

©2009

Saba Colakoglu

ALL RIGHTS RESERVED

ENHANCING SUBSIDIARY ABSORPTIVE CAPACITY: THE ROLE OF  
KNOWLEDGE ACQUISITION PRACTICES AND INTELLECTUAL CAPITAL

by

SABA COLAKOGLU

A dissertation submitted to the Graduate School-New Brunswick

Rutgers, The State University of New Jersey

in partial fulfillment of the requirements for the degree of

Doctor of Philosophy

Graduate Program in Industrial Relations and Human Resources

written under the direction of

Paula M. Caligiuri and David P. Lepak

and approved by

---

---

---

---

---

New Brunswick, New Jersey

October, 2009

## **ABSTRACT OF THE DISSERTATION**

Enhancing Subsidiary Absorptive Capacity: The Role of Knowledge Acquisition

Practices and Intellectual Capital

by SABA COLAKOGLU

Dissertation Directors:

Paula M. Caligiuri and David P. Lepak

Drawing from the absorptive capacity framework and the knowledge-based view of multinational corporations (MNCs), this dissertation explores linkages among knowledge acquisition practices, organizational learning, knowledge creation capability, and performance among a sample of US subsidiaries of multinational corporations operating in the manufacturing industry. Overall, data from 106 MNC subsidiaries located in the US and headquartered either in Europe or Japan support the predictions of this study and indicate that subsidiary performance is driven by both an internal and an external path of knowledge acquisition and learning. Specifically, results showed that internal and external knowledge acquisition practices were positively related to the learning of internal and external know-how respectively. Both internal and external learning, in turn, were positively related to a subsidiary's knowledge creation capability, which, in turn, was positively related to subsidiaries' performance in the US. However, the external learning–knowledge creation capability path was much stronger than the internal learning–knowledge creation path which was positive only under conditions of

low external learning, low subsidiary social capital, and high subsidiary organizational capital. Several methods for testing mediated relationships converged on the finding that internal and external learning as well as knowledge creation capability carry the influence of internal and external knowledge acquisition practices to subsidiary competitive advantage through an indirect path.

Results, in general, did not support the predictions that intellectual capital positively moderates the relationship between learning and knowledge creation capability. Moreover, two of the three significant interactions of the relationship between internal learning and knowledge creation capability – social capital and external learning - were in the opposite direction of what was hypothesized - yielding to an unexpected pattern of findings. Only in the case of high organizational capital, the relationship between internal learning and knowledge creation capability was positively stronger. For the relationship between external learning and knowledge creation capability, none of the proposed intellectual capital moderators were significant.

## **ACKNOWLEDGMENTS**

The past six years have been the greatest journey of my life and I owe thanks to many special people within and outside the School of Management and Labor Relations who have made this journey possible. First and foremost, I would like to thank Dr. Paula Caligiuri and Dr. David Lepak for always believing in me even more than I do and providing me countless opportunities, conversations, and discussions for my professional and personal development. I always felt like a valued individual, a colleague, and a friend and I am very grateful for that experience. Both of you will continue to inspire me as researchers and teachers for the rest of my academic life.

I also would like to extend special thanks to Dr. Susan Jackson who will always remain as a role model for me with her devotion to excellence and integrity in everything she does. I feel very privileged to have known and worked with her. I would also like to thank other SMLR faculty including Doug Kruse, Hui Liao, Stan Gully, Jeanne Philipps, Charles Fay, Patrick McKay, and Randall Schuler for being involved and showing interest in my studies. I would like to thank Ingmar Bjorkman for serving as an external committee member on my dissertation and providing excellent insight on my work. I thank the Society of Human Resource Management and the Human Resource Division of the Academy of Management for providing financial support for this study.

My current and former Ph.D. friends at SMLR – Yuan Jiang, Erika Harden, Ying Hong, Mee Sook Kim, Kyongji Han, Andrea Kim, Anne-Laure Winkler, Steve Guo, Bill Castellano, Mohammad Abbas Ali, Kaifeng Jiang Yun Chung, Carlos Martin Rios, Niclas Erhardt, and Ibraiz Tarique, – with whom I have shared all my frustrations

and from whom I have received many advice, support, help, and encouraging words – I thank you all...

My husband Ahmet, there are no words to describe how supportive he has been of this path he helped and encouraged me to choose. I truly could not have accomplished any of these without his genuine support - from putting in extra babysitting hours to doing matrix algebra or finding contact names for research...I could not have asked for a better research assistant – I thank you with all my heart for being there for me all the time and being proud of me. You are a great husband, father, partner, and my best friend forever...

My father Ergun Yucel, he has been the proudest recipient of all my accomplishments – I thank him for giving me the opportunities that led me to this path. Finally, I would like to thank three very special women in my life who continue to inspire me with their personalities and their presence: My grandmother Sabahat Camurdan, my aunt Gul Camurdan Surmen, my sister Zeynep Yucel Vural, – I thank you all for being in my life and always being by my side.

## **DEDICATION**

I dedicate this dissertation to Ali and Efe's future which I hope will be brighter than the brightest stars in the sky and to the loving memories of my mother Nur Camurdan Yucel and my mother-in-law Mujgan Colakoglu.

## TABLE OF CONTENTS

ABSTRACT OF THE DISSERTATION .....	ii
ACKNOWLEDGMENTS .....	iv
DEDICATION .....	vi
TABLE OF CONTENTS.....	vii
LIST OF TABLES .....	xi
LIST OF FIGURES .....	xii
INTRODUCTION .....	1
CONCEPTUAL BACKGROUND.....	9
DEFINITION OF KEY CONSTRUCTS.....	12
Knowledge Acquisition .....	12
Subsidiary Learning.....	14
Knowledge Creation .....	16
Intellectual Capital.....	17
THEORY DEVELOPMENT.....	20
Knowledge Acquisition Practices and Subsidiary Learning.....	20
Subsidiary Learning and Subsidiary Knowledge Creation.....	23
Interaction between Subsidiary Learning and Intellectual Capital .....	27
Subsidiary Knowledge Creation and Subsidiary Competitive Advantage .....	31
METHODS .....	35
Data Collection Procedure .....	35
Participants.....	38
Measures .....	39



Internal knowledge acquisitions practices .....	41
External knowledge acquisitions practices .....	41
Subsidiary learning of internal and external knowledge.....	42
Subsidiary knowledge creation .....	42
Subsidiary intellectual capital .....	43
Subsidiary competitive advantage .....	43
Control variables .....	45
Psychometric Properties of Measures .....	46
Construct validity of ‘internal knowledge acquisition practices’ .....	46
Construct validity of ‘internal knowledge acquisition practices’ .....	47
Construct validity evidence for ‘competitive advantage’ .....	48
Construct validity evidence for ‘intellectual capital’ measure .....	49
Construct validity evidence for ‘subsidiary learning’ and ‘knowledge creation capability’ measures.....	50
Preliminary Analyses .....	50
Power analysis .....	51
Sampling bias.....	52
Common method bias .....	52
Missing values and assumptions of multivariate analysis .....	53
Hypothesis Testing.....	54
Direct (main) effects hypotheses .....	55
Indirect (mediation) effects hypotheses .....	57
The Baron and Kenny procedure .....	57

The Sobel test.....	59
Path analysis.....	60
Results of Baron and Kenny (1986) procedure and the Sobel (1982) test.....	61
Results of path analysis.....	64
Summary of results .....	65
Interaction effects (moderation) hypotheses.....	66
Plotting and interpreting interaction effects.....	68
Post Hoc Analyses .....	69
The role of international strategy.....	69
Heckman Correction for selectivity bias.....	71
Negative interaction terms .....	72
DISCUSSION .....	73
Theoretical Implications .....	73
Internal knowledge acquisition practices and internal learning.....	74
External knowledge acquisition practices and external learning.....	75
Learning, knowledge creation, and subsidiary performance .....	76
The weakest link: internal learning-knowledge creation capability .....	78
Organizational capital - internal learning interaction .....	78
Internal learning - external learning interaction.....	79
Internal learning-social capital interaction.....	81
Discussion of unsupported hypotheses .....	82
Final note on contribution to absorptive capacity research .....	83
Final note on contribution to international management research.....	84

Practical and Managerial Implications.....	85
Practical implications for MNEs in general.....	86
Practical implications for international HRM Practitioners.....	89
Limitations and Future Research Directions.....	91
CONCLUSION.....	95
Appendix A – Invitation Letter.....	113
Appendix B – Survey Questions.....	114
REFERENCES .....	120
CURRICULUM VITAE.....	132

## LIST OF TABLES

TABLE 1:	Distribution of Parent Countries and Industries in the Sample.....	96
TABLE 2:	Exploratory Factor Analysis Results for Internal Knowledge Acquisition Practices Scale Items.....	97
TABLE 3:	Exploratory Factor Analysis Results for External Knowledge Acquisition Practices Scale Items.....	98
TABLE 4:	Exploratory Factor Analysis Results for Knowledge Acquisition Practices Scale Items.....	99
TABLE 5:	Descriptive Statistics of Study Variables.....	100
TABLE 6:	Correlations among Study Variables.....	101
TABLE 7:	Hierarchical Regression Results for Internal Learning and External Learning.....	102
TABLE 8:	Hierarchical Regression Results for Subsidiary Knowledge Creation Capability.....	103
TABLE 9:	Hierarchical Regression Results for Subsidiary Competitive Advantage.....	104
TABLE 10:	Moderated Regression Analysis Results for Knowledge Creation Capability.....	105
TABLE 11:	Summary of Results from Post Hoc Analysis Exploring the Role of International Strategy.....	106

## LIST OF FIGURES

FIGURE 1:	An Absorptive Capacity Model of Knowledge Creation in MNC Subsidiaries.....	107
FIGURE 2:	Moderating Impact of External Learning on Internal Learning and Knowledge Creation Capability.....	108
FIGURE 3:	Moderating Impact of Social Capital on Internal Learning and Knowledge Creation Capability.....	109
FIGURE 4:	Moderating Impact of Organizational Capital on Internal Learning and Knowledge Creation Capability.....	110
FIGURE 5:	Theoretical Model with Supported Paths Only.....	111
FIGURE 6:	Revised Figure with All Significant Paths.....	112

## INTRODUCTION

There is a consensus among managers and management scholars alike that knowledge is one of the most important strategic assets that has a great potential to provide global competitive advantage (Buckley & Carter, 2004; Caves, 1982; Grant, 1996; Hymer, 1976; Jaskon, Hitt, & DeNisi, 2003; Kogut & Zander, 1993; Takeuchi & Nonaka, 2002). For example, a 2006 survey by the Conference Board found that the majority of business leaders see global competitiveness and new knowledge creation as their most pressing strategic issues. A 2007 survey by McKinsey Company demonstrated that top-level executives view internal creation of new knowledge as their key driver for future profits. The same report documents that the greater ease and speed at which information can be obtained is the most significant trend shaping the business environment today. Yet, managers of MNCs have little guidance as to how to orchestrate knowledge-related processes in their globally dispersed operations and mostly do so in an ad hoc way (McKinsey, 2007). As such, international management scholars have been increasingly concerned with understanding the ways and mechanisms through which MNCs can create, disseminate, and exploit knowledge across borders (Buckley & Carter, 2004; Gupta & Govindarajan, 1991; Kogut & Zander, 1993).

According to the knowledge-based view of MNCs, firms internationalize their operations in order to internalize knowledge transfers across borders (Caves, 1982; Hedlund, 1986; Hymer, 1976). This perspective suggests that MNCs are superior to external market mechanisms as an organizational vehicle by which knowledge can be transferred across borders more efficiently (Kogut & Zander, 1993). Accordingly, MNCs are frequently conceptualized as internally differentiated inter-organizational networks of

relations and linkages among their subunits that engage in the multi-directional exchange and transfer of knowledge (Buckley & Carter, 2004; Ghoshal & Bartlett, 1990; Gupta & Govindarajan, 1991; Kostova & Roth, 2003). Based on this conceptualization, new knowledge can emerge anywhere in an MNC's network and be utilized elsewhere for competitive advantage (Andersson, Forsgren, & Holm, 2002). Therefore, it is widely accepted among international management scholars that subsidiaries act as agents of knowledge exploitation, creation, and dissemination in MNCs (Andersson, Bjorkman, & Forsgren, 2005; Bjorkman, Barner-Rasmussen, & Li, 2004; Foss & Pedersen, 2002; Gupta & Govindarajan, 2000; Harzing & Noorderhaven, 2006; Minbaeva, et al., 2003).

Given the importance of disseminating and exploiting firm-specific knowledge in host locations, prior research in this domain has examined and generally demonstrated positive linkages among a set of practices and mechanisms that are instrumental for acquiring knowledge from other units in the MNC – such as corporate headquarters and sister subsidiaries - and internal transfers of knowledge (e.g., Gupta & Govindarajan, 1991; 2000; Jaw, Wang, & Chen, 2006; Minbaeva et al., 2003). While the list of practices and mechanisms that enable knowledge transfers within MNCs tend to vary among studies (Foss & Pedersen, 2002; Hansen, 1999; Kostova, 1999; Li, 2005; Minbaeva et al., 2003; Subramaniam & Venkatraman, 2001; Szulanski, 1996), this research stream generally suggests that those practices and mechanisms which are based on both formal and informal interactions and relationships with other units, span subsidiary boundaries, and build connectivity among different MNC units tend to facilitate internal knowledge transfers.

What is currently missing from this research stream is that, although it is critical to internally transfer firm-specific knowledge to host locations for subsidiaries' competitive advantage, it is equally, if not more important for subsidiaries to acquire knowledge and learn from their external environments such as host country clients, distributors, and suppliers (Birkinshaw, Hood, & Young, 2005; Ghoshal & Bartlett, 1990; Foss & Pedersen, 2002). This is because competitive advantage of subsidiaries lies in their ability to transfer and exploit firm-specific knowledge in host markets (Kogut & Zander, 1993; Gupta & Govindarajan, 1991; 2000; Rugman & Verbeke, 1992) and to learn from and adapt to local environments simultaneously (Bartlett & Ghoshal, 1988; 1989; Gupta & Govindarajan, 2001). The strategic pressure faced by MNCs to respond to the opposing demands of global integration and local responsiveness also calls for an ability to learn from both the internal and the external environments for competitive advantage (Bartlett & Ghoshal, 1988, 1989).

Such organizational learning can be achieved by assimilating knowledge from other organizational units that are both internal and external to the host country subsidiaries. Andersson et al. (2002) capture this idea well by stating that "the assimilation and commercialization of new knowledge are carried out through the relationships with external units and with sister units. There is no immediate contradiction between deploying resources in, on one hand, relationships with external customers and suppliers and in, on the other hand, relationships with sister units (2002: 23)". In sum, by applying internally created knowledge that arises out of knowledge acquired from internal and external units to commercial ends, host country subsidiaries of MNCs can enjoy competitive advantage that results from differentiation based on firm-



specific advantages (Dunning, 1977; Porter, 1985; Rugman & Verbeke, 1992) and increased legitimacy, resources, and survival capabilities in the host country (Kostova & Zaheer, 1999; Miller & Eden, 2006; Pfeffer & Salancik, 1978).

However, research that links internal and external knowledge flows and transfers to subsidiary knowledge creation capability and competitive advantage and explains the process through which such knowledge transfers can result in enhanced subsidiary performance is very limited (e.g., Andersson et al., 2005; Jaw et al. 2006). Furthermore, while most of the previous research in this area focused on exploring the internal path, the same attention has not been paid to external knowledge flows. Moreover, the outcomes of successful knowledge transfers are an underexplored domain in international management research. For example, after a thorough review of the extant literature on international management, Griffith, Cavusgil, and Xu (2008) conclude that there is a pressing need to link knowledge transfers in MNCs to performance as well as to better understand how MNCs transfer valuable knowledge from one part of the organization to another.

Given these research gaps, the primary objective of this dissertation is to examine, both theoretically and empirically, the dual path through which internal and external knowledge acquisition practices relate to subsidiary competitive advantage. The model developed in this dissertation is theoretically grounded in the absorptive capacity framework which posits that competitive advantage results from firm capabilities related to acquiring, assimilating, transforming, and exploiting knowledge generated outside the boundaries of the firm (Cohen & Levinthal, 1989, 1990; Todorova & Durisin, 2007; Zahra & George, 2002). Through the lens of the absorptive capacity framework, the

model developed in this dissertation links internal and external knowledge acquisition practices to the learning of internal and external knowledge; learning of both internal and external knowledge to subsidiary knowledge creation capability; and finally subsidiary knowledge creation capability to subsidiary competitive advantage in the host location. Furthermore, I propose that the intellectual capital of subsidiaries that exists in the form of human, social, and organizational capital will strengthen the relationships between subsidiary learning of internal and external knowledge and subsidiary knowledge creation capability. The theoretical model that is developed and tested in this dissertation is depicted in Figure 1.

.....  
 Insert Figure-1 About Here  
 .....

There are several potential contributions that this dissertation makes to the international management and absorptive capacity literatures. First, by theoretically integrating the knowledge-based view of MNCs with the absorptive capacity framework, this dissertation illuminates the linkages between knowledge transfers and competitive advantage in MNC subsidiaries. Second, by taking a dual path approach to knowledge creation in MNC subsidiaries, this dissertation investigates the independent and joint effects of internal and external knowledge flows on subsidiary knowledge creation capability and performance. Finally, acknowledging that knowledge transfers do not automatically guarantee knowledge creation and suggesting that this relationship may depend on the existence of intellectual capital in subsidiaries is a further advancement in this stream of research.

While the phenomena investigated in this dissertation is not necessarily specific to MNCs but can also potentially apply to other multiunit organizations that are operating within their own national boundaries, the contextual richness of MNCs characterized by substantial external heterogeneity and intra-organizational complexity provides a rigorous opportunity to empirically test and enrich existing theories of absorptive capacity (cf. Roth & Kostova, 2003). For example, while absorptive capacity framework typically focuses on the external path explored in this manuscript (Cohen & Levinthal, 1989, 1990; Todorova & Durisin, 2007; Zahra & George, 2002), it is critical to integrate the internal path to a theory of absorptive capacity of MNC subsidiaries since, as noted earlier, intra-firm knowledge flows are one of the defining characteristics of MNCs. This does not mean to say that domestic multiunit organizations do not transfer knowledge internally, but rather, it points to the fact that successful internal knowledge transfers are harder to achieve and are more critical to the existence, functioning, and survival of MNCs and their local subunits. There are three reasons for why internal knowledge transfers are more critical, salient, and harder to achieve in MNCs and thus deserve special attention in research.

First of all, within the MNC context, internal knowledge transfers face considerable barriers due to cultural, geographic, institutional, language, and time zone differences – differences typically not found in national contexts except for maybe the US, where there is some variability in all of the stated contextual dimensions. Second and probably more important, competing pressures or tensions arising from the need to globally integrate activities and becoming locally responsive in different markets, inter-unit power struggles, potential inconsistencies and conflict among the interests, values,

practices, and routines of different subunits are essential for and even the defining characteristics of MNCs (Roth & Kostova, 2003; Kostova, Roth, & Dacin, 2009). This kind of intra-organizational complexity and a rich organizational context typically does not exist in domestic organizations. Indeed, the majority of the most influential work on knowledge transfers have been exclusively conducted within the international context and not multiunit domestic organizations, suggesting that internal knowledge transfers are much more *salient* in the MNC context compared to organizations operating within their national boundaries (e.g., Bresman, Birkinshaw, & Nobel, 1998; Gupta & Govindarajan, 1991, 2000; Kogut & Zander, 1993; Kostova, 1999; Lane, Salk, & Lyles, 2001; Lyles & Salk, 1996; Subramaniam & Venkatraman, 2001; Tsai, 2001). Finally, as stated earlier, the knowledge-based view of the MNC explicitly ties the existence of MNCs to their desire to exploit firm-specific knowledge in new markets; marking internal knowledge transfers another defining and distinct characteristic of MNCs (Kogut & Zander, 1993). For all these reasons stated above, internal knowledge transfers are more critical, salient, and harder to achieve in MNCs.

Having said that, this study does not propose any significant changes to the underlying exploratory mechanisms of absorptive capacity theory in MNC subsidiaries. That is, along with the majority of international management research, the basic premise and the nature of relationships among constructs proposed by theory remain intact. As such, the propositions and findings may apply both to MNCs and complex domestic organizations, as they are based on the characteristics of the MNC that represent differences “in degree” from domestic organizations (Ghoshal & Westney, 1993; Roth & Kostova, 2003; Kostova & Zaheer, 1999). Therefore, by studying absorptive capacity in

MNC subsidiaries, this study also serves to expand and enrich existing theories of absorptive capacity by integrating the internal path to knowledge creation and competitive advantage.

In what follows, first, I define the conceptual background of this dissertation – absorptive capacity. Then, I define and conceptualize the key constructs and assumptions of the absorptive capacity framework taken in this dissertation, namely, knowledge acquisition, subsidiary learning, knowledge creation, and intellectual capital. I then develop my theory and state my hypotheses. The results section is followed by a discussion of theoretical and practical implications, as well as the limitations of this study.

## CONCEPTUAL BACKGROUND

In their seminal work on absorptive capacity, Cohen and Levinthal (1990, p.128) define absorptive capacity as an organization's "ability to recognize the value of new external information, assimilate it, and apply it to commercial ends". According to Zahra and George (2002), absorptive capacity is a set of organizational routines and processes, by which firms acquire, assimilate, transform, and exploit knowledge. Lane, Koka, and Pathak (2006) define absorptive capacity as a firm's ability to utilize externally held knowledge through three sequential processes - (1) recognizing and understanding potentially valuable new knowledge outside the firm through exploratory learning, (2) assimilating valuable new knowledge through transformative learning, and (3) using the assimilated knowledge to create new knowledge and commercial outputs through exploitative learning. Several commonalities exist among the different definitions of absorptive capacity - such as the emphasis given to the existence of different components of absorptive capacity (*i.e.*, acquire knowledge, assimilate knowledge, exploit knowledge), the understanding that these different components result from different sets of organizational routines and practices, and its conceptualization primarily as an organizational capability to learn from external knowledge sources and to create new knowledge based on the acquired knowledge.

Development of the absorptive capacity framework rests on individual-level memory-development phenomena which suggest that individuals' learning is cumulative and that learning and knowledge creation is greatest when new knowledge to be assimilated is related to what individuals already know (Cohen & Levinthal, 1990). Extending these insights from the individual level to the organizational level, absorptive

capacity theorists suggest that a firm's absorptive capacity builds upon prior investments in its employees' absorptive capacities, tends to be path dependent, and depends on a firm's ability to store, share, and exchange knowledge internally (Cohen & Levinthal, 1990; Lane et al., 2006).

From this stand point, researchers have given significant emphasis to a firm's prior related knowledge as a condition that enhances absorptive capacity. While research on absorptive capacity has traditionally equated exiting or prior knowledge with absorptive capacity and measured it with proxies such as R&D intensity or spending (e.g., Cohen & Levinthal, 1990; Lane & Lubatkin, 1998; Tsai, 2001), this approach has been criticized widely for failing to reflect the richness of the construct and limiting the absorptive capacity research to only R&D related contexts (Lane et al., 2006; Minbaeva et al., 2003; Zahra & George, 2002). This is because such a simplified approach ignores the role of individuals who acquire and possess knowledge; share it with other organizational members; and store it in organizational structures and systems – assumptions all of which are core to the original absorptive capacity framework. Therefore, researchers have called out for a more complete account of absorptive capacity that reflects the multiple components and the richness of this construct.

Prior knowledge of a firm cannot be only accounted for by how much R&D spending or investment a firm makes but rather, it can be argued that, it resides in the minds of its people, the relationships among its people, and its structures, systems, and databases (Subramaniam & Youndt, 2003). Existence of skilled employees who can harvest and exploit knowledge, socialization capabilities related to knowledge combination and exchange, and system capabilities related to organizing and

withdrawing information are all essential for enhancing absorptive capacity and can help bridge the gap between a firm's potential (e.g., acquisition, assimilation) and realized (e.g., exploitation) absorptive capacity (Collins & Smith, 2006; Subramaniam & Youndt, 2005; Van den Bosch, Volberda, & De Boer, 1999; Zahra & George, 2002). Bridging this gap is important because firms focusing primarily on knowledge acquisition and assimilation can continually renew their knowledge stock without necessarily gaining benefits from exploitation. Conversely, firms focusing primarily on exploitation can fall into a competence trap without being able to respond to environmental changes (Jansen, Van Den Bosch, & Volberda, 2005; Zahra & George, 2002). Yet, firm competitiveness is contingent on a firm's ability to create new knowledge by simultaneously exploring its environment and absorbing new knowledge and exploiting existing know-how in a refined way (Cohen & Levinthal, 1990; March, 1991).

Based on the above lines of reasoning, absorptive capacity is not a construct per se – but rather - an overarching theoretical framework for explaining firm innovation as a function of firm capabilities related to knowledge acquisition and exploitation. In line with this understanding, I do not define or treat subsidiary absorptive capacity as a construct but rather, define it as a collection of firm capabilities related to knowledge acquisition and exploitation and enhanced by human, social, and organizational capital (see Figure 1).



## DEFINITION OF KEY CONSTRUCTS

### Knowledge Acquisition

Firms invariably need to acquire knowledge that lies outside their organizational boundaries to renew their knowledge stock and create new knowledge (Van den Bosch et al., 1999). Thus, knowledge acquisition refers to all the activities a firm's employees may engage in to identify and acquire externally generated explicit or tacit knowledge that is critical to a firm's operations (Zahra & George, 2002). It requires organizational members to recognize the value of external knowledge, acquire it, and incorporate it into the firm's existing knowledge stock (Cohen & Levinthal, 1990; Todorova & Durisin, 2007). Activities for acquiring knowledge vary in their richness and complexity as well as their speed, intensity, and direction (Zahra & George, 2002).

Explicit knowledge (*i.e.*, observable, articulable, and codifiable type of knowledge) can be acquired relatively fast through activities such as reading articles and journals, attending to workshops and seminars, or just by interacting with knowledgeable third parties such as consultants. Typically, these types of knowledge acquisition activities do not create opportunities for mutual learning; with knowledge flowing from only one direction. Other than these passive forms of knowledge acquisition activities, inter-organizational relationships create more active opportunities for knowledge acquisition and mutual learning (Dyer & Singh, 1998; Lane & Lubatkin, 1998). More active forms of knowledge acquisition through arm's length relationships with other firms involve engaging in bench-marking and competitive intelligence projects and creating strategic alliances with external partners (Lane & Lubatkin, 1998). While these types of knowledge acquisition activities are richer and create opportunities for mutual

learning compared to passive knowledge acquisition activities, they are still mostly instrumental for acquiring the more observable parts of another organization's knowledge and experiences (Lane & Lubatkin, 1998).

Tacit knowledge is revealed through its application and its transfer between people and units is slow, costly, and uncertain (Grant, 1996; Polanyi, 1966). As opposed to explicit knowledge that can be reliably communicated, tacit knowledge or know-how is contextually embedded, idiosyncratic, and can only be revealed through its application in highly embedded relationships. As such, acquiring tacit knowledge requires greater effort, time, resources, and stronger ties between the units in which knowledge exchange takes place (Hansen, 1999; Polanyi, 1966; Reagans & McEvily, 2003). To acquire external tacit knowledge, organizations need to invest in highly embedded inter-organizational relationships based on mutual trust, adaptation, and learning (Grant, 1996; Szulanski, 1996; Hansen, 1999). Thus, the types of activities firms engage in to acquire tacit knowledge are invariably more complex and involve much higher transaction costs than the kinds of activities aimed at acquiring external explicit knowledge (Dyer & Singh, 1998; Kostova, 1999; Kostova & Roth, 2002). For example, inter-organizational job rotation schemes used by Toyota and its suppliers are examples of how tacit knowledge from other firms can be acquired through highly embedded relationships based on mutual trust, learning, and adaptation (Dyer & Nobeoka, 2000; Foss & Pedersen, 2002). Such schemes require organizations to move beyond arm's length relationships and invest in relation-specific assets and combine complimentary but scarce capabilities that result in the creation of unique products and technologies (Dyer & Singh, 1998).

For the purpose of this dissertation, I focus on acquiring relatively more explicit and to some extent tacit knowledge – depending on whether knowledge is being acquired from internal or external units as well as the richness and complexity of knowledge acquisition channels used. Even though the type of knowledge that has value-creating potential for organizations is mostly tacit due to its ambiguous, socially complex, and contextually embedded nature, such qualities of tacit knowledge also make it necessary to accumulate internally within an organization's own boundaries (cf. Barney, 1991; Dierickx & Cool, 1989) - or acquire it through more strategic moves such as those described in the previous paragraph. Hence, this dissertation focuses on organizational practices that are instrumental for the acquisition of mostly explicit and to some extent tacit internal and external knowledge in MNC subsidiaries. With regards to knowledge content, the focus of this dissertation is on acquiring both business knowledge – e.g. knowledge of products, markets, and technologies and organizing knowledge – e.g. knowledge of processes, structures, and systems (Yli-Renko, Autio, & Sapienza, 2001).

### **Subsidiary Learning**

Dictionary definition of learning is “to gain knowledge or understanding of or skill in by study, instruction, or experience” (Merriam-Webster). This definition of individual learning is consistent with organizational learning theories that are based on research in cognitive sciences (e.g., Piaget, 1952) and take an information-processing perspective to organizational learning (e.g., Huber, 1991). These theories posit that an organization learns if any of its units acquires knowledge that it recognizes as potentially useful and assimilates or transforms that knowledge (Huber 1991; Zahra & George, 2002). In this respect, organizational assimilation of knowledge refers to analyzing,

processing, interpreting, and understanding the information obtained from external sources (Zahra & George, 2002). As an alternative process to assimilation (Todorova & Durisin, 2007), organizational transformation of knowledge denotes combining existing knowledge and the newly acquired knowledge by adding or deleting knowledge from the existing knowledge stock or simply by interpreting the same knowledge in a different manner (Zahra & George, 2002).

Drawing from research on individual learning and the development of new cognitive structures in individuals, Todorova and Durisin (2007) argue that organizational assimilation and transformation of acquired knowledge are alternative principles of learning that operate based on the type of knowledge acquired from the environment. Accordingly, these authors suggest, when newly acquired knowledge is compatible with existing organizational knowledge stocks, it is altered only slightly to improve fit and incorporated into the existing organizational knowledge stock – thus learning taking place through assimilation of new knowledge. Transformation, as an alternative process to assimilation, occurs only when newly acquired knowledge does not fit the existing knowledge stock (*i.e.*, cannot be assimilated) and thus needs to be transformed in order to be incorporated (Todorova & Durisin, 2007). In this scenario, learning takes place through the transformation of both acquired knowledge and existing knowledge stock to incorporate new knowledge.

Drawing from these definitions of organizational learning that are based on principles of individual learning and cognitive development, I define subsidiary learning as adding newly acquired internal or external knowledge to a subsidiary's existing knowledge stock through the processes of assimilation or transformation.

### **Knowledge Creation Capability**

Knowledge creation in this dissertation denotes an organization's capability to apply knowledge that has been acquired and learned, to commercial ends (Cohen & Levinthal, 1990; Zahra & George, 2002). It refers to the capability to exploit acquired knowledge through finding out new, improved, and refined ways of doing things that create organizational value or increase operational efficiency (Zahra & George, 2002). Knowledge exploitation in this sense is evident, for example, in new ventures which have the ability to capture knowledge from their customers, and then use it to create new competencies (Yli-Renko et al, 2001).

From this stand point, the knowledge creation perspective taken in this dissertation has similarities with what has been defined in the literature as *incremental innovation* (Dewar & Dutton, 1986). Incremental innovations refine and reinforce exiting products, services, and processes typically by exploiting the existing knowledge base of a firm (Subramaniam & Youndt, 2005). Such innovations should be more prevalent in subsidiaries compared to radical innovations (*i.e.*, major transformations of exiting products, services, processes), unless a subsidiary operates as an R&D hub or a Center of Excellence. Thus, a broader view of knowledge creation which resembles incremental types of innovations is taken in this dissertation.

This dissertation takes a broad view of knowledge creation – not limiting it to the capability to create only technical knowledge (*i.e.*, patents or innovations) but extending it to knowledge created in other areas such as general management, marketing, sales, and the like (cf. Andersson et al., 2005). Taking a broader perspective to knowledge creation is important because an overemphasis on tangible outcomes such as patents can come at

the expense of less concrete outcomes such as process knowledge which can be of greater importance over the long run (Andersson et al., 2005; Lane et al., 2006).

### **Intellectual Capital**

Intellectual capital is defined as ‘the sum of all knowledge an organization is able to leverage in the process of conducting business to gain competitive advantage’ (Youndt, Subramaniam, & Snell, 2004) (p. 337). Such knowledge accumulates over time and resides in an organization’s people, structures, systems, processes, and databases (Dierickx, & Cool, 1989; Youndt, et al., 2004). Previous research has identified three aspects of intellectual capital; namely, human, organizational, and social capital (Nahapiet & Ghoshal, 1998; Subramaniam & Youndt, 2005).

Human capital is the knowledge, skills, and abilities residing in and utilized by individual employees and creates value for firms in return for the investments (*i.e.*, hiring, training, motivating) made in them (Snell & Dean, 1992; Lepak & Snell, 1999). Organizational capital is the “institutionalized knowledge and codified experience stored in databases, routines, patents, manuals, structures, and the like” (Youndt et al., 2004; p. 338). Organizational capital requires the establishment of information storage mechanisms as well as formalization and routinization of organizational policies, practices, and processes. The third aspect of intellectual capital, social capital, suggests that organizational knowledge can also reside in interactions among individuals and their networks of interrelationships (Nahapiet & Ghoshal, 1998). Development of social capital in organizations requires establishing norms for collaboration, interaction, and sharing of ideas within firms (Subramaniam & Youndt, 2005).

There are dynamic and complex interrelationships among the three aspects of intellectual capital (Youndt et al., 2004) and “looking independently at any one of these subcategories most certainly results in an incomplete account of an organization’s intellectual capital” (p. 339). Yet, the precise nature of the interrelationships between human, social, and organizational capital are not known and several possibilities exist. First, different dimensions of intellectual capital can have independent and non-overlapping effects on organizational outcomes. This would be the case if having all aspects of intellectual capital together resulted in a greater level of the outcome than having either aspect alone, but not more than the sum of the individual effects of each form of capital (cf. Delery, 1998). For example, previous research suggests that while there are very few firms that are high on all aspects of intellectual capital, those firms that are high on all three tend to outperform others (Youndt et al., 2004).

It is also possible that the effectiveness of one aspect of intellectual capital can depend on the effectiveness of the other, thus, different aspects of intellectual capital acting in a synergistic manner. For example, Burt (1997) posits that the value of human capital is meaningless if without social capital (p. 339). Also, previous research suggests that human capital interacts with social capital to influence innovative capabilities; but without social capital, human capital does not work in isolation (Subramaniam & Youndt, 2005). Subramaniam and Youndt (2005) capture this synergistic idea by noting that “unless individual knowledge is networked, shared, and channeled through relationships, it provides little benefit to organizations in terms of innovative capabilities” (pg. 459).

Given that absorptive capacity framework requires an assessment of the existing and collective knowledge stock of a firm; this dissertation treats intellectual capital as

holistic construct (i.e., takes into account all of its different aspects rather than focusing on one or two dimensions) but examines its different aspects separately since different forms of intellectual capital may have different implications for enhancing absorptive capacity.



## **THEORY DEVELOPMENT**

### **Knowledge Acquisition Practices and Subsidiary Learning**

In this dissertation, knowledge acquisition practices refer to a set of activities subsidiary employees may engage in to identify and acquire explicit or tacit knowledge generated outside the boundaries of the subsidiary that is critical to that subsidiary's operations (Zahra & George, 2002). These practices are based on acquiring knowledge from internal or external units mostly through formal and informal interactions and relationships that span firm boundaries (Gupta & Govindarajan, 2001; Minbaeva, et al., 2003). Existence of relationships and connections among different units facilitate knowledge acquisition because willingness to share, disclose, or exchange explicit, tacit, or proprietary knowledge depends on the existence of mutual trust among parties that engage in such knowledge sharing (Nahapiet & Ghoshal, 1998).

For example, subsidiary employees can acquire internal knowledge through trips to other units in the MNC, serving on international committees, teams, and task forces, having informal or assigned mentors at other units, or through expatriation (Gupta & Govindarajan, 2001). Such activities create multiple opportunities for subsidiary employees to acquire firm-specific knowledge through increased contact with employees from other MNC units. Acquiring knowledge from other units in the MNC through such boundary-spanning practices can be facilitated by the existence of generalized trust - impersonal or institutional trust that is accorded to others as a result of belonging to the same social unit - among MNC employees (Kang, Moris, & Snell, 2007). Previous research has also shown these boundary-spanning practices to be related to knowledge

transfers within MNCs (Bjorkman, Barner-Rasmussen, & Li, 2004; Gupta & Govindarajan, 2001; Kostova & Roth, 2003).

Existence of expatriates in subsidiaries also facilitates acquiring such firm-specific knowledge. Previous research suggests that regardless of the different motivations for deploying expatriates to subsidiaries (Edstrom & Galbraith, 1977), an emergent outcome of any expatriate assignment is the transfer of MNC-specific knowledge from the parent company to its host country subsidiaries (Bonache & Brewster, 2001; Hocking, Brown, & Harzing, 2004; Riusala & Suutari, 2004). Having in-depth knowledge of parent company practices, policies, values, and goals, expatriates can be instrumental for transferring important forms of firm-specific know-how and competencies from headquarters or other MNC units to subsidiaries.

In addition to these relationship-based knowledge acquisition activities, existence of online global knowledge management systems (*i.e.*, intranet, databases, etc.) can create readily accessible opportunities to acquire internal knowledge for subsidiary employees. Most global firms have established and use such IT-based knowledge management systems to store explicit and codified knowledge and information on MNC policies, practices, services, solutions, and the like. The ability to access such information can be valuable for transferring and learning MNC-specific knowledge and information that can be useful for subsidiary operations.

Because engaging in such activities create multiple opportunities, paths, and channels through which internal knowledge can flow to MNC subsidiaries, subsidiaries should learn from these activities, firm-specific MNC knowledge that that they can exploit in host markets. Therefore, these various forms of knowledge acquisition

practices that complement each other with respect to their varying degrees of richness and complexity - should lead to subsidiary learning as a set rather than in isolation. I argue that these practices operate in an additive way such that using more of these practices should result in increased levels of learning from the internal environment. Hence, I propose the following:

***Hypothesis 1a:*** *There will be a positive relationship between MNC subsidiaries' use of knowledge acquisition practices for acquiring knowledge from the internal environment and subsidiary learning of internal knowledge.*

MNC subsidiaries can also learn through a related but a distinct set of knowledge acquisition practices that are instrumental for acquiring knowledge from the *external* environment. These practices are similar to the first set of knowledge acquisition practices such that they span subsidiary boundaries and mostly rely on relationship ties to acquire knowledge. Yet, they are different from the first set since practices for acquiring external knowledge are based on inter-organizational relationships characterized by weaker ties compared to intra-organizational relationships (Dyer & Singh, 1998; Li, 2005). Despite weaker ties among the parties to the knowledge exchange, acquisition of knowledge from external parties can be facilitated by the existence of resilient dyadic trust between the two parties that results from having direct experience with each other (Kang et al., 2007).

Subsidiaries can acquire external knowledge by providing its employees with the time and resources for engaging in a variety of knowledge acquisition activities (Collins

& Clark, 2003; Cohen & Prusak, 2001). For example, subsidiary employees can acquire knowledge from local customers, distributors, or suppliers by regularly approaching them or periodically organizing special meetings with them to collect new information. They can be provided expense accounts to organize special meetings (e.g., business lunch, dinner) or be reimbursed for joining local trade organizations, subscribing to journals, attending workshops, and the like, with the purpose of gaining local knowledge (Jansen et al., 2005). Further, they can engage in benchmarking or competitive intelligence projects to gain knowledge of local market trends and shifts in competition, regulation, and demography (Jansen et al., 2005).

Because engaging in such activities create multiple opportunities, paths, and channels through which external knowledge can flow to MNC subsidiaries, subsidiaries should learn from these activities, local knowledge that they can exploit in creating locally aligned products, services, and processes. I argue that these practices also operate in an additive way and complement each other such that using more of these practices should lead to increased learning of external knowledge and these practices should lead to learning as a set rather than in isolation. Hence, I propose the following:

***Hypothesis 1b:** There will be a positive relationship between MNC subsidiaries' use of knowledge acquisition practices for acquiring knowledge from the external environment and subsidiary learning of external knowledge.*

### **Subsidiary Learning and Subsidiary Knowledge Creation**

Research on absorptive capacity, as previously explained, draws a link between transformation and assimilation of knowledge generated outside the boundaries of the firm (*i.e.*, learning) and exploitation of that knowledge through creating new knowledge (Cohen & Levinthal, 1990; Todorova & Durisin, 2007). Accordingly, firms can integrate the knowledge they acquire from other parties with their existing knowledge stocks, make novel associations between different sources of knowledge, and create new or improved goods, services, systems, processes, or organizational forms (Todorova & Durisin, 2002; Yli-Renko et al., 2001). Learning from other sources is essential for knowledge creation capability because learning enhances the breath and depth of knowledge that exists in a firm's knowledge stock, thereby increasing opportunities for combining different types of knowledge domains and making novel associations within firms (Cohen & Levinthal, 1990).

In support of this argument, Yli-Renko et al. (2001) found that acquiring knowledge from key client relationships was related to new product development in young technology-based firms. Andersson et al. (2002) reported a positive relationship between learning from key local relationships and knowledge creation in MNC subsidiaries. Tsai (2001) found that having access to new knowledge developed by other internal units was positively related to business unit innovation. Ancona and Caldwell (1990) found that increased knowledge collection activities in teams led to better performance in product innovations.

Based on these theoretical arguments and empirical findings, it is likely that the more a host country subsidiary learns from its internal and external environment, the more opportunities it will have for increasing its capability to create new knowledge.

First, learning from sister subsidiaries and corporate headquarters will increase the opportunities for a host country subsidiary to apply MNC-specific knowledge, in novel ways, to subsidiary operations. For example, a subsidiary can learn a new manufacturing process from other MNC units, yet, process, analyze, and interpret this information within the context of the host country and apply it to its operations in a novel or improved way.

In a similar manner, learning from external units will create opportunities to integrate local knowledge with a subsidiary's existing knowledge stock. For example, learning from local customers, suppliers, and distributors on product and process improvement possibilities can lead to innovations in these areas; learning about market trends, changes, and shifts from industry friends can lead to coming up with new ways to respond to these shifts. Thus, I argue that learning from internal and external units are both positively related to knowledge creation capability.

***Hypothesis 2a:*** *There will be a positive relationship between MNC subsidiaries' learning of internal knowledge and its knowledge creation capability.*

***Hypothesis 2b:*** *There will be a positive relationship between MNC subsidiaries' learning of external knowledge and its knowledge creation capability.*

Although learning of internal and external knowledge can have independent effects on subsidiary knowledge creation capability, the opportunities for knowledge combinations and novel associations should be greatest in cases when both internal and external learning are high. For example, if a subsidiary learns new marketing know-how

from internal units, it can apply this know-how in a nuanced and improved way to the local context without having learned much from local units, thus, creating new knowledge. However, new knowledge creation opportunity should become more significant if the subsidiary has also learned from its external relationships and can integrate the two diverse sources of knowledge in a completely novel way. That is, recombination, cross-fertilization, and cross-application of different knowledge domains, as well as having access to diversity of ideas can improve innovative performance further in subsidiaries (Amabile, 1988). Thus, I propose that knowledge creation capability should be greatest when both types of learning are high.

***Hypothesis 3:*** *Subsidiary learning of internal knowledge will be more strongly related to subsidiary knowledge creation capability when subsidiary learning of external knowledge is high than when subsidiary learning of external knowledge is low (and vice versa).*

Collectively, these arguments lend themselves to a mediational hypothesis. That is, knowledge acquisition practices should relate to knowledge creation capability through their impact on subsidiary learning of internal and external knowledge. The mediational logic is consistent with previous models of absorptive capacity which suggest knowledge acquisition, learning, and exploitation to be sequential processes (Zahra & George, 2002, Todorova & Durisin, 2007). Accordingly, firms need to assimilate or transform the newly acquired knowledge first, in order to exploit it (Todorova & Durisin, 2007).

Subsidiaries can engage in the aforementioned activities for acquiring knowledge, yet, these activities may not lead to knowledge creation unless subsidiaries can learn from them. An example could be when, for example, cultural distance that invariably exists between home and host countries inhibits learning no matter how frequently knowledge acquisition practices are utilized. Similarly, if subsidiary employees do not have the willingness and motivation to learn from the foreign parent or local partners – engaging in a ‘not-invented-here’ syndrome, such a collective climate can decrease the level of learning (Szulanski, 1996). In these cases, knowledge acquisition practices would not lead to creation of new knowledge since subsidiary learning does not take place as a byproduct of these activities. Thus, it follows from these arguments that:

***Hypothesis 4a:*** *Subsidiary learning of internal knowledge will mediate the relationship between knowledge acquisition practices for acquiring knowledge from the internal environment and subsidiary knowledge creation capability.*

***Hypothesis 4b:*** *Subsidiary learning of external knowledge will mediate the relationship between knowledge acquisition practices for acquiring knowledge from the external environment and subsidiary knowledge creation capability.*

### **Interaction between Subsidiary Learning and Intellectual Capital**

The intellectual capital of a host country subsidiary that consists of its human, social, and organizational capital is likely to moderate the effect of subsidiary learning on subsidiary knowledge creation. Although learning in itself can lead to greater levels of knowledge creation capability as discussed in the previous section, its real impact may



depend on the extent to which there are individuals who are capable of exploiting the acquired knowledge, organizational norms for sharing and exchanging knowledge within the subsidiary, and systems and structures in place for storing and withdrawing information in the subsidiary. There are several reasons to believe that subsidiary learning will be more conducive to knowledge creation capability in subsidiaries with higher levels of intellectual capital.

First, existence of human capital should magnify the impact of subsidiary learning on knowledge creation since without the availability of talented, skilled, and motivated employees in a subsidiary's workforce, knowledge exploitation should be very limited. Related to this point, Cohen and Levinthal (1991, p. 135) state that "To integrate certain classes of complex and sophisticated technological knowledge successfully into the firm's activities, the firm requires an existing internal staff of technologists and scientists who are both competent in their fields and are familiar with the firm's idiosyncratic needs, organizational procedures, routines, complementary capabilities, and extramural relationships." This view is also consistent with human capital theory which posits that the collective knowledge, skills, and abilities of a firm's workforce is a form of capital that will create value in return for the investments made in them (Hatch & Dyer, 2004; Hitt, Bierman, Shimizu, & Kochar, 2001). Hence, in line with the original arguments of Cohen and Levinthal (1990) and the human capital theory, the relationship between learning and knowledge creation capability is expected to be stronger when a subsidiary has employees who have the necessary prior knowledge, skills, abilities, and experience which will help them exploit the acquired knowledge.

***Hypothesis 5a.1:*** *Subsidiary learning of internal knowledge will be more strongly related to its knowledge creation capability when a subsidiary's human capital is high than when a subsidiary's human capital is low.*

***Hypothesis 5b.1:*** *Subsidiary learning of external knowledge will be more positively related to its knowledge creation capability when a subsidiary's human capital is high than when a subsidiary's human capital is low.*

However human capital is not the only form of capital that may enhance knowledge creation capability in firms (Subramaniam & Youndt, 2005). This is because knowledge exploitation also requires the sharing of individuals' relevant knowledge with other members of the firm (Zahra & George, 2002) – hence, social capital. Social capital creates broad and tacitly understood norms for appropriate action and increases the density of linkages or connectedness within a firm - thereby facilitating knowledge exchange among its members (Jansen et al., 2005; Nahapiet & Ghoshal, 1998). It creates and encourages the development of trust, cooperation, and communication among organizational members (Nahapiet & Ghoshal, 1998). Thus, firms with higher levels of connectedness among its employees are better positioned to make their employees aware of what knowledge the organization already possesses, who knows what, who can help with what problem, and who can exploit new information (Cohen & Levinthal, 1990; Lane et al., 2006). This way, knowledge that has been learned from other sources can be more efficiently and effectively exploited. In support of these arguments, Jansen et al. (2005) found that connectedness within organizations was positively related to knowledge exploitation and Subramaniam and Youndt (2005) reported positive links

between the interaction of a firm's social and human capital and its radical innovative capability.

***Hypothesis 5a.2:*** *Subsidiary learning of internal knowledge will be more strongly related to its knowledge creation capability when a subsidiary's social capital is high than when a subsidiary's social capital is low.*

***Hypothesis 5b.2:*** *Subsidiary learning of external knowledge will be more positively related to its knowledge creation capability when a subsidiary's social capital is high than when a subsidiary's social capital is low.*

While human and social capital constitutes a significant portion of a firm's intellectual capital, they are an incomplete account of intellectual capital without organizational capital. This is because human and relationship-based repertoires of organizational knowledge are not perfectly reliable due to the limited and error-prone information-processing capabilities of individuals and collectives (Huber, 1991). As such, a great deal of organizational information needs to be recorded and stored in standard operating procedures, databases, patents, structures, and systems (Huber, 1991; Subramaniam & Youndt, 2005). Existence of such organizational capital in firms programs the behavior of individuals in advance of their execution and provides a reliable memory for handling routine situations (Van den Bosch et al., 1999). Related to organizational capital, Jansen et al. (2005) argued and reported that system capabilities related to formalization (*i.e.*, the degree to which rules, procedures, instructions, and communications are codified and recorded) was related to exploitation of newly acquired

knowledge. Similarly, Subramaniam and Youndt (2005) reported that organizational capital was positively related to incremental innovations. Moreover, Jansen et al. (2005, p. 1002) state that “Formalization supports the retrieval of knowledge that has already been internalized and enhances the casual understanding of sets of tasks within units. Accordingly, formalization increases the likelihood that unit members will identify opportunities for the transformation of new external knowledge.” Therefore, organizational capital should also help exploit learning from internal and external units in MNC subsidiaries. Based on the above arguments, the following hypotheses are proposed.

***Hypothesis 5a.3:*** *Subsidiary learning of internal knowledge will be more strongly related to its knowledge creation capability when a subsidiary’s organizational capital is high than when a subsidiary’s organizational capital is low.*

***Hypothesis 5b.3:*** *Subsidiary learning of external knowledge will be more positively related to its knowledge creation capability when a subsidiary’s organizational capital is high than when a subsidiary’s organizational capital is low.*

### **Subsidiary Knowledge Creation and Subsidiary Competitive Advantage**

The potential impact of a firm’s knowledge creation capability on its competitive advantage has been widely recognized and documented in the international management and strategy literatures. An important source of competitive advantage for firms is to utilize organizational resources that are rare, valuable, inimitable, and nonsubstitutable (Barney, 1991). According to the resource-based view of competitive advantage, a

resource is valuable when it enables a firm to take advantage of opportunities or neutralize threats that exist in its environment. Organizational resources are rare as long as the number of firms that possess a particular valuable resource is less than the number of firms needed to generate perfect competition. Finally, resources become inimitable if they develop as a result of unique historical conditions and if the link between the resource and competitive advantage is causally ambiguous and socially complex (Barney, 1991).

One such critical resource that satisfies the above criteria for developing and sustaining competitive advantage is a firm's capability to effectively create new knowledge (Matusik & Hill, 1998; Zahra & George, 2002). New knowledge creation that results from learning from internal and external sources can help firms attain superior performance because of first mover advantages, responsiveness to customers (Matusik & Hill, 1998; YliRenka et al., 2001), and/or the ability to adapt to changing and uncertain environments (Van Wijk et al., 2007) – thus, it is valuable. Knowledge creation capability is further not tradable in factor markets, path dependent, and is influenced by a firm's previous experiences (Lane et al., 2006; Zahra & George, 2002) – thus, it is both rare and inimitable. Although there may be equifinality in firm capabilities making it difficult to sustain competitive advantage (e.g., Eisenhardt & Martin, 2000), Cockburn, Henderson, and Stern (2000) argue that the key to competitive advantage lies in a firm's ability to identify and respond to environmental changes in advance of competitors. Therefore, the capability for knowledge creation in advance of competitors should lead to superior performance. Thus, it follows that a subsidiary's ability to create knowledge

should be related to its competitiveness in the host market. In line with these arguments, I propose the following:

***Hypothesis 6:*** *Subsidiary knowledge creation capability will be positively related to subsidiary competitive advantage.*

Viewed in combination, the effects of subsidiary learning of internal and external knowledge on subsidiary competitive advantage should be mediated by subsidiary knowledge creation. This argument is consistent with the work of Zahra and George (2002) who claim that firms that focus extensively on learning from and exploring the environment can constantly renew their knowledge stock but cannot benefit from it unless they can exploit what they have learned from their environment. Similarly, in his seminal work on the role of exploration and exploitation in organizational learning March (1991, p. 71) notes that “Adaptive systems that engage in exploration to the exclusion of exploitation are likely to find that they suffer the costs of experimentation without gaining many of its benefits. They exhibit too many underdeveloped new ideas and too little distinctive competence.” Therefore, the arguments of organizational learning and absorptive capacity theorists suggest knowledge creation capability should play a mediating role in the learning – competitive advantage relationship.

***Hypothesis 7a:*** *Subsidiary knowledge creation capability will mediate the relationship between subsidiary learning of internal knowledge and subsidiary competitive advantage.*

***Hypothesis 7b:*** *Subsidiary knowledge creation capability will mediate the relationship between subsidiary learning of external knowledge and subsidiary competitive advantage.*

## METHODS

### Data Collection Procedure

Data for this study were collected through an online questionnaire survey. Data collection process started in June 2008 and continued until November 2008. Prior to collecting data, a contact list including names of highest ranking executives, addresses, and telephone numbers of the US subsidiaries of 900 MNCs were compiled through Dun & Bradstreet using a random sampling technique. Three selection criteria were used for creating the list.

First, to ensure that subsidiaries have accumulated a certain degree of intellectual capital and have established mechanisms to acquire knowledge internally and externally, subsidiaries that have been in the US for a minimum of five years were drawn from this database. Second, to control for differences in the use of knowledge acquisition practices and outcome variables between companies operating in the manufacturing and the service sector, only those subsidiaries operating in the manufacturing sector were selected. The resultant list of subsidiaries operated in 12 different industries with two-digit SIC codes within the manufacturing sector and include measuring, analyzing, and controlling instruments; electronic and electrical equipment and components; industrial and commercial machinery, and computer equipments; fabricated metal products; primary metal industries; stone, clay, glass, and concrete products; chemicals; rubber and plastics products; lumber and wood products; paper and allied products; and printing and publishing.

Finally, those countries that share a major amount of foreign direct investment in the US were selected to ensure a sufficient population to draw the sample from. The



parent companies of these MNCs are located in 11 different countries including Japan, Germany, UK, France, Finland, Sweden, Switzerland, Denmark, Ireland, Italy, and Netherlands. After deleting redundant contact names for different business units within the same MNC from the list, a total of 869 subsidiaries were contacted.

The strategic nature of questions in the survey demands that high level senior executives fill in the questionnaire developed for this dissertation. However, while executives are the most knowledgeable sources of firm-level strategic phenomena, research shows a sharp decline in the last decade in the response rates achieved from the upper echelons of firms (Cycyota, Harrison, & Stahl, 2002; Cycyota & Harrison, 2006). Therefore, I followed Dillman (2007)'s tailored design approach, which suggests several ways to encourage response rates. The following precautions were taken to encourage response from potential respondents.

First, personalization and establishment of trust between the respondent and the researcher are suggested to encourage response (Harvey, 1987; LaGrace & Kuhn, 1995). In order to achieve this, I included a short bio and a picture in the invitation letter and addressed the letters to the potential respondents' names that were identified using the Dun & Bradstreet database (See Appendix 1 for a copy of the invitation letter). Also, strict confidentiality of individual responses was assured and all respondents were assigned a unique password to access the online survey – which were then used to link responses to archival data from secondary sources.

Second, research suggests that topical salience is one of the only tactics that leads to better response rates among high-level executives (Cycyota et al., 2002, Cycyota & Harrison, 2006). To achieve topical salience, the invitation letter included a short

description of the purpose of the study, its importance, and the target population. While monetary incentives do not seem to be effective among this group of key informants (Cycyota et al., 2002, Cycyota & Harrison, 2006), promising a summary of findings can be potentially effective – especially if the topic under study reaches salience - and was consequently offered to potential participants. Finally, as an additional incentive to encourage participation and especially to safeguard against gatekeepers who screen executives' letters, \$1.00 to a charity of the executives' choice was promised for a complete response set from each participating organization.

Creating multiple and diverse contacts with potential respondents is suggested to be one of the most effective methods for achieving greater response rates (Dillman, 2007). Therefore, the invitation letters were followed, approximately two weeks later, by a wave of reminders, which were then followed by two e-mail reminders to the executives. There were four undelivered mails, two cases where the respondents reported they were no longer foreign-owned, and one company which reported to have a policy of not responding to surveys of this kind. Among the completed responses, there was one organization which was not foreign-owned and one organization which was a start-up and therefore had no performance data. These instances reduced the number of companies that were eligible for participation from 869 to 860. After deleting cases with more than 30% missing values, 106 cases were retained for analysis yielding an effective response rate of 12.3%.

In their meta-analysis on response rates from executives, Cycyota and Harrison (2006) report that during the period of 1992-2003, the average response rate from 231 studies which mailed surveys to executives was 34%. While this percentage is

substantially higher than the response rate reported in this dissertation, the cases reported in the meta-analysis were published in top-tier journals of our field such as *Academy of Management Journal*, *Journal of Applied Psychology*, and *Strategic Management Journal* and thus may not accurately reflect all attempts to obtain data from senior executives. Other researchers have suggested much lower response rates from the executives of American firms. For example, Hambrick, Geletkanycz, and Fredrickson (1993) report that, 10-12% response rates are typical for mailed surveys to top executives of American firms. Harzing (1997), in a cross-national comparison of response rates among executives, found that US has the second lowest response rate (after Hong Kong) with 11% among 22 countries. Also given the evidence that online surveys generate lower response rates than traditional mail surveys because of lower trust in the data collection process (Birnbaum, 2004), the response rate achieved in this study can be considered appropriate.

### **Sample and Participants**

The individual respondents for this study had an average tenure of 14.9 (s.d.=9.3) years working for the US subsidiary and held titles such as President, General Manager, Chairman, Director, CEO, CFO, and VP, HR. Therefore, we can conclude that the responses came from key informants from each organization who have the knowledge and experience to address the issues under investigation in this study.

Because top executives and functional heads (i.e., HR, Finance) may have different perspectives when responding to the questions addressed in this study, a series of independent samples t-tests were run to diagnose any systematic differences in the response patterns of these two groups. The only construct that reached a significance

level of  $p < .05$  was *internal learning* - with functional heads having a significantly higher mean (mean = 4.53) than the top executive group (mean = 3.94). To explore whether this result was due to acquiescence bias on the part of the functional heads or due to actual differences between firms, each respondent's responses on all items were averaged and the means of the two subgroups compared (Harzing, 2004). Since there was no significant difference in the grand mean of the two groups' response sets, no further action was taken to adjust for differences in response styles or perspectives.

The average size of the participating organizations - measured as the number of US employees - was 2,968 (s.d. 6,774) and the average age of the subsidiaries were 54.6 years (s.d. 34.9). The percentage of MNCs that entered the US market through acquisition was 80% and the rest were Greenfield operations. Wholly owned subsidiaries comprised 97% of the sample and the rest were IJVs. Eighty percent of the sample had R&D facilities in the US and 94% had manufacturing facilities, with 75% having both R&D and manufacturing facilities. Table 1 shows the distribution of participant firms in terms of their country-of-origin and the industries that were represented in the sample.

## **Measures**

Items for the survey questionnaire were developed after an extensive review of the relevant literature on knowledge transfers in MNCs, absorptive capacity, and MNC strategy in general. The total number of items included in the survey was 84 including those items that were used in this study and other items that were used in order to tap into other research questions. Where applicable, items that were used in previous studies were adapted to the purpose of this study to ensure validity of survey measures. Pilot-testing that focused on the content of the study constructs were conducted with HR and

line managers in five large MNCs and the actual survey items were pilot tested with three PhD students in the management field and four individuals with extensive managerial experience in MNCs. Subsequently, minor modifications were made in survey items.

Because of potential differences in the way firms manage different groups of employees (Lepak & Snell, 1999), survey items focused only on the key employees of subsidiaries. The respondents were asked to consider their key employees such as top management team members, department and line managers, and their knowledge workers (e.g., scientists and engineers) when answering the questions in the survey. The focus on key employees as opposed to the whole subsidiary workforce is justified because key employees are more likely to be exposed to and engage in knowledge acquisition practices and are more likely to influence a firm's knowledge creation capability and performance (Collins & Smith, 2006; Smith, Collins, & Clark, 2005).

The knowledge acquisition measures developed for this dissertation is somewhat different from measures used in previous studies as the ones used in this study focus on the use of a specific set of organizational practices for knowledge acquisition purposes; while previous measures inquired about the use of such practices in generic terms. This approach reflects recent developments in strategic human resource management research which suggests that organizational practices need be designed around a particular strategic focus to be of value and that researchers need to evaluate outcomes directly related to that strategy (Bowen & Ostroff, 2004; Lepak, Liao, Chung, & Harden, 2006; Liao, Toya, Lepak, Hong, 2009). For example, Collins and Clark (2003), in a study of top management teams' (TMT) social networks and firm performance, focused on a

specific set of practices aimed at network building<sup>1</sup> and showed that these practices were significantly related to the size and strength of TMT internal and external networks.

The survey used for this dissertation is found in Appendix 2. The psychometric properties of the measures including reliability and validity evidence are provided in the next section of this manuscript. In what follows, the measures, sources of measures, and response scales are described.

***Internal knowledge acquisition practices.*** Nine items assessing internal knowledge acquisition practices are based on the work on mechanisms that enable knowledge transfers within MNCs (Gupta & Govindarajan, 2000; Bjorkman et al., 2004). The question stem asks respondents the extent to which key employees of the subsidiary engage in the stated activities to acquire knowledge from the foreign parent company using a 7-point Likert scale with anchors ranging from (1) not at all to (7) very frequently. Two example items are “Our key employees acquire knowledge through international trips and visits to other units of the foreign parent company” and “Our key employees acquire knowledge from their mentors at other units of the foreign parent company”.

***External knowledge acquisition practices.*** Six items assessing external knowledge acquisition practices are based on Jansen et al.’s (2005) work on organizational antecedents of absorptive capacity, Collins and Clark’s (2003) research on network-building human resource practices, and Lane and Lubatkin’s (1998) work on inter-organizational learning. The question stem asks respondents the extent to which key employees of the subsidiary engage in the stated activities to acquire knowledge from

---

<sup>1</sup> The items asked respondents whether those practices were used specifically for building relationships with organizational and non-organizational members. A sample item from this study is ‘The TMT frequently discusses strategies for developing personal relationships with key external stakeholders’.

local players in the U.S. market (e.g., clients, suppliers, distributors) using a 7-point Likert scale with anchors ranging from (1) not at all to (7) very frequently. Three example items are “Our key employees collect industry information through informal means (e.g. lunch with industry friends, talk with trade partners).”, “Our key employees are provided expense accounts for subscribing to trade journals, participating in workshops and seminars to acquire knowledge.”, and “Our key employees participate in bench-marking and competitive intelligence projects to acquire knowledge.”

***Subsidiary learning of internal and external knowledge.*** Learning is measured by five items from Lyles and Salk (1996) and Lane, et al. (2001) on a seven-point Likert scale with anchors ranging from (1) not at all to (7) to a great extent. The question stem asks respondents the extent to which the US subsidiary has learned from its foreign parent marketing and sales know-how, management techniques and practices, manufacturing processes, product development, and know-how on new technologies. The same items are repeated for learning from local players.

***Subsidiary knowledge creation.*** In order to put the meaning of knowledge creation in perspective, respondents were given a short definition of knowledge creation: “Creating new knowledge refers to finding out new, improved, or refined ways of doing things that generate organizational value or increase operational efficiency”. Respondents were then asked on a seven-point Likert scale ranging from (1) not at all to (7) to a great extent, the extent to which the US subsidiary has the capability to create new knowledge, in five areas that correspond to the areas inquired in subsidiary learning items - marketing and sales, management techniques and practices, manufacturing processes, products and services, and technology. This approach follows the work on

Centers of Excellence in MNCs (e.g., Holm & Pedersen, 2000) and has been previously applied by Andersson et al. (2005).

***Subsidiary intellectual capital.*** The level of intellectual capital in the subsidiaries were assessed by using Youndt and Subramaniam's (2005) intellectual capital measure which consists of three dimensions – human, social, and organizational capital. Human capital consists of five and social capital and organizational capital scales consist of four items. One item from the original social capital scale was dropped since it focused on external rather than within-subsidiary social capital. A seven-point Likert-scale, with anchors ranging from (1) strongly disagree to (7) strongly agree are used for this measure. A sample item for the human capital scale is “Our employees are highly skilled”; a sample item from the social capital scale is “They interact and exchange ideas with people from different areas of this subsidiary”; and a sample item from the organizational capital scale is “This subsidiary embeds much of its knowledge and information in structures, systems, and processes.”

***Subsidiary competitive advantage.*** Subsidiary competitive advantage was measured by using a perceptual measure of subsidiary performance. Because it is notoriously difficult to obtain objective performance data for host country subsidiaries (Andersson, Forsgren, & Pedersen, 2001), much of previous subsidiary performance research also relies on managers' perceptual evaluations of subsidiary success (e.g., Andersson et al, 2001, 2002; Venaik, Midgley, & Devinney, 2005; Taggart, 1999). Doing so presents less of a limitation especially when data is provided by top management team members who are well informed about the subsidiary in question (cf. Krishan, Martin, & Noorderhaven, 2006).



Competitive advantage is a multidimensional construct since the goals and objectives of subsidiaries are likely to vary depending on the competitive and contextual pressures faced by firms and the strategic objectives of the MNCs (Gilley & Rasheed, 2000; Gupta & Govindarajan, 1984; Kaplan & Norton, 2000; Venkatraman & Ramanujam, 1986). Therefore, subsidiary competitive advantage, in this study, is operationalized as the degree to which a subsidiary achieves the goals and objectives that are strategically important for its competitiveness. In line with the relative nature of this construct, subsidiary competitive advantage was measured by assessing the importance of as well as satisfaction with several performance dimensions simultaneously – based on the work of Gupta and Govindarajan (1984).

Subsidiary competitive advantage was assessed both from a market/product point of view and from a financial/accounting point of view (Venkatraman & Ramanujam, 1986). These outcomes were measured by asking the respondents the degree of importance the US subsidiary's top management team attaches to the US subsidiary's (1) overall sales growth, (2) sales growth from new products, (3) market share growth, (4) operational efficiency, and (5) profitability. A five-point Likert scale, with anchors ranging from (1) of little importance to (5) very important, were used for this measure. Next, respondents were asked to report on the subsidiary management team's level of satisfaction with the five outcome measures using a five-point Likert scale, with anchors ranging from (1) very dissatisfied to (5) very satisfied. In order to create a stronger measure of subsidiary performance, each 'satisfaction' answer was multiplied by its corresponding 'importance' score. A measure of competitive advantage was created by averaging the scores of the five cross-products.

***Control variables.*** Several subsidiary-level variables that can potentially affect the outcomes of this study were used as control variables. Subsidiary size was measured as the total number of employees of the US operation. Subsidiary age was measured as the age when the firm was originally established in the US<sup>2</sup>. Upstream competence of the subsidiary was also controlled for. Presence of an upstream value activity was measured by combining two items which asked about the presence of R&D facilities and the presence of manufacturing facilities in the US - with a resulting score ranging from 0 to 2. Finally, to control for country-of-origin or regional effects, a Japanese dummy variable was used in the analyses. The 10 industry dummies did not have significant correlations with the outcome variables – neither did they have significant coefficients when entered in regression equations. In order to preserve degrees of freedom and keep the models parsimonious, they were not used as control variables in the analyses.

---

<sup>2</sup> If the mode of entry was acquisition, the year in which the acquired firm was originally established in the US rather than the acquisition date was used since the former one is a more valid measure of the experience of the organizational entity in the US. Furthermore, compared to operationalizing age as the acquisition date, the age variable in this form provided more conservative estimates of the relationships in analyses.

## RESULTS

### Psychometric Properties of Measures

Because measures for two key variables - internal and external knowledge acquisition practices - were developed based on previous studies, I assessed the construct validity of these measures by examining their dimensionalities, and convergent, and discriminant validities. For other measures that were used based on previous studies, I used evidence from earlier research and/or conducted confirmatory factor analysis to establish their construct validities. Cronbach's alpha values are also reported to demonstrate inter-item reliabilities of the measures used.

*Construct validity of 'internal knowledge acquisition practices' measure.* The following analyses were conducted to demonstrate the validity of internal knowledge acquisition practices measure. First, the dimensionality of this measure was examined by conducting a principle components factor analysis with varimax rotation. A one-factor solution in which all the items had high loadings (average loading = .70) and the single factor explaining 50% of the variance was obtained (see Table 2 for factor analysis results). Then, convergent validity of this measure was examined by demonstrating its relationship with theoretically related constructs. The pattern of correlations was consistent with the nomological network of the aforementioned measure. Internal knowledge acquisition practices measure was significantly correlated with the number of expatriates in the top management team of the subsidiary ( $r = .33, p < .01$ ), the percentage of internal purchases that the US subsidiary makes from the rest of the MNC ( $r = .38, p < .01$ ), and a two-item measure of shared vision with the MNC ( $r = .41, p < .01$ ) adapted from Tsai and Ghoshal (1998) ( $\alpha = .83$ ). Finally, the discriminant validity of this

measure was evaluated by examining its relationship with theoretically unrelated constructs. For example, there is no compelling theory which suggests that there could be a relationship between such practices and the size or the age of the firm. The relationship between the internal knowledge acquisition practices measure and both firm size ( $r = .10$ ) and firm age ( $r = -.04$ ) was nonsignificant providing discriminant validity evidence for this construct. This measure had a coefficient alpha of .87 demonstrating good inter-item reliability.

***Construct validity of ‘external knowledge acquisition practices’ measure.*** The dimensionality of external knowledge acquisition practices measure was also examined by conducting a principle components factor analysis with varimax rotation. A one-factor solution in which all the items had high loadings (average loading = .72) and the single factor explaining 52% of the variance was obtained (see Table 3 for factor analysis results). Then, the convergent validity of the external knowledge acquisition practices measure was examined by examining its relationship with a three-item measure on local responsiveness adapted from Luo (2001) and a four-item measure on local adaptation adapted from Harzing (2000). While external knowledge acquisition practices measure was significantly correlated with local adaptation ( $r = .26, p < .01$ ), it was not correlated significantly with local responsiveness ( $r = .15$ , n.s.) providing partial support for convergent validity. Discriminant validity of this measure was again evaluated by examining its relationship with theoretically unrelated constructs of firm size and age. The relationship between external knowledge acquisition practices measure and both firm size ( $r = .15$ ) and firm age ( $r = -.10$ ) was not significant - providing discriminant validity

evidence for this construct. This measure had a coefficient alpha of .80 demonstrating good inter-item reliability.

Finally, a principal components factor analysis with varimax rotation was conducted with all of the items included in the internal and external knowledge acquisition scales (see Table 4 for factor analysis results), limiting the number of factors to be extracted to two<sup>3</sup>. All items loaded significantly on their respective constructs with no cross-loadings confirming that internal and external knowledge acquisition practices are separate constructs. In sum, the above results demonstrated that the two measures assessing internal and external knowledge acquisition practices had single-factor structures, were correlated with yet distinct from theoretically related constructs, and uncorrelated with theoretically non-related constructs, thus establishing construct validity of these measures.

*Construct validity evidence for ‘competitive advantage’.* Previous research has found strong correlations between subjective and objective measures of performance (Geringer & Hebert, 1991; Venkatraman & Ramanujam, 1986; Wall, Michie, Patterson, Wood, Sheehan, Clegg, West, 2004), providing construct validity evidence for subjective measures of performance in general. For example, Wall et al. (2004) tested the assumption that subjective measures of company performance are equivalent to objective measures and subsequently found that “(a) subjective and objective measures of company performance were positively associated (convergent validity); (b) those relationships were stronger than those between measures of differing aspects of performance using the

---

<sup>3</sup> Factor analysis based on Eigenvalues greater than one resulted in three factors with three items (two items from external and one item from internal knowledge acquisition practices) cross-loading on the third factor. Since all but one of the cross-loaded items had their highest loadings on their respective constructs, a decision was made to fix the number of factors to two in order to get a clean solution rather than deleting items.

same method (discriminant validity); and (c) the relationship of subjective and objective company performance measures with a range of independent variables were equivalent (construct validity)” (Wall et al., 2004, p. 95).

Because, as described earlier, performance is theorized to be a multidimensional construct, the dimensionality of the specific performance measure used in this study was evaluated by conducting a principle components factor analysis with varimax rotation. However, a one-factor solution with the single factor explaining 45% of the variance emerged, with an average item loading of .67. Convergent validity of this measure was evaluated by examining its relationship with a two-item measure on the overall performance of the subsidiary in the US market. The significant correlation coefficient ( $r = .49, p < .01$ ) between the two alternative measures of competitive advantage provides further evidence for this measure’s construct (convergent) validity. The inter-item reliability of this measure was also acceptable with a coefficient alpha value of .70.

***Construct validity evidence for ‘intellectual capital’ measure.*** Using LISREL 8.8, I conducted a confirmatory factor analysis (CFA) of the three aspects of intellectual capital – human, social, and organizational. CFA rather than exploratory factor analysis was used since the goal was to confirm the factor structure of this previously used measure rather than to explore its dimensionality. Results of CFA were comparable to the estimates obtained by Youndt and Subramaniam (2005) and suggested that intellectual capital model provided a modest fit to the data. Despite being significant, chi-square value was less than three times its degrees of freedom ( $\chi^2 = 169.12, df = 74, p < .01$ ). Furthermore, CFA fit indices exceeded the levels suggested by Bentler and Bonnet (1980) (CFI = .92, IFI = .92, NNFI = .90). RMSEA value was slightly above the

suggested cutoff point of .08 (RMSEA = .09). Since the loadings of all measurement items on their respective constructs were also significant ( $p < .05$ ), it was concluded that the constructs exhibited sufficient convergent and discriminant validity. The reliability scores for human, social, and organizational capital scales were .82, .85, and .75 respectively suggesting that the three intellectual capital subscales were internally consistent.

***Construct validity evidence for ‘subsidiary learning’ and ‘knowledge creation capability’ measures.*** All of the subsidiary learning and knowledge creation capability measures had acceptable inter-item reliabilities. The coefficient alphas were .80, and .83 for internal and external learning scales respectively and .79 for the knowledge creation capability scale. A close examination of the correlation table among the variables used in this study (Table 6) revealed that these measures were significantly correlated with other measures in their nomological networks providing convergent validity evidence. For example, knowledge creation capability was significantly correlated with all aspects of intellectual capital ( $r = .34, .36, .40$  for human, social and organizational capital;  $p < .01$ ), internal learning was significantly correlated with internal knowledge acquisition practices as expected ( $r = .57, p < .01$ ), and external learning was significantly correlated with external knowledge acquisition practices ( $r = .40, p < .01$ ).

In sum, the psychometric properties of the measures used in this study were concluded to be acceptable, demonstrating sufficient inter-item reliabilities and construct validities, limiting concerns about measurement error.

### **Preliminary Analyses**

**Power analysis.** Power analysis is a useful tool for researchers to estimate the required sample size for the detection of the proposed relationships among constructs. Statistical power analysis examines the relationships among four elements that are involved in a statistical inference: sample size, significance criterion, population effect size, and statistical power (Cohen, 1992; Seldmeier & Gigerenzer, 1989). While researchers widely use .05 as an acceptable and established significance criterion, estimating population effect sizes remains fairly muddled. Yet, in a recent meta-analysis on the antecedents and outcomes of organizational knowledge transfers, VanWijk, Jansen, and Lyles (forthcoming) shed light on the potential population effect sizes that are relevant to the research questions posed in this dissertation. For example, they report fairly strong effect sizes for the relationships that exist between absorptive capacity and knowledge transfer ( $r_c = .19$ ), knowledge transfer and innovativeness ( $r_c = .15$ ), and knowledge transfer and performance ( $r_c = .22$ ). In his categorization of effect sizes into small, medium, and large, Cohen (1992) considers the magnitude of such effect sizes reported by VanWijk et al. (forthcoming) to be medium.

The final element for estimating the sample size for the desired level of power is the number of independent variables. In this dissertation, the number of independent variables that will be entered in the regression equations for testing the proposed hypotheses will be a maximum of eight, including control variables. In order to achieve the desired power level of .80 with eight variables at  $\alpha = 0.05$ , a sample size of 107 is required (Cohen, 1992). This indicates that, with a sample of 107, I will have an 80% chance of detecting the medium effect size that I believe to exist in the population, and a 20% chance of engaging in a Type II error by not finding evidence against the false null



hypothesis. The sample size of 106 obtained in this study, therefore, should be an adequate sample size to detect the effects, if indeed, the assumption of a medium effect size is correct.

***Sampling bias.*** To check for potential sampling bias, a series of independent samples t-tests were performed to compare the means of respondent and non-respondent firms on several firm attributes. Using information from Dun & Bradstreet as the data source, firms were compared with respect to their total US sales, number of US employees, and their experience in the US market (*i.e.*, age). There were no significant differences in the profile of respondent and non-respondent firms on any of these firm attributes. Thus, sampling bias should not be a major concern for this study.

***Common method bias.*** This study relies on data collected from a single respondent from each organization and is thus vulnerable to common method bias. I took both procedural precautions in the design of the survey and performed post hoc analysis to reduce concerns about this potential problem (Podsakoff et al., 2003). Procedural remedies included using different scale formats for different variables (*5-point and 7-point Likert scales*) and using different scale anchors for different measures (*strongly agree – strongly disagree; not at all – very frequently*). Also, different constructs were separated from each other by placing them in different web pages to reduce artificial covariance among them (Podsakoff et al., 2003).

In order to further reduce concerns of common method bias, a *post hoc* analysis on all survey items using Harman's single-factor test was performed. According to this diagnostic test, if common method variance exists in the data, then either a single factor emerges or the first factor accounts for the majority of variance in the variables

(Podsakoff & Organ, 1986). Yet, the test resulted in 15 factors with Eigenvalues above one and the first factor accounting for only 10% of the total variance. Also, all items loaded on their respective constructs with some cross-loading of items. Because of both precautions taken to reduce common method bias in the design of the study and the post hoc diagnostic test showing no major signs of common method variance, concerns about this potential problem affecting the results of this study are reduced.

*Missing values and assumptions of multivariate analysis.* As a last step before starting the analyses, all variables included in this study were examined for accuracy of data (*i.e.*, out-of-range values), missing values, and the fit between their distributions and the assumptions of multivariate analysis (see Table 5 for the minimum and maximum values, means, standard deviations, variances, and skewness and kurtosis values of the variables used in the study).

In order to handle missing values on firm attributes such as number of employees, year of establishment, and presence of manufacturing and R&D, information from company websites or Dun & Bradstreet database were used as the data source. One case that had a missing score on the external learning scale was replaced with its predicted score based on regressing external learning on external knowledge acquisition practices. Another case with a missing score for the organizational capital scale was replaced by the grand mean of organizational capital since there were no independent variables in the data that would theoretically predict organizational capital. While this method reduces the variance in organizational capital, mean substitution is an accepted way of handling

missing data in cases where the proportion of missing values is very small – such as this one (Tabachnick & Fidell, 2001)<sup>4</sup>.

Finally, two variables, number of employees and firm age, which had extreme skewness and kurtosis values, were transformed using log transformation (number of employees) and square root transformation (firm age) in order to improve the fit between their distributions and the assumptions of normality, linearity, and homoscedasticity in multivariate analysis.

### **Hypothesis Testing**

Table 5 presents descriptive statistics and Table 6 presents zero-order correlations among all variables included in this study. The hypotheses depicted in the theoretical model illustrated in Figure 1 were tested using a series of ordinary least-square regression techniques and supplemented with path analytic procedures using maximum likelihood as the estimation method where applicable. Tables 7 through 10 present the results for the hypotheses. Figure 5 shows only those paths of the proposed theoretical model (Figure 1) that were empirically supported and Figure 6 shows all significant paths in the model.

This section is organized such that results of hypotheses that involve main (direct) effects are presented first (Hypothesis 1a, 1b, 2a, 2b, 6). Then, results of hypotheses involving meditational (indirect) effects are reported (Hypothesis 4a, 4b, 7a, 7b). Finally, the results of hypotheses that include interaction effects are presented (Hypothesis 3, 5a, 5b). Significance levels are based on two-tailed tests in all analyses in order to perform more conservative tests of proposed hypotheses. For all the tests performed, variance

---

<sup>4</sup> While there were incidental missing values in scale items, because of the high reliability scores reported in the measures section, scale scores were calculated by averaging at least three items from each scale - reducing the number of cases with missing values on self-reported constructs to two.

inflation factors for individual variables had values less than two and the tolerances did not approach zero, suggesting multicollinearity did not threaten parameter estimates.

***Direct (main) effects hypotheses.*** Hypothesis 1a predicted a positive relationship between the use of internal knowledge acquisition practices and internal learning. Regression results are reported in Table 7 with Model 1a including the control variables and Model 2a including internal knowledge acquisition practices. As reported in Table 7, the control variables as a set accounted for 5 percent of the variance in internal learning ( $F = 1.25$ , n.s.). Among the controls, the only variable which had a significant beta coefficient was subsidiary age ( $\beta = -.20$ ,  $p < .05$ ) suggesting that as subsidiaries age, the amount of learning from the rest of the MNC decreases. In Model 2a, the addition of internal knowledge acquisition practices explained 32 percent additional variance in internal learning ( $\Delta F = 51$ ,  $p < .001$ ) and the parameter estimate for internal knowledge acquisition practices was significant and positive ( $\beta = .57$ ,  $p < .001$ ) – providing support for Hypothesis 1a<sup>5</sup>.

Hypothesis 1b suggested a positive relationship between the use of external knowledge acquisition practices and external learning. As reported in Model 1b of Table 7, control variables accounted for 6 percent of the variance in external learning ( $F = 1.61$ , n.s.) and none of the control variables had a significant beta coefficient. When external knowledge acquisition practices were entered in Model 2b, the inclusion of this variable explained 12 percent additional variance in external learning ( $\Delta F = 15.29$ ,  $p < .001$ ). The

---

<sup>5</sup> The same analysis was rerun with external knowledge acquisition practices in the regression equation. There was no change in the results. Internal knowledge acquisition practices was still significant at  $p < .001$  and external knowledge acquisition practices was not a significant predictor of internal learning.

parameter estimate for external knowledge acquisition practices was also significant and positive ( $\beta = .36, p < .001$ ) providing support for hypothesis 1b<sup>6</sup>.

Hypothesis 2a and 2b predicted positive relationships between knowledge creation capability and internal and external learning respectively. Because these hypotheses shared the same dependent variable (knowledge creation capability), they were tested in the same regression equation. Table 8 presents the results of these hypotheses. In Model 1, control variables were entered in the regression equation and consequently explained 5 percent of the variance in knowledge creation capability ( $F = 1.47, n.s.$ ). The only control variable that was significant and positive was subsidiary size ( $\beta = .24, p < .05$ ) indicating that knowledge creation capability increases as the size of the subsidiary workforce increases. In Model 2, internal and external learning were entered in the regression equation and their inclusion explained 15 percent additional variance in knowledge creation capability ( $\Delta F = 9.31, p < .001$ ). The parameter estimates for both internal learning ( $\beta = .25, p < .01$ ) and external learning ( $\beta = .29, p < .01$ ) were significant and positive providing support for hypotheses 2a and 2b.

The last hypothesis that suggested a direct effect among study constructs was Hypothesis 6. Hypothesis 6 proposed that subsidiary knowledge creation capability will be positively related to subsidiary competitive advantage. Table 9 presents the regression results for this hypothesis with Model 1 including the control variables and Model 2 including knowledge creation capability. Control variables as a set accounted for 5 percent of the variance in subsidiary competitive advantage ( $F = 1.40, n.s.$ ) with

---

<sup>6</sup> The same analysis was rerun with internal knowledge acquisition practices in the regression equation. There was no change in the results. External knowledge acquisition practices was still significant at  $p < .001$  and internal knowledge acquisition practices was not a significant predictor of external learning.

subsidiary age having a slight negative impact on performance ( $\beta = -.19, p < .10$ ). The addition of knowledge creation capability in the second step explained 5 percent additional variance in subsidiary competitive advantage and the sign of this variable was significant and positive ( $\beta = .22, p < .05$ ) providing support for Hypothesis 6 ( $F = 2.15, p < .05$ ).

***Indirect (mediation) effects hypotheses.*** Methods to test mediation and intervening variable effects are abound in research. While the so-called Baron and Kenny (1986) procedure is the most commonly used method in organizational research, MacKinnon and his colleagues (2002) compared 14 methods that test mediation effects and found that the Baron and Kenny (1986) procedure has low statistical power and that the best balance of Type I error and statistical power in tests of mediation is achieved by the Sobel (1982) test. In this dissertation, I relied on three methods to test for mediation – the Baron and Kenny (1986) procedure, the Sobel (1982) test, and path analysis. All of these methods have different strengths and weaknesses associated with them and there is no agreement in the research literature as to the best way for testing mediation. I briefly describe each method and the decision criteria to support a mediating effect below, prior to reporting results based on these three tests.

***The Baron and Kenny procedure.*** The most popular method for testing mediation in organizational research is the so-called Baron and Kenny (1986) procedure. In this procedure, one must estimate three regression equations and satisfy four conditions in order to establish mediation. The first step in this procedure (*regression 1, condition 1*) involves establishing a direct relationship between the dependent and the independent variable. The second step (*regression 2, condition 2*) involves establishing a

relationship between the independent variable and the mediator. The final step (*regression 3, condition 3*) is to form a relationship between the mediator and the dependent variable controlling for the effect of the independent variable. According to this procedure, when the effect of the mediator is accounted for, if the direct relationship between the independent and dependent variable either becomes non-significant or substantially smaller compared to the first regression equation (*condition 4*), then one can establish the presence of full or partial mediation.

More recently, some researchers noted that if there is a significant relationship between the independent variable and the mediator (*condition 2*) and a significant relationship between the mediator and the dependent variable (*condition 3*), then even if the independent variable is not related to the dependent variable (*i.e., condition 1* and subsequently *condition 4* are violated), an indirect effect is still implied – thus questioning and relaxing the first and the fourth conditions of the original Baron and Kenny (1986) procedure (cf. Kenny, Kashy, & Bolger, 1998; Preacher & Hayes, 2004; MacKinnon, 2000; Shrout & Bolger, 2002). For example, Holmbeck (1997) differentiated between mediated effects and indirect effects and argued that the first one (mediation) is a special case of the second one wherein the total effect is present initially. Srivastava, Bartol, and Locke (2006), among others, utilized this more recent version of the Baron and Kenny (1986) procedure in their research. Gully, Frone, and Edwards (1998) discussed conditions under which the independent and dependent variables are not significantly related yet in which important mediational relationships may still exist.

Despite its popularity among organizational researchers for its logical appeal and its ease of use, the weaknesses of the Baron and Kenny procedure are noted to be its low

statistical power and the absence of a formal significance test in the procedure (Preacher & Hayes, 2004; MacKinnon, et al., 2002). For example, a true mediation may go unnoticed using this procedure if the independent variable and the mediator is highly correlated (which may be true in most cases) – as the procedure calls for sufficient power to detect the incremental contribution of the mediator on the dependent variable above and beyond the contribution of the independent variable per *condition 3* (cf. Gully et al., 1998). Further, as discussed above, since the procedure requires the researcher to establish a relationship between the independent and the dependent variable, important mediations may go unnoticed using this procedure (Gully et al., 1998).

In this study, if all four conditions of the Baron and Kenny procedure are met, I conclude the presence of a *mediated* effect based on Baron and Kenny's (1986) original work. If the more relaxed assumptions of the Baron and Kenny procedure are met (*i.e.* only *condition 2* and *3* are satisfied), I conclude the presence of an *indirect* effect based on the work of Holmbeck (1997) and other scholars that distinguish between mediated and indirect effects (e.g., Gully, et al., 1998; Kenny et al., 1998, MacKinnon, 2000; Srivastava et al., 2006). Differentiating between the two is especially appropriate in the current research context, as I do not propose any specific hypotheses that directly link the independent and dependent variables in the proposed mediated relationships.

***The Sobel test.*** As an alternative to the Baron and Kenny (1986) procedure, the Sobel (1982) test is a formal test of the joint significance of the two effects comprising the mediating variable effect (MacKinnon et al., 2002; Preacher & Hayes, 2004). In the case of simple mediation, the indirect effect of the independent variable on the dependent variable is defined as the cross-product of the independent variable-mediator path and the



mediator-dependent variable path and the significance test associated with the product term. According to Preacher and Hayes (2004), testing the hypothesis of no difference between the total effect and the direct effect more directly addresses the mediation hypothesis than do the series of regression analyses proposed by Baron and Kenny (1986). In this research, I use the formula provided by MacKinnon and Dwyer (1994) and MacKinnon, Warsi, and Dwyer (1995) to establish the presence of an indirect effect based on the Sobel (1982) test.

Despite some of its potential statistical superiority over the Baron and Kenny (1986) procedure, the Sobel (1982) test has also been questioned and criticized for its use of the normal distribution for the computation of the  $p$  value – as the sampling distribution of the product term may not always be normal (cf. Preacher & Hayes, 2004). Especially in cases when the sample size is small, the distribution of the product term may not even be symmetrical yielding to an underpowered test of significance and subsequently Type II error (Bollen & Stine, 1990).

***Path analysis.*** As a third alternative for testing mediation, path analysis (Joreskog, 1969; Wright, 1918; 1934) – an analysis which employs multiple simultaneous regression equations to yield parameter estimates focused on assessing the fit of observed patterns of relationships to hypothesized patterns of relationships – was used. The superiority of this method over other methods for testing mediation arises from the fact that this method allows for testing the hypothesized model of relationships simultaneously and shifts the focus from the significant relationships between variables to the adequacy the whole theoretical model. Therefore, more complex models, such as

those involving multiple meditational relationships, are better tested using path analytic procedures.

The criteria for establishing mediation using this technique requires testing each path in the model for significance and then assessing the overall fit of the model to the data (cf. Gully et al., 1998). If all the paths in the model are significant and if the overall fit of the model to the data is adequate based on various fit indices, one can establish mediation. This guideline is also consistent with the logic behind the more recent version of the Baron and Kenny (1986) procedure (Kenny et al., 1998, MacKinnon, 2000). While some researchers choose to compare the fits of nested models in order to test for mediation, this is only appropriate if one of the hypotheses leading to mediation involves a direct relationship between the independent and the dependent variables.

The major pitfall of this procedure is that alternative models can also fit the data equally well even if they are misspecified. Therefore, this method is suggested to be more suitable for analyses which are more confirmatory rather than exploratory in nature and for which one is willing to accept theoretical assumptions for an increase in power of significance tests (Gully et al., 1998). As the model developed in this dissertation involves multiple mediators and the relationships are hypothesized based on prior theorizing, among all the methods discussed so far, this may be the most appropriate test for analyzing the adequacy of the theoretical model in its unity.

***Results of Baron and Kenny (1986) procedure and the Sobel (1982) test.***

Hypothesis 4a proposed that the relationship between internal knowledge acquisition practices and knowledge creation capability is mediated by internal learning. The results in Table 8, Model 3 show that internal knowledge acquisition practices do not have a

significant impact on knowledge creation capability failing to satisfy the first condition of the Baron and Kenny (1986) procedure for establishing mediation.

Drawing from the more recent developments in the use of the Baron and Kenny (1986) procedure (e.g., Kenny et al., 1998), testing the *indirect effect* of internal knowledge acquisition practices on knowledge creation capability requires a significant relationship between internal knowledge acquisition practices and internal learning (*condition 2*) and between internal learning and knowledge creation capability in the presence of internal knowledge acquisition practices (*condition 3*). There was support for the second condition based on the results of Hypothesis 1a reported in the preceding section (Table 4, Model 2a). Table 8, Model 4 shows that internal learning and knowledge creation capability are also significantly related in the presence of internal knowledge acquisition practices ( $\beta = .25, p < .05$ ) – satisfying the third condition. Based on the support found for both of these relationships, the presence of an indirect relationship is supported between internal knowledge acquisition practices and knowledge creation capability through internal learning.

Sobel (1982) test was further conducted to test the significance of the indirect effect of internal knowledge acquisition practices on knowledge creation capability. The result of this test provided further support for the significance of such an indirect effect ( $z_{\text{Sobel}} = 2.18, p < .05$ ). Based on these results, Hypothesis 4a was supported.

Hypothesis 4b proposed that the relationship between external knowledge acquisition practices and knowledge creation capability is mediated by external learning. The results in Table 8, Model 3 show that external knowledge acquisition practices are significantly and positively related to the dependent variable ( $\beta = .25, p < .01$ ) –

satisfying the first condition of the Baron and Kenny (1986) procedure. The second condition that the independent variable (external knowledge acquisition practices) be related to the mediator (external learning) was also satisfied, given the support found for Hypotheses 2b reported above (Table 8, Model 2). Finally, as shown in the Model 4 of Table 8, in the presence of external learning, the effect of external knowledge acquisition practices on knowledge creation capability was reduced ( $\beta = .20, p < .05$ ), while the impact of external learning was positive and significant ( $\beta = .21, p < .05$ ), satisfying the third and fourth conditions for establishing partial mediation. Thus, Hypothesis 4b was supported based on the original Baron and Kenny (1986) procedure. The results of the Sobel test provided further support for the significance of the indirect relationship between external knowledge acquisition practices and knowledge creation capability through external learning ( $z_{\text{Sobel}} = 1.96, p < .05$ ).

Hypothesis 7 predicted that knowledge creation capability will mediate the relationship between internal learning and subsidiary competitive advantage (Hypothesis 7a) and between external learning and subsidiary competitive advantage (Hypothesis 7b). As reported in Table 9, Model 3, neither internal learning nor external learning was significantly related to subsidiary competitive advantage failing to satisfy the first condition of Baron and Kenny (1986) procedure to establish mediation.

Drawing from the more recent developments in the use of the Baron and Kenny (1986) procedure (e.g., Kenny et al., 1998), testing the indirect effects of internal and external learning on subsidiary competitive advantage through knowledge creation capability requires a significant relationship between internal and external learning and knowledge creation capability (*condition 2*) and between knowledge creation capability

and subsidiary competitive advantage in the presence of internal and external learning (*condition 3*). There was support for significant relationships between both internal and external learning and knowledge creation capability based on the results reported in the preceding section (Hypothesis 2a and 2b). As reported in Table 9, Model 4, the beta coefficient of knowledge creation capability remained positive and significant ( $\beta = .18, p < .10$ ) after controlling for internal and external learning, satisfying *condition 3* for establishing the presence of an indirect relationship. However, the Sobel (1982) test for these hypotheses did not reach significance in both cases ( $z_{\text{Sobel}} = 1.41$  for internal learning path and  $z_{\text{Sobel}} = 1.45$  for external learning path).

As a result, while there is support for Hypothesis 7a and 7b based on the more recent version of the Baron and Kenny (1986) procedure (e.g., Kenny et al, 1998), viewed in combination, the support is somewhat weaker compared to the support found for the previous hypotheses – indicating a relative lack of power to detect an existing mediated relationship in this case.

***Results of path analysis.*** Finally, I conducted a path analysis with observed variables in LISREL 8.8 using maximum likelihood as the estimation method, which provides accurate estimations of parameters with sample sizes of 100-200 (Gerbing & Anderson, 1985). Observed variables, rather than latent variables were used because of the modest sample size.

When assessing the fit of the hypothesized model with the data, it is recommended that several fit indices be used (Kline, 2005). Conventionally, models that provide a good fit to the data are those that have indices of explained variances (e.g., GFI, NFI, CFI) greater than .90 (Bentler & Bonnet, 1980) and indices of error (e.g., RMSEA)

smaller than .08 (Hu & Bentler, 1999). While a non significant chi-square test is also desirable and indicates that the measurement model does not significantly differ from the observed data, this test is very sensitive to sample size and even small differences show up as significant in large samples.

All fit indices, including the chi-square test, confirmed that the theoretical model depicting Hypothesis 1a, 1b, 2a, 2b, 4a, 4b, 6, 7a, and 7b provided a good fit to the data ( $\chi^2 = 9.87$ ,  $df = 9$ ,  $p > .10$ ; RMSEA = .02; GFI, .97; NFI = .92; CFI = .99). All the paths included in the model were significantly positive, supporting all of these hypotheses and satisfying the conditions for establishing the presence of a series of meditational relationships using path analytic procedures. In summary, the results of the path analytic procedure supported that the effect of knowledge acquisition practices on subsidiary competitive advantage is indirectly conveyed through subsidiary learning and knowledge creation capability.

***Summary of results.*** The results from multiple methods for testing meditational or indirect effects in the model provide support for the overall theoretical model developed in this dissertation. The goal in terms of employing multiple methods was to maximize confidence in results and the conclusions that can be drawn from the results. Since there is no agreement in the research methods literature as to the best way for testing mediation, multiple methods were employed. Despite the relative strengths and weaknesses of each method, the results converged in most cases, landing strong support to proposed patterns of relationships.

While the theoretical model developed in this dissertation also includes interaction effects, treatments of appropriate methods for statistically testing and

interpreting highly complex models – such as moderated mediational models – are not readily accessible. While there are some guidelines on testing interaction effects in LISREL (Cortina, Chen, & Dunlop, 2001), full-information estimation methods depend on large-sample properties, and consequently a sample size of at least 150 is needed to obtain a converged and proper solution for the current theoretical model that includes interaction effects (Anderson & Gerbing, 1988). Therefore, interaction effects were tested separately using established and conventional methods of moderated regression.

***Interaction effects (moderation) hypotheses.*** In order to test hypotheses proposing interaction effects among study constructs, the independent and moderator variables were first centered to decrease collinearity between these variables and their product terms (Aiken & West, 1991; Cohen & Cohen, 1983). The moderation analysis was then conducted in two steps. In the first step, control, independent, and moderator variables (non-centered) were entered in order to partial out variance due to the main effects of these variables. In the second step, the interaction terms (product terms of the centered variables) were entered allowing for the unique variance due to interaction terms to be observed (Cohen & Cohen, 1983). The moderation effect is present when the addition of the interaction terms to the model that contains the control, independent, and the moderator variables causes a significant change in the *F* value and the coefficients of the interaction terms are significant.

Table 10 presents the results of the moderated regression analysis for knowledge creation capability. In the first set of hypotheses, it was predicted that internal learning will be more strongly related to knowledge creation capability in cases when external learning (Hypothesis 3) and the three facets of intellectual capital (Hypothesis 5a.1, 5a.2,

5a.3) are high. Model 1 and 2 in Table 10 reports the results of the moderated regression analysis for these hypotheses. In Model 1, control, independent, and moderator variables were entered. Consistent with previous results, subsidiary size and external learning were positively and significantly related to knowledge creation capability. Yet, in the presence of intellectual capital, internal learning was no longer a significant predictor of knowledge creation capability. Among the proposed intellectual capital moderators, the only one which had a positive main effect on knowledge creation capability was organizational capital ( $\beta = .24, p < .05$ ). In Model 2, four interaction terms were entered simultaneously causing a significant  $F$  change in the model ( $\Delta F = 2.47, p < .01$ ) suggesting the interaction terms explained additional variance over and above that accounted for by variables in the first step.

While the interaction term of internal and external learning was significant ( $\beta = -.18, p < .05$ ), the beta coefficient was negative, failing to support Hypothesis 3. The interaction term of internal learning and social capital had also the same trend with a significant and negative coefficient ( $\beta = -.22, p < .05$ ). The only interaction term with a positive and significant coefficient was internal learning and organizational capital ( $\beta = .18, p < .10$ ). Thus, there was only minor support for Hypothesis 5a.

Hypothesis 5b predicted that the three facets of intellectual capital (human, social, and organizational) would have a positive moderating impact on the relationship between external learning and knowledge creation capability. Model 3 in Table 10 reports the results of the moderated regression analysis. There was no significant  $F$  change after the inclusion of the interaction terms and none of the interaction terms had a significant coefficient. Therefore, Hypothesis 5b was not supported.



*Plotting and interpreting interaction effects.* In order to increase the interpretability of the interaction effects found in this set of hypotheses, the regression equation in Table 10, Model 2 was solved for high and low levels of the significant moderators and then plotted on graphs as outlined by Aiken and West (1991) using the macro provided at <http://www.jeremydawson.co.uk/slopes.htm>.

Figure 2 illustrates the negative moderating impact of external learning on the relationship between internal learning and knowledge creation capability. Visual inspection of Figure 2 suggests that under low levels of external learning, the relationship between internal learning and knowledge creation capability is positive. However, under high levels of external learning this relationship becomes almost flat – with a very slight negative trend suggesting that internal learning does not have any impact on knowledge creation capability under conditions of high external learning.

Figure 3 illustrates the negative and disordinal moderating impact of social capital on the relationship between internal learning and knowledge creation capability. Visual inspection of Figure 3 suggests that when subsidiaries possess high levels of social capital, the relationship between internal learning and knowledge creation capability is negative and under low levels of social capital the relationship between internal learning and knowledge creation capability is positive.

Finally, Figure 4 displays the positive moderating impact of organizational capital on the relationship between internal learning and knowledge creation capability. The figure suggests that under low levels of organizational capital, the relationship between internal learning and knowledge creation capability is slightly negative and under high

levels of organizational capital, there is a positive relationship between internal learning and knowledge creation capability.

In sum, the results from this section as well as the plots of interactions lead to an empirical conclusion which is somewhat different from the conclusions drawn in earlier sections which pointed to a direct relationship between internal learning and knowledge creation capability. Based on the results of this last section, it seems that in the presence of intellectual capital and external learning, internal learning does not predict knowledge creation capability and that this relationship becomes positive, contrary to predictions, under conditions of low social capital and low external learning, and consistent with predictions, under conditions of high organizational capital.

### **Post Hoc Analyses**

*The role of international strategy.* There is theoretical reason to believe that international strategy can play a role in the relationships proposed by the current theoretical model since MNCs with different strategies could engage in different levels of knowledge acquisition practices internally and externally. In order to probe such a probability, several analyses were performed using an item – based on Caligiuri and Stroh (1995) and Harzing (2000) - which inquired whether the parent of the subsidiary executed a global, multinational, or a transnational strategy (see Appendix 2 for this measure) (Bartlett & Ghoshal, 1988, 1989). There were 60 subsidiaries which reported their parents to have a multinational strategy, 20 to have a transnational strategy, and 16 to have a global strategy (with 10 cases missing data for the strategy variable).

First, analysis of variance tests were conducted to test systematic differences in outcome variables. Internal learning ( $F = .55$ , n.s.), external learning ( $F=1.31$ , n.s.),

knowledge creation capability ( $F = .21$ , n.s.), and subsidiary performance ( $F = .20$ , n.s.) did not differ significantly among firms with different international strategies. There were also no significant differences between subsidiaries' use of internal knowledge acquisition practices ( $F = .81$ , n.s.), external knowledge acquisition practices ( $F = .22$ , n.s.), and levels of human ( $F = .16$ , n.s.), social ( $F = 1.95$ ), and organizational capital ( $F = 1.28$ , n.s.) based on strategy. Therefore, there is little reason to believe that international strategy could have played an important role in the overall theoretical model or the empirical findings for that matter.

In order to investigate these possibility further, results from hypotheses testing were compared among three strategy groups – the results of which are displayed in the Table 11. None of the results were contrary to the original results and therefore, did not lead to any changes in the overall findings. However, a number of significant interactions emerged - despite small sample sizes - that did not emerge in the original analysis. These were: 1) for subsidiaries of transnational MNCs, human capital was significant and negative as a moderator for both internal and external learning and 2) for subsidiaries of multinational MNCs, social capital-external learning interaction was positive and significant and organizational capital-external learning interaction was negative and significant.

These new results from post hoc analysis shall be treated with utmost caution as they are based on very small sample sizes (especially the transnational group) to provide stable estimates or sufficient power for statistical analyses. While a thorough interpretation and theoretical explanation of these results are beyond the scope of this dissertation which did not focus on strategy as a key variable in the theoretical model, the

results may point to three-way interactions among variables used in this study and international strategy.

***Heckman Correction for selectivity bias.*** While the preliminary analyses showed no signs of sampling bias among respondent and non-respondent subsidiaries in terms of firm attributes, another type of selectivity bias occurs when the probability of responding to a survey is related to subsidiaries' knowledge creation capability, performance, or the use of knowledge acquisition practices. It is possible to statistically correct this type of selectivity bias using the two-step Heckman (1979) procedure.

The two-step Heckman correction was performed using the SPSS procedures described in <http://home.planet.nl/~smits.jeroen> based on Heckman (1979). In the first step, a logit regression was performed predicting the odds of responding to the survey based on subsidiary age, size, and U.S. sales using Dun&Bradstreet database as the data source. The predicted scores were saved and then transformed into quasi probit scores after which Lambda (inverse mills ratio) values were calculated. In the second step, Lambda values were used as an additional control variable – controlling for unmeasured variables that may have effected the decision to respond to the survey and that are related to the use of knowledge acquisition practices, knowledge creation capability, or subsidiary performance. All the analyses involving main effects remained consistent with the results from previous analyses, and these corrections for selectivity bias have not altered any of the conclusions. Therefore, there is no evidence – based on Heckman (1979) correction - which suggested that firms may have self-selected into responding to this survey because they make use of such practices, because they find these practices useful, or they perform better as a result of using such practices.

*Negative interaction terms.* The two significant and negative interaction terms which were contrary to predictions can also be a statistical artifact for including highly correlated terms in moderated regression analyses. In order to rule out this possibility, I tested the predicted interactions one at a time. The results did not change substantially – internal learning-external learning interaction was still negative and significant. The signs for social capital and organizational capital-internal learning interactions were still the same but none of them were significant when entered separately. The human capital-internal learning interaction was again not significant. Again, none of the moderators for the external learning–knowledge creation capability were significant when entered at once. The original analysis was thus retained since it provides a more conservative test for the proposed relationships and keeps the theoretical unity of the intellectual capital construct intact.

## **DISCUSSION**

In this study, I found that using organizational practices that facilitate acquisition of knowledge that lies outside the boundaries of host country subsidiaries have an indirect effect on host market performance. These practices were positively related to organizational learning, which, in turn, was related to knowledge creation capability. While the positive relationship between external learning and knowledge creation capability was a strong and consistent finding throughout all the analyses performed, the relationship between internal learning and knowledge creation capability seems to be weaker and depend on the absence (external learning or subsidiary social capital) or presence (subsidiary organizational capital) of other contextual variables. Results also supported a direct relationship between knowledge creation capability and host country performance. No support was found for the moderating role of intellectual capital in strengthening the relationship between external learning and knowledge creation capability. The theoretical and practical implications of these findings as well as the limitations of this study are discussed below.

### **Theoretical Implications**

Overall, the findings of this study extend both international management and absorptive capacity literatures in important ways. First of all, it provides empirical support for the existence of a dual path – internal and external - through which MNC subsidiaries can gain competitive advantage in host markets through organizational learning and knowledge creation. Yet, it shows that external learning is more critical for subsidiaries' knowledge creation capability compared to internal learning. Second, it shows that the absorptive capacity framework is a useful theory for opening up the black

box between knowledge transfers and performance in MNC subsidiaries (Griffith et al., 2008).

***Internal knowledge acquisition practices and internal learning.*** Consistent with findings of previous studies on knowledge transfers in MNCs (Foss & Pedersen, 2002; Hansen, 1999; Kostova, 1999; Li, 2005; Minbaeva et al., 2003; Subramaniam & Venkatraman, 2001; Szulanski, 1996), this study also found that global practices which are based on formal or informal interactions and relationships with other MNC units, that span subsidiary boundaries, and build connectivity among units facilitate internal knowledge transfers and subsidiary learning. Through the use of such practices, host country subsidiaries gain important, strategic, and proprietary know-how from the rest of the MNC and can apply them in new ways to the host country context to achieve competitive advantage.

However, in this research, it was not possible to identify the nature of know-how that is being transferred to host country subsidiaries with the use of such practices. That is, this study did not distinguish between the transfer of explicit and tacit know-how. Yet, we know from previous research that while tacit knowledge is more valuable, it is also contextually embedded, making it hard to transfer across borders (Polyani, 1966; Szulanski, 1996; Tsai, 2001). On the other hand, the basic premise of the knowledge-based view of the MNC is that it ties the existence of MNCs to their efficiency in transferring tacit knowledge internally (Kogut & Zander, 1993). Therefore, future research can improve on the findings of this study by making the distinction between tacit and explicit knowledge and better understand the nature of knowledge that is being transferred along with the use of such practices.

It is also interesting to note that the ‘internal knowledge acquisition practices’ measure, developed for the purpose of this study, had a single factor structure and a high reliability score indicating that MNCs tend to use these practices in combination. Yet, the nature of practices that were included in the scale varied greatly in terms of their richness, complexity, and intensity. As such, they also varied in terms of their ability to transfer either tacit or explicit knowledge. Within the menu of organizational practices available for MNCs to achieve their strategic objectives of global integration and worldwide learning, there is some evidence that MNCs are beginning to lean towards less costly mechanisms to achieve these objectives and substituting them for the more expensive ones.

For example, there is some practitioner research which suggests that some MNCs are limiting their use of expatriates and inpatriates - a costly, but a richer and more complex and intense mechanism to transfer knowledge – and substituting them with less costly alternatives such as frequent international travels, short-term assignments, and the like. Yet, the results of this study suggest that MNCs tend to view these different mechanisms as a system of practices that reinforce each other’s effectiveness and use them as a set rather than in isolation. This type of strategic choice that firms make in terms of the practices they utilize is also evident in strategic HRM research which suggests that firms choose to utilize a system of practices that are aligned with their strategic objectives rather than using single practices in isolation (Arthur, 1992; Huselid, 1995).

***External knowledge acquisition practices and external learning.*** The external path explored in this dissertation extends previous research on MNC knowledge transfers



which typically focuses on the internal path. However, integrating the external path into a model of absorptive capacity of MNC subsidiaries is essential; as the competitiveness of these organizations relies on their ability to exploit firm-specific knowledge in host markets coupled with their ability to be locally responsive to the markets they are operating in. According to the findings of this study, host country subsidiaries that utilize a set of practices that are aimed at building relationships with important external parties become more efficient at organizational learning and thus are able to absorb more knowledge from the local market. As a result, these practices can help subsidiaries shrug off the liability they carry with them due to being foreign in the host market.

While it is widely accepted among international management scholars that MNCs need to be locally responsive and adaptive to the host markets they are operating in, this study focused on how local responsiveness and adaptation can be achieved through knowledge acquisition practices focused on building or strengthening relationships with key local stakeholders. Even if the current study explored local learning as an outcome of utilizing such practices based on absorptive capacity theory, future research can examine whether such practices also influence other local outcomes such as local responsiveness and adaptation. Furthermore, the research question of whether the utilization of such practices depends on the international management strategy of the MNC remains to be explored in future studies.

***Learning, knowledge creation, and subsidiary performance.*** The relationship found between the use of knowledge acquisition practices – both internal and external - and organizational learning is a new empirical finding in the literature on absorptive capacity. This is the only study, to the best of my knowledge, which directly tests the

link between knowledge acquisition practices and organizational learning. Previous studies have explored the link between knowledge acquisition and new product development or sales costs (Yli-Renko et al., 2001) implicitly assuming organizational learning as the intervening mechanism. Other studies have examined organizational antecedents that increase knowledge acquisition capability from other units and linked this capability to various forms of innovation (Jansen et al., 2005; Lane et al., 2001). By demonstrating that knowledge acquisition impacts other innovative outcomes indirectly through organizational learning, this study further contributes to the absorptive capacity literature.

Another finding of this study which is consistent with the findings of previous studies is the relationship between knowledge creation capability and firm performance (e.g., Matusik & Hill, 1998; YliRenka et al., 2001). In this study, it was found that host country subsidiaries which had greater levels of knowledge creation capability enjoyed better performance in the host country. Since knowledge creation capability was found to be a direct outcome of both internal and external learning in most cases, it can be assumed that the knowledge that these host country subsidiaries are able to create carry the blueprints of both MNC-specific and local market knowledge and thus, differentiate these organizations from the rest of the competition that exists in the host country. That is, the knowledge created by these host country subunits can be superior because first, firm-specific advantages related to parent country are embedded in it and second, the new processes, products, systems developed can be assumed to be locally and culturally aligned with the context and thus do not jeopardize local competitiveness.

***The weakest link: internal learning-knowledge creation capability.*** As reported in the results section, while most empirical findings point to a positive and direct relationship between internal learning and knowledge creation capability, the patterns of interactions and the fact that internal learning was no longer a significant predictor of knowledge creation capability in the presence of human, social, and organizational capital suggests that this relationship is the weakest link in the whole pattern of relationships. While we can not completely rule out the possibility that there is a positive relationship between internal learning and knowledge creation based on both theory and empirical findings – what we can more confidently conclude is that external learning is a much stronger predictor of knowledge creation capability for host country subsidiaries compared to internal learning. Based on the empirical results, it seems that internal learning may be substituting for lower levels of external learning and lower levels of subsidiary social capital, whereas it benefits from high levels of organizational capital to have an impact on knowledge creation capability.

***Organizational capital - internal learning interaction.*** The only significant and positive moderator in this study was organizational capital. Subsidiary organizational capital not only had a positive and a direct effect on knowledge creation capability; but also made the relationship between internal learning and knowledge creation capability positive and strong. The finding that organizational capital is directly related to knowledge creation capability is not new. Youndt and Subramanian (2005) also found that this form of intellectual capital has a positive impact on a firm's incremental innovation and concluded that "institutionalized knowledge accumulated in and utilized through an organization's structures, systems, processes, and the like seems to help it

reinforce its prevailing knowledge and it, consequently augments its incremental innovative capabilities” (Youndt & Subramaniam, 2005, p. 457).

Extending on this previous finding, this study discovered that organizational capital also moderates the relationship between internal learning and knowledge creation capability and that the relationship becomes positive in cases when the subsidiaries have high organizational capital and that there is a slightly negative relationship when organizational capital is low. This finding is, in part, consistent with Jansen et al.’s (2005) observation that organizational capital increases the likelihood that organizational members can better identify opportunities for the transformation of newly acquired knowledge. It seems that organizational capital, due to its more reliable and less error-prone information-processing capabilities compared to other forms of intellectual capital, is especially effective in helping subsidiary employees make novel connections between subsidiary’s own knowledge stock and knowledge flows from the rest of the MNC, and consequently in enhancing the subsidiary’s knowledge creation capability. In sum, this finding improves our understanding of the studied phenomena by showing that organizational capital is especially critical in cases when organizations try to exploit knowledge acquired from culturally, geographically, and institutionally more distant sources but is not necessarily critical for exploiting knowledge acquired from less distant sources such as the host country.

***Internal learning - external learning interaction.*** In this study, I found that the relationship between internal learning and knowledge creation capability is positive in cases when the subsidiary learning from the external environment is low but not under conditions of high external learning. That is, subsidiaries that transfer knowledge from

the rest of the MNC do not benefit in terms of exploiting this know-how when they also transfer a significant amount of know-how from the local market. While previously Andersson et al. (2002) noted that “the assimilation and commercialization of new knowledge are carried out through the relationships with external units and with sister units” and suggested that “There is no immediate contradiction between deploying resources in, on one hand, relationships with external customers and suppliers and in, on the other hand, relationships with sister units (2002: 23)”, the finding of this study suggests other possibilities.

More specifically, this finding indicates that internal learning may be substituting for low levels of external learning in terms of knowledge creation capability but that it does not impact a subsidiary’s knowledge creation capability under conditions of high external learning. Under high levels of both external and internal learning, subsidiary employees may be making more significant use local know-how in order to create new knowledge rather than relying on know how acquired from a more distant (culturally, geographically, and contextually) source. Indeed, absorptive capacity theory posits that innovative capabilities are related to acquiring knowledge that is aligned with the existing knowledge stock of a firm and it suggests that knowledge creation is greatest when new knowledge to be assimilated is related to what firms already know (Cohen & Levinthal, 1990). Local sources of knowledge can be culturally and locally better aligned with the context and thus may be easier to utilize in creating new knowledge. Under low levels of local learning, the impact of internal learning on knowledge creation capability resurfaces and subsidiaries may be compensating for the lack of local learning by making use of internal knowledge transfers. Despite these potential explanations, since this is a novel

and unexpected finding, future research is needed to replicate this finding and further improve the theoretical explanations provided here.

***Internal learning - social capital interaction.*** The second finding that was in the opposite direction of what was hypothesized is the negative moderating impact of subsidiary social capital on the relationship between internal learning and knowledge creation capability. The interaction plot showed that the relationship was negative under conditions of high social capital and positive under conditions of low social capital.

This finding indicates that when subsidiary employees have constructive social relationships with each other, freely share knowledge and exchange ideas, and help each other solve organizational problems, the relationship between internal learning and knowledge creation capability becomes negative. One potential explanation for this finding can be found in the discussions of barriers to successful knowledge transfers between organizational units. One such barrier is the lack of motivation on the part of the recipient unit to transfer knowledge from the source unit (Szulanski, 1996). The reluctance of the recipient unit to accept knowledge from the source unit - or the so-called 'not invented here' syndrome - is well documented in the literature on knowledge management (e.g., Katz & Allen, 1982; Szulanski, 1996). Accordingly, lack of motivation on the part of the recipient unit may result in foot dragging, feigned acceptance, or outright rejection in the implementation and use of new knowledge (cf. Szulanski, 1996; Zaltman, Duncan, & Holbeck, 1973).

In the case of this research, while it was found that knowledge can be transferred successfully to subunits as a result of utilizing inter-unit mechanisms (e.g., internal knowledge acquisition practices), it seems that, in cases where there are high levels of

within subsidiary social capital, subsidiary employees are not motivated to exploit this know-how engaging in a ‘not invented here’ syndrome (Katz & Allen, 1982; Szulanski, 1996). High levels of social capital within the subsidiary can be an indication of a strong and shared subsidiary subculture which may or may not be aligned with the values, interests, practices, and routines of other units in the MNC. I have already noted that inter-unit power struggles, potential inconsistencies and conflict among the goals, interests, values, practices, and routines of different subunits are the defining characteristics of MNCs. Therefore, motivational problems related to exploiting internal knowledge are highly likely as a result of these conflicting goals, interests, and the like, as indicated by the work of Szulanski (1996) and other knowledge management scholars (Katz & Allen, 1982). Consistent with this interpretation, under low levels of subsidiary social capital, there are no motivational barriers that can inhibit or sabotage the utilization of internal knowledge transfers and consequently a positive relationship between internal learning and knowledge creation capability is observed. However, since this was an unexpected but an important finding, it should be subject to further empirical investigation, replication, and theoretical explanation.

***Further discussion of unsupported hypotheses.*** This study did not find any evidence that the three dimensions of intellectual capital enhance the relationship between external learning and knowledge creation capability. Also this study did not find evidence that human capital is a significant moderator of internal learning and knowledge creation capability. These results may be due to inadequate power to detect the existence of a moderator as the effect size could be lower than originally predicted. Future studies

can test these interactions on larger sample sizes to examine whether the results also hold for larger sample sizes.

Another reason may be that, as stated in the theory development section, the exact relationships among the three facets of the intellectual construct are not yet known with great empirical confidence. The interrelationships among constructs may be more complex - such as more than two-way interactions - which would not have been possible to detect with a modest sample size. That is, there may be synergistic relationships between human, social, and organizational capital that may enhance the external learning and knowledge creation capability relationship. Still another possibility, which is contrary to the explanation provided in the preceding sentence, would be that the existence of high levels of intellectual capital is not necessarily a condition that enhances external learning and knowledge creation relationship. That is, as long as subsidiaries have the capability to acquire and absorb knowledge from the host country, they increase their innovative capabilities without necessarily benefiting from higher levels of intellectual capital. Future researchers can examine both possibilities on larger sample sizes and extend on the findings on this study.

***Final note on contribution to absorptive capacity research.*** The existence of both an internal and also an external path to knowledge creation capability and ultimately firm performance is what essentially differentiates this model of absorptive capacity from models of absorptive capacity that would be applicable to non-MNCs or organizations operating within their own national boundaries. That is, while the addition of the external path is a contribution to the international management literature which has traditionally explored internal knowledge transfers; exploration of the internal path is a contribution to



the absorptive capacity literature which has traditionally focused on the external path. As stated in the introduction section, the presence of both paths may also be relevant for and applicable to complex domestic organizations. Yet, the characteristics of MNCs which represent differences “in degree” from domestic organizations – namely, in terms of intra-organizational complexity, external heterogeneity, and the chronic presence of strategic paradoxes, tensions, and dualisms – provided a rich context and a rigorous opportunity to test, validate, and enrich absorptive capacity theory.

***Final note on contribution to international management research.*** As a final note about the contribution of this study to international management literature, it is important to note that the significant moderations only emerged in the internal path and at the intersection of the internal and external path; but not the external path. That is, while the relationship between external knowledge acquisition practices, external learning, and knowledge creation capability is more straightforward and does not necessarily require a significant amount of intellectual capital to hold or the effect sizes are much smaller, the relationships are more complicated and complex for the internal path and for the joint effect of internal and external paths. Viewed in combination, these findings suggest that, unlike my previous contention in the introduction section, some of the underlying exploratory mechanism of absorptive capacity framework do not seem to hold for MNC subsidiaries and require modification of theory in these settings. In sum, while it was not immediately apparent, there is theoretical reason and empirical evidence to believe that exploratory mechanisms of absorptive capacity framework not only differ “in degree” in MNC subsidiaries, but also seems to differ “in kind” (Ghoshal & Westeny, 1993; Roth & Kostova, 2003). Furthermore, by showing that external learning is more important for

knowledge creation capability of host country subsidiaries compared to internal learning; this study opens up new avenues for further theoretical and empirical advancements in international management research.

Indeed, Roth and Kostova (2003) note that this kind of new theory development, leveraging the rich MNC context, represents the highest potential contribution of MNC research to management theory and literature, yet is the least utilized so far. Similarly, Whetten (1989, p. 493) states that “Applying an old model to a new setting and showing that it works as expected is not instructive by itself. This conclusion has theoretical merit only if something about the new setting suggests the theory shouldn’t work under those conditions”. Finally, according to Sutton and Staw (1995, p. 378), “Strong theory, in our view, delves into underlying processes, so as to understand systematic reasons for a particular occurrence or a non-occurrence”. As a result, the findings and non-findings of this research have the potential to make significant theoretical contributions to both international management and absorptive capacity literatures.

### **Practical and Managerial Implications**

It is now common knowledge among scholar and managers alike that surviving in the hypercompetitive global business landscape requires firms to be innovative and enhance their knowledge creation capabilities. For MNCs, their host country units are sources and pockets of innovation for new products, processes, systems, and structures; which in turn can enhance host country performance and also facilitate global organizational learning and knowledge sharing. Yet there is limited knowledge and research on what MNCs can purposefully do to boost their host country subsidiaries’

innovative capabilities. Based on the findings of this study, several practical implications are warranted.

***Practical implications for MNCs in general.*** First, this study found that knowledge acquisition practices, both internal and external, facilitate the transfer of knowledge that resides outside the boundaries of the subsidiary and enhance organizational learning. Use of global practices such as expatriation and inpatriation, cross-border mentoring and reporting relationships, international trips, trainings, meetings, and global data management sites result in increased subsidiary learning of global MNC know-how. Thus, MNCs can purposefully utilize this set of global learning practices to transfer knowledge to their host country subsidiaries, according to the findings of this study. However, given the high cost of implementing and maintaining such practices, MNCs may consider using these practices extensively only in cases when there is a high need for knowledge transfer to host units – such as when starting up operations in a new country, if there is lack of local competence in the host country, or in cases when knowledge transfer and organizational learning is a strategic priority for the MNC.

An example from an organization that launched a knowledge management initiative around these practices to transfer its centralized know-how to its local offices is International Finance Corporation (IFC). Traditionally, IFC has had a very centralized global structure with all its know-how and expertise residing in its D.C headquarters. However, as the clients in their local offices around the world started to demand more value added expertise and knowledge and not just capital, the centralized know-how structure became problematic and the performance of local offices started to suffer based

on not adequately meeting client needs (e.g., the reports took much longer to finalize and the quality of reports were poor). Now, IFC is relying extensively on the use of the practices explored in this manuscript to transfer its know-how in D.C. to its local offices and to better meet the needs of its local clientele around the world.

Similarly, use knowledge acquisition practices that are based on building relationships with local stakeholders facilitate the transfer of know-how from the local market. Since many host country subsidiaries carry the liability of being foreign in local markets, it is important that they utilize practices such as having their employees engage in regularly with important third parties, reimbursing them for joining local professional organizations, participating in benchmarking projects, and the like, in order to overcome their liability of foreignness. While these practices may require considerable time on the part of and investment in key employees of the host country subsidiary, the results of this study suggest that they ultimately pay off in terms of favorable organizational outcomes.

Not learning from the local market may have detrimental consequences for host country units as in the case of Wal-Mart in Germany. Wal-Mart failed in Germany, in part, because it failed to learn the dynamics of the German labor, competitive, consumer, and institutional landscapes. Since its entry to Germany in 1998, it has been fined for breaching several important German laws and regulations, failed to build relationships with and understand the criticality of the labor unions, in addition to not understanding how to serve German consumers. If Wal-Mart utilized the kind of practices explored in this manuscript for its key employees and absorbed more information from the German market, the outcomes for the German subsidiary could have been different.

This study also established that these global and local learning practices do not only enhance organizational learning, but also indirectly impact subsidiaries' knowledge creation capability – a capability which has become a source of competitive advantage for many firms since knowledge creation is a highly complicated and casually ambiguous process. As reported in the introduction section of this dissertation, the majority of business leaders view internal creation of new knowledge as their key driver for future profits. While organizations typically hold their R&D organizations responsible for this capability, this study suggests that having key employees play a critical role in gaining and absorbing knowledge from outside also contributes significantly to innovative capabilities. The results of this study suggests that increasing the amount of knowledge and information that enters an organization - through the relationships its mission critical employees build with outside parties - impact knowledge creation capability in a positive way. For host country units of MNCs, this involves building relationships with parties both internal to the MNC and also external to it.

Examples from firms that have effectively transformed internal and external learning into new products, processes, and systems include the consumer-products giant Procter & Gamble and the telecommunications giant Nokia. Procter & Gamble, with its now famous “Connect and Develop” strategy where key employees team up with other companies, universities, and individual inventors, reports that 40% of its products have an externally sourced component, up from less than 10% six years ago (Davenport, Prusak, & Strong, 2008). Nokia, with a well-chartered knowledge-creation strategy that extends far beyond its R&D headquarters, take advantage of local innovations worldwide with different wikis and web sites that encourage employees to record their knowledge in

blogs and collaborate with each other on issues ranging from technical know-how to a broader understanding of the way different cultures understand mobility (Davenport et al., 2008). While these case examples are related to the MNC as a whole and have been used for illustrative purposes, this study shows that the same principles apply at the MNC subunit level as well.

Finally, this study has practical implications for the establishment of organizational capital in host country subsidiaries. Since organizational capital is the institutionalized knowledge and codified experience stored in databases, routines, manuals, structures, and the like (Subramaniam & Youndt, 2005), it requires the establishment of information storage mechanisms as well as formalization and routinization of organizational policies, practices, and processes. According to the findings of this study, it is advisable that MNCs invest in the organizational capital of their subunits as it not only influences subsidiaries' innovative capabilities directly, but also helps them better leverage the know-how that they transfer from other units within the MNC. The findings of this study suggest that organizational capital is especially helpful in utilizing knowledge sourced from culturally, geographically, and institutionally different environments but not as useful when knowledge is sourced from the host country.

***Practical implications for international HRM practitioners.*** The practical implications of this study may be especially valuable for a targeted group of professionals who are practicing HRM at a global and strategic level. For those international HRM managers who are responsible for supporting a global innovation strategy, the results of

this study suggest that when used in combination and in a systematic manner, the practices explored in this manuscript can enhance local innovation in MNC subsidiaries.

For example, local innovation can be stimulated by creating global programs implemented at the local level and that are aimed at global knowledge transfer. The global program may include sending expatriates to a certain host unit with the explicit purpose of training local personnel and transferring valuable know-how from the headquarters to that host unit. It may also include receiving inpatriates from that host unit at the headquarters with the explicit goal of training them and socializing them to the parent company culture and values. These practices can be complemented by creating or facilitating cross-boundary mentoring relationships with senior managers at headquarters who serve as mentors to key employees at the subsidiary. The value of such mentoring relationships for developing mentees has been well documented in the mentoring literature. Moreover - periodically sending subsidiary employees to international teams and meetings for them to build a global network of MNC employees to draw knowledge from can be another feature of such an initiative. While each individual practice can have its own success measure, the overall effectiveness of the program can be evaluated by tracking down local innovation metrics over a period of time.

The second path through which international HRM managers can support local innovation is to encourage local units and provide sufficient resources to them for building relationships with key local clientele, government, trade associations, and research institutions. For example, creating such local learning systems that enable key subsidiary employees to build relationships with local stakeholders can be a performance goal for local HR managers. Previous research along with this research shows that the

so-called ‘network building HRM’ practices or ‘external knowledge acquisition practices’ as referred in this study, help firm performance as well as innovation.

While most MNCs may use such practices in isolation and in an ad hoc manner for different purposes, the lack of consistency and a coherent goal among such practices can prevent them from reaching their full potential. That is, it is critical for international and local HRM managers to design and implement internally consistent global and local learning systems by explicitly stating out ‘learning and innovation’ as a goal and developing relevant metrics for the evaluation of such programs.

Finally, the results of this research suggest that allocating more resources to local learning opportunities may be more critical for innovative capabilities compared to allocating resources to global learning opportunities within the MNE. The conditions under which global learning opportunities pay off are when there are no motivational barriers within the subsidiary workforces to utilizing knowledge acquired from the rest of the MNE. Therefore, motivational practices (e.g., performance management systems) can be developed to remove these barriers and build a shared vision with the MNE.

### **Limitations and Future Research Directions**

As with any research, this study is not without its limitations and therefore, its results should be interpreted with caution. First, given the use of cross-sectional data, no causal inference can be made regarding the relationships in this study, although the relationships depicted in Figure 1 are based on prior theorizing on absorptive capacity (Cohen & Levinthal, 1989, 1990; Todorova & Durisin, 2007; Zahra & George, 2002). Ideally, data on knowledge acquisition practices, learning, knowledge creation capability, and performance should have been collected at different points in time in order to infer



causality and improve confidence in results. Thus, future researchers should try to use a longitudinal design to uncover the influence of knowledge acquisition practices on subsidiary performance through learning and knowledge creation.

Second, because this study was conducted using data from a sample of foreign firms that have subsidiaries in the U.S., the generalizability of the present research may be limited to such companies. While the current research design inherently controls for host country effects on the studied phenomena, future research can sample MNC subsidiaries operating in multiple host countries to explore whether the results of this study hold in multiple host country contexts. For example, the impact of using knowledge acquisition practices on knowledge creation capability and performance could be stronger for the Chinese subsidiaries of MNCs compared to the US subsidiaries of the same MNCs. This is because Chinese subsidiaries may be more dependent on their parents' know-how compared to MNC subsidiaries operating in the US – a host country where know-how and local competence is readily available – and therefore the impact of utilizing such mechanisms can be even stronger.

Further research is also needed to extend some of the findings of this study. For example, most MNCs view their US subsidiaries as a source of know-how for the rest of the MNC rather than a unit to which to transfer their know-how. Therefore, future research will be needed to study reverse knowledge transfers from US subsidiaries to the rest of the MNC and factors that influence the success of such reverse knowledge transfers. Also, this study was conducted among a sample of firms that are operating in the manufacturing industry and therefore no claims can be made with regards to their

applicability to service firms. Thus, future research is also needed to investigate whether the same relationships hold among global firms operating in the service factor.

Furthermore, some of the propositions of this study were not supported – specifically, with respect to the moderating impact of intellectual capital on the relationship between subsidiary learning and knowledge creation capability. For example, none of the intellectual capital dimensions significantly moderated the relationship between external learning and knowledge creation capability. Since the nonsignificant results may be due to statistical power problems, future research can strive for a larger sample size to test those propositions. Also, other than organizational capital, both social capital and external learning were significant but negative moderators of the relationship between internal learning and knowledge creation capability. Therefore, future research is needed to understand the conditions under which this relationship can be stronger. For example, having a shared vision with the rest of the MNCs may help overcome the motivational problems related to knowledge transfers discussed in the preceding section among other potential moderators.

Finally, while I have taken several precautions to avoid common method bias, the potential for such a bias can not be completely eliminated. Common method bias could have inflated some of the relationships in this study – for example the relationships between knowledge acquisition practices and subsidiary learning. As opposed to earlier studies which inquired the use of such practices in generic terms and linked them to knowledge transfers – the items used in this study focused explicitly on whether these practices were used specifically to acquire knowledge internally and externally. This approach coupled with a cross-sectional design and a single respondent may have inflated

the significance of the relationships reported between these practices and organizational learning. Similarly, Although Wall et al. (2004) have demonstrated the construct validity of subjective measures of performance, future studies should try to improve this research design by obtaining data from different rating sources such as multiple respondents from the same subsidiary and/or using more objective outcome measures for performance and knowledge creation.

## **CONCLUSION**

Despite its limitations, the results of this study contribute to our understanding of knowledge management in globally dispersed MNCs and the competitiveness of their host country subsidiaries. The findings highlight the importance of using practices to acquire knowledge internally and externally for organizational learning, knowledge creation capability, and host country performance. This research also opens up new and fruitful areas of research for furthering our understanding of absorptive capacity as it applies to MNC subsidiaries.

**TABLE 1**  
**Distribution of Parent Countries and Industries in the Sample**

<b>Country</b>	<b>Frequency</b>	<b>Percent</b>	<b>Industry</b>	<b>Frequency</b>	<b>Percentage</b>
Denmark	2	1.9	Chemicals	18	17
Germany	28	26.4	Electronic and electrical equipment	14	13.2
Germany and France	1	.9	Fabricated metal products	8	7.5
Finland	6	5.7	Industrial and commercial machinery	20	18.9
France	9	8.5	Lumber and wood products	2	1.9
Ireland	2	1.9	Measuring, analyzing, controlling equipments	8	7.5
Italy	2	1.9	Paper and allied products	7	6.6
Japan	20	18.9	Printing and publishing	7	6.6
Netherlands	5	4.7	Primary metal industries	6	5.7
Sweden	5	4.7	Rubber and plastics products	7	6.6
Switzerland	5	4.7	Stone, glass, concrete products	8	7.5
UK	21	19.8			
Missing				1	.9
<b>Total</b>	<b>106</b>			<b>106</b>	

**TABLE 2**  
**Exploratory Factor Analysis Results for Internal Knowledge Acquisition**  
**Practices Scale Items**

<b>Items</b>	<b>Factor Loadings</b>
Our key employees acquire knowledge through international trips and visits to other units of the foreign parent company.	<b>.705</b>
Our key employees gain knowledge by working in virtual and international teams, committees, and task forces within the foreign parent company.	<b>.714</b>
We have key employees who have acquired knowledge through expatriation to other units of the foreign parent company.	<b>.623</b>
We have expatriates among our key employees who bring in know-how to this firm.	<b>.681</b>
Our key employees acquire knowledge from their mentors at other units of the foreign parent company.	<b>.720</b>
They gain knowledge by attending international training programs or meetings involving participants from other units of the foreign parent company.	<b>.788</b>
They are visited by employees of other units of the foreign parent company for purposes of knowledge transfer.	<b>.758</b>
They utilize global knowledge management systems (i.e., intranet, company databases) to access information.	<b>.677</b>
They communicate with employees from other units of the foreign parent company through phone calls, conference calls, or e-mails.	<b>.715</b>

Notes:

Extraction method: Principal components  
 Rotation method: Varimax  
 Rotated solution displayed.

**TABLE 3**  
**Exploratory Factor Analysis Results for External Knowledge Acquisition Practices Scale Items**

Items	Factor Loadings
<i>Our key employees...</i>	
...collect industry information from through informal means (e.g., lunch with industry friends, talk with trade partners).	<b>.643</b>
...organize special meetings with customers and other important third parties to acquire new knowledge.	<b>.826</b>
...gain new knowledge by partnering with important third parties.	<b>.829</b>
...participate in bench-marking and competitive intelligence projects to acquire knowledge.	<b>.673</b>
...reimbursed for joining professional and trade associations to gain new knowledge.	<b>.564</b>
...network with individuals from research institutions, government agencies, and trade associations to obtain information.	<b>.764</b>

Notes:

Extraction method: Principal components

Rotation method: Varimax

Rotated solution displayed.

**TABLE 4**  
**Exploratory Factor Analysis Results for Knowledge Acquisition Practices**  
**Scale Items**

Items	Factor Loadings	
	1	2
Our key employees acquire knowledge through international trips and visits to other units of the foreign parent company.	<b>.701</b>	
Our key employees gain knowledge by working in virtual and international teams, committees, and task forces within the foreign parent company.	<b>.754</b>	
We have key employees who have acquired knowledge through expatriation to other units of the foreign parent company.	<b>.645</b>	
We have expatriates among our key employees who bring in know-how to this firm.	<b>.662</b>	
Our key employees acquire knowledge from their mentors at other units of the foreign parent company.	<b>.678</b>	
They gain knowledge by attending international training programs or meetings involving participants from other units of the foreign parent company.	<b>.754</b>	
They are visited by employees of other units of the foreign parent company for purposes of knowledge transfer.	<b>.714</b>	
They utilize global knowledge management systems (i.e., intranet, company databases) to access information.	<b>.671</b>	
They communicate with employees from other units of the foreign parent company through phone calls, conference calls, or e-mails.	<b>.706</b>	
Our key employees collect industry information from through informal means (e.g., lunch with industry friends, talk with trade partners).		<b>.709</b>
Our key employees organize special meetings with customers and other important third parties to acquire new knowledge.		<b>.822</b>
Our key employees gain new knowledge by partnering with important third parties.		<b>.815</b>
Our key employees participate in bench-marking and competitive intelligence projects to acquire knowledge.		<b>.624</b>
Our key employees reimbursed for joining professional and trade associations to gain new knowledge.		<b>.578</b>
Our key employees network with individuals from research institutions, government agencies, and trade associations to obtain information.		<b>.748</b>

Notes:

Extraction method: Principal components with the number of factors to be extracted limited to two.

Rotation method: Varimax

Rotated solution displayed.



**TABLE 5**  
**Descriptive Statistics of Study Variables**

Variable	Coefficient									
	Minimum	Maximum	Mean	Variance	Std. Deviation	Alpha	Skewness		Kurtosis	
							Statistic	Std. Error	Statistic	Std. Error
Subsidiary age <sup>a</sup>	2.83	13.08	7.0325	5.20	2.27963	-	.462	.235	-.354	.465
Subsidiary size <sup>b</sup>	.90	4.74	2.8946	.51	.71233	-	.201	.235	-.182	.465
Upstream competence	.00	2.00	1.6415	.36	.60456	-	-1.487	.235	1.149	.465
Japanese dummy	.00	1.00	.1887	.15	.39311	-	1.614	.235	.617	.465
Internal knowledge acquisition practices	1.44	6.75	4.6207	1.26	1.12175	.87	-.605	.235	.190	.465
External knowledge acquisition practices	2.00	6.67	4.8398	1.04	1.02117	.80	-.550	.235	-.073	.465
Internal learning	1.00	7.00	4.1071	2.18	1.47599	.80	-.245	.235	-.781	.465
External learning	1.40	6.20	4.1948	1.30	1.14364	.83	-.320	.235	-.636	.465
Human capital	4.00	7.00	5.9373	.39	.62800	.82	-.568	.235	1.149	.465
Social capital	2.75	7.00	5.5511	.67	.81784	.85	-.667	.235	.729	.465
Organizational capital	2.25	7.00	5.2730	.93	.96482	.75	-.624	.235	.196	.465
Knowledge creation capability	3.20	7.00	5.1184	.90	.94937	.79	-.334	.235	-.508	.465
Subsidiary competitive advantage	6.00	25.00	15.8627	12.01	3.46635	.70	-.182	.235	-.187	.465

<sup>a</sup> Subsidiary age has been transformed using square root transformation.

<sup>b</sup> Subsidiary age has been transformed using log transformation.

**TABLE 6**  
**Correlations among Study Variables**

Variable	1	2	3	4	5	6	7	8	9	10	11	12
1. Subsidiary age												
2. Subsidiary size	.10											
3. Upstream competence	.10	.31**										
4. Japanese dummy	-.06	-.25*	-.07									
5. Internal knowledge acquisition practices	-.03	.07	.07	-.03								
6. External knowledge acquisition practices	-.12	.19	.05	.06	.33**							
7. Internal learning	-.20*	-.02	-.01	-.07	.57**	.10						
8. External learning	-.15	.12	-.02	.09	.17	.40**	.09					
9. Human capital	-.15	.07	-.05	.06	.17	.24*	.17	.15				
10. Social capital	.00	-.01	-.17	.06	.18	.15	.23*	.07	.43**			
11. Organizational capital	-.06	.04	.07	-.07	.22*	.26**	.30**	.20*	.43**	.19*		
12. Knowledge creation capability	-.04	.20*	.03	.02	.24*	.33**	.27**	.33**	.34**	.25**	.40**	
13. Subsidiary competitive advantage	-.18	.06	-.04	-.11	.15	.14	.20	.11	.14	.09	.25**	.22**

N = 106

\* p < .05

\*\* p < .01

**TABLE 7**  
**Hierarchical Regression Results for Internal Learning and External Learning**

Variables	Internal Learning								External Learning							
	Model 1a				Model 2a				Model 1b				Model 2b			
	<i>B</i>	SE <i>b</i>	$\beta$	<i>t</i>	<i>b</i>	SE <i>b</i>	$\beta$	<i>T</i>	<i>b</i>	SE <i>b</i>	$\beta$	<i>t</i>	<i>b</i>	SE <i>b</i>	$\beta$	<i>t</i>
Subsidiary age	-.13	(.06)	-.20	-2.06*	-.11	(.05)	-.18	-2.19*	-.08	(.05)	-.16	-1.62	-.05	(.04)	-.11	-1.16
Subsidiary size	-.05	(.21)	-.02	-.22	-.11	(.18)	-.05	-.61	.30	(.17)	.19	1.81	.17	(.16)	.11	1.07
Upstream competence	.03	(.25)	.01	.11	-.05	(.20)	-.02	-.25	-.10	(.19)	-.05	-.54	-.11	(.18)	-.06	-.60
Japanese dummy	-.34	(.38)	-.09	-.91	-.30	(.30)	-.08	-1.00	.36	(.29)	.12	1.25	.25	(.27)	.09	.92
Internal knowledge acquisition practices					.75	(.10)	.57	7.14***								
External knowledge acquisition practices													.40	(.10)	.36	3.91***
R <sup>2</sup> ( $\Delta R^2$ )	.05				.37 (.32)				.06				.18 (.12)			
F ( $\Delta F$ )	1.25				11.69** *(51***)				1.61				4.53*** (15.29***)			

N = 106

† p &lt; .10

\* p &lt; .05

\*\* p &lt; .01

\*\*\* p &lt; .001

All significance levels are based on two-tailed tests.

**TABLE 8****Hierarchical Regression Results for Subsidiary Knowledge Creation Capability**

Variables	Model 1				Model 2				Model 3				Model 4			
	<i>b</i>	SE <i>b</i>	$\beta$	t	<i>B</i>	SE <i>b</i>	$\beta$	T	<i>b</i>	SE <i>b</i>	$\beta$	t	<i>b</i>	SE <i>b</i>	$\beta$	t
Subsidiary age	-.03	(.04)	-.06	-.63	.01	(.04)	.03	.37	-.00	(.04)	-.02	-.21	.02	(.04)	.05	.54
Subsidiary size	.33	(.14)	.24	2.34*	.26	(.13)	.20	1.99*	.24	(.14)	.18	1.78	.22	(.13)	.17	1.67 <sup>†</sup>
Upstream value activity	-.05	(.16)	-.03	-.31	-.03	(.15)	-.02	-.19	-.06	(.15)	-.04	-.43	-.04	(.15)	-.02	-.25
Japanese dummy	.19	(.24)	.08	.08	.16	(.23)	.07	.72	.14	(.23)	.05	.59	.13	(.22)	.05	.59
Internal knowledge acquisition practices									.13	(.08)	.15	1.57	-.00	(.10)	-.00	-.07
External knowledge acquisition practices									.23	(.09)	.25	2.45**	.18	(.10)	.20	1.93 <sup>†</sup>
Internal learning					.16	(.06)	.25	2.77**					.16	(.07)	.25	2.21*
External learning					.24	(.08)	.29	3.08**					.18	(.08)	.21	2.18*
R <sup>2</sup> ( $\Delta R^2$ )	.05				.20 (.15)				.16				.48			
F ( $\Delta F$ )	1.47				4.25*** (9.31***)				3.12**				3.75***			

N = 106

<sup>†</sup> p < .10

\* p &lt; .05

\*\* p &lt; .01

\*\*\* p &lt; .001

All significance levels are based on two-tailed tests.

**TABLE 9**  
**Hierarchical Regression Results for Subsidiary Competitive Advantage**

Variables	Model 1				Model 2				Model 3				Model 4			
	<i>B</i>	<i>SE b</i>	$\beta$	<i>t</i>	<i>B</i>	<i>SE b</i>	$\beta$	<i>T</i>	<i>b</i>	<i>SE b</i>	$\beta$	<i>t</i>	<i>B</i>	<i>SE b</i>	$\beta$	<i>t</i>
Subsidiary age	-.28	(.15)	-.19	-1.94 <sup>†</sup>	-.27	(.15)	-.18	-1.83 <sup>†</sup>	-.22	(.15)	-.14	-1.45	-.23	.15	-.15	-1.53
Subsidiary size	.33	(.51)	.07	.95	.08	(.51)	.02	.15	.28	(.51)	.06	.55	.11	.52	.03	.22
Upstream value activity	-.31	(.58)	-.05	-.52	-.27	(.57)	-.05	-.47	-.29	(.58)	-.05	-.50	-.28	.58	-.05	-.48
Japanese dummy	-.96	(.88)	-.10	-1.09	-1.11	(.87)	-.13	-1.29	-.91	(.88)	-.10	-1.03	-1.02	.88	-.11	-1.15
Internal learning									.37	(.23)	.16	1.61	.27	.24	.11	1.12
External learning									.22	(.30)	.07	.73	.07	.31	.02	.21
Knowledge creation capability					.79	(.36)	.22	2.21*					.65	.39	.18	1.66 <sup>†</sup>
R <sup>2</sup> ( $\Delta R^2$ )	.05				.10 (.05)				.08				.11			
F ( $\Delta F$ )	1.40				2.15 <sup>†</sup> (4.90)				1.50				1.71			

N = 106

<sup>†</sup> p < .10

\* p < .05

\*\* p < .01

\*\*\* p < .001

All significance levels are based on two-tailed tests.

**TABLE 10****Moderated Regression Analysis Results for Knowledge Creation Capability**

Variables	Model 1			Model 2			Model 3		
	<i>b</i>	SE <i>b</i>	$\beta$	<i>b</i>	SE <i>b</i>	$\beta$	<i>b</i>	SE <i>b</i>	$\beta$
Subsidiary age	.02	(.04)	.04	.00	(.04)	.00	.00	(.04)	.01
Subsidiary size	.24	(.12)	.18 <sup>†</sup>	.24	(.12)	.18 <sup>†</sup>	.26	(.13)	.19*
Upstream value activity	-.01	(.14)	-.01	-.09	(.14)	-.05	-.00	(.14)	-.00
Japanese dummy	.16	(.21)	.07	.15	(.22)	.06	.12	(.22)	.05
Internal learning	.09	(.06)	.15	.07	(.06)	.11	.11	(.06)	.16 <sup>†</sup>
External learning	.19	(.07)	.22*	.21	(.07)	.25*	.17	(.07)	.20*
Human capital	.20	(.16)	.13	.17	(.16)	.11	.18	(.15)	.12
Social capital	.11	(.11)	.09	.01	(.12)	.00	.10	(.11)	.09
Organizational capital	.23	(.10)	.24*	.31	(.10)	.31*	.24	(.10)	.24*
Internal learning X External learning				-.10	(.05)	-.18*	-.11	(.05)	-.21*
Internal learning X human capital				.04	(.11)	.03			
Internal learning X social capital				-.16	(.08)	-.22*			
Internal learning X organizational capital				.13	(.07)	.18 <sup>†</sup>			
External learning X human capital							-.12	(.15)	-.09
External learning X social capital							.03	(.10)	.03
External learning X organizational capital							.16	(.10)	.17
R <sup>2</sup> ( $\Delta R^2$ )	.32			.38 (.06)			.36 (.04)		
F ( $\Delta F$ )	4.95***			4.40*** (2.47*)			3.97***(1.51)		

N = 106

<sup>†</sup> p < .10

\* p &lt; .05

\*\* p &lt; .01

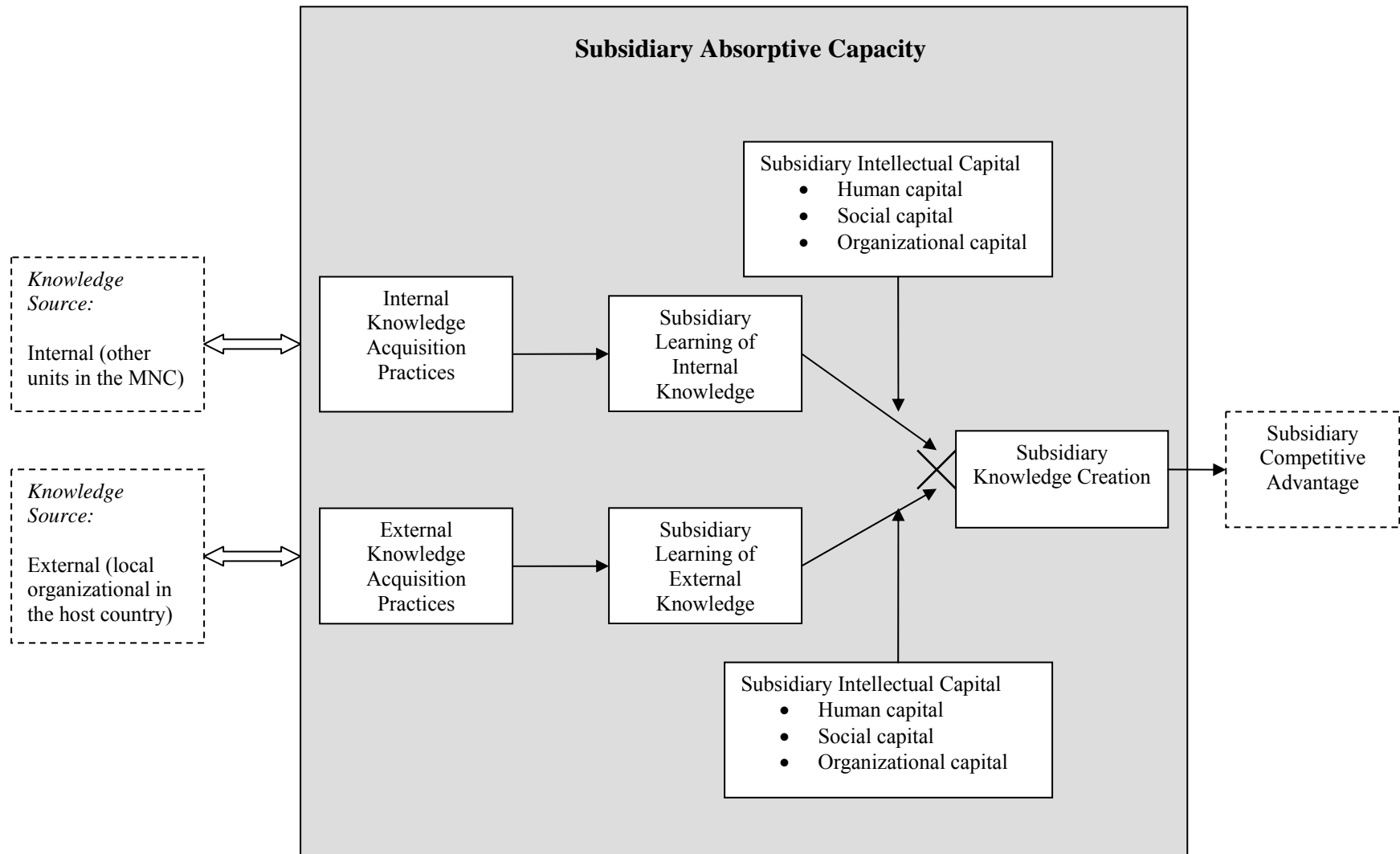
\*\*\* p &lt; .001

All significance levels are based on two-tailed tests.

**TABLE 11****Summary of Results from Post Hoc Analysis Exploring the Role of International Strategy**

Hypotheses	Global Strategy (N= 16)	Multinational Strategy (N = 60)	Transnational Strategy (N = 20)
Internal knowledge acquisition practices are related to internal learning.	Supported at $p < .01$ .	Supported at $p < .001$ .	Not supported.
External knowledge acquisition practices are related to external learning.	Not supported.	Supported at $p < .001$	Not supported.
Internal learning and external learning are related to knowledge creation capability.	Internal learning supported at $p < .05$ , external learning not supported.	Supported at $p < .05$ and $p < .01$	Not supported.
Knowledge creation capability is related to subsidiary performance.	Not supported.	Not supported.	Supported at $p < .05$ .
Internal learning and knowledge creation capability is moderated by intellectual capital.	No significant interactions.	No significant interactions.	Human capital*internal learning interaction negative and significant at $p < .10$ .
External learning and knowledge creation capability is moderated by intellectual capital.	No significant interactions.	Social capital*external learning interaction positive and significant at $p < .05$ Organizational capital*external learning interaction negative and significant at $p < .10$ .	Human capital*external learning interaction negative and significant at $p < .01$ .
Internal learning and external learning have an interaction effect on knowledge creation capability.	Not supported.	Not supported.	Not supported.

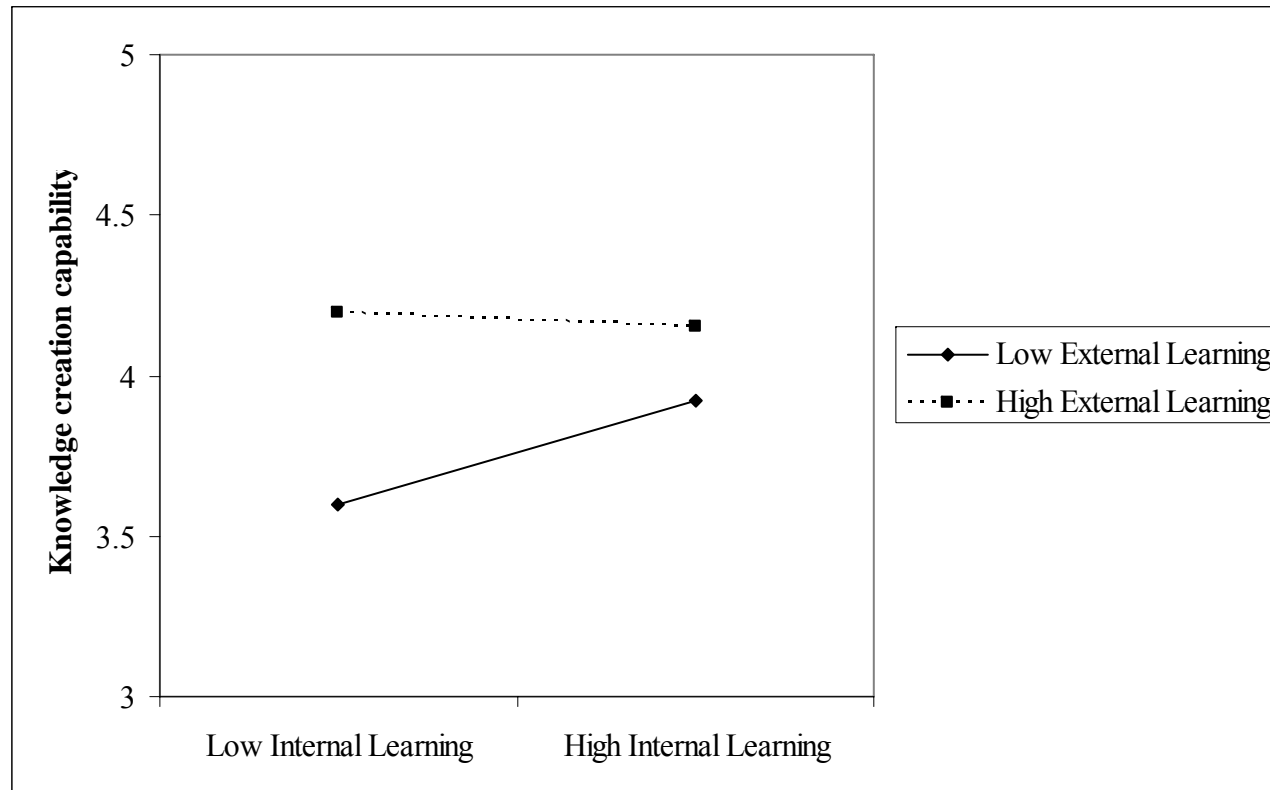
**FIGURE 1**  
**An Absorptive Capacity Model of Knowledge Creation in MNC Subsidiaries**





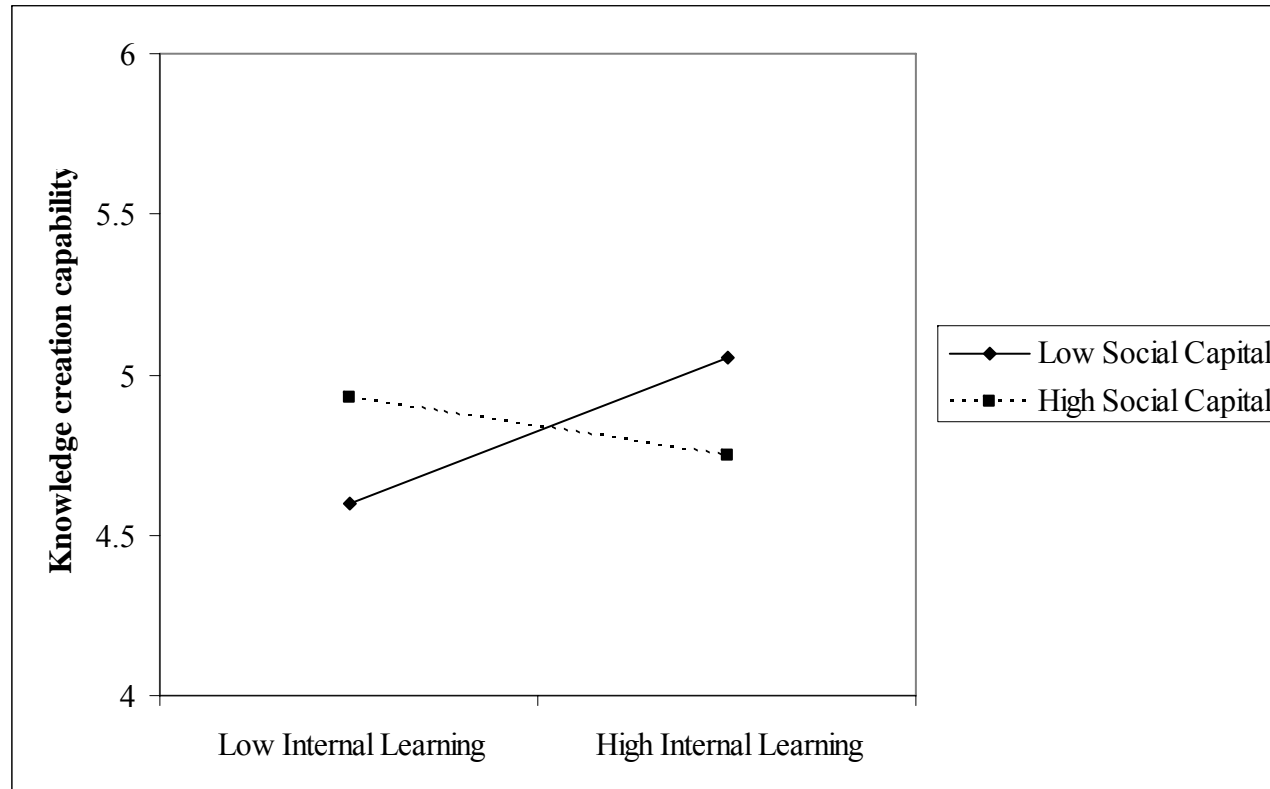
**FIGURE 2**

**Moderating Impact of External Learning on Internal Learning and Knowledge Creation Capability**



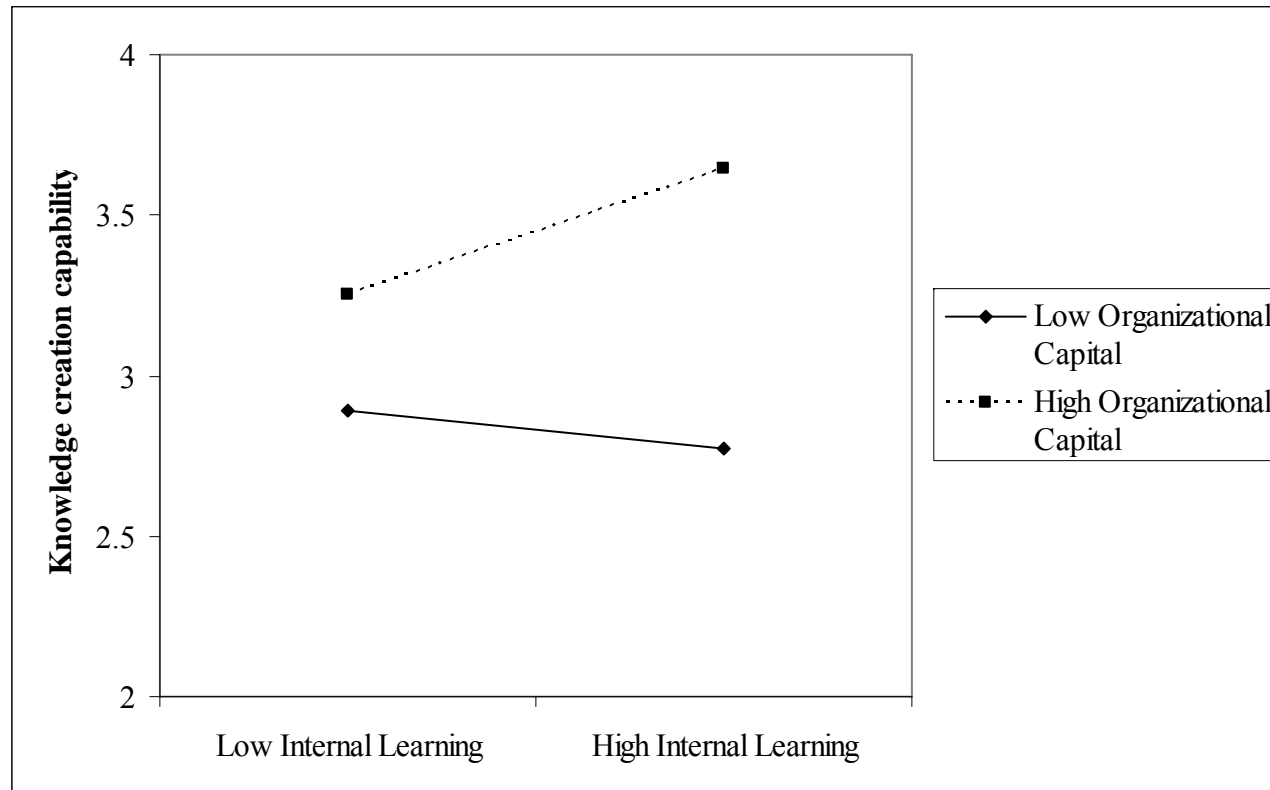
**FIGURE 3**

**Moderating Impact of Social Capital on Internal Learning and Knowledge Creation Capability**

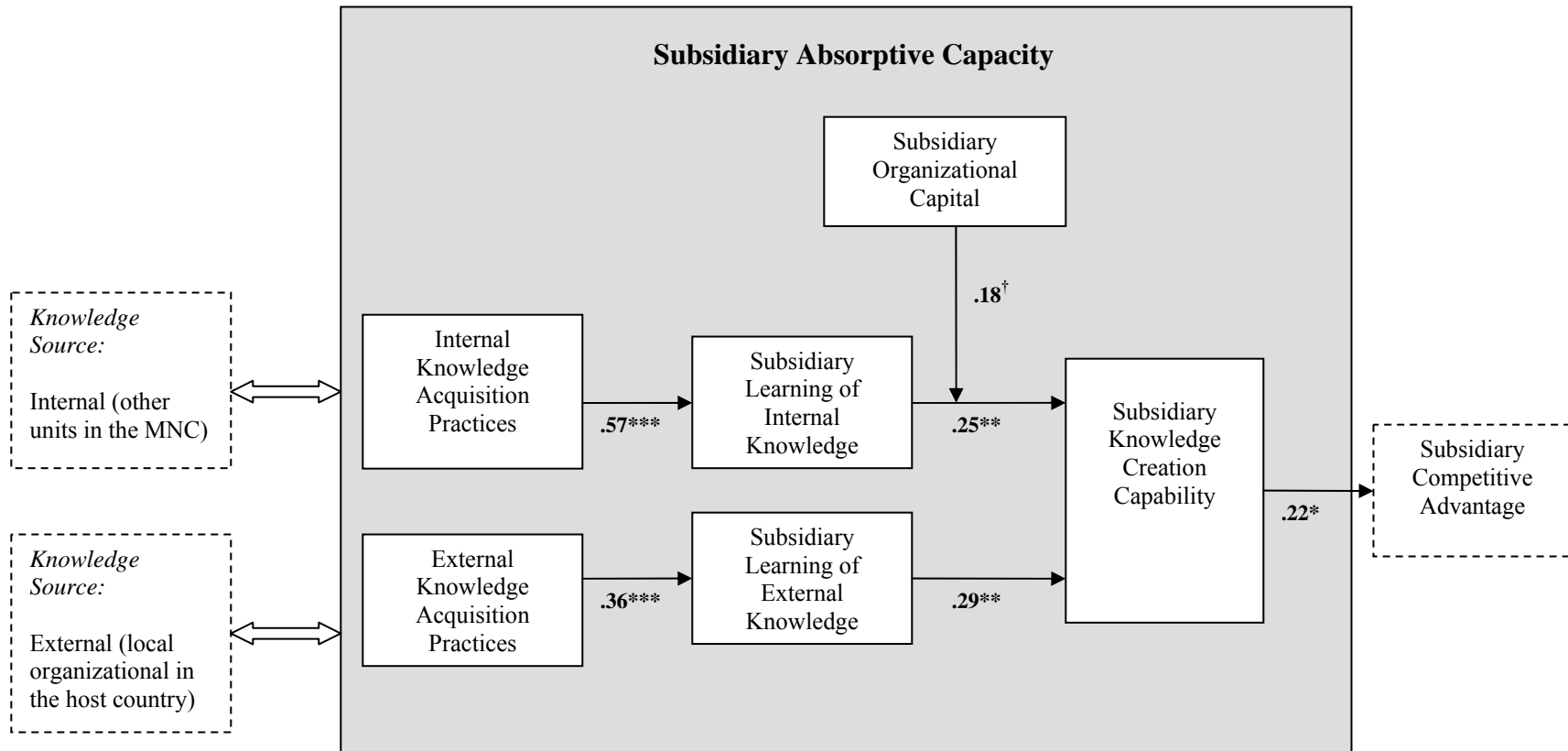


**FIGURE 4**

**Moderating Impact of Organizational Capital on Internal Learning and Knowledge Creation Capability**



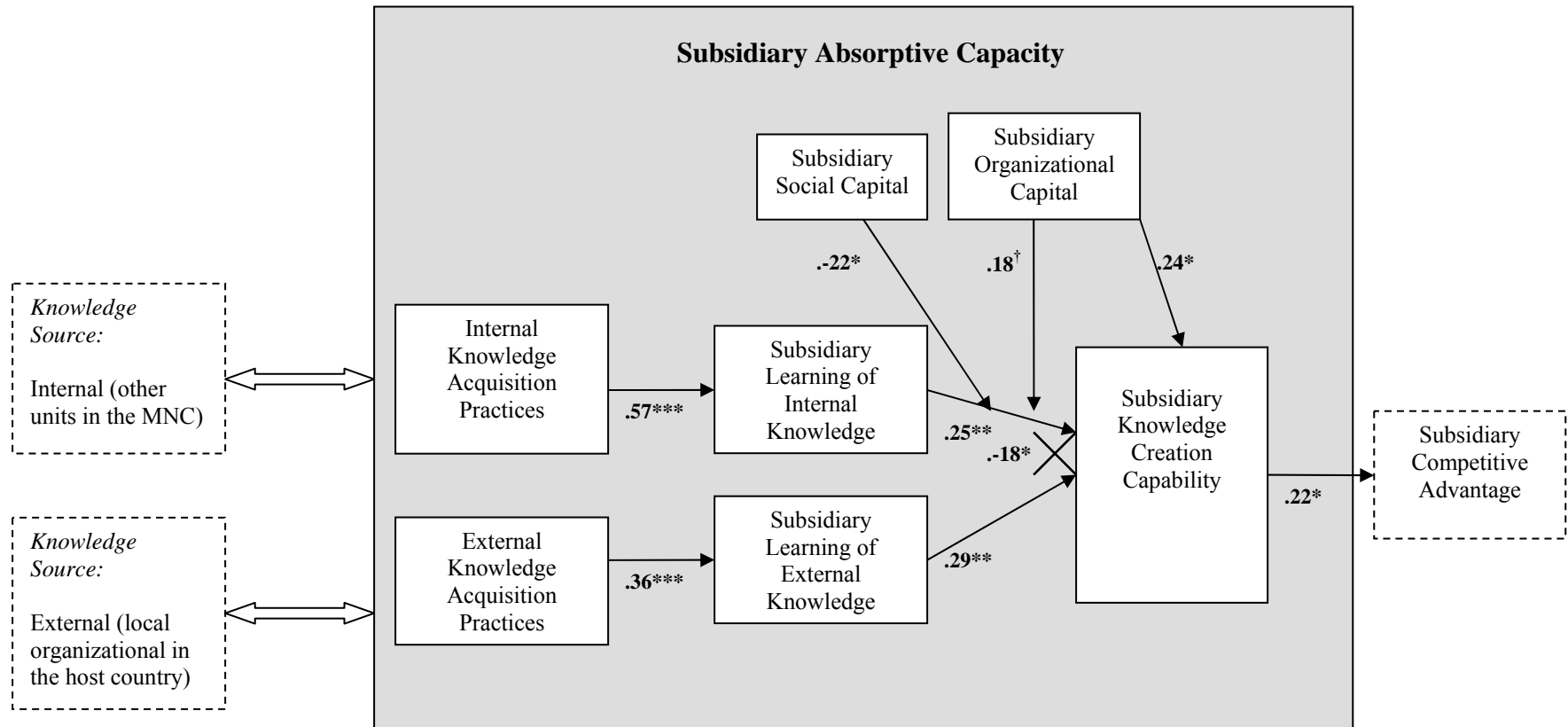
**FIGURE 5**  
**Theoretical Model with Supported Paths Only <sup>a, b</sup>**



<sup>a</sup> Reported values are standardized beta coefficients.

<sup>b</sup> All values are based on models including their respective control variables .

**FIGURE 6**  
**Revised Figure with All Significant Paths <sup>a, b</sup>**



<sup>a</sup> Reported values are standardized beta coefficients.

<sup>b</sup> All values are based on models including their respective control variables .

## Appendix A – Invitation Letter

Dear Mr./Mrs. Last Name,

I am a Ph.D. student at Rutgers University and I am writing to cordially request your help with my dissertation which examines the **knowledge management** practices of **foreign-owned firms in the U.S.** Specifically, my study investigates whether knowledge sharing with and transfer of know-how from foreign parents impact the bottom line results of companies like yours. As the Managing Director of a foreign-owned company in the U.S., you are in a unique position to contribute to this important study.

Participation in this study entails completion of an **8-10 minute online survey** by **two managers** from each organization - Managing Director and Director of Human Resources - or two Senior Managers who are familiar with your organization's overall operations in the U.S.

I will keep your and your colleague's responses to the survey in the **strictest confidence** and report only aggregated information in any published survey findings. To show my gratitude for your participation, I will provide both of the respondents with a **report of key study findings** and also donate **\$1.00 to a charity of the respondents' choice**.

Before beginning the survey, respondents will be asked to enter a code in the survey website which will then be used to link the responses of the two respondents from each participating organization.

**The code for your organization is 0001.**

To take the survey, respondents need to go to:

<http://www.surveyz.com/TakeSurvey?id=82429>

Thank you very much for your help and support! Please feel free to contact me with any questions, concerns, or comments you may have about this study or the study procedures.

Best Regards,  
Saba Colakoglu



Saba is a 4<sup>th</sup> year doctoral student at Rutgers University. Her research focuses on knowledge management, strategic human resource management, and expatriate assignment management in multinational corporations. Saba has extensively presented her work at international conferences and published in academic journals.

**This research study was approved by the Rutgers University Institutional Review Board in February, 2008.**

## Appendix B – Survey Questions

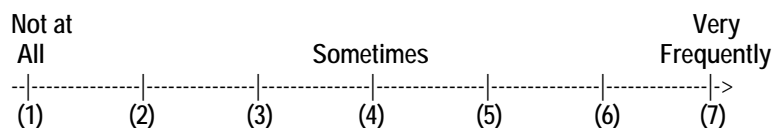
### IMPORTANT NOTE!

For **ALL** items in this survey, base your responses solely on your firm's business operations in the **United States**. Foreign parent company refers to the foreign owner of your firm that is located outside the U.S.

### PART 1 – ABOUT YOUR KEY EMPLOYEES

*The following questions are related to the **key employees of this U.S. subsidiary**. Key employees are those employees that have the greatest potential to influence your firm's bottom line. Key employees may include, but are not limited to, top management team members, department and line managers, sales and marketing managers, project, product, and program managers, as well as knowledge workers (e.g., engineers, scientists, R&D personnel).*

*Please indicate how frequently your firm's key employees engage in the following activities to acquire knowledge from other units in the foreign parent company (i.e., corporate headquarters, sister subsidiaries).*



\_\_\_ They acquire knowledge through international trips and visits to other units of the foreign parent company.

\_\_\_ They gain knowledge by working in virtual and international teams, committees, and task forces within the foreign parent company.

\_\_\_ We have key employees who have acquired knowledge through expatriation to other units of the foreign parent company.

\_\_\_ We have expatriates among our key employees who bring in know-how to this firm.

\_\_\_ Our key employees acquire knowledge from their mentors at other units of the foreign parent company.

\_\_\_ They gain knowledge by attending international training programs or meetings involving participants from other units of the foreign parent company.

\_\_\_ They are visited by employees of other units of the foreign parent company for purposes of knowledge transfer.

\_\_\_ They utilize global knowledge management systems (i.e., intranet, company databases) to access information.

\_\_\_ They communicate with employees from other units of the foreign parent company through phone calls, conference calls, or e-mails.

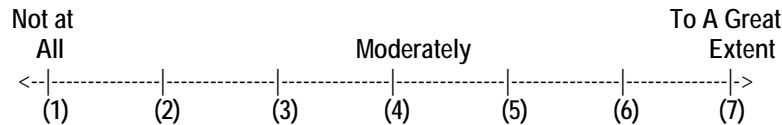
*Please indicate how frequently your firm's key employees engage in the following activities to acquire knowledge from important third parties in the U.S. (i.e., U.S. clients, suppliers, distributors, research institutions, government agencies, trade associations).*





- ☐ Marketing and sales know-how  
☐ Supply chain management know-how  
☐ Organizational management techniques and practices  
☐ Product and packaging design/development  
☐ Manufacturing processes/technology

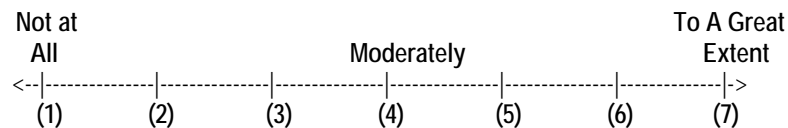
Please indicate the extent to which your firm has learned the following types of know-how from its relationships with important third parties in the U.S. (e.g., U.S. clients, suppliers, distributors, research institutions, government agencies, trade associations).



- \_\_\_\_\_ Marketing and sales know-how
- \_\_\_\_\_ Supply chain management know-how
- \_\_\_\_\_ Organizational management techniques and practices
- \_\_\_\_\_ Product and packaging design/development
- \_\_\_\_\_ Manufacturing processes/technology

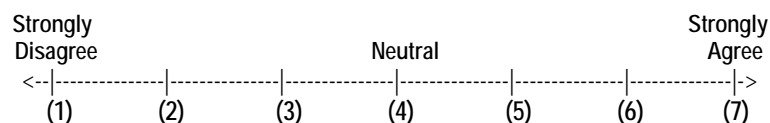
*Creating new knowledge refers to finding out new, improved, or refined ways of doing things that generate organizational value or increase operational efficiency.*

*Based on this definition, please indicate the extent to which your firm has the capability to create new knowledge in the following areas.*



- ☐ Marketing and sales know-how  
☐ Supply chain management know-how  
☐ Organizational management techniques and practices  
☐ Product and packaging design/development  
☐ Manufacturing processes/technology

Please indicate the extent to which you agree or disagree with the following statements about your firm.



- \_\_\_\_\_ We use patents and licenses as a way to store knowledge.
- \_\_\_\_\_ Much of this firm's knowledge is contained in manuals, databases, etc.
- \_\_\_\_\_ This firm's culture (stories, rituals) contains valuable ideas, ways of doing business.

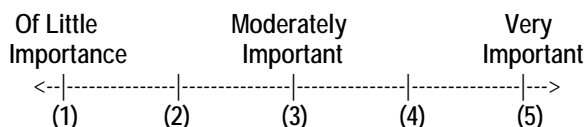
\_\_\_\_ This firm embeds much of its knowledge and information in structures, systems, and processes.

\_\_\_\_ We are quick to recognize shifts in the U.S. market regarding customer needs, government policies, and competition.

\_\_\_\_ New opportunities to serve our U.S. clients are quickly understood.

\_\_\_\_ We quickly analyze and interpret changing market demands in the U.S.

*Using the scale provided, please indicate the degree of importance your subsidiary's top management team attaches to the following dimensions of your firm's performance.*



\_\_\_\_ Overall sales growth

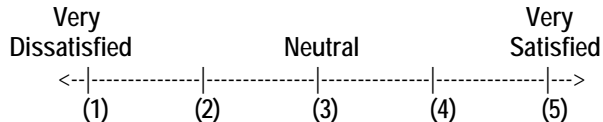
\_\_\_\_ Sales growth from new products

\_\_\_\_ Market share growth

\_\_\_\_ Operational efficiency

\_\_\_\_ Profitability

*Using the scale provided, please indicate the extent to which your subsidiary's top management team is satisfied with the performance of your firm in the following dimensions.*



\_\_\_\_ Overall sales growth

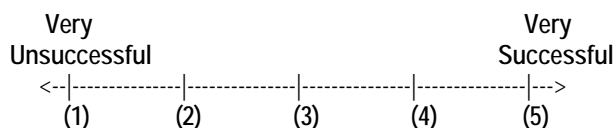
\_\_\_\_ Sales growth from new products

\_\_\_\_ Market share growth

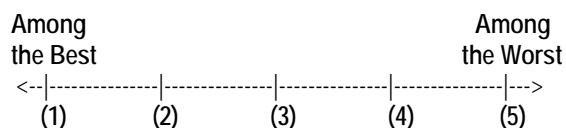
\_\_\_\_ Operational efficiency

\_\_\_\_ Profitability

*What is your overall assessment of your firm's current performance in the U.S.?*



*Compared to its competitors in the U.S., how do you assess your firm's performance?*





\_\_\_\_ People in this firm are enthusiastic about pursuing the collective goals and missions of the foreign parent company.

Please give your best estimate of the percentage of purchases (including parts/semi-manufactured articles) from other units of the foreign parent company in relation to the total amount of purchases of your firm.

☐ 0%      ☐ 1-25%      ☐ 26-50%      ☐ 51-75%      ☐ 76-99%      ☐ 100%

Please give your best estimate of the percentage of yearly output (including parts/semi-manufactured articles) of your firm that is sold or delivered to other units of the foreign parent company.

☐ 0%      ☐ 1-25%      ☐ 26-50%      ☐ 51-75%      ☐ 76-99%      ☐ 100%

Does your firm have one or more R&D facilities in the U.S.?      ☐ Yes      ☐ No

Does your firm have one or more manufacturing facilities in the U.S.? ☐ Yes      ☐ No

What is the total number of employees of your firm? \_\_\_\_\_

What is the total number of expatriates that are present in your firm? \_\_\_\_\_

What is the number of expatriates that are present in your firm's top management team? \_

Which of the following best describes the ownership structure of this U.S. subsidiary?

☐ Wholly owned by the foreign parent      ☐ International joint venture

What is the form of establishment of this U.S. subsidiary?

☐ Acquired by the foreign parent

○ Please indicate the year in which this firm was acquired \_\_\_\_\_

○ Please indicate the year in which this firm was originally established in the U.S. \_\_\_\_\_

☐ Greenfield site

○ Please indicate the year in which this firm was established in the U.S. \_\_\_\_\_

Please indicate your job title. \_\_\_\_\_

Please indicate how long you have been working for this firm. If you are an expatriate, please also indicate how long you have been working for the foreign parent company \_\_\_\_\_

*If you would like a report of survey findings, please indicate your first and last name and e-mail address \_\_\_\_\_*

*Additional Comments \_\_\_\_\_*

## REFERENCES

- Aiken, L. S., & West, S. G. 1991. *Multiple Regression: Testing and interpreting interactions*. Thousand Oaks: Sage.
- Amabile, T. 1988. *A model of creativity and innovation in organizations*. Greenwich, Conn: JAI Press.
- Ancona, D. G., & Caldwell, D.F. 1990. Beyond boundary spanning: Managing external dependence in product development teams. *Journal of High Technology Management Research*, 1: 119-135.
- Anderson, J. C. & Gerbing, D.W. 1988. Structural equation modeling in practice: A review and recommended two-step approach. *Psychological Bulletin*, 103:411–423.
- Andersson, U., Forsgren, M., & Holm, U. 2002. The strategic impact of external networks: Subsidiary performance and competence development in the multinational corporation. *Strategic Management Journal*, 23: 979-996.
- Andersson, U., Bjorkman, I., & Forsgren, M. 2005. Managing subsidiary knowledge creation: The effect of control mechanisms on subsidiary local embeddedness. *International Business Review*, 14: 521-538.
- Arthur, J. B. 1992. The link between business strategy and industrial relations systems in American steel minimills. *Industrial and Labor Relations Review*, 45, 488-506.
- Barney, J. 1991. Firm resources and sustainable competitive advantage. *Journal of Management*, 17: 99-129.
- Baron, R. M., & Kenny, D. A. 1986. The moderator-mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. *Journal of Personality and Social Psychology*, 51, 1173-1182.
- Bartlett, C. A., & Ghoshal, S. 1988. Organizing for worldwide effectiveness: The transnational solution. *California Management Review*, 31: 54-74.
- Bartlett, C. A., & Ghoshal, S. 1989. *Managing across borders : The transnational solution*. Boston, Mass.: Harvard Business School Press.
- Bentler, P.M. & Bonnet, D.C. 1980. Significance tests and goodness of fit in the analysis of covariance structures. *Psychological Bulletin*, 88: 588-606.
- Birkinshaw, J. Hood, N. & Young, S. 2005. Subsidiary entrepreneurship, internal and external competitive forces, and subsidiary performance. *International Business Review*, 14: 227-248.

Birnbaum, M. H. 2004. Human research and data collection via the Internet. *Annual Review of Psychology*, 55: 803-832.

Bjorkman, I., Barner-Rasmussen, W., & Li, L. 2004. Managing knowledge transfer in MNCs: the impact of headquarters control mechanisms. *Journal of International Business Studies*, 35: 443-455.

Bollen, K.A. & Stine, R. 1990. Direct and indirect effects: Classical and bootstrap estimates of variability. *Sociological Methodology* 20:115-140.

Bonache, J., & Brewster, C. 2001. Knowledge transfer and the management of expatriation. *Thunderbird International Business Review*, 43: 145-168.

Bowen, D.E., & Ostroff, C. 2004. Understanding HRM-firm performance linkages: The role of the “strength” of the HRM system. *Academy of Management Review*, 29: 203-221.

Bresman, H., Birkenshaw, J., & Nobel, R. 1999. Knowledge transfer in international acquisitions. *Journal of International Business Studies*, 30: 439-462.

Buckley, P.J., & Carter, M. J. 2004. A formal analysis of knowledge combination in multinational enterprises. *Journal of International Business Review*, 35: 371-384.

Burt, R.S. 1997. The contingent value of social capital. *Administrative Science Quarterly*, 42: 339-365.

Caligiuri, P., & Stroh, L. 1995. Multinational corporation management strategies and international human resource practices: Bringing IHRM to the bottom line. *International Journal of Human Resource Management*, 6: 494-507.

Caves, R.E. 1982. *Multinational enterprise and economic analysis*. Cambridge: Cambridge University Press.

Cockburn, I., Henderson, R., & Stern, S. 2000. Untangling the origins of competitive advantage. *Strategic Management Journal*, 21: 10-11.

Cohen, J. 1992. A power primer. *Quantitative Methods in Psychology*, 112: 155-159.

Cohen, J., & Cohen, P. 1983. *Applied multiple regression/correlation analysis for the behavioral sciences*. Hillsdale, NJ: Lawrence Erlbaum Associates, Inc.

Cohen, M. W., & Levinthal, D. A. 1989. Innovation and learning: The two faces of R&D. *Economic Journal*, 99: 569-596.

Cohen, M. W., & Levinthal, D. A. 1990. Absorptive capacity: A new perspective on learning and innovation. *Administrative Science Quarterly*, 35: 128-152.

Cohen, D., & Prusak, L. 2001. *In good company: How social capital makes organizations work*. Boston, MA: Harvard Business School Press.

Collins, C. J. & Clark, K. D. 2003. Strategic human practices, top management team social networks, and firm performance: The role of human resource practices in creating organizational competitive advantage. *Academy of Management Journal*, 46: 740-751.

Collins, C. J., & Smith, K. G. 2006. Knowledge exchange and combination: The role of human resource practices in performance of high technology firms. *Academy of Management Journal*, 49: 544-560.

Cortina, J.M., Chen, G. & Dunlop, W.P. 2001. Testing interaction effects in LISREL: Examination and illustration of available procedures. *Organizational Research Methods*, 4: 324-360.

Cycyota, C.S., Harrison, D. A., & Stahl, A. S. 2002. Enhancing response rates at the executive level: Are employee- or consumer-level techniques effective? *Journal of Management*, 28: 163-189.

Cycyota, C.S., & Harrison, D. A. 2006. What (not) to expect when surveying executives: A meta-analysis of top manager response rates and techniques over time. *Organizational Research Methods*, 9: 133-160.

Davenport, T., Prusak, L., & Strong, B. 2008. Putting ideas to work: Knowledge management can make a difference—but it needs to be more pragmatic. *Wall Street Journal*, March 10, 2008.

Delery, J. 1998. Issues of fit in strategic human resource management: Implications for research. *Human Resource Management Review*, 8: 289-309.

Dewar, R. D., & Dutton, J. E. 1986. The adoption of radical and incremental innovations. An empirical analysis. *Management Science*, 32: 1422-1433.

Dierickx, I., & Cool, K. 1989. Asset stock accumulation and sustainability of competitive advantage. *Management Science*, 35: 1504-1511.

Dillman, D. A. 2007. *Mail and internet surveys: The tailored design method (2<sup>nd</sup> ed.)*. New York: John Wiley and Sons.

Dunning, J. H. 1977. Trade, location of economic activity, and the MNC: A search for an eclectic approach. In B. Ohlin, P. Hesselborn, and P.M. Wijkman (Eds.), *The*

***international allocation of economic activity: Proceedings of a Nobel symposium held at Stockholm***: 395-418. London: The Macmillan Press.

Dyer, J. H., & Singh, H. 1998. The relational view. Cooperative strategies and sources of interorganizational competitive advantage. ***Academy of Management Review***, 23: 660-679.

Dyer, J. H., & Nobeoka, K. 2000. Creating and managing a high-performing knowledge-sharing network: The Toyota case. ***Strategic Management Journal***, 21: 345-367.

Edstrom, A., & Galbraith, J. R. 1977. Transfer of managers as a coordination and control strategy in multinational organizations. ***Administrative Sciences Quarterly***, 22: 248-263.

Eisenhardt, K. M., & Martin, J. A. 2000. Dynamic capabilities: What are they? ***Strategic Management Journal***, 21: 1105-1121.

Foss, N., & Pedersen, T. 2002. Transferring knowledge in MNCs: The role of sources of subsidiary knowledge and organizational context. ***Journal of International Management***, 8: 49-67.

Gerbing, D. W., & Anderson, J. C. 1985. The effects of sampling error and model characteristics on parameter estimation for maximum likelihood confirmatory factor analysis. ***Multivariate Behavioral Research***, 20: 255-271.

Geringer, J., & Herbert, L. 1991. Measuring performance of international joint ventures. ***Journal of International Business Studies***, 22: 249-264.

Gilley, K., & Rasheed, A. 2000. Making more by doing less: An analysis of outsourcing and its effects on firm performance. ***Journal of Management***, 26: 763-790.

Ghoshal, S., & Bartlett, C. A. 1990. The multinational corporation as an interorganizational network. ***Academy of Management Review***, 15: 603-625.

Ghoshal, S., & Westney, E. 1993. ***Organizational theory and the multinational corporation***. New York: St. Martin's.

Grant, R.M. 1996a, Winter. Toward a knowledge-based theory of the firm. ***Strategic Management Journal***, 17:109-122.

Griffith, D. A., Cavusgil, S.T., & Xu, S. 2008. Emerging themes in international business research. ***Journal of International Business Studies***, 36: 1220-1235.



Gully, S. M., Frone, M. R., & Edwards, J. R. 1998. Problems and pitfalls in mediational tests. Paper presented at the Annual Meeting of the Society of Industrial and Organizational Psychology, Texas.

Gupta, A. K., & Govindarajan, V. 1984. Business unit strategy, managerial characteristics, and business unit effectiveness at strategy implementation. *Academy of Management Journal*, 27, 25-41.

Gupta, A. K., & Govindarajan, V. 1991. Knowledge flows and the structure of control within multinational corporations. *Academy of Management Review*, 16: 768-792.

Gupta, A. K., & Govindarajan, V. 2000. Knowledge flows within multinational corporations. *Strategic Management Journal*, 21: 473-496.

Gupta, A. K., & Govindarajan, 2001. Converting global presence into global competitive advantage. *Academy of Management Executive*, 15: 45-58.

Hambrick, D. C., Geletkanycz, M. A., & Frerickson, J. W. 1993. Top executive commitment to the status quo: Some tests of its determinants. *Strategic Management Journal*, 14: 401-418.

Hansen, M. T. 1999. The search-transfer problem: The role of weak ties in sharing knowledge across organization subunits. *Administrative Science Quarterly*, 44: 82-111.

Harvey, L. 1987. Factors Affecting Response Rates to Mailed Questionnaires: A Comprehensive Literature Review. *Journal of Market Research Society*, 29: 341-353.

Harzing, A. W. 1997. Response rates in international mail surveys: Results of a 22 country study. *International Business Review*, 6: 641-665.

Harzing, A.W. 2000. An empirical test and extension of the Bartlett and Ghoshal typology of multinational companies. *Journal of International Business Studies*, 31: 101-120.

Harzing, A.W. 2004. Ideal Jobs and International Student Mobility in the Enlarged European Union, *European Management Journal*, 22: 693-703.

Harzing, A. W., & Noorderhaven, N. 2006. Knowledge flows in MNCs: An empirical test and extension of Gupta & Govindarajan's typology of subsidiary roles. *International Business Review*, 15: 195-214.

Hatch, N. W., & Dyer, J. H. 2004. Human capital and learning as a source of sustained competitive advantage. *Strategic Management Journal*, 25: 1155-1178.

Heckman, J. 1979 Sample selection bias as a specification error. *Econometrica*, 47: 153-61.

Hedlund, G. 1986. The hypermodern MNC – A heterarchy? *Human Resource Management*, 25:9-36.

Hitt, M. A., Bierman, L., Shimizu, K., & Kochhar, R. 2001. Direct and moderating effects of human capital on strategy and performance in professional service firms: A resource-based perspective. *Academy of Management Journal*, 44: 13-28.

Hocking, B. J., Brown, M., & Harzing A. W. 2004. A knowledge transfer perspective of strategic assignment purposes and their path-dependent outcomes. *International Journal of Human Resource Management*, 15: 565-586.

Holm, U., & Pedersen, T. (eds.) 2000. *The emergence and impact of MNC Centres of Excellence: A Subsidiary perspective*. MacMillan Press: New York and London.

Holmbeck, G. N. 1997. Toward terminological, conceptual, and statistical clarity in the study of mediators and moderators: Examples from the child-clinical and pediatric psychology literatures. *Journal of Consulting and Clinical Psychology*, 65: 599-610.

Huselid, M.A. 1995. The impact of human resource management practices on turnover, productivity, and corporate financial performance. *Academy of Management Journal*, 38: 635-672.

Hu, L.T., & Bentler, P.M. 1999. Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling*, 6: 1-55.

Huber, G. P. 1991. Organizational learning: The contributing processes and literatures. *Organization Science*, 2: 88-115.

Hymer, S. 1976. *The international operations of national firms*. Cambridge, MA: MIT Press.

Jackson, S. E., Hitt, M. A., DeNisi, A. S. 2003. *Managing Knowledge for Sustained Competitive Advantage*. San Francisco, CA: Jossey-Bass.

Jansen, J. J. P., Van den Bosch, F. A. J., & Volberda, H. W. 2005. Managing potential and realized absorptive capacity: How do organizational antecedents matter? *Academy of Management Journal*, 48: 999-1015.

Jaw, B. S., Wang, Y. P., & Chen, Y. H. 2006. Knowledge flows and performance of multinational subsidiaries: the perspective of human capital. *International Journal of Human Resource Management*, 17: 225-244.

Joreskog, K.G. 1969. A general approach to confirmatory maximum-likelihood factor analysis. *Psychometrika*, 34: 183-202.

- Kang, S-C., Morris, S. M. & Snell, S. A. 2007. Relational archetypes, organizational learning, and value creation: Extending the Human Resource Architecture. *Academy of Management Review*, 32: 236-256.
- Kaplan, R. S., & Norton, D. P. 2001. *The strategy-focused organization: How balanced scorecard companies thrive in the new business environment*. Boston, MA: Harvard Business School Press.
- Katz, R., & Allen, T. J. 1982. Investigating the not invented here (NIH) syndrome: A look at the performance, tenure, and communication patterns of 50 R&D project groups. *R & D Management*, 12: 7-19.
- Kenny, D. A., Kashy, D. A., & Bolger, N. 1998. Data analysis in social psychology. In D. Gilbert, S. Fiske, & G. Lindzey (Eds.), *The handbook of social psychology* (Vol. 1, 4th ed., pp. 233-265). Boston, MA: McGraw-Hill.
- Kline, R.B. 2005. *Principles and practice of structural equation modeling* (2<sup>nd</sup> Ed.). New York: The Guilford Press.
- Kostova T. 1999. Transnational transfer of strategic organizational practices: A contextual perspective. *Academy of Management Review*, 24: 308-24.
- Kostova, T., & Zaheer, S. 1999. Organizational legitimacy under conditions of complexity: the case of the multinational enterprise. *Academy of Management Review*, 24: 64-81.
- Kostova, T., Roth, K. & Dacin, T. 2009. Theorizing on MNCs: A promise for institutional theory. *Academy of Management Review*, 34: 171-173.
- Krishnan, R., Martin, X., & Noorderhaven, N. G. 2006. When does trust matter to alliance performance? *Academy of Management Journal*, 49: 894-917.
- Kogut, B., & Zander, U. 1993. Knowledge of the firm and the evolutionary theory of the multinational corporation. *Journal of International Business Studies*, 34: 625-645.
- Kostova, T., & Roth, K. 2003. Social capital in multinational corporations and a micro-macro model of its formation. *Academy of Management Review*, 28: 297-317.
- LaGrace, R. & Kuhn, L. D. 1995. The effect of visual stimuli on mail survey response rates. *Industrial Marketing Management*, 24: 11-18.
- Lane, P. J., & Lubatkin, M. 1998. Relative absorptive capacity and interorganizational learning. *Strategic Management Journal*, 19: 461-477.

- Lane, P. J., Salk, L. E., & Lyles, M. A. 2001. Absorptive capacity, learning, and performance in international joint ventures. *Strategic Management Journal*, 22: 1139-1161
- Lane, P. J., Koka, B. R., & Pathak, S. 2006. The reification of absorptive capacity: A critical review and rejuvenation of the construct. *Academy of Management Review*, 31: 833-863.
- Lepak, D. P., & Snell, S. A. 1999. The human resource architecture: Toward a theory of human capital allocation and development. *Academy of Management Review*, 24(1): 31-48.
- Lepak, D.P., Laio, H., Chung, Y., & Harden, E. 2006. A conceptual review of human resource management systems in strategic human resource management research. In J. Martocchio (Ed.), *Research in Personnel and Human Resource Management* (pp. 217-271). Stamford, CT: JAI Press.
- Li, L. 2005. The effect of trust and shared vision on inward knowledge transfer in subsidiaries' intra- and inter-organizational relationships. *International Business Review*, 14: 77-95.
- Liao, H., Toya, K., Lepak, D.P., & Hong, Y. 2009. Do they see eye to eye? Management and employee perspectives of high-performance work systems and influence processes on service quality. *Journal of Applied Psychology*, 94 (2): 371-391.
- Luo, Y. 2001. Determinants of local responsiveness: Perspectives from foreign subsidiaries in an emerging market. *Journal of Management*, 27: 451-477.
- Lyles, M. A., & Salk, J. E. 1996. Knowledge acquisition from foreign parents in international joint ventures. *Journal of International Business Studies*, 27(5): 877-904.
- MacKinnon, D. P., & Dwyer, J. H. 1993. Estimating mediated effects in prevention studies. *Evaluation Review*, 17: 144-158.
- MacKinnon, D. P., Warsi, G., & Dwyer, J. H. 1995. A simulation study of mediated effect measures. *Multivariate Behavioral Research*, 30: 41-62.
- MacKinnon, D. P. 2000. Contrasts in multiple mediator models. In J. Rose, L. Chassin, C. C. Presson, & S. J. Sherman (Eds.), *Multivariate applications in substance use research: New methods for new questions* (pp. 141-160). Mahwah, NJ: Erlbaum.
- MacKinnon, D. P., Lockwood, C. M., Hoffman, J. M., West, S. G., & Sheets, V. 2002. A comparison of methods to test mediation and other intervening variable effects. *Psychological Methods*, 7: 83-104.

- March, J. G. 1991. Exploration and exploitation in organizational learning. *Organization Science*, 2: 71-87.
- Matusik, S. F., & Hill, C. W. L. 1998. The utilization of contingent work, knowledge creation and competitive advantage. *Academy of Management Review*, 23: 680-697.
- Miller, S. R., & Eden, L. 2006. Local density and foreign subsidiary performance. *Academy of Management Journal*, 49:341-357.
- Minbaeva, D., Pedersen, T., Bjorkman, I., Fey, C. F., & Park, H. J. 2003. MNC knowledge transfer, subsidiary absorptive capacity, and HRM. *Journal of International Business Studies*, 34: 586-599.
- Nahapiet, J., & Ghoshal, S. 1998. Social capital, intellectual capital, and the organizational advantage. *Academy of Management Review*, 23(2): 242-266.
- Pfeffer, J., & Salancik, G.R. 1978. *The external control of organizations*. New York: Harper & Row.
- Piaget, J. *The origins of intelligence in children*. New York: International University Press.
- Preacher, K. J., & Hayes, A. F. 2004. SPSS and SAS procedures for estimating indirect effects in simple mediation models. *Behavior Research Methods, Instruments, & Computers*, 36: 717-731.
- Podsakoff, P., MacKenzie, S., Lee, J., Podsakoff, N. 2003. Common method biases in behavioral research: A critical review of the literature and recommended remedies. *Journal of Applied Psychology*, 88: 879-903.
- Podsakoff, P.M., & Organ, D. W. 1986. Self-reports in organizational research: Problems and prospects. *Journal of Management*, 12: 531-544.
- Polyani, M. 1966. *The tacit dimension*. London: Routledge & Kegan Paul.
- Porter, M. E. 1985. *The competitive advantage: Creating and sustaining superior performance*. New York: Free Press.
- Reagans, R., & McEvily, B. 2003. Network structure and knowledge transfer: the effects of cohesion and range. *Administrative Science Quarterly*, 48: 240-267.
- Riusala, K., & Suutari, V. 2004. International knowledge transfers through expatriates. *Thunderbird International Business Review*, 46: 743-770.
- Roth, K. & Kostova, T. 2003. The use of the multinational corporation as a research context. *Journal of Management*, 9: 883-90.

Rugman, A. M., & Verbeke, A. 1992. A note on the transnational solution and the transaction cost of theory of multinational strategic management. *Journal of International Business Studies*, 23: 761-771.

Seldmeier, P., & Gigerenzer, G. 1989. Do studies of statistical power have an effect on the power of studies? *Psychological Bulletin*, 105: 309-316.

Shrout, P. E., & Bolger, N. 2002. Mediation in experimental and nonexperimental studies: New procedures and recommendations. *Psychological Methods*, 7: 422-445.

Smith, K. G, Collins, C., & Clark, C. 2005. Existing Knowledge, Knowledge Creation Capability and the Rate of New Product Introduction in High Technology Firms. *Academy of Management Journal*, 48(2): 346-357.

Snell, S. A., & Dean, J. J. 1992. Integrated manufacturing and human resource management: A human capital perspective. *Academy of Management Journal*, 35(3): 467-504.

Sobel, M. E. 1982. Asymptotic intervals for indirect effects in structural equations models. In S. Leinhardt (Ed.), *Sociological methodology* (pp.290-312). San Francisco: Jossey-Bass.

Srivastava, A., Bartol, K.M., & Locke, E.A. 2006. Empowering leadership in management teams: Effects on knowledge sharing, efficacy, and performance. *Academy of Management Journal*, 49: 1239-1251.

Subramaniam, M. & Youndt, M. A. 2005. The influence of intellectual capital on the types of innovative capabilities. *Academy of Management Journal*, 48: 450-464.

Subramaniam, V., & Venkatraman, N. 2001. Determinants of transnational new product development capability: Testing the influence of transferring and deploying tacit overseas knowledge. *Strategic Management Journal*, 22: 359-378.

Sutton, R.I., & Staw, B.M. 1995. What theory is *Not*. *Administrative Science Quarterly*, 40: 371-84.

Suzulanski, G. 1996, Winter. Exploring internal stickiness: Impediments to the transfer of best practice within the firm. *Strategic Management Journal*, 17: 27-43.

Tabachnick, B. G., & Fidell, L. S. 2001. *Using multivariate statistics* (4th ed.) Needham Heights, MA: Allyn & Bacon.

Taggart, J.H. 1999. MNC Subsidiary performance, risk, and corporate expectations. *International Business Review*, 8: 233-255.

Takeuchi H., & Nonaka, I. 2002. Theory of organizational knowledge creation. In D. Morey, M. Maybury, & B. Thuraisingham (Eds.), ***Knowledge management: Classic and contemporary works***:139-182. London, England: The MIT Press.

Tsai, W. 2001. Knowledge transfer in intraorganizational networks: Effects of network position and absorptive capacity on business unit innovation and performance. ***Academy of Management Journal***, 44: 996- 1004.

Tsai, W., & Ghoshal, S. 1998. Social capital and value creation: The role of intrafirm networks. ***Academy of Management Journal***, 41: 464-476.

Todorova, G., & Durisin, B. 2007. Absorptive capacity: Valuing a reconceptualization. ***Academy of Management Review***, 32: 774-786.

Van den Bosch, F. A. J., Volberda, H. W., & De Boer, M. 1999. Coevolution of firm absorptive capacity and knowledge environment: Organizational forms and combinative capabilities. ***Organization Science***, 10(5): 392-416.

Van Wijk, R., Jansen, J., & Lyles, M. Forthcoming. Organizational knowledge transfer: A meta-analytic review of its antecedents and its outcomes. ***Journal of Management***.

Venaik, S., Midgley, D. F., & Devinney, T. M. 2005. Dual paths to performance: the impact of global pressures on MNC subsidiary conduct and performance. ***Journal of International Business Studies***, 36: 655-675.

Venkatraman, M., & Ramanujam, V. 1991. Measurement of business performance in strategy research: A comparison of approaches. ***Academy of Management Review***, 11: 801-814.

Wall, T. D., Michie, J., Patterson, M., Wood, S. J., Sheehan, M., Clegg, C. W., & West, M. 2004. On the validity of subjective measures of company performance. ***Personnel Psychology***, 57: 95-118.

Whetten, D.A. 1989. What constitutes a theoretical contribution? ***Academy of Management Review***, 14: 490–5.

Wright, S. 1918. On the nature of size factors. ***Genetics***, 3: 367-74.

Wright, S. 1934. The method of path coefficients. ***Annals of Mathematical Statistics***, 5: 161-215.

Yli-Renko, H., Autio, E., & Sapienza, H. J. 2001. Social capital, knowledge acquisition, and knowledge exploitation in young technology-based firms. ***Strategic Management Journal***, 22: 587-613.

Youndt, M. A., Subramaniam, M., & Snell, S. A. 2004. Intellectual capital profiles: An examination of investments and returns. *Journal of Management Studies*, 41: 335-361.

Zaltman, G., Duncan, R., & Holbeck, J. 1973. *Innovations and organizations*. New York: Wiley.

Zahra, S. A., & George, G. 2002. Absorptive capacity: A review, reconceptualization, and extension. *Academy of Management Review*, 27: 185-203.



## CURRICULUM VITAE

**SABA COLAKOGLU**

### EDUCATION

Ph.D. in Industrial Relations and Human Resources (2009) – School of Management and Labor Relations, Department of Human Resource Management, Rutgers, The State University of New Jersey. Piscataway, NJ, U.S.A.

Master of Business Administration (1997) – Organizational Behavior and Marketing, Bilkent University, Ankara, Turkey.

Bachelor of Science in Psychology (1995) – Middle East Technical University, Ankara, Turkey.

### PUBLICATIONS

Caligiuri, P., Colakoglu, S., Cerdin, J.L., & Kim, M.S. (*Forthcoming*) Examining cross-cultural and individual differences in predicting employer reputation as a driver of employer attraction. *International Journal of Cross-Cultural Management*.

Colakoglu, S., Tarique, I., & Caligiuri, P.M. (*In press*) MNC subsidiary staffing strategy and performance: A differentiated fit perspective, *International Journal of Human Resource Management*, 6: 1288-1305.

Colakoglu, S., Hong, Y., & Lepak, D.P. (*In-press*) Models of strategic human resource management. In A. Wilkinson, T. Redman, S. Snell, and N. Bacon (Eds.), *The Handbook of Human Resource Management*, Sage.

Colakoglu, S., & Caligiuri, P.M. 2008. Cultural distance, expatriate staffing, and subsidiary performance: The case of U.S. subsidiaries of multinational corporations. *International Journal of Human Resource Management*, 2: 223-239.

Caligiuri, P.M., & Colakoglu, S. 2007. A strategic contingency approach to expatriate assignment management. *Human Resource Management Journal*, 17:393-410.

Colakoglu, S., Lepak, D.P., & Hong, Y. 2006. Measuring human resource management effectiveness: Considering multiple stakeholders in a global context. *Human Resource Management Review*, 16: 209-218.

Lepak, D.P., & Colakoglu, S. 2006. Strategic human resource management and ethics. In J. Deckop, B. Giacalone, and C. L. Jurkiewicz (Eds.), *Human Resource Management Ethics* (pp. 27-45). Greenwich, CT: Information Age.

Lepak, D.P., Takeuchi, R., Erhardt, N.L., & Colakoglu, S. 2006. Emerging perspectives on the relationship between human resource management and performance. In R. Burke, and C. Cooper (Eds.), *The Human Resources Revolution: Research and Practice* (pp. 31-54). Oxford, U.S.: Elsevier.