs investing in DMs rich in technological resources benefit from positive spillover effects that augment their proprietary technological capabilities at home. In addition, the positive effect of institutional development for a market economy on market-related firm capabilities such as technological capabilities, documented in Papers 1 and 2, also suggests that transfer of technological knowledge back home is critical for EMNEs, which in general facing a domestic environment of market-supporting institutional reform (e.g., Wright et al., 2005).

These papers shed light on theories of IB and global strategy. First, Papers 1 and 2 suggest that determinants of FDI, such as location (e.g., country-specific advantage (CSA) and locational advantage), firm capability, and TC (or internationalization) factors suggested by Dunning's eclectic theory, are not parallel; instead, they should be reorganized into an integrative system. Specifically, the nature of institutional factors at home as one of CSAs or locational advantages can influence firm capabilities characteristics of local firms (Narula, 2011); in a cross-institutional environment (e.g., from EMs to DMs), the relevance of firm capabilities to the surrounding institutions needs to be considered in evaluating the benefits of internalization. Second, Paper 3 adds value to the literature on IB and global strategy by finding that subsidiaries can serve as competence-creating agencies (e.g., Cantwell and Mudambi, 2005). All three papers

together suggest that an EMNE's firm capabilities can be influenced by both home- (e.g., institutions) and host environments (e.g., technological resources). All in all, the three papers build a new fundamental framework to study the relationships among institution, internationalization, and innovation of MNEs.

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Tables

Table 1. Correlation Matrix and Summary Statistics (Paper 1)

		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
(1)	OFDI-DM	1.00															
(2)	Market-related Firm capability	0.15	1.00														
(3)	Institutional quality (WB survey, city level)	0.12	0.08	1.00													
(4)	Firm size	0.05	0.04	-0.05	1.00												
(5)	Overseas assets as % of total assets	-0.13	0.12	-0.05	-0.21	1.00											
(6)	Exports as % of sales	0.04	-0.03	-0.18	-0.05	0.41	1.00										
(7)	Whether having prior OFDI in a DM	0.31	0.04	0.09	0.10	-0.06	-0.16	1.00									
(8)	Whether state-owned	-0.03	0.01	-0.27	0.28	-0.12	-0.01	0.03	1.00								
(9)	Physical infrastructure quality	0.08	0.13	-0.11	0.01	-0.04	0.18	-0.14	0.00	1.00							
(10)	Home market size	0.09	0.01	0.54	-0.08	0.02	0.01	-0.01	-0.13	-0.04	1.00						
(11)	Home income level	0.00	0.27	0.41	-0.05	0.13	-0.01	0.00	-0.07	-0.09	0.49	1.00					
(12)	Provincial ratio of foreign assets to total assets	-0.05	-0.15	0.51	-0.06	0.14	-0.16	0.07	-0.12	-0.33	0.43	0.70	1.00				
(13)	Provincial ratio of trade-to-GDP ratio	0.06	0.07	0.62	-0.05	-0.07	-0.24	0.13	-0.08	-0.30	0.55	0.44	0.70	1.00			
(14)	Sector dummy for manufacturing	0.06	0.19	0.06	-0.02	-0.14	0.06	-0.06	-0.06	-0.03	0.10	-0.14	-0.09	0.07	1.00		
(15)	Sector dummy for finance, trade, and services	-0.05	-0.14	-0.08	0.02	0.22	0.06	-0.04	0.10	0.04	-0.11	0.14	0.08	-0.13	-0.85	1.00	
(16)	Sector dummy for transport, utility, and infrastructure	-0.04	-0.13	0.01	0.01	-0.10	-0.21	0.17	-0.05	-0.02	0.00	0.02	0.02	0.08	-0.46	-0.09	1.00
	Statistics																
	Mean	0.14	0.44	0.52	19.55	0.50	0.73	0.06	0.11	-1.37	5.97	4.20	25.17	8.35	0.82	0.14	0.05
	Standard deviation	0.35	0.07	0.90	1.43	0.36	0.37	0.24	0.32	1.95	0.32	0.20	17.94	7.55	0.39	0.35	0.21
	Number of observations	553	553	553	553	553	553	553	553	553	553	553	553	553	553	553	553

Table 2. Step 1 OLS Estimation Results for Causal Mediation Analysis (Paper 1)
Regressing Market-related Firm capability on Institutional Quality (WB Survey)

	Coef.	Std. Err.	t	P>t	
Institutional quality (WB survey, city level)	0.0223	0.0046	4.8900	0.0000	***
Control Variables					
Firm size	0.0001	0.0022	0.0600	0.9500	
Overseas assets as % of total assets	-0.0163	0.0095	-1.7200	0.0860	*
Exports as % of sales	0.0037	0.0094	0.3900	0.6930	
Whether having prior OFDI in a DM	0.0108	0.0127	0.8500	0.3950	
Whether state-owned	0.0120	0.0100	1.1900	0.2340	
Physical infrastructure quality	0.0072	0.0016	4.3700	0.0000	***
Home market size	0.0266	0.0126	2.1200	0.0350	**
Home income level	0.1298	0.0227	5.7100	0.0000	***
Provincial ratio of foreign assets to total assets	0.0001	0.0003	0.2400	0.8090	
Provincial ratio of trade-to-GDP ratio	0.0021	0.0007	3.1700	0.0020	***
Sector dummy for finance, trade, and services	-0.0156	0.0090	-1.7400	0.0830	*
Sector dummy for transport, utility, and infrastructure	-0.0461	0.0145	-3.1900	0.0020	***
Constant	0.8276	0.1070	7.7400	0.0000	***
Statistics					
Number of observations	553				
F	9.5800				
Probability > F	0.0000	***			
R-squared	0.1876				
Adjusted R-squared	0.1680				
Root mean squared error (MSE)	0.0677				

Note. *p<0.1, **p<0.05, ***p<0.01

Table 3. Step 2 Logit and Probit Estimation Results for Causal Mediation Analysis (Paper 1) Regressing OFDI-DM on Market-related Firm capability and Institutional Quality (WB Survey)

	Logit				Probit			
	Coef.	Std. Err.	z	P>z	Coef.	Std. Err.	z	P>z
Institutional quality (WB survey, city level)	0.4619	0.2513	1.8400	0.0660*	0.2310	0.1326	1.7400	0.0820*
Market-related Firm capability	27.7865	8.2081	3.3900	0.0010***	10.7805	2.5215	4.2800	0.0000***
Control Variables								
Firm size	0.0379	0.1107	0.3400	0.7320	0.0309	0.0583	0.5300	0.5960
Overseas assets as % of total assets	-1.1683	0.4954	-2.3600	0.0180**	-0.6659	0.2630	-2.5300	0.0110**
Exports as % of sales	1.0368	0.4912	2.1100	0.0350**	0.6351	0.2577	2.4600	0.0140**
Whether having prior OFDI in a DM	3.0463	0.4928	6.1800	0.0000***	1.7528	0.2766	6.3400	0.0000***
Whether state-owned	-0.5785	0.5627	-1.0300	0.3040	-0.3156	0.2894	-1.0900	0.2750
Physical infrastructure quality	0.1855	0.0977	1.9000	0.0580*	0.0958	0.0498	1.9300	0.0540*
Home market size	0.3801	0.7191	0.5300	0.5970	0.0892	0.3564	0.2500	0.8020
Home income level	0.5765	1.4491	0.4000	0.6910	0.6345	0.6838	0.9300	0.3530
Provincial ratio of foreign assets to total assets	-0.0451	0.0217	-2.0800	0.0370**	-0.0183	0.0098	-1.8700	0.0610*
Provincial ratio of trade-to-GDP ratio	0.0770	0.0536	1.4400	0.1510	0.0261	0.0239	1.0900	0.2740
Sector dummy for finance, trade, and services	0.3466	0.4793	0.7200	0.4700	0.2062	0.2473	0.8300	0.4040
Sector dummy for transport, utility, and infrastructure	-1.2341	0.9035	-1.3700	0.1720	-0.6189	0.4577	-1.3500	0.1760
Constant	-20.1991	6.9425	-2.9100	0.0040***	-9.9333	3.2213	-3.0800	0.0020***
Statistics								
Number of observations	553				553			
LR chi-square	109.2600				106.3800			
Probability > chi-square	0.0000***				0.0000***			
Pseudo R-squared	0.2390				0.2327			
Log likelihood	-173.9472				-175.3877			
Direct- and indirect effects								
Average causal mediation effect (ACME)	0.0238	58.09%***			0.0202	51.57%***		
Direct effect	0.0172	41.91%*			0.0190	48.43%*		
Total effect	0.0410	*			0.0392	*		

Note. *p<0.1, **p<0.05, ***p<0.01

Table 4. Step 1 OLS Estimation Results for Robustness Check (Paper 1)
Regressing Market-related Firm capability on Institutional Quality (IFC Survey)

	Coef.	Std. Err.	t	P>t	
Institutional quality (IFC survey, provincial level)	0.1110	0.0467	2.3800	0.0180	**
Control Variables					
Firm size	0.0007	0.0022	0.3400	0.7330	
Overseas assets as % of total assets	-0.0176	0.0096	-1.8300	0.0680	*
Exports as % of sales	0.0002	0.0095	0.0200	0.9860	
Whether having prior OFDI in a DM	0.0120	0.0129	0.9300	0.3520	
Whether state-owned	0.0024	0.0100	0.2400	0.8080	
Physical infrastructure quality	0.0064	0.0017	3.8300	0.0000	***
Home market size	0.0308	0.0133	2.3100	0.0210	**
Home income level	0.1276	0.0231	5.5100	0.0000	***
Provincial ratio of foreign assets to total assets	0.0001	0.0003	0.2900	0.7710	
Provincial ratio of trade-to-GDP ratio	-0.0019	0.0007	-2.6200	0.0090	***
Sector dummy for finance, trade, and services	-0.0157	0.0092	-1.7100	0.0870	*
Sector dummy for transport, utility, and infrastructure	-0.0499	0.0147	-3.4000	0.0010	***
Constant	0.7481	0.1074	6.9700	0.0000	***
Statistics					
Number of observations	553				
F	7.9200				
Probability > F	0.0000	***			
R-squared	0.1603				
Adjusted R-squared	0.1401				
Root mean squared error (MSE)	0.0688				

Note. *p<0.1, **p<0.05, ***p<0.01

Table 5. Step 2 Logit and Probit Estimation Results for Robustness Check (Paper 1)
Regressing OFDI-DM on Market-related Firm capability and Institutional Quality (IFC Survey)

	Logit				Probit			
	Coef.	**Std. Err.**	**z**	**P>z**	**Coef.**	**Std. Err.**	**z**	**P>z**
Institutional quality (IFC survey, provincial level)	10.7177	3.6947	2.9000	0.0040***	5.3123	1.7986	2.9500	0.0030***
Market-related Firm capability	30.1720	7.9331	3.8000	0.0000***	13.9816	2.8730	4.8700	0.0000***
Control Variables								
Firm size	0.0757	0.1161	0.6500	0.5140	0.0348	0.0602	0.5800	0.5630
Overseas assets as % of total assets	-1.1962	0.5046	-2.3700	0.0180**	-0.6911	0.2694	-2.5700	0.0100**
Exports as % of sales	0.9474	0.4883	1.9400	0.0520*	0.6171	0.2599	2.3700	0.0180**
Whether having prior OFDI in a DM	2.9827	0.4940	6.0400	0.0000***	1.7309	0.2783	6.2200	0.0000***
Whether state-owned	-0.6893	0.5543	-1.2400	0.2140	-0.3610	0.2872	-1.2600	0.2090
Physical infrastructure quality	0.2438	0.0984	2.4800	0.0130**	0.1303	0.0519	2.5100	0.0120**
Home market size	-0.0194	0.7687	-0.0300	0.9800	-0.1186	0.3808	-0.3100	0.7550
Home income level	-0.2397	1.5271	-0.1600	0.8750	0.4523	0.7035	0.6400	0.5200
Provincial ratio of foreign assets to total assets	-0.0588	0.0244	-2.4100	0.0160**	-0.0212	0.0103	-2.0500	0.0400**
Provincial ratio of trade-to-GDP ratio	0.0491	0.0583	0.8400	0.3990	0.0008	0.0269	0.0300	0.9760
Sector dummy for finance, trade, and services	0.3800	0.4806	0.7900	0.4290	0.2383	0.2492	0.9600	0.3390
Sector dummy for transport, utility, and infrastructure	-1.2427	0.8978	-1.3800	0.1660	-0.6125	0.4590	-1.3300	0.1820
Constant	-20.0528	6.6994	-2.9900	0.0030***	-11.3668	3.1651	-3.5900	0.0000***
Statistics								
Number of observations	553				553			
LR chi-square	115.9600				113.5900			
Probability > chi-square	0.0000***				0.0000***			
Pseudo R-squared	0.2537				0.2485			
Log likelihood	-170.5981				-171.7841			
Direct- and indirect effects								
Average causal mediation effect (ACME)	0.1014	22.11%**			0.1013	21.37%**		
Direct effect	0.3574	77.89%***			0.3728	78.63%***		
Total effect	0.4589	**			0.4740	**		

Note. *p<0.1, **p<0.05, ***p<0.01

Table 6. Selected OFDI Measures for the Largest Five EMs

	OFDI Flow ($M)				OFDI/GDP (%)			M&A Purchases ($M)				# of Top 100 EMNEs by Foreign Revenue
	2005-2007	2008	2009	2010	2008	2009	2010	2005-2007	2008	2009	2010	2010
China	18630	52150	56530	68000	2.8	2.6	2.6	4487	37941	21490	29201	9
Russia	27278	55594	43665	51697	15.0	16.5	17.1	9378	16634	7599	9082	9
India	11501	19397	15929	14626	4.4	3.7	2.7	12558	13482	291	26421	7
Mexico	6830	1157	7019	14345	0.5	3.7	6.8	8004	-463	3247	3306	4
Brazil	12595	20457	-10084	11519	6.7	-3.8	3.1	10640	5243	2501	7757	3

Note. Adapted from UNCTAD (2011).

Table 7. Correlation Matrix and Summary Statistics (Paper 2)

Variables		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
(1)	Full-ownership entry	1.00										
(2)	Technological capability	0.09	1.00									
(3)	Institutional quality	0.29	0.06	1.00								
(4)	Prior experience	0.09	0.04	-0.02	1.00							
(5)	Firm size of EMNE	-0.01	0.07	-0.07	0.05	1.00						
(6)	Relative firm size of the subsidiary	0.01	-0.07	0.07	-0.05	**-1.00**	1.00					
(7)	Home market level of economic development	-0.17	0.00	-0.65	-0.05	0.17	-0.17	1.00				
(8)	Host market growth	-0.01	-0.02	0.04	-0.05	-0.02	0.02	-0.07	1.00			
(9)	Host market-industry R&D intensity (SIC2)	0.11	-0.05	0.01	0.11	0.04	-0.04	0.13	0.05	1.00		
(10)	Common language between home and host markets	0.13	0.00	0.25	0.21	0.02	-0.02	-0.27	0.02	0.09	1.00	
(11)	Colonial relationship in history	0.00	-0.01	0.05	-0.03	-0.04	0.04	-0.14	-0.04	-0.34	0.37	1.00
	Statistics											
	Mean	0.70	0.00	0.00	0.16	3.73	-3.36	7.86	0.81	2.43	0.52	0.13
	Standard deviation	0.46	0.99	4.73	0.43	4.95	4.46	0.92	2.42	0.65	0.50	0.34
	Number of observations	492	492	492	492	492	492	492	492	492	492	492

Table 8. Step 1 OLS Estimation Results for Causal Mediation Analysis (Paper 2)
Regressing Mediation Variable Technological Capability on Treatment Variable Institutional Quality

	Coef.	Std. Err.	t	P>t	
Institutional quality	0.0227	0.0116	1.9600	0.0500	*
Control Variables					
Firm size of the EMNE	0.0121	0.0074	1.6500	0.1000	
Home market level of economic development	0.0720	0.0418	1.7300	0.0850	*
Constant	-0.6281	0.3523	-1.7800	0.0750	*
Home-country dummies	Controlled				
Year dummies					
Statistics					
Number of observations	492				
F	1.7400				
R-squared	0.0126				
Root mean squared error (MSE)	0.9927				

Note. *p<0.1, **p<0.05, ***p<0.01

Table 9. Step 2 Logit and Probit Estimation Results for Causal Mediation Analysis (Paper 2) Regressing Full-Ownership Entry on Technological Capability and Institutional Quality

	Logit				Probit			
	Coef.	**Std. Err.**	**z**	**P>z**	**Coef.**	**Std. Err.**	**z**	**P>z**
Institutional quality	0.1445	0.0294	4.9200	0.0000***	0.0894	0.0174	5.1500	0.0000***
Technological capability	0.1704	0.0972	1.7500	0.0800*	0.1058	0.0591	1.7900	0.0730*
Control Variables								
Prior experience	0.5236	0.2920	1.7900	0.0730*	0.3065	0.1655	1.8500	0.0640*
Relative firm size of the subsidiary	0.0026	0.0244	0.1100	0.9140	0.0014	0.0143	0.1000	0.9230
Home market level of economic development	-0.0224	0.0445	-0.5000	0.6150	-0.0118	0.0260	-0.4600	0.6490
Host market growth	0.1261	0.1587	0.7900	0.4270	0.0827	0.0931	0.8900	0.3740
Host market-industry R&D intensity (SIC2)	0.3654	0.1890	1.9300	0.0530*	0.2128	0.1094	1.9500	0.0520*
Common language between home and host markets	0.1472	0.2517	0.5800	0.5590	0.1011	0.1477	0.6800	0.4940
Colonial relationship in history	0.1029	0.3775	0.2700	0.7850	0.0509	0.2199	0.2300	0.8170
Constant	-1.1083	1.2439	-0.8900	0.3730	-0.7022	0.7296	-0.9600	0.3360
Home-country dummies Host-country dummies Industry dummies (SIC2) Year dummies	Controlled							
Statistics								
Number of observations	492				492			
LR chi-square	53.5100				57.4900			
Pseudo R-squared	0.0895				0.0906			
Log likelihood	-273.9530				-273.6264			
Direct- and indirect effects								
Average causal mediation effect (ACME)	0.0007*				0.0007*			
Direct effect	0.0252***				0.0261***			
Total effect	0.0259**				0.0269**			

Note. *p<0.1, **p<0.05, ***p<0.01

Table 10. Step 2 Logit and Probit Estimation Results for Robustness Check (Paper 2) Using 80% and 95% Cut-Off Points for Full Ownership

	80% Cut-Off Point								95% Cut-Off Point							
	Logit				Probit				Logit				Probit			
	Coef.	Std. Err.	z	P>z	Coef.	Std. Err.	z	P>z	Coef.	Std. Err.	z	P>z	Coef.	Std. Err.	z	P>z
Institutional quality	0.1490	0.0316	4.72000	0.0000***	0.0915	0.0181	5.06000	0.0000***	0.1384	0.0294	4.71000	0.0000***	0.0857	0.0173	4.95000	0.0000***
Technological capability	0.2384	0.1193	2.00000	0.0460**	0.1480	0.0707	2.09000	0.0360**	0.1828	0.1033	1.77000	0.0770*	0.1139	0.0621	1.84000	0.0730*
Control Variables																
Constant	-0.1954	1.3877	-0.14000	0.8880	-0.1502	0.7814	-0.19000	0.8480	-0.9385	1.2604	-0.74000	0.4560	-0.5964	0.7362	-0.81000	0.3360
Prior experience	0.2327	0.2997	0.78000	0.4370	0.1318	0.1673	0.79000	0.4310	0.4373	0.2881	1.52000	0.1290	0.2555	0.1636	1.56000	0.0640*
Relative firm size of the subsidiary	-0.0203	0.0265	-0.77000	0.4420	-0.0124	0.0151	-0.83000	0.4090	0.0041	0.0246	0.17000	0.8660	0.0022	0.0143	0.16000	0.9230
Home market level of economic development	-0.0313	0.0492	-0.64000	0.5250	-0.0167	0.0276	-0.61000	0.5440	-0.0214	0.0444	-0.48000	0.6310	-0.0113	0.0259	-0.44000	0.6490
Host market growth	0.0264	0.1793	0.15000	0.8830	0.0239	0.1005	0.24000	0.8120	0.1429	0.1618	0.88000	0.3770	0.0920	0.0942	0.98000	0.3740
Host market-industry R&D intensity (SIC2)	0.4065	0.2061	1.97000	0.0490**	0.2307	0.1159	1.99000	0.0460**	0.2426	0.1894	1.28000	0.2000	0.1408	0.1093	1.29000	0.0520*
Common language between home and host markets	0.3202	0.2704	1.18000	0.2360	0.2039	0.1546	1.32000	0.1870	0.3350	0.2523	1.33000	0.1840	0.2108	0.1478	1.43000	0.4940
Colonial relationship in history	0.0431	0.4160	0.10000	0.9170	0.0070	0.2330	0.03000	0.9760	-0.1354	0.3759	-0.36000	0.7190	-0.0902	0.2193	-0.41000	0.8170
Home-country dummies Host-country dummies Industry dummies (SIC2) Year dummies	Controlled															
Statistics																
Number of observations	492				492				492				492			
LR chi-square	63.7900				68.7000				51.6900				55.2700			
Pseudo R-squared	0.1179				0.1201				0.0850				0.0864			
Log likelihood	-242.0947				-241.4972				-271.3335				-270.9193			
Direct- and indirect effects																
Average causal mediation effect (ACME)	0.0009*				0.0009*				0.0008*				0.0008*			
Direct effect	0.0230***				0.0240***				0.0238***				0.0247***			
Total effect	0.0238**				0.0249**				0.0245**				0.0255**			

Note. *p<0.1, **p<0.05, ***p<0.01

Table 11. Step 1 Results for Hausman Test of Endogeneity (Paper 3)

	Measure 1	Measure 2	Measure 3
Effective corporate tax rate of host market	410.81**	-3.64*	802.16***
Constant	-6581.37	2625.38***	-98690.68***
Sigma u	16692.12***	6271.37***	155433.92***
Sigma e	17296.17***	1547.47***	3748.89***
Year dummies	Included		
Statistics			
Number of observations	1321	1057	1360
Number of left-censored observations	3	1	0
Chi-square	26.53	17.33	103.12
P-value	0.00	0.00	0.00

Note. *p<0.1, **p<0.05, ***p<0.01

Table 12. Step 2 Results for Hausman Test of Endogeneity (Paper 3)

	Measure 1	Measure 2	Measure 3
Residual from step 1	0.01	0.05	0.09
Host R&D measure	-0.08	1.10	-0.01
Firm age	37797.97*	43109.53*	35175.15*
Firm size	0.00***	0.00	0.00***
Current ratio	-2076.04	-1370.50	-1846.82
Solvency ratio	28.36	38.30	35.71
Home R&D environment	1.66***	2.05***	1.65***
Home market size	8951.79	10188.24	8038.31
Host market size	12616.60*	3262.57	5247.68
Home tax burden	-862.61	-573.26	-941.92
Weighted geographic distance	-1589.55	-2953.21	-629.85
Common official language	-6321.55	3934.85	-2739.67
Constant	-604162.27**	-387801.72	-383753.47
Sigma u	77389.85	83103.46	76555.37
Sigma e	60735.54	66505.32	59970.17
Year dummies	Included		
Host dummies			
Home dummies			
Statistics			
Number of observations	850	686	871
Number of left-censored observations	41	28	41
Chi-square	259.84	213.04	265.72
P-value	0.00	0.00	0.00

Note. *p<0.1, **p<0.05, ***p<0.01

Table 13. Correlation Matrix and Summary Statistics (Paper 3)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)
(1) Proprietary R&D activeness	1.00																
(2) Host 3SIC # of patent (mean)	0.21	1.00															
(3) Host 3SIC $ of R&D investments (mean)	0.10	0.20	1.00														
(4) Host 3SIC # of R&D employment (mean)	0.29	0.48	0.75	1.00													
(5) Host 3SIC # of patent (sum)	0.32	0.92	0.15	0.43	1.00												
(6) Host 3SIC $ of R&D investments (sum)	0.27	0.30	0.87	0.70	0.43	1.00											
(7) Host 3SIC # of R&D employment (sum)	0.41	0.52	0.67	0.92	0.62	0.81	1.00										
(8) Firm size	0.23	0.06	0.02	0.08	0.13	0.11	0.15	1.00									
(9) Firm age	-0.05	-0.10	-0.06	-0.09	0.01	0.06	0.01	0.13	1.00								
(10) Firm current ratio	-0.06	0.01	0.00	0.06	-0.01	-0.03	0.05	0.04	-0.01	1.00							
(11) Firm solvency ratio	0.06	-0.02	0.01	-0.01	-0.04	-0.03	-0.02	0.00	0.06	0.33	1.00						
(12) Home R&D environment	0.62	0.26	0.24	0.38	0.33	0.35	0.46	0.21	-0.03	-0.03	-0.03	1.00					
(13) Home market size	-0.06	0.01	0.09	0.04	0.00	0.06	0.01	0.07	-0.15	0.03	-0.09	-0.12	1.00				
(14) Host market size	0.20	0.89	0.16	0.48	0.81	0.25	0.52	0.09	-0.06	0.03	-0.01	0.22	-0.01	1.00			
(15) Weighted geographic distance	0.02	0.36	0.08	0.28	0.43	0.24	0.40	0.21	0.10	0.03	-0.03	0.42	0.03	0.33	1.00		
(16) Home tax burden	-0.02	0.15	0.10	0.16	0.21	0.20	0.24	-0.07	0.08	0.05	-0.03	0.20	-0.03	0.11	0.45	1.00	
(17) Common official language	0.01	0.29	0.12	0.26	0.32	0.22	0.36	0.14	0.22	0.06	-0.07	0.37	-0.05	0.26	0.54	0.46	1.00
Number of observations	1561	2721	2637	2170	2721	2637	2170	2550	2721	2551	2551	2630	2721	2721	2721	2721	2721
Mean	7.71	0.84	7.81	5.96	0.87	8.58	6.85	2.44	1.43	2.24	47.70	6.15	3.27	3.33	2.13	30.96	0.24
Standard deviation	2.42	0.07	1.76	2.25	0.08	1.98	2.58	0.60	0.30	4.12	26.62	2.75	0.03	0.04	0.08	5.92	0.37

Table 14. Panel Tobit Regression Results (Paper 3)

	Measure 1		Measure 2		Measure 3	
	Mean	Sum	Mean	Sum	Mean	Sum
	1	2	3	4	5	6
Independent Variable						
Host DM's technological resources (Lagged by 4 Years)	0.20***	0.22***	0.10*	0.11*	-0.06	-0.05
Control Variables						
Constant	-2.87	-0.06	-2.55	1.80	-1.74	0.58
Firm size	0.31***	0.28***	0.36***	0.32***	0.33***	0.30***
Firm age	-0.53	-0.91*	-1.04*	-1.45***	-0.95*	-1.30**
Current ratio	-0.51	-0.08	-12.36**	-11.66**	-11.92**	-11.29**
Solvency ratio	-0.82*	-0.74	-0.41	-0.39	-0.38	-0.36
Home R&D environment	1.15***	1.12***	0.71***	0.64***	0.68***	0.62***
Home market size	0.45***	0.37***	0.54***	0.43***	0.53***	0.49***
Host market size	-0.16	-0.11	-0.14	-0.12	-0.14	-0.11
Weighted geographic distance	-0.33	-0.50	-0.67**	-0.81***	-0.58**	-0.73**
Home tax burden	0.79	0.38	0.77	0.22	0.25	-0.14
Common official language	-0.63	-0.76	0.39	0.43	0.42	0.42
Sigma u	2.09***	2.01***	2.19***	2.14***	2.24***	2.20***
Sigma e	1.21***	1.21***	1.38***	1.37***	1.35***	1.35***
Year dummy	Included					
Home dummy						
Host dummy						
Statistics						
Number of observations	853	853	1053	1053	1084	1084
Number of left-censored observations	35	35	53	53	53	53
Chi-square	106.33	132.15	110.15	130.74	105.98	124.50
P-value	0.00	0.00	0.00	0.00	0.00	0.00

Note. *p<0.1, **p<0.05, ***p<0.01

Table 15. Panel Tobit Regression Results using Measure 1 for Robustness Check (Paper 3)

Measure 1	Using Host-Measure Means					Using Host-Measure Summations				
	7	8	9	10	11	12	13	14	15	16
	(No lag)	(Lag 1)	(Lag 2)	(Lag 3)	(Lag 5)	(No lag)	(Lag 1)	(Lag 2)	(Lag 3)	(Lag 5)
Independent Variable										
Host DM's industry-level $value of R&D	0.46***	0.29***	0.27***	0.22***	0.21***	0.46***	0.29***	0.29***	0.25***	0.22***
Control Variables										
Constant	-14.36**	-12.07	-11.65	-7.53	-1.62	-3.23	-2.27	-5.60	-3.30	0.78
Firm size	0.26***	0.23***	0.20***	0.18***	0.36***	0.25***	0.22***	0.19***	0.16***	0.31***
Firm age	-0.20	-0.44	-0.09	-0.30	-0.67	-0.83*	-0.99*	-0.60	-0.77	-1.02*
Current ratio	-7.58**	-10.38***	-5.03	-3.27	6.47	-6.83*	-9.77**	-4.66	-2.90	6.79
Solvency ratio	-0.16	0.01	-0.50	-0.79*	-1.08**	-0.12	0.03	-0.44	-0.72*	-1.01**
Home R&D environment	2.30***	1.74***	1.60***	1.45***	0.98***	2.22***	1.61***	1.55***	1.42***	0.96***
Home market size	0.56***	0.61***	0.55***	0.51***	0.43**	0.23**	0.32***	0.39***	0.41***	0.36***
Host market size	0.34*	0.25	0.15	0.02	-0.21	0.35*	0.24	0.16	0.04	-0.14
Weighted geographic distance	-1.10***	-0.99***	-0.55	-0.37	-0.31	-1.26***	-1.11***	-0.74**	-0.58*	-0.47
Home tax burden	-3.18**	-2.42*	-0.86	-0.37	0.52	-4.09***	-3.24**	-1.29	-0.71	0.04
Common official language	0.31	0.58	-0.30	-0.46	-0.70	0.51	0.70	-0.42	-0.60	-0.84
Sigma u	2.03***	2.13***	2.08***	2.13***	2.23***	1.98***	2.07***	1.96***	2.01***	2.17***
Sigma e	2.00***	1.78***	1.52***	1.32***	1.04***	2.00***	1.79***	1.52***	1.32***	1.04***
Year dummy Home dummy Host dummy	Included									
Statistics										
Number of observations	1559	1393	1188	1021	686	1559	1393	1188	1021	686
Number of left-censored observations	155	108	69	47	28	155	108	69	47	28
Chi-square	436.20	275.96	185.53	131.65	78.24	450.35	287.67	214.23	161.17	98.98
P-value	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Note. (1) *p<0.1, **p<0.05, ***p<0.01. (2) Host measures include independent variable and host market size.

Table 16. Panel Tobit Regression Results using Different Weights for Robustness Check (Paper 3) (Estimates for independent variables only)

	Host Measures Weighted by Host GDP						Host Measures Weighted by Distance					
	(No lag)	(Lag 1)	(Lag 2)	(Lag 3)	(Lag 4)	(Lag 5)	(No lag)	(Lag 1)	(Lag 2)	(Lag 3)	(Lag 4)	(Lag 5)
Host DM's industry-level $ value of R&D investments	0.51***	0.32***	0.30***	0.25***	0.22***	0.23***	0.23***	0.23***	0.24***	0.15**	0.12*	0.11*
Host DM's industry-level # of R&D employment	0.74***	0.48***	0.43***	0.35***	0.31***	0.31***	0.32***	0.33***	0.34***	0.22**	0.16*	0.16*
Host DM's industry-level number of patents	-0.13	-0.12	-0.12	-0.15	-0.07	-0.03	-0.12	-0.15	-0.16	-0.21	-0.1	-0.05

Note. (1) *p<0.1, **p<0.05, ***p<0.01. (2) Host measures include independent variable and host market size.

Figures

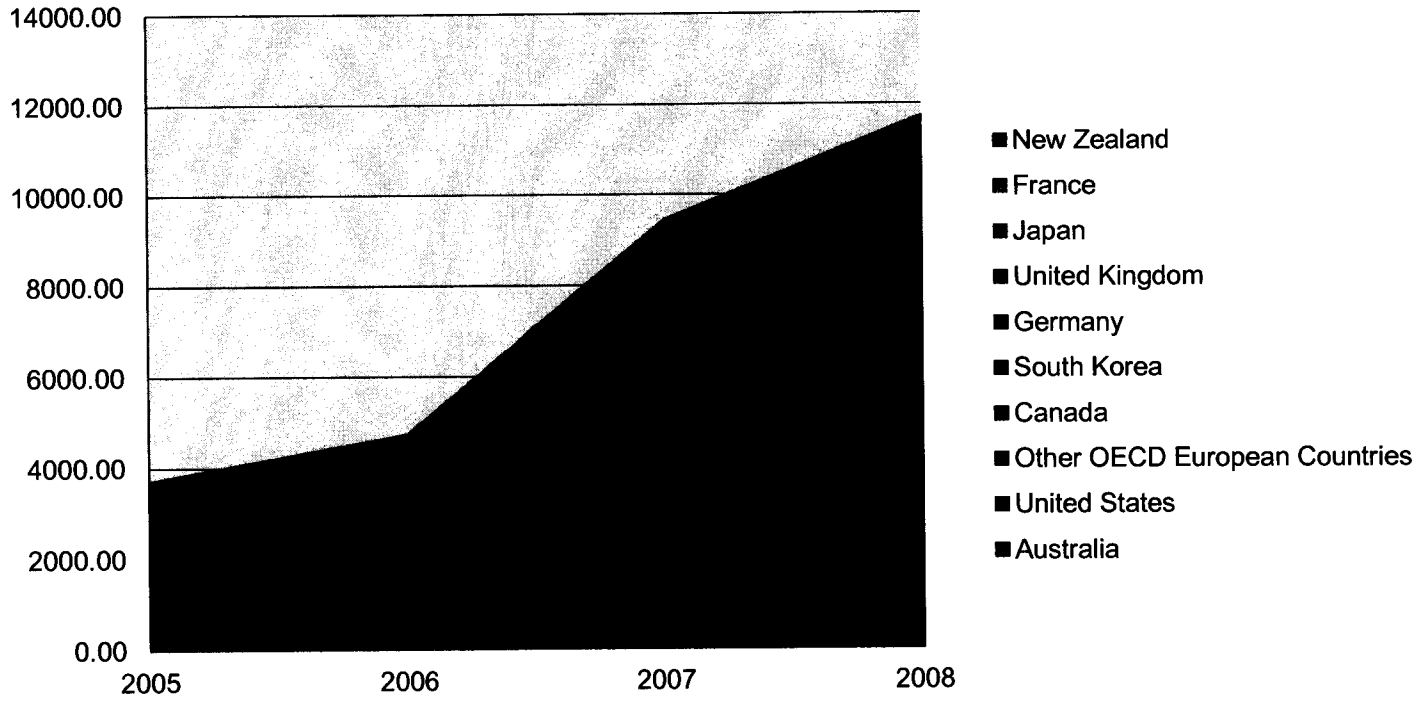

Figure 1. China's Outward FDI Flows to OECD Countries (Unit: Millions of USD)

Note. The data has included OFDI from financial sectors.

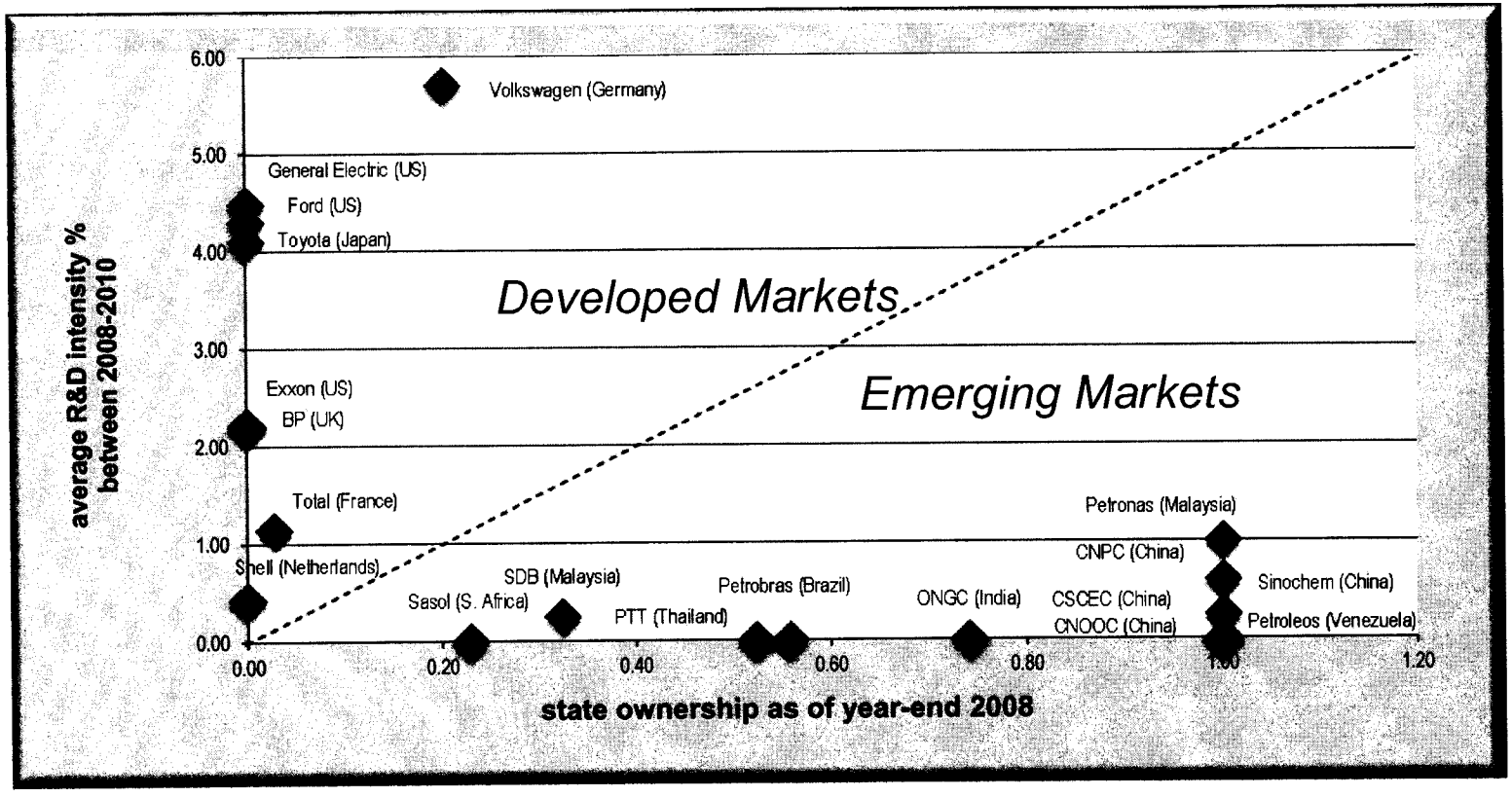

Figure 2. National Industry Leaders in DMs and EMs

Note. (1) Data are based on various sources, including each company's financial statements, WIRs 2008-2010 of UNCTAD, BvD Orbis, & Vale Columbia Center for Sustainable International Investment of Columbia University. (2) Service sectors such as finance and wholesales/retails, and highly regulated industries such as transport and utility are excluded.

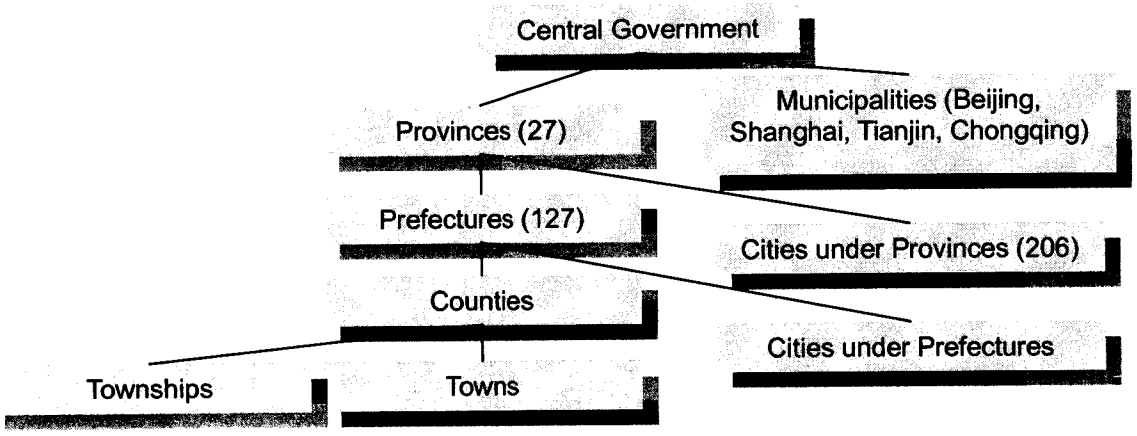

Figure 3. Level of Administration in China
Note. Adapted from Rao (2003).

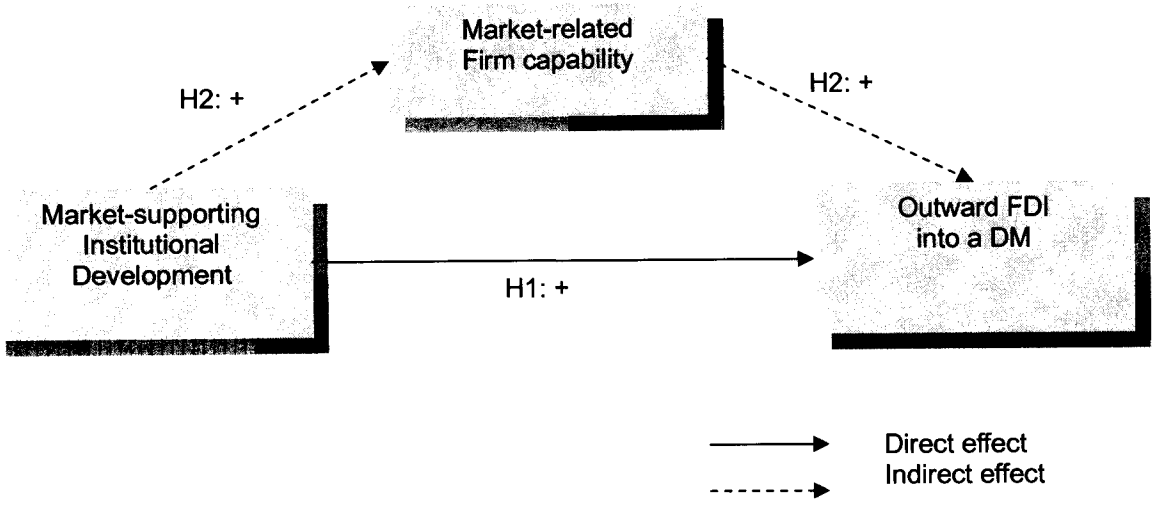

Figure 4. A Proposed Institutional Effect Framework of OFDI

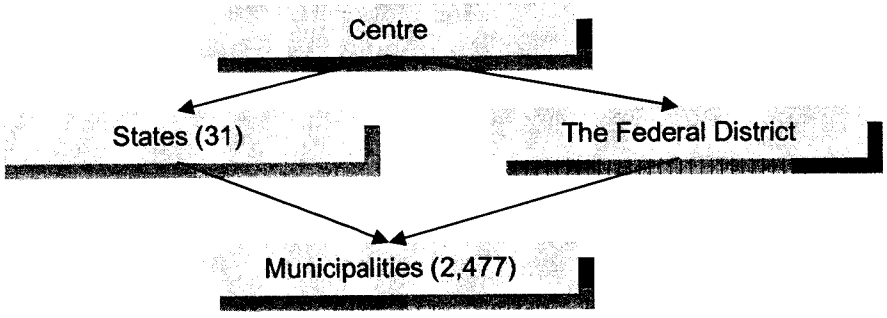

Figure 5. Level of Administration of Mexico
Note. Adapted from Hernández-Trillo and Jarillo-Rabling (2008).

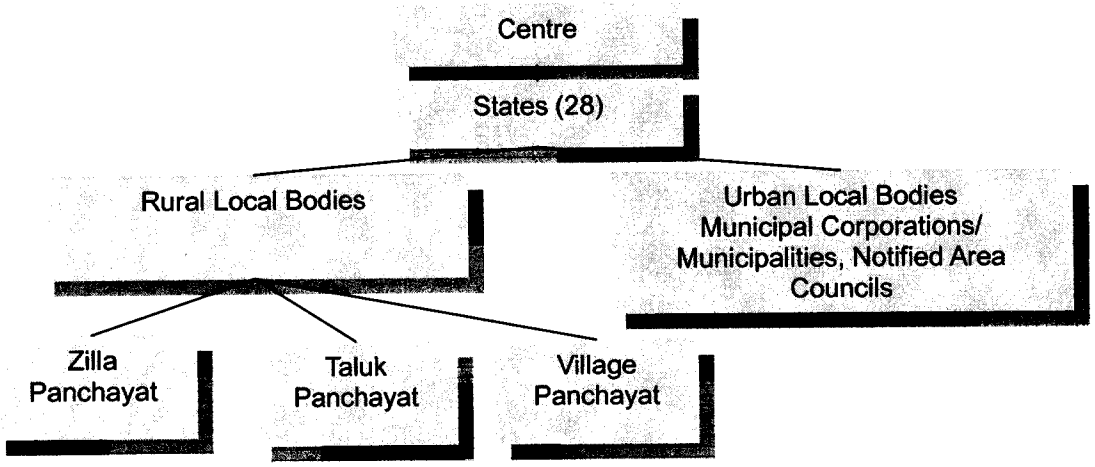

Figure 6. Level of Administration in India
Note. Adapted from Rao (2003).

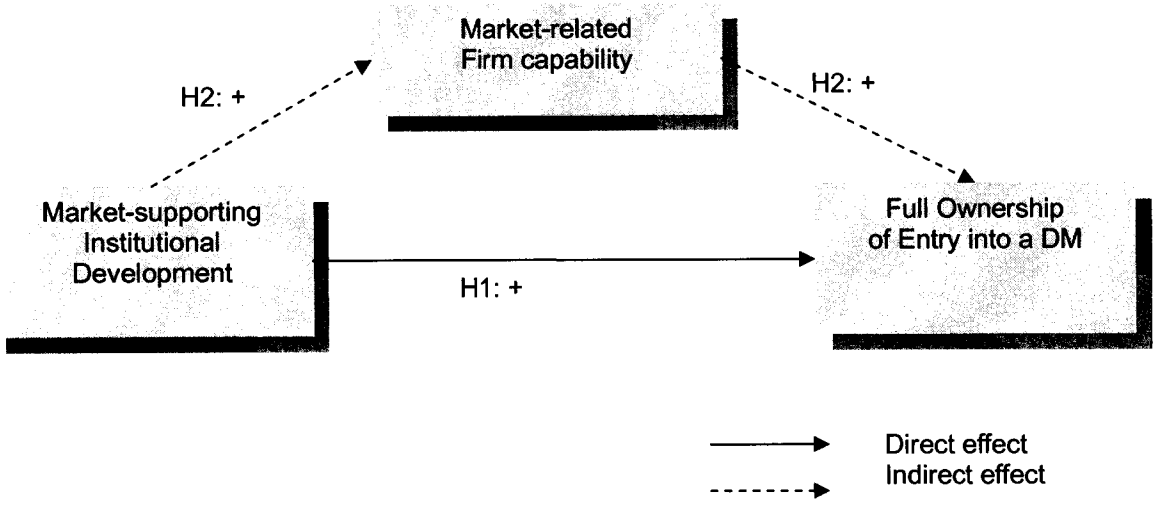

Figure 7. A Proposed Institutional Effect Framework of Entry Ownership

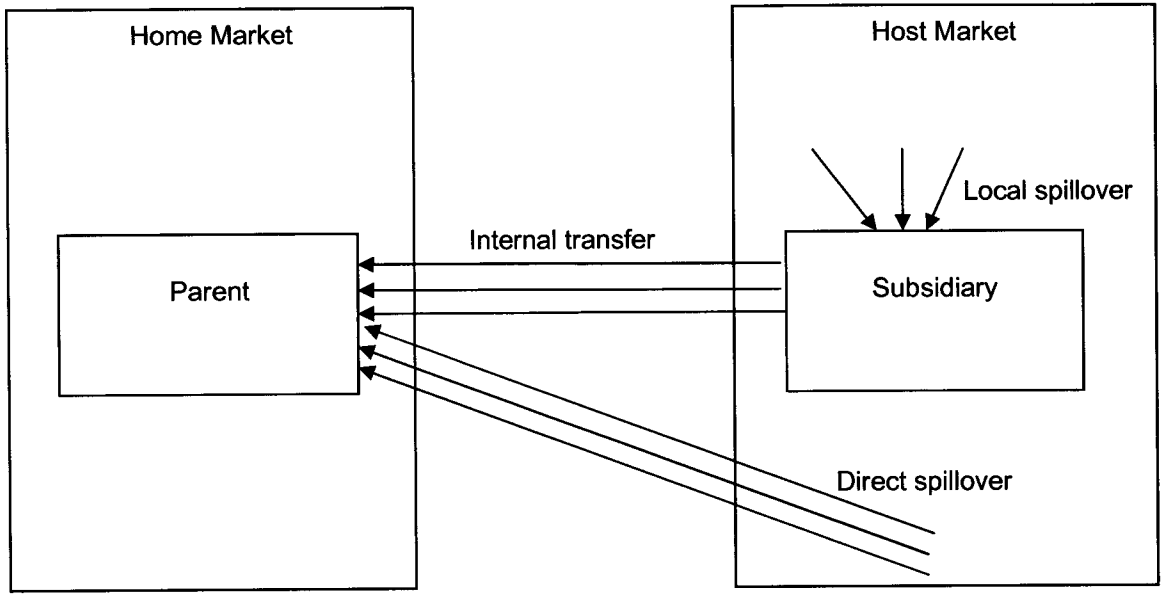

Figure 8. Reverse Knowledge Spillovers to Parent Firms

Appendices

Appendix 1. Descriptive Summary and Correlation Matrix of Sub-Indices of Institutional Quality from WB Survey (Paper 1)

		(1)	(2)	(3)	(4)	(5)	(6)	(7)
(1)	taxes and fees	1.0000						
(2)	business entertainment costs	0.5506*	1.0000					
(3)	bureaucratic interaction	0.2537*	0.0856	1.0000				
(4)	expected informal payment for loans	0.1531	0.3222*	0.1229	1.0000			
(5)	confidence in courts	-0.4462*	-0.4468*	-0.3925*	-0.3003*	1.0000		
(6)	percentage of private firms	-0.4555*	-0.3244*	-0.3346*	-0.1994	0.3413*	1.0000	
(7)	percentage of private SMEs with bank loans	-0.0936	-0.3219*	-0.1359	-0.0449	0.3104*	0.2098	1.0000
	Mean	4.9400	1.1250	60.5350	7.2167	63.7500	82.8500	45.3294
	Standard deviation	1.3975	0.4519	21.3859	4.7202	16.8120	10.4533	17.1409
	Number of observations	120	120	120	120	120	120	119

Note. (1) * $p<0.01$

(2) Descriptions of sub-indices:

Taxes and fees: average percentage of total taxes and fees over sales revenue

Business entertainment costs: average percentage of firm expenditures on business entertainment and travel over sales revenue

Bureaucratic interaction: average days per year firms spend with major bureaucracies (e.g., tax administration, public security, environment protection, labour and social security)

Expected informal payment for loans: percentage of survey respondents who perceive a need for informal payments to obtain loans

Confidence in courts: percentage of survey respondents who expect that courts will protect legitimate property and contract rights

Percentage of private firms: percentage of private (i.e., non-state) enterprises

Percentage of private SMEs with bank loans: average percentage of private SMEs that have access to bank loans

Appendix 2. Descriptive Summary and Correlation Matrix of Sub-Indices of Market-related Firm capability (Paper 1)

		(1)	(2)	(3)
(1)	Question 1	1.000		
(2)	Question 2	0.7989*	1.000	
(3)	Question 3	0.8034*	0.8199*	1.000
	Mean	0.393	0.369	0.351
	Standard deviation	0.489	0.483	0.477
	Number of Observations	1080	1080	1080

Note. * $p<0.01$

Appendix 3. Descriptive Summary and Correlation Matrix of Sub-Indices of Institutional Quality from IFC Survey (Paper 1)

		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
(1)	starting a business - number of procedures	1.0000								
(2)	starting a business - time (days)	0.5728*	1.0000							
(3)	starting a business - cost (% of income per capita)	0.2806	0.3969*	1.0000						
(4)	starting a business - paid-in minimum capital (% of income per capita)	0.3012	0.4438*	0.8955*	1.0000					
(5)	property right registration - number of procedures	0.1465	0.3582*	0.3883*	0.2634	1.0000				
(6)	property right registration - time (days)	0.3347*	0.5631*	0.4893*	0.5620*	0.4808*	1.0000			
(7)	property right registration - cost (% of property value)	0.3144*	0.4307*	0.7499*	0.8131*	0.1008	0.4865*	1.0000		
(8)	contract enforcement - time (days)	0.4440*	0.4631*	0.3166*	0.3275*	0.2216	0.5455*	0.3267*	1.0000	
(9)	contract enforcement - cost (% of claim)	0.3144*	0.4307*	0.7499*	0.8131*	0.1008	0.4865*	1.0000*	0.3267*	1.0000
	Mean	13.5667	41.0667	11.0167	2.7375	9.0333	52.4000	5.2382	319.0667	5.2382
	Standard deviation	0.6789	6.6381	5.2614	0.8988	1.8843	13.8405	1.8339	89.3308	1.8339
	Number of observations	30	30	30	30	30	30	30	30	30

Note. * $p<0.01$

Appendix 4. Descriptive Summary and Correlation Matrix of Sub-Indices of Institutional Quality from IFC Survey (Paper 2)

		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
(1)	starting a business - number of procedures	1.0000									
(2)	starting a business - time (days)	0.7292*	1.0000								
(3)	starting a business - cost (% of income per capita)	0.1427	0.0517	1.0000							
(4)	starting a business - paid-in minimum capital (% of income per capita)	-0.8677*	-0.5686*	-0.4637*	1.0000						
(5)	property right registration - number of procedures	0.3560*	0.4088*	-0.4646*	-0.0604	1.0000					
(6)	property right registration - time (days)	0.3336*	0.5257*	0.1094	-0.3218*	0.2187*	1.0000				
(7)	property right registration - cost (% of property value)	0.3705*	0.2609*	0.6637*	-0.5587*	-0.2563*	0.2268*	1.0000			
(8)	contract enforcement - number of procedures	-0.2926*	-0.2992*	0.8219*	-0.1060	-0.6977*	-0.0074	0.4837*	1.0000		
(9)	contract enforcement - time (days)	0.1777	0.0706	0.8813*	-0.4932*	-0.4470*	0.1637	0.5588*	0.7993*	1.0000	
(10)	contract enforcement - cost (% of claim)	0.0401	-0.1028	0.1928*	-0.0848	-0.2039*	-0.0702	0.2372*	0.2075*	0.1574	1.0000
	Mean	11.2405	32.8861	20.1797	5.4767	7.1266	47.0253	5.7182	36.9494	474.8734	6.7718
	Standard deviation	2.4401	10.9462	15.6254	4.6938	2.2666	22.0365	3.6763	5.6385	284.4810	9.5294
	Number of observations	79	79	79	79	79	79	79	79	79	79

Note. * $p<0.01$