

S.P.L. FOURNÉ

Managing Organizational Tensions

A Multi-level Perspective on Exploration, Exploitation, and Ambidexterity



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A multi-level perspective on exploration, exploitation, and
ambidexterity

Het managen van organisationele spanningen

Een multi-level perspectief op exploratie, exploitatie en
ambidexteriteit

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To my parents.

Preface

In this dissertation I report four of the studies that I have been developing during the last four years at Rotterdam School of Management, Erasmus University. The studies reported here are the result of dedication towards generating a deeper understanding of why some organizations and their members are more able to balance exploration and exploitation, to nurture ambidextrous behaviors, and to be strategic, yet agile across emerging and established markets. The tensions revealed in the four studies in this dissertation pose challenges to top as well as middle managers of large global firms. But these very challenges also create opportunities to excel for the actors involved, their respective units, and organizations. The studies underwent significant development trajectories, and I would like to acknowledge those who contributed in one way or another to bringing the content of this dissertation to fruition.

Study 1, titled “Exploration and Exploitation: A Meta-Analytic Review of Conceptual, Level-of-Analysis, and Contextual Factors” benefitted greatly from rich discussions with my friend Bernardo Correia-Lima, who initiated this research project and whose methodological expertise was critical in realizing it. I am also thankful for the guidance of my mentor Prof.dr. Justin Jansen (RSM Erasmus University, The Netherlands). Previous versions of this study were presented at the Strategic Management Society Annual Meeting 2012 in Prague (Czech Republic) and the Academy of Management Annual Meeting 2013 in Orlando (United States). Prof.dr. Pursey Heugens (RSM Erasmus University, The Netherlands) was inspirational and insightful in helping me develop meta-analytic skills for the purpose of extending existing theories.

The ideas put forward in study 2, titled “Managers’ Work Experience, Ambidexterity, and Performance: The Contingency Role of the Work Context” emerged during intense collaboration and discussions with my friend, daily supervisor, and driving companion Dr. Tom Mom (RSM Erasmus University, The Netherlands). The first version of this study was exceptionally well-received at the Academy of Management Annual Meeting 2013 in Orlando (United States). Prof.dr. Justin Jansen also played a pivotal role

in developing this study, which was accepted in November 2013 by the Human Resource Management journal.

Study 3, titled "Interpersonal Processes of Middle Managers and the Emergence of Ambidexterity within Business Units," builds on a unique dataset of pairs of top and middle managers who are in a direct reporting relationship at leading European manufacturing and service firms. Development of the survey was guided by Prof.dr. Justin Jansen and Dr. Tom Mom, data collection benefitted greatly from Dr. Murat Tarakci (RSM Erasmus University, The Netherlands) who shared his expertise with me. This study has been presented at the Strategic Management Society Annual Meeting 2013 in Atlanta (United States). I would also like to extend particular gratitude to ERIM, Erasmus Trustfonds, and the Department of Strategic Management and Entrepreneurship for enabling a research visit to INSEAD (Institut Européen d'Administration des Affaires) to work on this project with Dr. Quy Huy, who has become an important mentor to me.

The final study, titled "Strategic Agility in MNEs: Managing Tensions to Capture Opportunities across Emerging and Established Markets," was published in the Spring 2014 issue of the California Management Review (CMR). Throughout a two-year R&R process I learned immensely from my co-authors Prof.dr. Justin Jansen and Dr. Tom Mom, who provided exceptional feedback and support in four major revisions. I am grateful to all our interview partners and my friends in the business community who enabled these interviews. An early version of this study was presented at the Organization Science Winter Conference 2012 in Steamboat Springs (United States).

To all my colleagues, friends, and family who inspired and supported me in the process of crafting this dissertation – I am forever grateful. I would like to thank the Erasmus Research Institute of Management (ERIM) and Erasmus Trustfonds for supporting conference participation, data collection efforts, the research visit at INSEAD. I am particularly indebted to Prof.dr. Justin Jansen, Prof.dr. Slawek Magala (RSM Erasmus University, The Netherlands), Dr. Tom Mom, Prof.dr. Ed Zajac (Northwestern University, United States), Dr. Reddi Kotha (SMU, Singapore), and Prof.dr. Gerry George (Imperial College, London, UK) for always believing in me and inspiring me to deliver ever more relevant and rigorous contributions to management theory and practice.

The path to this dissertation took me to four continents and allowed me to meet many thought-leading scholars who have inspired me and who provided useful advice that I will cherish throughout my academic career. A special thank you goes to my current and former colleagues at RSM Erasmus University, including but not limited to Dr. Mariano 'Pitosh' Heyden, Dr. Sebastiaan van Doorn, Dr. Shiko Ben-Menahem, Dr. Patrick Reinmoeller, Dr. Lotte Glaser, Dr. Vareska van de Vrande, Dr. Luca Berchicci, Dr. Raymond van Wijk, and my fellow PhD students Bernardo Correia-Lima, Jochem Kroezem, Ivana Naumovska, Riccardo Valboni, Pengfei Wang, and Aybars Tuncdogan for collaborating, helping out, and making it fun to work on floor T-11. In addition, I am extremely thankful for the everlasting support of the secretaries of the Department of Strategic Management and Entrepreneurship: Carolien Heintjes, Patricia de Wilde-Mes, and Janneke Suijker. Moreover, my new colleagues Prof.dr. Utz Schäffer, Prof.dr.dr. Jürgen Weber, and Dr. Marko Reimer have been instrumental to my development as a scholar by providing feedback on my research, introducing new perspectives, and offering career development advice.

On a personal note, I am particularly thankful to my parents Ricarda and Peter, who prepared me well for academic tasks, co-sponsored many of my conference visits, facilitated data collection efforts, and made travelling the world a pleasure. Moreover, I am forever indebted to my beloved grandmother Else Aarden, who is dearly missed. Furthermore, Yvonne and Achim Hegger, Marietje and Jacques Ewalds, and Christopher Brawley deserve a special thank you for generously providing workspace to me and even some of my colleagues and supporting me personally and in research endeavors. Last but not least, I am grateful to a few close friends who have always been accommodating and made me feel at home, thereby making my global journeys much more enjoyable: Caryl and Gary Kaplan as well as Dr. Timm Lohmann in California, Peter Colombo and Raymond & Kerrie Farrell in Texas, John Hoover's family in Colorado, Stefan and Carla Krautwald in Colombia, and Fabian Munz in Singapore.

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Chapter 1. Introduction

1.1 Exploration and Exploitation

Management scholars and organization theorists agree that organizations must engage in both exploration and exploitation to adapt to changes in the business environment (Levinthal & March, 1993). According to March (1991: 71), “maintaining an appropriate balance between exploration and exploitation is a primary factor in system survival and prosperity.” An organization that exclusively engages in exploitation faces obsolescence, whereas one that solely focuses on exploration may never be able to reap the benefits of its discoveries (Levinthal & March, 1993). Although balance between exploration and exploitation is fundamental for organizational performance, a central underlying assumption of this framework concerns the inherent tensions between exploration and exploitation (Gupta, Smith, & Shalley, 2006; Smith, 2014). While exploration includes activities such as “search, variation, risk taking, experimentation, play, flexibility, discovery, innovation,” exploitation refers to “refinement, choice, production, efficiency, selection, implementation, execution” (March, 1991: 71). Exploration and exploitation are thought to be conflicting because they demand different resources and routines, prosper in different contexts, and produce different organizational outcomes (Gupta et al., 2006; Levinthal & March, 1993).

This dissertation draws on qualitative and quantitative data to develop fine-grained insights – spanning the individual, unit, and organizational level – that contribute to the exploration-exploitation framework by clarifying key underlying assumptions (Lavie, Stettner, & Tushman, 2010; Raisch & Birkinshaw, 2008) and by explaining how organizations and their managers can manage the tensions that arise in the simultaneous pursuit of exploration and exploitation and thus improve their performance (O’Reilly & Tushman, 2013; Smith, 2014).

Thereby, the four studies in this dissertation contribute to further development of organizational learning theory (Duncan, 1974; Fiol & Lyles, 1985; March, 1991) and to the enrichment of paradox theory (Ford & Backoff, 1988; Lewis, 2000; Smith & Lewis, 2011), both of which have attracted considerable attention and been key theoretical perspectives in the strategic management literature.

1.2 Ambidexterity - 'Necessity' vs. 'Ability'

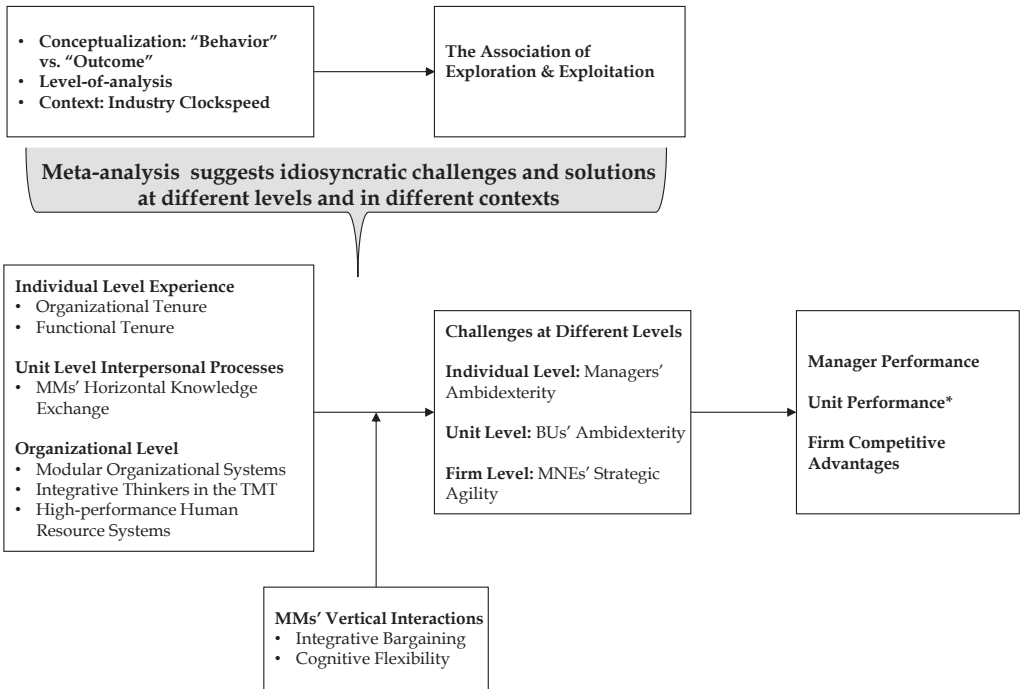
The simultaneous pursuit of exploration and exploitation has been labeled organizational ambidexterity (Duncan, 1976; Tushman & O'Reilly, 1996). More than three decades ago Abernathy's (1978) study of the automobile industry revealed that a focus on efficiency and productivity enhancing efforts was directly related with economic decline. His research suggests that for an organization to compete effectively in the long run the ability to be efficient needed to be paired with the capacity to innovate (Abernathy, 1978; Hayes & Abernathy, 1980).

Contemporary organizations simultaneously pursue exploration and exploitation in order to master both incremental and radical changes and thereby respond effectively to escalating contextual demands and shifts in dominant technologies (Benner & Tushman, 2003; Birkinshaw & Gibson, 2004; Christensen, Suárez, & Utterback, 1998). In order to compete effectively, organizations have to harmonize explorative and exploitative activities with the demands of more and more uncertain and turbulent product-market domains (Lavie & Stettner, 2013; O'Reilly & Tushman, 2004). March's (1991: 101) seminal work underscores that organizations' demands for both exploration and exploitation remain "a central concern of studies of adaptive processes." Ambidexterity has been positively associated with objective and subjective performance measures capturing financial, growth, and innovation performance (see the reviews of O'Reilly and Tushman (2013) and Junni, Salara, Taras, & Tarba (2013)).

Ambidexterity research (Raisch & Birkinshaw, 2008; Simsek, Heavey, Veiga, & Souder, 2009) explains how organizations can pursue exploration and exploitation simultaneously, yet it also shows that the strategic demands and activities underlying exploration and exploitation are contradictory, self-reinforcing, and yield persistent, paradoxical tensions (Andriopoulos & Lewis, 2009; Levinthal & March, 1993; Smith, 2014). Organizational tensions emerge due to the different processes (Benner & Tushman, 2003), cultures (Ghoshal & Bartlett, 1994), leadership demographics (Beckman, 2006), and knowledge management approaches which exploration and exploitation demand (Sheremata, 2000). Thus, the combination of the performance benefits of ambidexterity and the challenges in realizing it leads to an interesting ‘necessity’ vs. ‘ability’ dilemma.

Large global firms such as those studied in this dissertation are faced with structural and bureaucratic constraints (Bartlett & Ghoshal, 1999). Moreover, they have to compete at the business unit level as strategic domains are shifting quickly (Smith, 2014). As such, they may aspire to facilitate the emergence of ambidexterity at lower levels within the organization. In order to generate a better understanding about how to facilitate a simultaneous pursuit of exploration and exploitation, research has advocated zooming in on ambidextrous behaviors of individual managers (Mom, Van Den Bosch, & Volberda, 2009; Raisch, Birkinshaw, Probst, & Tushman, 2009). In light of the importance of insights into nurturing ambidexterity at different levels (Gupta et al., 2006; Lavie et al., 2010), this dissertation develops insights into the locus and nature of tensions associated with pursuing competing strategic and organizational activities and how they can be addressed using specific managerial practices and organizational mechanisms (Smith & Lewis, 2011). Since the ability to “manage the challenges of strategic paradoxes critically impacts an organization’s success, yet remains relatively unexamined” (Smith, 2014: 2), this dissertation (*cf.* the research framework in Figure 1.1) tackles the overarching question:

How can organizations and their managers manage organizational tensions?



* Unit Ambidexterity-Performance relationship previously established by Gibson and Birkinshaw (2004) and Jansen et al. (2012).

Figure 1.1: Research Framework

1.3 Research Aim, Questions, and Contributions

While the resource and knowledge based perspectives of the firm propose competitive advantage to arise from an exploitative accumulation of knowledge and assets (Barney, 1991; Dierickx & Cool, 1989; Kogut & Zander, 1992), other scholars advocate reconfiguring the knowledge base and departing from existing routines through exploration (Greve, 2007; Rosenkopf & Nerkar, 2001; Nerkar, 2003). In an age of fleeting competitive advantage (D'Aveni, Dagnino, & Smith, 2010), we see that there are merits to combining both approaches (O'Reilly & Tushman, 2013) and the exploration-exploitation typology parsimoniously captures these dynamics. Consequently, research on exploration, exploitation, and ambidexterity has drawn the interests of both management scholars and

practitioners (O'Reilly & Tushman, 2004; Simsek, 2009). Yet, two decades after March's (1991) seminal paper, empirical evidence on the relationship between exploration and exploitation and which conditions drive their interplay remains inconclusive. Findings on the association between these two constructs range from negative (Beckman, 2006; Hoang & Rothaermel, 2010) to positive (Beckman, Haunschild, & Phillips, 2004; Rothaermel, 2001). The mixed results regarding the interplay of exploration and exploitation led to ongoing scholarly debates about the assumptions underlying the exploration-exploitation framework and the contingencies driving the association between these two constructs (Lavie et al., 2010; Raisch & Birkinshaw, 2008). To tackle three of the core debates recent review papers have highlighted (Gupta et al., 2006; Lavie et al., 2010; Raisch & Birkinshaw, 2008) the meta-analysis, study one presented in the next chapter of this dissertation, addresses *which and how contingency factors influence the association of exploration and exploitation*.

Answering this question is pivotal to generating a better understanding of when and why the association between exploration and exploitation is stronger, which bears important implications as to when and how a simultaneous pursuit can be realized. This first dissertation study reveals the impact of different *conceptualizations, levels-of-analyses, and industry contexts* on the association of exploration and exploitation. As such, we contribute to organizational learning research (Crossan, Lane, & White, 1999; Huber, 1991; Levitt & March, 1988; March, 1991) by shedding light on the impact of the assumptions underlying the exploration-exploitation framework and enabling more coherent and precise future theoretical development and empirical analyses. Furthermore, the findings suggest taking care with respect to the applicability and generalizability of primary studies (Klein, Dansereau, & Hall, 1994) and facilitate making more reliable interpretations of the results of exploration-exploitation research. More specifically, the results point to the necessity to study the idiosyncratic challenges of and solutions to tensions that emerge when competing strategic thrusts such as

exploration and exploitation are pursued at different levels-of-analyses and in different contexts.

The analysis performed in the meta-study demonstrates that the mix of exploration and exploitation activities is a matter of contingency. For instance, at different levels-of-analyses the mechanisms managing the exploration-exploitation trade-offs vary (Gupta et al., 2006). Consequently, this dissertation zooms in on how to embrace and reconcile tensions and trade-offs across different contexts and levels-of-analyses, working its way upward from the individual to the firm level (*cf.* Figure 1.1). First, at the individual level, antecedents and outcomes of managers' ambidexterity are uncovered and tested. Second, I put forward a multiactor model investigating interpersonal processes in relation to business units' ambidexterity. Finally, at the organizational level it covers the foundations and drivers of strategic agility (Doz & Kosonen, 2008) and how the inherent tensions can be managed in a multi-market context. Strategic agility is closely related to exploiting strategic competencies and flexibly exploring new ones. This multi-level approach is vitally important since organizational change and adaptation do not only spur contradictions (Smith & Lewis, 2011), but are a multi-level affair (Noda & Bower, 1996).

Present studies have focused primarily on organizational structures at the firm level (Tushman & O'Reilly, 1996) and systems (Patel, Messersmith, & Lepak, 2013) and the work context (Gibson & Birkinshaw, 2004) as drivers of ambidexterity at the unit level. Despite this focus, scholars have repeatedly argued that ambidexterity may depend on managers' ambidextrous behaviors (Raisch & Birkinshaw, 2008; O'Reilly & Tushman, 2004). Managers may need to engage in paradoxical or integrative thinking (Martin, 2007; Smith & Tushman, 2005), different kinds of learning, and multitasking (Mom et al., 2009; Raisch et al., 2009). That said, studies on human resource management (HRM) have only provided insights into how high performance work systems or high involvement practices may foster organizational ambidexterity (Kang & Snell, 2009; Patel et al., 2013

Prieto & Santana, 2012), not capturing individual level variety within organizations (Becker & Huselid, 2006) and, hence, have not been able to develop detailed theory about *when managers may need to act ambidextrously and how they may raise their efficacy in mastering ambidextrous behaviors*.

Existing research is not clear about whether only top managers or also other managers should behave ambidextrously. On the one hand, senior leaders should excel at paradoxical cognition and orchestrate resource allocation to balance exploration and exploitation (Smith & Tushman, 2005; Tushman & O'Reilly, 1996). On the other hand, Gibson and Birkinshaw (2004) argued an ambidextrous orientation needs to be nurtured and integrated at lower hierarchical levels, and as such, middle and operational level managers may also need to act ambidextrously in order to improve their performance. Consequently, scholars have called for better understanding about the conditions under which ambidexterity leads to success, particularly at the individual level (Lavie et al., 2010; Raisch et al., 2009). Study 2 (Chapter 3) conceptually and empirically investigates how uncertainty and interdependence in the work context (Griffin, Neil, & Parker, 2007) of individual managers influences the relationship between ambidextrous behaviors and their individual performance.

By assessing these interaction effects, we are the first to address the ambidexterity-performance relationship and show who benefits most from ambidextrous behaviors. Furthermore, unlike treating HRM practices and ambidexterity as overarching phenomena at the organizational level, we take an HRM perspective to better understand how different types of tenure (Sturman, 2003; Tesluk & Jacobs, 1998) influence to managers' ambidexterity. This study zooms in on organizational and functional tenure as they are the most commonly studied types of tenure and have been shown to influence individuals' abilities and behaviors (Farrell & McDaniel, 2001; Guile & Griffiths, 2001, Ng & Feldman, 2010; Quinones, Ford, & Teachout, 1995). Accordingly, career paths can be shaped in order to enable those managers to master ambidextrous behaviors who benefit

most from it. More generally, from research on the antecedents and outcomes of managers' ambidexterity, we can infer how HRM practices and systems may be adapted and geared towards distinct needs and individual predicaments of managers within organizations.

Both this dissertation's meta-analytic study and recent review papers have highlighted the value of examining the antecedents of ambidexterity at lower levels (Junni et al., 2013; Raisch et al., 2009). The third study (Chapter 4) in this dissertation extends recent research on unit level ambidexterity (Gibson & Birkinshaw, 2004; Jansen et al., 2012). We know relatively little about efficient ways of fostering unit ambidexterity beyond studies showcasing managers' indirect impact through creation of a supportive context (Gibson & Birkinshaw, 2004). Moreover, dual structures (Jansen et al., 2009; Tushman, Smith, Wood, Westerman, & O'Reilly, 2010) are unlikely to be a feasible solution for nurturing exploration and exploitation in parallel within a business unit (Boumgarden, Nickerson, & Zenger, 2012). While there is some research about horizontal linkages across units (Taylor & Helfat, 2009), research about direct influence of senior leaders on unit ambidexterity and how middle managers, i.e. those managers in charge of units, exert and influence on unit ambidexterity is scarce. This is surprising as middle management (MM) has a crucial role in their unit's strategy formation and learning processes (Balogun, 2003; Burgelman & Grove, 2007; Taylor & Helfat, 2009; Wooldridge, Schmid, & Floyd, 2008). Rather, the extant body of research on ambidexterity has scrutinized the role of senior leaders in integrating structurally separate exploitative and explorative activities at the organizational level (*cf.* Jansen, George, Van Den Bosch, & Volberda, 2008; Smith & Tushman, 2005; Lubatkin, Simsek, Ling, & Veiga, 2006). Notwithstanding the value of ambidexterity for organizational units (Jansen et al., 2012; Gibson & Birkinshaw, 2004), theory on *why and how organizational units may become ambidextrous* is far from complete (Birkinshaw and Gupta, 2013).

On the one hand, research on strategy formation and learning has stressed the importance of horizontal interactions that occur between MMs from different units (Hansen, 1999; Martin & Eisenhardt, 2010; Pappas & Wooldridge, 1997; Tsai & Ghoshal, 1998). This research indicates horizontal knowledge exchange and integration activities of middle managers are relevant for business unit learning and innovation (Schulz, 2001; Tsai, 2001) and strategy formation (Floyd & Wooldridge, 1999; Pappas & Wooldridge, 2007). Building on theories of knowledge exchange and interpersonal processes (Floyd & Lane, 2000; MacNeil, 1974; Ring & Van de Ven, 1994; Schulz, 2001), study 3 explains how middle managers can engage in horizontal knowledge exchange to stimulate best practice transfers and knowledge inflows that improve their units' ambidexterity (Cummings, 2004; Schulz, 2003; Taylor & Helfat, 2009). Thereby, it extends not only ambidexterity research (Raisch & Birkinshaw, 2008), but also the literature on the effectiveness of knowledge sharing across units by pinpointing to the effectiveness of specific mechanisms (Ancona & Caldwell, 1992; Hansen, 2002; Brass, Galaskiewicz, Greve, & Tsai, 2004).

I argue that MMs can draw upon horizontal knowledge exchange to recognize and avoid success (competence) and failure (renewal) traps by learning from fellow MMs how to counter these tendencies (Levinthal & March, 1993). For instance, MMs' knowledge exchange and integration of broad bases of expertise located throughout the organization can be used to develop new competencies (Zhou & Li, 2012). Moreover, MMs benefit from horizontal interactions with their counterparts in developing integrative thinking skills that help them resolve tensions associated with the simultaneous pursuit of exploratory and exploitative activities in their units (Martin, 2007). Thus, rather than focusing on how MMs may create a supportive context (Gibson and Birkinshaw, 2004), our study provides novel insights into how MMs may improve their skills and competences in balancing exploration and exploitation. However, MMs also compete with other units' MMs for resources and for obtaining support from top managers to realize

their unit's ambitions and goals (Bouquet & Birkinshaw, 2008a; Burgelman, 1991; Dutton & Ashford, 1993; Raes, Heijltjes, Glunk, & Roe, 2011).

Studies on strategy formation and learning indicate that middle managers' strategy making is also contingent on vertical interpersonal processes, i.e. on the interactions between them and members of the top management team (TMT) (Nonaka, 1994; Raes et al., 2011; Wooldridge et al., 2008). This study investigates interpersonal processes vital for managing forces for stability and change and detecting discontinuities, i.e. integrative bargaining and cognitive flexibility in vertical interactions (Raes et al., 2011). It provides conceptual and empirical insights with respect to how vertical interpersonal processes moderate the relationship between horizontal knowledge exchange and ambidexterity at the unit level. Doing so allows drawing out the relative explanatory strengths and limitations of the vertical interactions in facilitating or inhibiting the value that MMs can extract from horizontal interactions for unit ambidexterity. Research has traditionally looked separately at the vertical and horizontal interpersonal processes, however, recommends considering both types of interpersonal processes together (Kilduff & Tsai, 2003; Nonaka, 1988; Schulz, 2001), because there is a debate about which mechanisms are most effective and whether there are complementarities or trade-offs among the horizontal and vertical interface mechanisms. The third study in this dissertation addresses this debate by showing that different combinations of the studied horizontal and vertical interactions reveal important complementarities and trade-offs. Thereby, it addresses the general lack of quantitatively validated insights in strategy process research (Floyd & Lane, 2000), which advocates the importance of vertical hierarchy-spanning exchanges (e.g., Bartlett & Ghoshal, 1993; Burgelman, 1984; Van Cauwenbergh & Cool, 1982), but offers only few quantitative examinations.

The fourth study (fifth chapter) of this dissertation draws on a dynamic capabilities perspective (Eisenhardt & Martin, 2000; Teece, Pisano, & Shuen, 1997; Zollo & Winter, 2002) as well as on paradox theory (Lewis, 2000; Smith & Lewis,

2011; Smith, 2014), both of which offer insights into developing and deploying strategic agility (Doz & Kosonen, 2008, 2010). Strategic agility refers to being strategic by making firm resource commitments, while remaining flexible to “reassess past choices and change direction in light of new developments” (Doz & Kosonen: 95). At the organizational level I study the foundations and drivers of strategic agility of seven MNEs that operate across emerging and established markets. This is a unique context in which MNEs face relatively slow or even declining growth patterns in developed economies and rapid but unstable growth conditions in emerging markets. Such conditions require decisive, yet agile responses in terms of differentiated product offerings, marketing approaches, and distribution channels, while still leveraging best practices and synergies globally.

Although research has identified important insights into the emergence of strategic agility, this notion has been built on rather generic leadership and resource allocation insights (Doz & Kosonen, 2008, 2010), thereby *leaving the origins and components of strategic agility underspecified in particular contexts*. The purpose of this chapter therefore is to extend our understanding of strategic agility by reconceptualizing its components in large global firms which face unique challenges when competing in emerging and established markets. We find that strategic agility enables regenerating competitive advantages through deep localization and profound global integration, but is difficult to develop and maintain as organizational tensions arise in this quest.

First, building on Doz & Kosonen’s (2008) framework on strategic agility, we identify and uncover three underlying dynamic capabilities and associated management practices and processes that large global firms use to behave strategically agile across both emerging and established markets. Research on dynamic capabilities has shown that effective dynamic capabilities may be non-substitutable across contextual domains and may differ in form and details (Eisenhardt & Martin, 2000). For instance, MNEs active in emerging markets face unique challenges in terms of demands and growth rates, political and regulatory

uncertainties, and fierce competition from local and global players. All these have important consequences for how strategic agility is built and nurtured over time.

Despite common features such as strategic sensitivity, leadership unity, and fluidity of resources (Doz & Kosonen, 2008) our interview data reveal that the manifestation of strategic agility in MNEs has idiosyncratic features and requires the investigation of unique pathways to develop and deploy it. Drawing on qualitative data from seven case companies, we have identified three key dynamic capabilities – sensing local opportunities, enacting global complementarities, and appropriating local value – and the associated organizational practices and managerial activities. Strategically agile global companies maintain a dynamic balance between these capabilities.

Second, although scholars have argued that strategic agility has become a challenging contradiction for corporate leaders and management teams (Doz & Kosonen, 2008, 2010), *insights into the type and nature of organizational tensions are still lacking*. Addressing this gap our study contributes to paradox theory (Lewis, 2000; Smith & Lewis, 2011; Smith, 2014) by uncovering organizational tensions that emerge within strategically agile MNEs, explicating their nature, and providing viable pathways for reconciling these tensions. Interestingly, the more experienced and successful the seven focal firms became in operating in both emerging and established markets by implementing the three capabilities, the more these tensions became pronounced. Thus, strategically agile global firms face more tensions – rather than less – compared to firms which lack such strategic agility. Thus, it is imperative for top managers in MNEs to recognize and resolve these organizational tensions in order to develop and maintain strategic agility of their organizations. We recommend specific responses in terms of organizational systems, leadership attributes, and human resource systems.

1.4 Research Design

Different quantitative and qualitative methods have been adopted to conduct the studies that form the basis of this dissertation. Moreover, every study in this dissertation is based on a unique dataset. I combine quantitative and qualitative data from primary and secondary sources to investigate phenomena at the organizational, unit, and individual level-of-analysis and in different research contexts. Using multi-source data allows for triangulation and increases the predictive validity of this dissertation. Adopting a multi-level approach to studying the drivers, contradictions, and outcomes of exploration, exploitation, and ambidexterity is crucial to generate a detailed understanding that facilitates further theoretical development and to uncover actionable insights for management practice. The mixed-method research design of the four chapters is partially an intentional choice and partially emerged on-the-go as new research questions and data sources have been discovered over the past four years.

The first paper uses advanced meta-analytic techniques. Since a meta-analysis produces a weighted average of effect sizes and minimizes random sampling error (Hunter & Schmidt, 2004), it is preferable to vote counting prior quantitative work (Combs, Ketchen, Crook, & Roth, 2011). Furthermore, meta-analytical techniques are crystallizing as the preferred method for accumulating evidence and re-evaluating established theories and extending theoretical underpinnings that can advance research domains (Combs et al., 2011).

The second paper uses survey data from one of the 'big four' accounting and professional services firm and one manufacturing firm (Firm B) which is a chemicals and life-sciences firm that ranks among the top 5 on the Fortune Global 500 (2011) in terms of total revenues in its industry. The survey was sent to 1,026 managers of whom 359 responded. This data was complemented with objective annual performance review ratings of a subset of 57 managers in the sample (Dokko, Wilk, & Rothbard, 2009).

For the third chapter a survey was disseminated at twelve publicly listed European manufacturing and service firms. We collected data from matched pairs of top and middle managers connected by a direct reporting relationship. To separate the collection of data on the independent and dependent variables as to mitigate common method biases (Podsakoff & Organ, 1986), top managers reported unit ambidexterity measure and provided objective data for control variables. Data pertaining to the vertical TMT-MM interface mechanism as well as horizontal knowledge exchange is reported by middle managers because these hierarchy- and unit boundary-spanning mechanisms can better be judged by the less powerful exchange participants (Sethi, Iqbal, & Sethi, 2012).

The final chapter in this dissertation is a qualitative study. We collected data by means of 43 in-depth interviews in seven MNEs and triangulated these with company-specific documents and reports. Through our data collection and analysis, we gained a fine-grained understanding of the challenges that these companies face when competing in multiple emerging markets and in established markets. We followed Langley (1999) and Miles and Huberman (1994) in coding the data. Following triangulation of the uncovered data patterns with archival company data, we asked several interviewees to review and cross-check the identified patterns. The research framework is presented in Figure 1.1 and the four studies at the heart of this dissertation are summarized in Table 1.1.

Table 1.1: Overview of Dissertation Studies

	Research Questions	Theoretical Lens(es)	Method	Main Contribution(s)
<i>Study 1</i>	<p>What is the association between exploration and exploitation?</p> <p>Which and how do contingency factors influence this association?</p>	<ul style="list-style-type: none"> • Organizational learning • Paradox Theory 	<ul style="list-style-type: none"> • Meta-analysis of 124 primary studies capturing the relationship of exploration and exploitation 	<p>Addressing three debates concerning assumptions and interpretations in exploration-exploitation research by showing how conceptual choices, level-of-analysis, and industry context influence the association between these two constructs.</p>
<i>Study 2</i>	<p>How do organizational and functional tenure relate to managers' ambidexterity?</p> <p>How does the work context - in terms of uncertainty and interdependence - influence the managers' ambidexterity-performance relationship?</p>	<ul style="list-style-type: none"> • Organizational learning • Managerial cognition • HRM Perspective 	<ul style="list-style-type: none"> • Survey of 337 managers at one of the 'big four' accounting and professional services firm and one chemicals and life-sciences firm ranked among the top 5 in its industry on the Fortune 500 list • Hierarchical Regression 	<p>Generating an individual level understanding of the effects of experience antecedents and of the performance consequences of managers' ambidextrous behaviors. Advancing the micro perspective on ambidexterity.</p>

Table 1.1: Overview of Dissertation Chapters (continued)

Research Questions	Theoretical Lens(es)	Method	Main Contribution(s)
<p><i>Study 3</i></p> <p>How does horizontal knowledge exchange among middle managers influence unit ambidexterity?</p> <p>How do vertical interpersonal processes characterized by integrative bargaining and cognitive flexibility shape the influence of MMs' horizontal knowledge exchange on unit ambidexterity?</p>	<ul style="list-style-type: none"> • Information processing • Interpersonal processes • Middle management perspective 	<ul style="list-style-type: none"> • Survey of 148 units using multisource data from 148 middle managers and 87 top managers who are in a reporting relationship at 12 central European Fortune 1000 firms • Hierarchical Regression 	<p>This study examines conceptually and empirically the effectiveness of MMs' horizontal interpersonal processes in driving unit ambidexterity. Also, it reveals how MMs' vertical information exchange and bargaining processes with TMs shape this link.</p>
<p><i>Study 4</i></p> <p>What are the foundations and drivers of strategic agility of large global firms competing across emerging markets and established markets?</p> <p>How can the organizational tensions associated with strategic agility be managed?</p>	<ul style="list-style-type: none"> • Dynamic Capabilities Perspective • Paradox Theory 	<ul style="list-style-type: none"> • Multiple case study • Interview data from 43 interviews lasting between 60 and 90 minutes conducted at emerging and established market offices of 7 Western Fortune 500 organizations 	<p>Identification of three dynamic capabilities which enable MNEs to operate successfully with strategic agility across emerging and established markets, if they can create and deploy these three capabilities in a dynamic balance. Achieving this balance demands aptly managing tensions.</p>



Chapter 2. Study 1: Exploration and Exploitation: A Meta-analytic Review of Conceptual, Level-of-analysis, and Contextual Factors¹

2.1 Introduction

There is near consensus that both exploration and exploitation are needed for survival and prosperity of organizations (Levinthal & March, 1993; March, 1991). Despite complementary benefits between exploration and exploitation, a central premise of March's (1991) framework is that both activities are fundamentally different and provide tradeoffs within organizations. As such, the emerging consensus in the exploration-exploitation framework is that entities need to engage in both activities, yet the complexities inherent in simultaneously pursuing exploration and exploitation pose paradoxical challenges (Tushman & O'Reilly, 1996). March's (1991) seminal work focused on exploration and exploitation as manifestations of organizational learning and described exploration as search, variation, discovery, and experimentation, while exploitation denoted refinement, efficiency, implementation, selection, and execution.

Over the past two decades, scholars have applied the notions of exploration and exploitation in a variety of other literatures such as technology and innovation management (Katila & Ahuja, 2002), strategic management (Crossan & Berdrow, 2003; Lechner & Floyd, 2012), organization design (Tushman & O'Reilly, 1996), knowledge management (Drazin & Rao, 2002),

¹ This chapter has been crafted together with Bernardo Correia-Lima and Justin Jansen and has received a first round R&R from the *Academy of Management Journal*.

internationalization (Barkema & Vermeulen, 1998), alliances (Lavie & Rosenkopf, 2006), and mergers and acquisitions (Karim & Mitchell, 2000; Vermeulen & Barkema, 2001). Although promising in number of applications, the broad range of studies on exploration and exploitation has raised important concerns about the state of research and its collective accomplishments (Birkinshaw & Gupta, 2013). For instance, debates concerning fundamental assumptions and interpretations of the exploration-exploitation framework have emerged (Gupta, Smith, & Shalley, 2006; Raisch, Birkinshaw, Probst, & Tushman, 2009) and have led scholars to wonder *what the true association between exploration and exploitation is* (Lavie, Stettner, & Tushman, 2010).

By using a meta-analytic approach, we aim to provide important inroads into answering this key question. We contend that differences in conceptualization (Lavie et al., 2010; Raisch et al., 2009), level-of-analysis, and study context may have resulted in inconclusive findings about the true relationship between exploration and exploitation (Gupta et al., 2006). We build on March's (1991) fundamental assumption that both exploration and exploitation are necessary for any system to survive and prosper, and thus expect an overall positive association between both constructs. Yet, we argue that the observed association between both activities is contingent upon important conceptual, level-of-analysis, and contextual aspects. By uncovering these contingencies, we contribute to earlier research in at least three important ways.

First, manifestations of exploration and exploitation have ranged quite broadly from behaviors in terms of learning and risk-taking towards outcomes such as innovations and strategies (O'Reilly & Tushman, 2013). Although scholars have recognized that exploration-exploitation patterns may vary across such conceptualizations (Lavie et al., 2010), unclear implications of various interpretations may create threats to the validity of the exploration-exploitation framework. For instance, the key premise about inherent tradeoffs between exploration and exploitation (March, 1991) may be unwarranted since scholars

have relied on very different phenomena when investigating exploration and exploitation (O'Reilly & Tushman, 2013). Developing new theoretical logic requires the categorization of exploration and exploitation in order to understand inconsistent findings and to assess the scope of assumptions underlying the exploration-exploitation framework (Lavie et al., 2010; Turner, Swart, & Maylor, 2013). In an effort to reach consensus about how the conceptualization of exploration and exploitation matters, we investigate the contingency role of two main categorizations that have been used in the literature: behaviors versus outcomes (Crossan & Apaydin, 2010; Li, Vanhaverbeke, & Schoenmakers, 2008). Such an examination allows us to reveal the implications in terms of the salience and manageability of inherent tensions between the idiosyncratic natures of exploration and exploitation.

Second, scholars have started to debate about the locus of the paradox between exploration-exploitation and to investigate at which level the tensions are most pronounced and more difficult to be resolved (Gupta et al., 2006; Lavie et al., 2010). Exploration and exploitation have been studied at multiple levels that range from individual-level research to studies at the inter-firm level (Raisch & Birkinshaw, 2008). The tensions involved as well as the mechanisms that shape the relationship between exploration and exploitation, however, may be different across levels-of-analyses (*cf.* Chan, 1998; Rousseau, 1985), and may have important implications for the generalizability of assumptions across different levels-of-analyses (Klein, Dansereau, & Hall, 1994). By discerning the contingency role of the level-of-analysis, we generate a more nuanced understanding about the variability in the strength of tradeoffs when governing exploration-exploitation across different levels-of-analyses (Markides, 2013).

Third, while some scholars emphasize the necessity of the simultaneous pursuit of exploration and exploitation in fast moving environments (e.g., Brown & Eisenhardt, 1997), others remain skeptical about the organizations' ability to accomplish this, especially under challenging environmental conditions. We

address this debate by examining how environmental clockspeed affects the relationship between exploration and exploitation. High clockspeed environments are characterized by fast changes in technologies, products, and end-user preferences, and threats of obsolescence (Fine, 1998). Although this creates incentives to sustain a sequence of innovations (Brown & Eisenhardt, 1997; Wang & Li, 2008) and harmonize a portfolio of exploratory and exploitative initiatives, we argue that it is particularly difficult to master the parallel pursuit of exploration and exploitation under more turbulent conditions (Amabile, Hadley, & Kramer, 2002; Mendelson & Pillai, 1999). By considering the ‘necessity’ versus ‘ability’ debate, we address calls for research into how contextual conditions may shape the co-existence of exploration and exploitation (Nosella, Cantarello, & Filippini, 2012).

We test our contingency framework using meta-analytic methods. Meta-analytical techniques have become the preferred method for synthesizing accumulating evidence and serve as a catalyst for re-evaluating and extending theoretical underpinnings (Combs, Ketchen, Crook, & Roth, 2011). They allow for testing several hypotheses that are otherwise difficult to be addressed and assessed in single-sample primary studies and have thus far not been subject to empirical scrutiny (Eden, 2002). We propose a unified and comprehensive framework that explains inconsistent findings and contributes to further theoretical and empirical advancements in exploration and exploitation research.

2.2 Theoretical Overview & Hypotheses Development

The normative logic underlying the exploration and exploitation framework is that organizations need to engage in both activities in order to survive in the long run (Levinthal & March, 1993; March, 1991). In this way, organizations are able to reap the benefits of exploiting existing competences while developing new ones necessary to adapt to changing environmental

conditions (Levinthal & March, 1993). Based on survival logic, one would expect the observed association between exploration and exploitation to be positive. Despite the persuasiveness of this rationale, however, extant research exhibits considerable variation regarding the observed relationship between exploration and exploitation.

Notwithstanding the compelling performance incentives to explore and exploit in parallel, adaptive processes have the tendency to polish exploitation faster than exploration (March, 1991). On the one hand, exploration and exploitation rely on inconsistent organizational resources and routines (Benner & Tushman, 2003; Galunic & Eisenhardt, 2001) which may lead to specialization. Thus, self-reinforcing learning mechanisms accelerate either exploration or exploitation (Heaton, 2002; Wang & Li, 2008). On the other hand, exploitation and exploration compete for scarce resources and managerial attention (Gupta et al., 2006; Jansen, Simsek, & Cao, 2012; March, 1991; O'Reilly & Tushman, 2004). The simultaneous pursuit of exploration and exploitation is rather challenging and may lead to conflicts, tensions, trade-offs, and inconsistencies (Smith & Lewis, 2011). Despite these widely-held assumptions about the advantages as well as inherent tensions between exploration and exploitation, scholars have begun suggesting that the broad application of the framework has led to inconclusive findings and fragmented theory building (Lavie et al., 2010). Based on prior research, we identify issues about conceptualization, level-of-analysis, and environmental context have fuelled current debates in research about exploration and exploitation (Lavie et al., 2010; Li et al., 2008; Rosenkopf & McGrath, 2011).

First of all, scholars have debated about what exploration and exploitation really mean and started to address conceptual issues (Gupta et al., 2006). Earlier studies have mostly equated exploration with the pursuit of new knowledge and exploitation with the application and refinement of existing knowledge (Levinthal & March, 1993). Since the notion of exploration and exploitation has been applied to different fields of inquiry over time, scholars adapted these original concepts to

the idiosyncrasies of different contexts. Although this has resulted in a substantial increase in the number and range of definitions of exploration and exploitation (Lavie et al., 2010), it has created a major source of confusion about whether exploration and exploitation are conceptualized as behaviors or outcomes (Li et al., 2008). Whereas some authors investigated exploration and exploitation in terms of behaviors (He & Wong, 2004; Katila & Ahuja, 2002), which encompasses learning activities and search behaviors, others defined them in terms of outcomes, such as radical and incremental innovation (Greve, 2007).

Second, the exploration-exploitation framework has witnessed a proliferation of studies at the inter-organizational (Lavie & Rosenkopf, 2006; Tiwana, 2008), organizational (Lubatkin, Simsek, Ling, & Veiga, 2006), intra-organizational (Gibson & Birkinshaw, 2004; Jansen et al., 2012) and individual level-of-analysis (Mom, Van Den Bosch, & Volberda, 2009). Yet, the ability to draw conclusions about the relationship between exploration and exploitation hinges upon the understanding of the impact of different mechanisms at different levels, their intensity, and direction (Gully, Incalcaterra, Joshi, & Matthew, 2002). Most fundamentally, while scholars have theorized about the mechanisms that enable the simultaneous pursuit of exploration and exploitation (Gupta et al., 2006), the extant body of research lacks empirically validated insights about the locus of the tension between exploration and exploitation (Lavie et al., 2010; Raisch & Birkinshaw, 2008). This is an important omission as a nuanced understanding of such tensions allows uncovering viable ways for buffering and reconciling contradictory forces at different levels (Raisch et al., 2009; Smith & Lewis, 2011).

Third, the generalizability of findings and identification of patterns of exploration and exploitation may be hampered by the inherent specificity of the various empirical settings examined (Lavie et al., 2010; Rosenkopf & McGrath, 2011). On the one hand, scholars have posed that success in high-velocity markets is determined by the ability to produce multiple product innovations in rapid succession (Brown & Eisenhardt, 1997). On the other hand, combining exploration

and exploitation is a complex task that demands high levels of coordination and integration of activities (Jansen, Tempelaar, Van Den Bosch, & Volberda, 2009; Puranam, Singh, & Zollo, 2006), and becomes considerably harder under conditions of high-velocity environmental change (Sheremata, 2000). In order to better understand the contingency role of the environmental context, we investigate industry clockspeed. Fine (1998) defines clockspeed in terms of introduction and obsolescence rates of processes, products, and organizational practices. It reflects the speed of change in market conditions, customer preferences, and commonly used technologies within an industry (Mendelson & Pillai, 1999). Previous studies have shown that industry clockspeed influences a firm's product development activities and product launch decisions (Mendelson & Pillai, 1999; Souza, Bayus, & Wagner, 2004), which are closely intertwined with exploration and exploitation (O'Reilly & Tushman, 2004). Overall, considerable ambiguity exists regarding how the external environment may impact the interplay between exploration and exploitation.

2.2.1 Conceptualization: Behaviors versus Outcomes

This meta-analysis provides insights into the impact of conceptual choices by scrutinizing the broad range of conceptualizations of exploration and exploitation that have appeared over time (Lavie et al., 2010; Rosenkopf & McGrath, 2011). We introduce two major reasons for why the association of exploration and exploitation depends on whether they are conceptualized as 'behaviors' or 'outcomes.' Overall, we argue that combining exploration and exploitation is more complicated due to (i) higher degrees of tacitness and ambiguity and (ii) stronger interdependencies among exploratory and exploitative behaviors (i.e. work processes) compared to outcomes (i.e. finished products or technologies).

First, because exploratory and exploitative behaviors are considered to be more tacit and ambiguous, we expect that emerging tensions are less likely to be

resolved effectively (Li et al., 2008; Nonaka, 1994). They tend to be more diffuse and less systematic (Sgourev, 2013) and make it more difficult for individuals or organizations to orchestrate and recombine exploration and exploitation. The tacitness and ambiguity associated with behaviors strain decision-makers' cognitive limits (King, 2007; Simonin, 1999) and can reduce their motivation (Szulanski, 1996) to resolve tensions and complexities associated with pursuing exploratory and exploitative behaviors. It makes it difficult for people to understand why a particular behavior produces a specific result and consequently to develop best practices (Szulanski, 1996). As such, accumulated experience cannot be easily translated into best practices, which can be drawn upon in combining exploratory and exploitative behaviors. Overall, these arguments suggest that the ability to identify, specify, and effectively address the contradictions arising between exploratory and exploitative behaviors is compromised in face of tacitness and ambiguity. In contrast, such outcomes in terms of finished products or technologies are more definitive in nature and their developmental trajectories are more clearly separable than behaviors (Gulati & Garino, 2000). The nature of the tensions between exploratory and exploitative outcomes is more salient and makes the allocation of resources and the realization of complementarities to appear more naturally (Beckman, Haunschild, & Phillips, 2004; Gupta et al., 2006). Furthermore, it is more feasible to enhance motivation and boost morale when goals and incentive schemes can be based on objective measures when focusing on outcomes rather than instilling behaviors (Anderson & Oliver, 1987; Ouchi & Maguire, 1975). In practice, Knott (2002) observed complementarities between exploration and exploitation outcomes (i.e. new product introductions with new characteristics, enhanced quality, and reduced unit cost) in Toyota's product development. Product innovation studies lend support to the simultaneous and complementary pursuit of exploration and exploitation (Danneels, 2002; Katila & Ahuja, 2002; Laursen & Salter, 2006).

Second, the underlying activities and resources needed for exploration and exploitation behaviors to thrive may be more inextricably related (Crossan & Apaydin, 2010). Behaviors – such as knowledge flows, communication patterns, and work routines – are more intertwined at both the task and interpersonal level. This makes coordination and reconciliation of conflicts more difficult than for outcomes (Farh, Seo, & Tesluk, 2012; Gibson & Birkinshaw, 2004; Reichstein & Salter, 2006), as absence of one clear strategic thrust in behaviors inhibits achieving consensus and organizing inconsistent workflows (Voss, Cable, & Voss, 2006). In contrast, exploitative and explorative outcomes can be managed in less interconnected fashion e.g. by executing them flexibly in a modular fashion (Brown & Eisenhardt, 1997; Sanchez, 1999). Moreover, exploration and exploitation in terms of finished products can be managed more easily by putting in place parallel structures, incentives, and control systems (O'Reilly & Tushman, 2011). Overall, we argue therefore:

Hypothesis 1: Conceptualization moderates the positive relationship between exploration and exploitation in such a way that this positive relationship will become stronger when 'outcome'-based rather than 'behavior'-based conceptualizations are used.

2.2.2 Level-of-analysis

At higher levels-of-analyses, loosely-coupled architectures may be utilized to span a diversified range of business activities and opportunities (Audia & Greve, 2006; Haveman, 1993; Jiang, Tao, & Santoro, 2010; Wassmer, 2010). As such, decoupling of organizational activities makes the simultaneous pursuit of exploration and exploitation more viable (Markides, 2013). For instance, alliance portfolios may enable the pursuit of different, yet complementary activities by exploring new skills and capabilities while leveraging existing capabilities in market-oriented partnerships (Gilsing & Nooteboom, 2006; Rothaermel & Deeds, 2004). Hess and Rothaermel's (2011) study shows that star scientists' contribution

is complemented by downstream alliances. Structurally separated units hosting seemingly conflicting activities obviate the friction between exploratory and exploitative initiatives through tailor-made systems and processes (Andriopoulos & Lewis, 2009). In loosely coupled systems, exploration and exploitation become orthogonal activities and make it both feasible and also desirable for organizational leaders to pursue both and invest resources accordingly (Gupta et al., 2006; Smith & Tushman, 2005).

In the absence of loosely coupled systems, however, using partitioning to manage the interplay of exploration and exploitation is less viable (Lechner & Floyd, 2012). At lower levels-of-analysis one finds more tightly coupled systems, in which capabilities, information-sharing resources (Siggelkow & Rivkin, 2006), and other resource and experience buffers absorbing complexity and hosting contradictions are scarce (Cao, Gedajlovic, & Zhang, 2009; Voss & Voss, 2013). Levinthal (1997) goes even further by concluding that within tightly coupled systems one cannot pursue exploration without foregoing benefits of exploitation, i.e. these activities are antagonistic and negate each other's advantages. Even more so at the individual level, employees or managers are challenged by irreconcilable tensions between both efficiency and flexibility related activities (Adler, Goldoftas, & Levine, 1999; Birkinshaw & Gibson, 2004). Moreover, they are susceptible to the effects of attention residue, i.e. persistent cognitive processes related to one activity that distract from focusing on another (Leroy, 2009). Working under a lingering cognitive load, such as the pursuit of inherently conflicting goals, individuals reduce their ability to blend conflicting logics of these different tasks. Overall, we predict therefore:

Hypothesis 2: Level-of-analysis moderates the relationship between exploration and exploitation in such a way that this positive relationship will be stronger when the level-of-analysis becomes higher.

2.2.3 Industry Clockspeed

Building on the notion that best performing firms match the appropriate organizational practices to their environment (Burns & Stalker, 1961; Lawrence & Lorsch, 1967), scholars have posed that success in high clockspeed environments is dictated by the ability to simultaneously pursue exploratory and exploitative activities (Junni, Sarala, Taras, & Tarba, 2013). However, others have started to suggest that combining exploration and exploitation is a complex task that demands high levels of coordination and integration of conflicting activities (Gilbert, 2005; Jansen et al., 2009; O'Reilly & Tushman, 2008), and significant amounts of managerial attention (Smith & Tushman, 2005; Tushman & O'Reilly, 1996). Coordination and integration requires that individuals and organizational units exchange and process vast amount of information and decentralize decision-making authority in order to reconcile the tensions arising from the simultaneous pursuit of exploration and exploitation (Jansen et al., 2009). Although both exploration and exploitation may be deemed necessary in high clockspeed environments (Brown & Eisenhardt, 1997; Raisch & Birkinshaw, 2008), at least two sets of arguments suggest that the ability to execute complex tasks is significantly compromised in high-velocity environments.

First, high clockspeed industries are characterized by rapid technological change, short product life cycles and frequent changes in organizational structure (Fine, 1998; Nadkarni & Narayanan, 2007). In contrast, slow clockspeed industries are relatively more stable and demand less frequent environmental scanning and organizational responses (Keck, 1997). Previous studies indicates that time pressure leads to a decrease in the number of communication channels used during information exchange (Brown & Miller, 2000). Furthermore, in high clockspeed environments, threats of obsolescence can compromise organizational goal attainment capacity, triggering restriction in information processing and constriction of control (Staw, Sandelands, & Dutton, 1981). Constriction of control and restriction in information processing overload the chain of command and

reduce managerial attention dedicated to the integration of exploration and exploitation. This increases the difficulty simultaneously pursuing exploratory and exploitative activities.

Second, the simultaneous pursuit of exploration and exploitation demands cognitive flexibility among people, which is hard to achieve under conditions of high industry clockspeed. Scholars have suggested that time pressure is negatively associated with creative and comprehensive decision-making (Amabile, Mueller, et al., 2002). In face of time pressure, information search and filtering is frequently accelerated leading to omissions, which may be accepted in order to speed up internal processes (Edland & Svenson, 1993), yet incomplete information may impede the coordination of exploration and exploitation. For instance, Weenig and Maarleveld (2002), investigated the impact of time constraint on information search for complex tasks, and found that under time constraint participants screened based on fewer attributes and considered fewer alternatives in the final choice set than without time constraint. Similarly, Amabile, Mueller, and colleagues (2002), collected detailed narrative reports from individuals working in creative projects, and found that high time pressure reduced individual's creative cognitive processing.

In sum, although changing environmental conditions may place a premium on the simultaneous pursuit of exploration and exploitation, the rate of environmental change and associated time pressure increase the challenges of combining these conflicting activities.

Hypothesis 3: Industry clockspeed moderates the relationship between exploration and exploitation in such a way that the positive relationship becomes weaker when the industry clockspeed increases.

2.3 Methods

The objective of a meta-analysis is to aggregate the results of previous quantitative studies that have investigated a similar phenomenon and to estimate more precisely the true effect size of a given relationship than would be possible in a single study. In order to achieve this goal it is necessary to (1) calculate the mean effect size of the relationship of interest, (2) test for the significance level of this mean effect size by calculating its confidence intervals, (3) check whether the effect size distribution that generated the mean effect size is homogenous, and (4) – if the homogeneity assumption is rejected – model this heterogeneity through further moderator analyses. Sources of heterogeneity of effect sizes can be broadly classified into either methodological issues (i.e. measurement) or substantive issues (i.e. study characteristics, research context, etc.). We take both sources of heterogeneity into account in our analysis (Hedges & Olkin, 1985; Lipsey & Wilson, 2001).

2.3.1 Sample and Coding

We used five complementary search strategies to identify and retrieve previous quantitative empirical studies that could have captured the relationship between exploration and exploitation. First, we read several review articles (Gupta et al., 2006; Lavie & Rosenkopf, 2006; Li et al., 2008; Raisch & Birkinshaw, 2008; Simsek, Heavey, Veiga, & Souder, 2009). Second, we searched four electronic databases: (1) EBSCO, (2) Web of Knowledge, (3) JSTOR, and (4) Google Scholar using terms like: “exploration and exploitation”, “incremental and radical innovation”, and “static and dynamic efficiency”. Third, we conducted a manual search of 12 leading journals in the field of management. Fourth, we examined the title and abstracts of all articles that cited March’s (1991) seminal work according to Google Scholar. Finally, we used a snowballing procedure that involved backward-tracing all articles cited by the articles retrieved in steps one to four and which were not yet included in our dataset. This procedure yielded an initial

sample of 170 quantitative empirical studies. For this study, we further excluded 21 studies that operationalized exploration and exploitation as a continuum and 30 studies with missing effect size information, which resulted in a final sample of 124 primary studies. Afterwards, we developed a coding protocol for extracting data on relevant variables (Lipsey & Wilson, 2001). The coding scheme was based on operationalizations of exploration and exploitation and studies' methodological and sample characteristics. Table 2.1 presents a description of variables collected from the studies that are included in this meta-analysis. The first two authors coded the studies. To assess inter-rater agreement, they both coded a subsample of 40 randomly selected studies. We then calculated the inter-rater reliability score (i.e., Cohen's kappa coefficient; see *cf.* LeBreton & Senter, 2007). The average reliability score was 87%, and lowest reliability score was 80% ($Z = 5.05, p < 0.001$), which indicates a very high inter-rater reliability.

Insert Table 2.1 about here

2.3.2 Effect Size Statistics and Effect Size Adjustments

The effect size statistic we use in this study is the Pearson product-moment correlation r . We choose r as the effect size of interest because it is the most common reported statistic on the relationship between exploration and exploitation across studies and it is an easily interpreted and scale-free measure of the linear association between two variables. Before performing the statistical analysis we adjusted the individual effect sizes for bias, artifact, and error. We applied Fisher's Zr transformation to r to attenuate the skewness in the effect size distribution which violates the assumption of normality necessary for our analysis (Hedges & Olkin, 1985). We also corrected effect sizes for attenuation due to unreliability of the variance of the variables used in the effect size (Hunter & Schmidt, 2004). Finally, given that effect sizes are derived from sample statistics

and their statistical properties depended in part on the underlying sample size, we weighted each effect size by the inverse of the sampling error variance w . This was done because an effect size derived from a larger sample contains less sampling error and, therefore, provides a more precise and reliable estimate than an effect size based on a small sample.

The same notion needs to be taken into consideration when conducting the outlier analysis. While we did create a funnel plot as well as considered effect size variability from the minimum to the maximum value present in the primary studies, such conventional techniques do implicitly assume equal status for all data points. As the sample sizes in the studies collected for this meta-analysis vary considerably, outlier analysis needs to take into account the principle of sampling error, i.e. that coefficients based on small samples are more likely to deviate from the population mean (Hunter & Schmidt, 2004). Hence, we also applied the sample adjusted meta-analytic deviance statistic (SAMD) developed specifically for meta-analytic purposes by Huffcutt and Arthur (1995), which is more appropriated for these situations. For every primary study we calculated the sample-weighted mean coefficient while excluding that study in the analysis, thereby ensuring the final result is not influenced. Next, the study and mean coefficient sampling errors are combined “to form the sampling error of the difference between a study coefficient and the mean coefficient without that study” (Huffcutt & Arthur, 1995: 329). Finally, the raw deviance measure for each study was divided by the sampling standard error of the difference to generate the SAMD statistic which indicates based on systematic analysis which studies do not fit with the other studies collected for this meta-analysis. We did eliminate 3 studies based on the SAMD procedure.

2.3.3 HOMA Procedure

Before conducting the formal test of our hypothesis, we performed a Hedges and Olkin-type meta-analysis (HOMA) in order to establish the overall

association between exploration and exploitation across studies. Given the heterogeneity in the effect size distribution of the relationship between exploration and exploitation, instead of using the usual fixed effect model, we decided to use a random effects approach. The random effects model not only corrects for individual study sampling error, but also includes a random component intended to capture differences between studies stemming from variations in methods, settings, and other study characteristics (Hedges & Vevea, 1998). This extra parameter relaxes the assumption that all the effects sizes come from the same effect size population, meaning that “the observed effect sizes will have study-level sampling error as well as subject-level sampling error associated with them” (Lipsey & Wilson, 2001: 117). In this sense, random effects models produce more conservative, reliable, and hence more generalizable estimates.

2.3.4 MARA Procedure

To test our hypothesis we used meta-analytical regression analysis (Lipsey & Wilson, 2001), which allows us to model extant heterogeneity in the retrieved effect size distribution. Equivalent to multiple regression analysis, MARA uses individual effect sizes as the dependent variable and methodological and substantive variables as the independent variables. MARA is a type of weighted least squares regression which weights effect sizes by w . We estimated the regression parameters using mixed effects models, which attributes the variability in the effect size distribution to systematic between-study differences (modeled heterogeneity), subject level sampling error, and a random component (as in the HOMA random effects model discussed above) (Geyskens, Krishnan, Steenkamp, & Cunha, 2009; Lipsey & Wilson, 2001). The intercept in the MARA analysis can be interpreted as the corrected overall effect size.

To test for hypothesis 1, we included a dummy variable capturing whether exploration and exploitation was operationalized as process (e.g., depth or scope of search) or outcome (e.g., radical or incremental innovation). To test

Hypothesis 2, we included dummy variables capturing whether exploration and exploitation were operationalized at the individual, organizational (reference category), or alliance level. To test Hypothesis 3, we included a dummy variable indicating whether the effect sizes originated from studies based on samples of firms in high clock speed industries (reference category) or not. As high clockspeed environments are typically characterized by a quick succession of multiple process and product innovations (Brown & Eisenhardt, 1997) we classified samples according to Fine (1998), who distinguished industries by speed of product development, production processes and organizational changes.

We also control for possible substantive and methodological factors that could influence the strength of the relationship between exploration and exploitation (Hedges & Pigott, 2004). To control for substantive difference across studies (i.e. study characteristics) we include a dummy variable capturing whether the study was based on U.S. data (the reference category is rest of the world). To control for the effects associated with journal quality, we included the JCR 'impact factor' score of the journal from which an effect size was harvested. We assigned a value of zero for journals not covered by the ISI Web of Knowledge. To test whether the use of primary or secondary data affect the strength of the association between exploration and exploitation, we included a dummy variable capturing whether the effect sizes were derived from studies based on survey or archival data (the latter being the reference category). As noted by Lavie et al. (2010), most of the earlier studies on exploration and exploitation closely followed the definition of exploration and exploitation put forward by Levinthal and March (1993), and restricted the application of these concepts to the knowledge domain. Within this stream of research exploration refers to "the pursuit of new knowledge" while exploitation refers to "the use an development of things already know" (Levinthal & March, 1993: 105). Later, researchers reverting to March's original definitions, start to apply the concepts to other domains, in such a way that exploration has been "broadly associated with

notions such as organizational diversity, diversification, and variation, whereas exploitation has been used to generally describe organizational focus, experience, and variance reduction” (Lavie et al. 2010: 112). Because of the relevant conceptual distinction between these two domains, we control for whether the conceptualization, and consequent operationalization, of exploration and exploitation is narrow (i.e. rooted in the knowledge domain) or broad (i.e. capturing other domains) by including a dummy indicating whether the operationalization is broad.

2.4 Results

Table 2.2 reports the Hedges and Olkin-type meta-analysis for the relationship between exploration and exploitation and shows that the average correlation between these two variables, across 121 different samples (k) encompassing a total of 60,223 firms-year observations (N), is .35. The 95% confidence interval for this relationship, between .29 and .40, indicates that this relationship is statically significant. Furthermore, the homogeneity analysis ($Q = 7,862$; $p < 0.001$) rejects the null hypothesis that the various effect sizes estimate the same population mean, and therefore the variability in effect sizes is larger than would be expected from subject-level sampling error alone. In other words, this result indicates the effect size distribution to be quite heterogeneous, suggesting the presence of methodological and substantive moderator (Hedges & Pigott, 2004). Table 2.3 reports the MARA results for Hypotheses 1, 2, and 3. Model 1 includes the methodological and substantive control variables, whereas Model 2 reports all control variables as well as the hypothesized main effects explaining the strength of the association between exploration and exploitation. Together, the control variables explain about 7% of the variance in the effect size distribution (Model 1). Including the hypothesized main effects raises the explanatory power of the model to 25% (Model 2), suggesting that whether the

variables are operationalized as process or outcome, level-of-analysis, and organizations size, play an import role in explaining the strength of the association between exploratory and exploitative activities.

Insert Table 2.2 and 2.3 about here

Regarding the control variables, the variable intended to capture differences in the regional context in which the different studies were conducted present non-significant effects ($p > 0.10$). This result suggests that country effects (U.S. versus rest of the world) do not explain the strength of the association between exploratory and exploitative activities. We also did not find differences accruing from studies published in different outlets, as evidenced by non-significant effect of the variable journal impact factor ($p > 0.05$). Similarly, our results suggest that the domain of inquiry does not moderate the relationship between exploration and exploitation given that the variable intended to capture differences between studies that that employ a broad or narrow conceptualization of exploration and exploitation turn out not significant ($p > 0.10$). We did, however, find strong differences stemming from authors methodological choices. Our results indicate that the relationship between exploration and exploitation is considerably weaker in studies that use archival data than in studies that used survey data ($\beta = -0.225, p < 0.01$).

Regarding our hypotheses, we do find that the whenever exploration and exploitation are conceptualized as an outcome the association between these variables is stronger than when they operationalized as behavior ($\beta = 0.180, p < 0.05$). Therefore, Hypothesis 1 is supported. We also find strong support for the idea that the level-of-analysis positively moderates the relationship between exploration and exploitation. We find that, in comparison to studies based on the organizational level, exploration and exploitation is less strongly associated at the individual ($\beta = -0.277, p < 0.05$) level, and more strongly associated at the alliance level ($\beta = 0.316, p < 0.01$). Hypothesis 3 is supported. In line with your theorizing,

results indicate that industry clockspeed negatively moderates the relationship between exploration and exploitation, implying that in exploration is less strongly associated with exploitation in industries with high clockspeed than in industries with slow clock speed (the dummy variable indicating whether the sample is based on industries with high clockspeed is negative, $\beta = -0.136$, and significant at $p < 0.05$).

2.5 Discussion & Conclusion

Research on the exploration of new possibilities and the exploitation of existing capabilities has captured the interest of management scholars and practitioners (O'Reilly & Tushman, 2004; Simsek, 2009). Two decades after March's (1991) seminal paper, the notion that both exploration and exploitation are crucial for organizational prosperity (March, 1991) has gained normative character in the literature. Yet, important debates have emerged about the relationship between exploration and exploitation. In seeking answers to outstanding questions, our study developed a contingency model that addresses key boundary conditions shaping the association between exploration and exploitation. In this way, we develop a fine-grained understanding about how conceptualization, level-of-analysis, and environmental context may affect the relationship between exploration and exploitation. By grounding our framework in meta-analytic evidence, we go beyond existing theoretical reviews, and contribute to exploration-exploitation literature in theoretical and practical ways.

2.5.1 Theoretical Implications

Our study acknowledges earlier assertions about the importance of both exploration and exploitation for firm survival and prosperity (Levinthal & March, 1993; March, 1991). Notwithstanding the inherent challenges and contradictions, our findings indicate that – on the whole – there is a positive association between exploration and exploitation. Although we did not formally hypothesize this

fundamental assumption of the exploration-exploitation framework, our study does provide strong empirical support for the claim that entities may not survive when they lack the ability to simultaneously engage in both exploration and exploitation. The positive baseline association between exploration and exploitation provides support for research on organizational ambidexterity, which suggests that the simultaneous pursuit of exploration and exploitation contributes to sustained performance and survival rates of organizational entities (Gibson & Birkinshaw, 2004; O'Reilly & Tushman, 2013; Tushman & O'Reilly, 1996). This provides credence to the original reasoning of March (1991). Yet, our study shows that various boundary conditions need to be taken into account in order to better understand how and under what conditions the co-existence of exploration and exploitation may be managed more effectively.

While it has been acknowledged that the meaning of exploration and exploitation may vary across domains of research (Lavie et al., 2010), extant literature provides little guidance about how different conceptualizations of the key constructs may impact research findings (Rosenkopf & McGrath, 2011). The lack of understanding about the implications of various conceptualizations makes it difficult to compare research findings and to draw conclusions based on them (Li et al., 2008). Over time, this may cause contributions to become fragmented and create threats to the validity of the exploration-exploitation framework. Uncovering unifying features and understanding their implications for the association between exploration and exploitation is a pivotal step in building a deeper understanding about the generalizability and applicability of the exploration-exploitation framework. By investigating the implications of conceptualizing exploration and exploitation as behaviors or outcomes, our study offers import steps towards this goal. In general, our findings suggest that when treating exploration and exploitation as behaviors, it is more difficult to reconcile underlying dynamics than when conceptualizing them in terms of outcomes (Ancona & Caldwell, 1992). Behavioral features are more ambiguous and

interdependent, and make it harder to recognize and resolve emerging tensions (Galunic & Eisenhardt, 2001). Outcome-based conceptualizations of exploration and exploitation, on the other hand, are more tangible and provide better opportunities to allocate sufficient resources and to set up parallel structures and incentives (Markides, 2013). Exploration and exploitation in terms of innovative outcomes or strategies allow for the adoption of modular designs with standardized interfaces to integrate both activities along the value chain (Sanchez, 1999). All in all, our study indicates that tensions between exploration and exploitation are more pronounced in studies adopting behavioral-based conceptualization than in those using outcome-based conceptualizations.

Interestingly, while coding papers for this meta-analysis, we noticed a trend towards a broader application of the exploration and exploitation framework, from the knowledge domain to a wider range of domains. The majority of studies that have been published in the second decade after March's (1991) publication employ such a wider range of conceptualizations (Lavie et al., 2010). Overall, only 37 studies have used a narrow operationalization based on the knowledge domain, while 87 studies in our sample feature a broad operationalization. Despite this widening scope of conceptualizations, our analysis of the control variables provides no conclusive evidence for a stronger or weaker association between exploration and exploitation when the two concepts are more broadly operationalized, i.e. associated with varying degrees of diversity, diversification, variation, focus, and experience (Atuahene-Gima, 2005; Lavie & Rosenkopf, 2006). This is contrary to Gupta and colleagues' (2006) logic that since information and knowledge resources are infinite; they can sustain both exploratory and exploitative initiatives in parallel by reducing the perceived tensions in terms of partitioning and resource allocation. Overall, our study implies that the association between exploration and exploitation cannot be explained by the broadness of conceptualization, but rather depends on whether both activities are conceptualized as behaviors or outcomes as discussed before.

Although scholars have noted the relevance of level-of-analysis for research on exploration and exploitation (Gupta et al., 2006), we still lack insights about whether scholars may combine theoretical logic and empirical insights across different levels-of-analyses. We contribute to our understanding about the importance of the level-of-analysis within the exploration-exploitation framework (Raisch et al., 2009) and provide a novel understanding about the assumptions and mechanisms that are prevalent at different levels-of-analyses (Turner et al., 2013). Such insights are not only important for coherent theory building, but also for improving the ability of scholars to make linkages between the exploration-exploitation framework and other theories (Klein et al., 1994). Our findings indicate that the association between exploration and exploitation is stronger at higher levels-of-analyses, suggesting that at higher levels-of-analyses it is easier to orchestrate exploration and exploitation in a fruitful way without compromising the coexistence of both (Levinthal, 1997; O'Reilly & Tushman, 2011; Voss, Sirdeshmukh, & Voss, 2008). This is in line with the logic of systems theory (Forrester, 1994) and the notion of loose coupling of organizational activities (Gupta et al., 2006; Siggelkow & Levinthal, 2003). Conversely, at lower levels-of-analyses, such as teams or individuals, the concomitantly pursue of exploration and exploitation is more difficult because of the cognitive challenges they entail (Kang & Snell, 2009) in terms of cognitive flexibility and attention residue (Leroy, 2009; Martin & Rubin, 1995). Given the different nature of the relationship between exploration and exploitation across levels-of-analyses, our findings imply that scholars may need to theorize differently about the inherent tensions and identify specific mechanisms to cope with exploration and exploitation in an effective way (Smith, 2014).

The heterogeneity in the observed relationship between exploration and exploitation has also been attributed to contextual factors (Adner & Levinthal, 2008; Nosella, Cantarello & Filippini, 2012; Rosenkopf & McGrath, 2011; Rubera & Kirca, 2012). In this study, we applied the notion of industry clockspeed (Fine,

1998) to uncover how environmental changes in technologies and markets may affect the inclination and the ability to pursue exploration and exploitation simultaneously. Based on the idea that benefits may accrue from synchronizing exploration and exploitation in more turbulent environments, scholars have underscored that high clockspeed industries make it mandatory to leverage both exploratory and exploitative activities (Kim & Rhee, 2009; Sirmon, Hitt, & Ireland, 2007). Yet, despite these incentives, our study indicates that exploration and exploitation are more easily combined and simultaneously pursued in low clock-speed environments. This suggests that rapid environmental change and severe time pressure increases the complexity and decreases the feasibility of combining exploration and exploitation within the same system. This finding is in line with March's (1991) insight that slow socialization processes, although important to enable the parallel development of exploration and exploitation, is not viable in high clockspeed environments. Such environments reduce the time and efforts that individuals or organizations may expend to the development and integration of both exploration and exploitation, and may result in an either/or approach to organizational learning and new product development.

2.5.2 Limitations & Future Research Directions

The findings of our study should be considered in light of its limitations. Some of those are related to the specific method used. Because most studies have applied a cross-sectional approach in examining exploration and exploitation, we need to be careful in deriving conclusions about causal relationships in this meta-analysis. Moreover, given the nature of prior studies, our meta-analytic analysis has been limited to static approaches to pursuing exploration and exploitation. Although we found several contingencies to play a role in shaping the association between both aspects at one point in time, scholars need to develop a better understanding about the feasibility and applicability of more dynamic. Organizations may not choose to pursue exploration and exploitation at all times,

but rather may use more dynamic approaches by emphasizing and deemphasizing exploration or exploitation over time. Future research may uncover the consequences and viability of such approaches by using inductive and longitudinal data collection procedures. We may expect some sort of temporal switching or changes in the relative exploration orientation in order to avoid substantial misfits with the business environment (Uotila, Maula, Keil, & Zahra, 2009; Wang & Li, 2008).

In a more conceptual way, the inclusion of previous studies has been limited to those that included the relationship between exploration and exploitation. As such, we relied on studies that have treated exploration and exploitation as orthogonal and we had to exclude those studies taking a unidimensional approach to the exploration-exploitation framework. Because the unidimensional treatment of exploration and exploitation is a methodological artifact within our meta-analytic approach, in the sense that it assumes a perfectly negative correlation between exploration and exploitation, we cannot include it in the analysis for this meta-analysis.

Our study's approach is also limited by the number of boundary conditions that we have been able to include in our theoretical model. Future research may include additional factors in order to provide additional insights into the true relationship between exploration and exploitation. For instance, Lavie et al. (2010) mentioned assessing the impact of cross-national or cultural differences. Our initial results indicate that broad geographic regions in which the primary studies are set do not make a significant statistical difference. Yet, regional differences, as reflected by region-specific cultural and institutional features, may be examined (O'Reilly & Tushman, 2008). Moreover, given the importance of resources as apparent drivers of exploration and exploitation, we recommend elucidating how and under what conditions different types of resources, i.e. physical and human, and legitimacy may facilitate exploration and exploitation individually as well as their interplay (Kang & Snell, 2009; King &

Zeithaml, 2001). Our results suggest that the mechanisms linking exploration and exploitation are different depending on the level-of-analysis. In that sense we invite cross-level analyses into the way organizational, social, and human capital influence exploration and exploitation separately and in combination. Thereby, a more detailed understanding of the different mechanisms that nurture or constrain exploration and exploitation as well as of viable ways for recognizing and realizing synergies and resolving the associated tensions may be generated (Smith & Lewis, 2011).

In conclusion, two decades after March's seminal work on exploration and exploitation, various debates about key assumptions underlying the framework have emerged. This study addresses three of these debates as it develops a contingency framework about how differences in conceptualization, level-of-analysis, and study context influence the relationship between exploration and exploitation and thus may account for inconclusiveness regarding their true relationship (Gupta et al., 2006; Lavie et al., 2010). First, we show that understanding the effect of outcome- and behavior-based conceptualizations of exploration and exploitation is crucial to make sense of the relationship among these constructs and to assess the scope and impact of assumptions underlying the exploration-exploitation framework. Second, scholars have started to debate at which level-of-analysis the paradox between exploration-exploitation is strongest (Gupta et al., 2006; Lavie et al., 2010; Smith & Lewis, 2011). Our results suggest that the tensions are more pronounced and thus more difficult to be resolved the lower the level-of-analysis. Third, we address the influence of industry context on the relationship of exploration and exploitation, thereby revealing an interesting 'necessity' vs. 'ability' dilemma. While extant research emphasizes the necessity and performance benefits of the simultaneous pursuit of exploration and exploitation in fast moving environments (e.g., Brown & Eisenhardt, 1997; Raisch & Birkinshaw, 2008; O'Reilly & Tushman, 2013), this meta-analysis reveals that organizations' ability to accomplish this may be limited in such challenging

environments. Overall, this study provides an important step in finding answers to key outstanding questions and further contributes to new insights and a fine-grained, empirically validated understanding about the validity and impact of key assumptions in exploration-exploitation research.

Table 2.1 Description of Variables

Variable	Description
Exploration^a	We classified as exploration “things captured by terms such as search, variation, risk taking, experimentation, play, flexibility, discovery, [radical, disruptive] innovation” (March 1991: 71).
Exploitation^a	We classified thing captured by terms such as “refinement, choice, production, efficiency, selection, implementation, execution” and incremental or exploitative types of innovation (March, 1991:71).
Broad conceptualization	A dummy variable capturing whether the operationalization of exploration and exploitation was restricted to the knowledge domain (0) or not (1). Examples of studies that operationalized exploration and exploitation within the knowledge domain are Belderbos, Faems, Leten, and Looy (2010) and Katila and Ahuja (2002), while Atuahene-Gima (2005) and Gatignon, Tushman, Smith, and Anderson (2002) are examples of studies using a broad conceptualization of exploration and exploitation.
Outcome	A dummy variable capturing whether the focal studies operationalized exploration and exploitation as behavior (e.g., exploratory and exploitative search) (0) or as an outcome (e.g., exploratory and exploitative innovation) (1). The following studies represent studies that operationalized exploration and exploitation as behavior: Katila and Ahuja 92002 and Nemanich and Vera (2009); while the following studies are examples of studies that operationalized exploration and exploitation as outcomes: Cao, Gedajlovic, and Zhang (2009) and Gatignon, Tushman, Smith, and Anderson (2002).
Level-of-analysis	A set of dummy variables capturing whether exploration and exploitation was measured at individual or team level, organizational level (reference category), or alliance level.
Fast clock-speed	A dummy variable measuring whether the study sample was based on industries with fast clock speed (1) or not (0).
Archival data	A dummy variable measuring whether the data used in a specific study was based on archival (1) or survey (0) data.
ISI impact factor	This variable captures the average number of citations to articles in a given journal.
North America	A dummy variable measuring whether the study sample is based on North American firms (1) or not (0).

^a We deliberately use a broad definition of exploration and exploitation in order to capture the many different operationalizations of these concepts prevalent in the extant literature. We try to model this heterogeneity by including a number of moderators that capture more nuanced perspectives of exploration and exploitation.

Table 2.2 HOMA Results for the Relationship between Exploration & Exploitation^a

Relationship	K	N	SE	Mean	V	95% CI	Q Test
Explore-Exploit	121	60,223	0.033	0.349	0.128	0.291/0.403	7,862(0.00)

^a k = number of samples; N = total sample size; Mean = meta-analytic mean effect size; SE = standard error of the mean effect size; V = the random variance component CI 95% = 95% confidence interval around the meta-analytic mean; Q test = Hedges and Olkin (1985) chi-square test for homogeneity (Q).

Table 2.3 Results of the Mixed Effects WLS Regression^{b, c}

Variables	Model (1)	Model (2)
<i>Constant</i>	0.364 (0.087)***	0.370 (0.083)***
<i>Sample characteristics</i>		
North America	0.049(0.076)	0.066(0.069)
<i>Methodology and study characteristics</i>		
ISI impact factor	-0.040 (0.026)	-0.019 (0.024)
Archival data	-0.072 (0.081)	-0.225 (0.079)**
Broad conceptualization	0.163 (0.074)*	0.087 (0.067)
<i>Independent variables</i>		
Outcome		0.180 (0.063) **
Level: individual		-0.277 (0.110)*
Level: alliance		0.316 (0.112)**
Fast clock-speed		-0.136 (0.061)*
<i>R</i> ²	0.07	0.25
K	127	127
N	60,223	60,223
<i>Q</i> _{Model} (p)	8.87 (0.06)	41.44 (0.00)
<i>Q</i> _{Residual} (p)	124.42 (0.42)	126.73 (0.27)
V	0.1376	0.1077

^b Unstandardized regression coefficients with standard errors in parenthesis. K = total number of effect sizes; N = total sample size; Q = homogeneity statistic with its associated probability in parenthesis; V = the random variance component.

^c Random effect estimated via method of moments.

† p<0.1, * p<0.05, ** p<0.01, *** p<0.001



Chapter 3. Study 2: Managers' Work Experience, Ambidexterity, and Performance: The Contingency Role of the Work Context²

3.1 Introduction

In today's turbulent business environment, it has become an imperative for firms to act ambidextrously, i.e. to be aligned and efficient in the management of today's business demands while simultaneously adaptive to environmental changes (Raisch & Birkinshaw, 2008). However, the emergence of ambidexterity brings about internal tensions because it requires firms to host contradictory logics associated with exploration and exploitation (March, 1991; Smith & Lewis, 2011). Although studies have typically focused on organizational structures and systems for cultivating both competences (Gibson & Birkinshaw, 2004; Tushman & O'Reilly, 1996), scholars have increasingly argued that ambidexterity may also root in the ambidextrous behaviors of their managers. For instance, managers may need to engage in paradoxical thinking, a repertoire of diverse activities and roles, and different kinds of learning (Mom, Van Den Bosch, & Volberda, 2009; O'Reilly & Tushman, 2004; Raisch, Birkinshaw, Probst, & Tushman, 2009; Smith & Tushman, 2005). Despite the notion that ambidextrous organizations need ambidextrous managers, we still lack a thorough understanding about *when* managers may need to act ambidextrously to improve their performance and *how* they actually may be able to do so. In order to answer these intriguing questions,

² This chapter has been crafted together with Tom Mom and Justin Jansen and has been accepted for publication by the *Human Resource Management* journal.

we develop a human resource perspective on managers' ambidexterity and contribute to current literatures in at least three important ways.

First, studies on human resource management (HRM) have provided insights into how high performance work systems or high involvement practices may be conducive to the emergence of organizational ambidexterity, and they have argued that organizational ambidexterity roots in the ambidextrous behavior of the workforce (Kang & Snell, 2009; Patel, Messersmith, & Lepak, 2013; Prieto & Santana, 2012). Yet, this earlier research has not captured the variety among individuals within the same organization (Becker & Huselid, 2006) and, hence, has not been able to explain how and why some managers may be more ambidextrous than others as to improve their performance. Similarly, evidence on the relationship between ambidexterity and performance only exists at more aggregate levels-of-analyses than the individual level (Junni, Sarala, Taras, & Tarba, 2013). Unlike treating HRM practices and ambidexterity as overarching phenomena at the organizational level, we examine how personal characteristics and immediate work contexts of individual managers drive and shape the relationship between their ambidextrous behavior and performance (Gibson & Birkinshaw, 2004; Smith & Tushman, 2005). As such, our study suggests going beyond examining organizational-level implications of HRM to facilitate the emergence of organizational ambidexterity and to reveal how HRM practices and systems may be adapted and geared towards distinct needs and requirements of individual managers within organizations.

Second, in understanding the underpinnings of managers' ambidextrous behavior, we examine the importance of organizational and functional tenure (Farrell & McDaniel, 2001; Guile & Griffiths, 2001, Ng & Feldman, 2010; Quinones, Ford, & Teachout, 1995). Recent meta-analytic studies support the claim that work experience is one of the preeminent drivers of behaviors (Sturman, 2003; Taras, Kirkman, & Steel, 2010) and show that it shapes behavior-driving cognitive processes, skills, and motivations (Ng & Feldman, 2010). The length of service

within organizations and functions are the most commonly encountered concepts in personnel and work experience research (Quinones et al., 1995). Yet, although previous research has suggested that they affect a manager's motivations and repertoire of skills and competences (Beier & Ackerman, 2001; Collins, Smith, & Stevens, 2001), research on HRM and ambidexterity has ignored potential effects from work experience on the ability and motivation of managers to be ambidextrous. By examining how organizational and functional tenure jointly shape the ambidextrous behavior of individual managers, our study addresses this gap. As such, we are able to make important inferences about experience shaping HRM practices which may help attain and sustain managers' ambidexterity, and it may provide important implications for management development programs as well as for decisions regarding attracting and retaining managers (Campion, Cheraskin, & Stevens, 1994; McEnrue, 1988; Raisch & Birkinshaw, 2008).

Third, our understanding about the conditions under which ambidextrous managers may be most effective is far from complete and fundamental pieces are missing. For instance, previous research has tended to suggest that senior executives operating at upper-echelons within the organization should behave ambidextrously in order to engage in balanced resource allocation across exploratory and exploitative activities (Smith & Tushman, 2005; Tushman & O'Reilly, 1996). Other studies, however, have argued that exploratory and exploitative activities need to be integrated at lower hierarchical levels within the organization, and as such, lower-level managers may also need to act ambidextrously in order to improve their performance (Gibson & Birkinshaw, 2004). In this sense, scholars have called for better understanding about the conditions under which ambidexterity leads to success, particularly at the individual level (Lavie, Stettner, & Tushman, 2010; Raisch et al., 2009). Building on the notion that individual performance is the outcome of the interaction between a person's behavior at work and the specific formal and informal demands imposed

by that person's work context (Griffin, Neil, & Parker, 2007; Ilgen & Pulakos, 1999; Borman & Motowidlo, 1993), we suggest that the effectiveness of ambidextrous managers is contingent upon the specific attributes of their work context. To ground our contingency argumentation, we examine the importance of work context uncertainty and interdependence in order to explain individual effectiveness (Griffin et al., 2007). Although many of today's jobs increasingly demand managers to deal with uncertainty and interdependencies, Griffin and colleagues (2007: 330) conclude that "it has proved difficult for researchers to capture the full range of activities that contribute to effectiveness in uncertain and interdependent organizational contexts." In this sense, our study contributes to research on HRM and ambidexterity by developing our understanding about how a manager's ambidextrous behavior may fit with distinct contextual aspects such as work uncertainty and interdependence in order to successfully execute his or her work.

In the next section, we present the literature review and hypotheses. Then, we present our methodology and empirical findings using data from 337 managers of two large firms. We conclude with a discussion of the results, implications, and issues for further research.

3.2 Theory & Hypotheses

3.2.1 HRM and Managers' Ambidexterity

Scholars have traditionally proposed a structural model of organizational ambidexterity which stresses that firms may achieve ambidexterity by adopting structural solutions, i.e. by building separate organizational units which focus either on exploration or exploitation (Duncan, 1976; Tushman & O'Reilly, 1996). Current studies on HRM argue for a more behavioral model of ambidexterity which stresses that a firm's ambidexterity is likely to arise from the firm's human resource base (Kang & Snell, 2009; Patel et al., 2013; Prieto & Santana, 2012). In line

with this, and with Gibson & Birkinshaw's (2004) view on ambidexterity, studies have begun investigating how HRM practices may assist firms in developing a behavioral context which enables and motivates employees to explore and exploit. For instance, Patel et al. (2013) examined the effectiveness of a high performance work system as a systematic tool for assisting firms in developing a behavioral context that promotes ambidexterity in the workforce by providing employees with the discretion and motivation to allocate time and attention flexibly towards exploration and exploitation. Prieto and Santana (2012) investigated the role of complementary high-involvement HR practices in establishing a supportive social climate within ambidextrous organizations. Finally, Kang and Snell (2009) identified two alternative HR configurations to create an organizational context which is supportive to the creation of intellectual capital that facilitates ambidextrous learning within organizations. While these studies have shown the importance of HRM systems in fostering the emergence of ambidexterity in the workforce as a whole, there is considerable debate about whether all managers within an organization should be ambidextrous (Lavie et al. 2010; Raisch & Birkinshaw, 2008). Consequently, some scholars have argued for differentiating HRM practices across managers with different roles and positions to develop organizational ambidexterity (Probst, Raisch, & Tushman, 2011).

A manager's ambidexterity can be referred to as a manager's behavioral orientation toward combining exploration and exploitation related activities within a certain period of time (Mom et al., 2009). A thorough comprehension about managers' ambidexterity is still lacking. A human resource management perspective may help to improve our understanding by pointing to the importance of understanding the cognitive processes, skills and motivations which lay at the foundation of managers' ambidextrous behavior (Kang & Snell, 2009; Patel et al., 2013). Regarding this, the current literature indicates that ambidextrous managers have several commonalities (Birkinshaw & Gibson, 2004; Mom et al., 2009; Raisch et al., 2009).

Ambidextrous managers engage in complex cognitive processes like integrative or paradoxical thinking (Martin, 2007; Smith & Tushman, 2005) in order to reconcile the tensions which may emerge in their pursuit of a range of different opportunities, goals, and needs which seem to conflict in terms of time horizon (O'Reilly & Tushman, 2004), risk profile (March, 1991), relation to the current strategy (Andriopoulos & Lewis, 2009; Probst et al., 2011), and managerial responsibilities (Floyd & Lane, 2000; Probst et al., 2011). That is, rather than stressing the polarity of seemingly conflicting opportunities, goals, and needs, ambidextrous managers have the skills and are motivated to come up with creative solutions which contain elements of both ends by highlighting their interrelatedness (Martin, 2007).

As another commonality, ambidextrous managers are skilled and motivated to engage in a wide repertoire of different or even opposing activities and roles like conducting both routine and non-routine activities (Adler, Goldoftas, & Levine, 1999; Denison, Hooijberg, & Quinn, 1995), fulfilling entrepreneurial and administrative leadership roles (Jansen, Vera, & Crossan, 2009; Probst et al., 2011), and acting outside the narrow confines of their own job (Gibson & Birkinshaw, 2004). In this sense, ambidextrous managers have been referred to as 'multitaskers' and to being rather a generalist than a specialist (Birkinshaw & Gibson, 2004). Furthermore, they are able to shift attention quickly between such different behaviors and roles depending on the situation and the broader interest of the organization (Birkinshaw & Gibson, 2004; Laureiro-Martinez, Brusoni, & Zollo, 2010; O'Reilly & Tushman, 2011).

Finally, studies indicate that ambidextrous managers have the skills and motivation to engage in different kinds of learning activities like reliability enhancing and variety increasing learning activities to both refine and renew their knowledge and skills (Floyd & Lane, 2000; Mom et al., 2007). They build internal linkages to cooperate and combine efforts with others (Birkinshaw & Gibson, 2004) and develop and maintain rather large and dense personal networks for

sharing knowledge and information (Hansen, Podolny, & Pfeffer, 2001; Sheremata, 2000; Subramaniam & Youndt, 2005).

3.2.2 Tenure and Managers' Ambidexterity

Work experience is a preeminent driver of repertoires of behaviors (Boeker, 1997; Datta, Guthrie, & Wright, 2005) and it is one of the most salient demographic characteristics in studies in management research (Dokko, Wilk, & Rothbard, 2009; Ng & Feldman, 2010). We explained several cognitive processes, skills and motivations which ambidextrous managers have in common and which lay at the foundation of their ambidextrous behavior. We focus on work experience as an antecedent of ambidexterity as it encapsulates a wide-ranging, multifaceted influence on behavior-driving cognitive processes, skills, and motivation (e.g., Guile & Griffiths, 2001; Ng & Feldman, 2010; Tesluk & Jacobs, 1998; Sturman, 2003) and as recent meta-analytic reviews confirm work experience as a more significant predictor of behaviors than other demographic characteristics (Taras et al., 2010).

In general, organizational tenure is the most commonly studied type of work experience (Ford, Quinones, Sego, & Sorra, 1992; Quinones et al. 1995). The length of service in an organization influences managers' repertoire of cognitive and behavioral skills and motivations to conduct certain behaviors as well as the associated learning (Beier & Ackerman, 2001; McEnrue, 1988). Through gaining work experience, managers can develop an encompassing set of competences and become more knowledgeable about their organization as a whole (Datta et al., 2005). We argue that these factors are important for developing the behavioral characteristics of ambidextrous managers (Gibson & Birkinshaw, 2004; Simsek, 2009). As such, organizational tenure is an important personal determinant in understanding managers' ambidexterity.

However, we argue that organizational tenure is not uniformly beneficial for facilitating managers' ambidexterity but its impact is contingent on functional

tenure. This is the case because organizational-related experience is different from functional-related experience in that two managers with identical organizational tenures may have accumulated qualitatively distinct work experiences in terms of depth and scope due to potential differences in their functional tenures (Sturman, 2003; Tesluk & Jacobs, 1998). In terms of developing the necessary ability-based and motivational underpinnings of ambidextrous behaviors, the rather narrow, more specialized functional tenure may impact the effectiveness of organizational tenure. As such, we differentiate between organizational and functional tenure as to investigate not only the direct relationship between organizational tenure and managers' ambidexterity, but also examine how this relationship is contingent upon each managers' functional tenure.

Organizational tenure. Due to greater experience and exposure over time to a variety of organizational challenges and solutions, organizational tenure increases the complexity of mental models and facilitates problem-solving processes of individuals (Klahr & Simon, 1999; Mantzavinos, North, & Shariq, 2004). To master the cognitive ability to handle several problems at once, ambidextrous managers need organizational experience in knowing which type of support to draw on. With increasing levels of organizational tenure comes enhanced knowledge about what it takes to manage conflicting tasks and whom to call upon for support in tackling antagonistic demands (Reagans & McEvily, 2003). Organizational tenure will be reflected in an enhanced ability to locate and mobilize resources due to familiarity with the skills and interests of colleagues in other business units (Sturman, 2003). It will help managers to address paradoxical tensions that arise from pursuing conflicting agendas that need the integration of distinct competences and resources (Gupta, Smith, & Shalley, 2006).

Second, organizational tenure increases perceived controllability of complex situations and has been shown to lead to more effective decision-making in such situations (Bandura & Wood, 1989). Organizational tenure may lead to more open-mindedness in terms of taking risks and challenging conventional

wisdom when experienced managers handle efficiency and flexibility related initiatives (Alvesson & Spicer, 2012). Perceived controllability has also been associated with a strong belief in individual self-efficacy and effective analytical thinking (Bandura & Wood, 1989). The latter bolsters managers' ambidexterity as it makes managers more efficacious at ferreting out and integrating information from a wide array of sources. With a strong sense of self-efficacy, experienced managers are more inclined to engage in complex behaviors and to integrate competing behaviors (Hooiberg & Quinn, 1992; Lawrence, Lenk, & Quinn, 2009).

Third, organizational tenure improves managers' understanding of social knowledge, organizational values, and behavioral expectations (Chatman, 1991). With this enhanced understanding they are better equipped to make sense of seemingly conflicting goals in the context of the overall organizational purpose and can better frame and resolve interpersonal challenges related to fulfilling multiple roles (Denison et al., 1995). Moreover, managers within higher tenures within the organization tend to enjoy more autonomy to multitask and to seek integrative solutions (Martin, 2007; Shimizu, 2012). Organizational tenure has been shown to increase the perceived tolerance for mistakes by and trust in more experienced managers within organizations (Aquino, Tripp, & Bies, 2006; Feldman, 1976), and therefore, we expect organizational tenure is likely to lead to heightened levels of ambidextrous behaviors. Based on these arguments we propose the following hypothesis.

Hypothesis 1: Organizational tenure of a manager will be positively related to his/her ambidexterity.

The moderating role of functional tenure. Although organizational tenure may increase the number of cognitive schemata and processes managers may develop and use, we argue that heightened functional tenure of managers may lessen the variety and diversity of experiences and feedback (Bower & Hilgard, 1981; Fiske & Dyer, 1985). As such, functional tenure may lead to narrowing expertise and cognitive schemata which may be detrimental to individual

reflexivity and variety in knowledge development and application (Alvesson & Spicer, 2012). Functional tenure diminishes the effectiveness of organizational tenure because it diminishes paradoxical thinking about both tried and novel situations (Ford & Backoff, 1988; Smith & Tushman, 2005). Cognitive processes of managers with a high functional tenure will be less flexible and schemata will be limited to a fixed set that is shaped by in-function experiences and expectations (Sternberg & French, 1992). Thus, functional tenure decreases the effectiveness of higher organizational tenure in that less diverse cognitive structures are developed over time (Holmqvist, 2004; McGrath, 2001) which decreases the ability of managers to behave ambidextrously. Higher functional tenure of a manager may also lead to alienation and reduce familiarity with the skills and interests of colleagues in other units. This may constrain the ability to locate colleagues in other parts of the organization to help master diverse problems and provide the resources required to multitask effectively and behave ambidextrously (Ng & Feldman, 2010; Sturman, 2003). Consequently, higher functional tenure may dampen the positive effect of organizational tenure on the ability of managers to behave ambidextrously.

Second, while organizational tenure increases perceived controllability of complex tasks, this controllability is increasingly limited to a narrower set of tasks and roles over time when functional tenure increases as well. Managers with higher functional tenure, therefore, can be expected to be less adept to analyze and integrate ideas, knowledge, and needs from a variety of sources (Cohen & Levinthal, 1990) than his or her more broadly experienced colleagues with lower levels of functional tenure. Also, with increasing functional tenure, socialization processes associated with the functional area of expertise become more salient and thus the understanding of different values and behavioral expectations that play a vital role in addressing interpersonal challenges and in fulfilling multiple roles will more difficult for the manager with high functional tenure (Denison et al., 1995).

Third, the manager with high functional tenure will be less willing to use substantive reasoning to question deeply held functional beliefs and functional goals will top that manager's priority lists (Alvesson & Willmott, 2012; Stanovich, 2002). Hence, functional tenure reduces the curiosity and open-mindedness normally present among managers with longer organizational tenure and may set in motion the creation of silos of expertise and polarization of subgroups as personal arguments trump the ability to think analytically (Mooney, Holahan, & Amason, 2007).

Taken together these arguments suggest that functional tenure inhibits the positive effects of organizational tenure on managers' ambidexterity.

Hypothesis 2: Functional tenure of a manager moderates the relationship of that manager's organizational tenure and his/her ambidexterity in such a way that it becomes less strongly positive as functional tenure increases.

3.2.3 Managers' Ambidexterity, Work Context, and Performance

Manager performance refers to the degree to which the manager fulfills or meets the requirements of his/her overall work context (*cf.* Griffin et al., 2007; Ilgen & Pulakos, 1999). Current studies on individual performance stress that work context requirements not only emanate from a manager's formally prescribed tasks, duties, and responsibilities, but may also include requirements which go beyond the core substantive tasks that are central to the job including requirements which are not formally listed in the job-description (Becker & Kernan, 2003; Rotundo & Sackett, 2002). To contribute to theory development about the conditions under which managers' ambidextrous behavior may be effective to increase performance, we investigate two 'features' or 'characteristics' of work contexts; i.e. uncertainty and interdependence (e.g., Dean & Snell, 1991; Griffin et al., 2007; Gupta, Dirsmith, & Fogarty, 1994). Work context *uncertainty* refers to the frequency of encountering exceptional or novel circumstances and events, the difficulty to anticipate problems and demands, the variety of

requirements encountered, and unclearness about the alternatives for action to effectively meet requirements (*ibid*). Work context *interdependence* reflects the extent to which people must collaborate and interact with others for effectively meeting the demands they face (*ibid*). Both uncertainty and interdependence impose specific and different demands upon managers and are mentioned as two of the major contemporary work context features explaining the performance effects of people's behavior at work (Griffin et al., 2007). Or, as Griffin et al. (2007: 328) put it, "these contextual features suggest the types of behaviors that are valued in organizations and that are important for effectiveness."

Work context uncertainty. In order to deal with uncertainty in their work context, managers need to put more effort in developing a broader set of skills and knowledge as well as utilize a wider variety of potential roles (Dean & Snell, 1991; Milliken, 1987). We argue that ambidextrous managers can effectively comply with these contextual requirements as they have been characterized as 'multitaskers who are comfortable wearing more than one hat' (Birkinshaw & Gibson, 2004: 49), i.e. they fulfill multiple roles and conduct multiple different tasks within a certain period of time (Floyd & Lane, 2000). By switching back and forth between routine and non-routine activities (Adler et al., 1999), ambidextrous managers increase their effectiveness in meeting a variety of requirements (Dean & Snell, 1991; Van de Ven & Delbecq, 1974). Scholars have emphasized that uncertain contexts can be characterized by 'the presence of multiple desired outcomes' (Campbell, 1988: 43) that may conflict with each other. By engaging in paradoxical thinking and by pursuing a range of seemingly conflicting opportunities (O'Reilly & Tushman, 2004; Smith & Tushman, 2005), we argue that ambidextrous managers will be able to improve their performance under heightened levels of work context uncertainty. They are better able to deal with the uncertain nature of their work context when compared to non-ambidextrous managers, and therefore, we expect ambidextrous managers to fit an uncertain work context. Ambidextrous managers are more flexible in terms combining a

long-term or short-term orientation (O'Reilly & Tushman, 2004) and in searching for local or distant knowledge (Hansen et al., 2001; Subramaniam & Youndt, 2005). As such, they will be able to increase their performance in uncertain contexts by making more effective judgments when encountering exceptional, unclear, or novel circumstances and events (O'Reilly & Tushman, 2004).

Moreover, uncertain work contexts require managers to anticipate problems and call for greater information processing (Griffin et al., 2007; Zeffane & Gul, 1993). Ambidextrous managers can be expected to be capable of dealing with these requirements as they typically engage in obtaining and processing various kinds of knowledge and information (Hansen et al., 2001; Mom et al., 2007; Subramaniam & Youndt, 2005). Furthermore, ambidextrous individuals are sufficiently motivated and informed to take the initiative to initiate change and act on unanticipated problems (Birkinshaw & Gibson, 2004). Based on these arguments, we expect that ambidextrous managers will fit with the requirements of an uncertain work context, and therefore, this interaction will lead to higher levels of performance.

Hypothesis 3: There is a positive interaction effect between a manager's ambidexterity and work context uncertainty on that manager's performance such that high ambidexterity will be more beneficial at high (rather than low) levels of work context uncertainty.

Work context interdependence. Ambidextrous managers typically build and maintain far-reaching and dense personal networks throughout the firm crossing internal vertical and horizontal boundaries (Floyd & Lane, 2000; Hansen et al., 2001; Mom et al., 2007). This increases interactions and opportunities for collaboration with others (Nahapiet & Ghoshal, 1998), and opens up possibilities to more effectively manage interdependencies, i.e. to better tie the managers own abilities to meet certain demands to the abilities of other networked members to do so (Hansen et al., 2001). As such, the more managers are ambidextrous, the more they can be expected to extract value from their activities in work contexts

characterized by increasing interdependencies. Concurrent with these arguments, Birkinshaw and Gibson (2004: 49) conclude that “ambidextrous individuals are brokers, always looking to build internal linkages” which may increase collaboration and long-term commitment while constraining opportunism (Galup, Klein, & Jiang, 2008).

Some scholars emphasize that work interdependence also refers to the “social nature of work demands” (Wong, DeSanctis, & Staudenmayer, 2007: 287); i.e. to the extent to which an “individual can be effective by simply managing the responsibilities of his or her role as an individual within an organization or also needs to act to support the broader social context of the organization” (Griffin et al., 2007: 328). This highlights the value of ambidextrous managers’ characteristic to effectively deal with conflicts and to maintain and build a social context (Duncan, 1976; Floyd & Lane, 2000). Moreover, in an interdependent context performance of ambidextrous managers is higher as they adopt a broad perspective in terms of pursuing opportunities and goals (Tushman & O’Reilly, 1996). This helps them to better create alignment between their individual level goals and behaviors and those at the team or organization levels (Griffin et al., 2007). Furthermore, ambidextrous managers’ performance will also benefit in an interdependent work context from their ability to harmonize and integrate efforts of individuals in different parts in the organization focusing on either exploration or exploitation (Raisch et al., 2009; Tushman & O’Reilly, 1996). Concurrent with these arguments, Birkinshaw and Gibson (2004: 49) conclude that ambidextrous individuals are cooperative and seek out opportunities to combine their efforts with others. Based on these arguments we expect in a work context characterized by increasing interdependence that the more a manager acts ambidextrously the higher that manager’s performance will be.

Hypothesis 4: There is a positive interaction effect between a manager’s ambidexterity and work context interdependence on that manager’s

performance such that high ambidexterity will be more beneficial at high (rather than low) levels of work context interdependence.

3.3 Methods

3.3.1 Sample and Data Collection

In order to examine the proposed relationships, we drew upon a sample of managers of two large firms: one service firm (Firm A) which is one of the 'big four' accountancy and professional services firm and one manufacturing firm (Firm B) which is a chemicals and life-sciences firm that ranks among the top 5 on the Fortune Global 500 (2011) in terms of total revenues in its industry. Scholars have suggested that managers in both industries are confronted with pressures to explore due to changes in technologies, customer demands, competition, and regulation, and with pressures to exploit due to short term competitive pressures in terms of an increased focus on efficiency and the growing importance of economies of scale (Banker, Chang, & Natarajan, 2005, Barnett & King, 2008). Moreover, our sample of managers within two large firms increases the possibility to observe variance in this study's explanatory variables (Tesluk & Jacobs, 1998) as well as in terms of the features of managers' work context (McDonough & Leifer, 1983; Van de Ven & Delbecq, 1974).

We sent surveys to managers who varied substantially in terms of organizational and functional tenure as well as in terms of age, education, and hierarchical level. To ensure confidentiality, we agreed not to reveal the names of the respondents and had the completed surveys returned to us without interference of corporate management. The survey was sent to 1,026 managers of whom 359 responded (35 percent). List-wise deletion of cases with missing values resulted in a final sample of 337, including 199 managers of Firm A and 138 managers of Firm B. The average age of the managers was 40.0 years (s.d. = 8.8 years), the average organizational tenure was 97 months (8.1 years; s.d. = 76

months), and the average functional tenure was 52 months (4.3 years; s.d. = 36 months). The average number of subordinates of a manager, i.e. those people who directly report to the manager as well as those which reside at further levels below, is 47 (s.d. = 151). We examined differences between respondents and non-respondents to test for non-response bias. Chi-square tests ($p < .05$; $\alpha = .05$) indicate that the distribution of the respondents over the firms, hierarchical levels, and demographic-characteristics does not significantly deviate from the population's distribution. We also compared early and late respondents (t -test; $p < .05$) in terms of model variables but found no significant differences (Armstrong & Overton, 1977).

3.3.2 Measures and Validation

Manager performance. Manager performance captures the extent to which the manager last year fulfilled all the requirements or demands of that manager's work context (Becker & Kernan, 2003; Dalal, Lam, Weiss, Welch, & Hulin, 2009; Sparrowe, Liden, Wayne, & Kraimer, 2001). We adopted a widely-used (Williams & Anderson, 1991), self-reported scale consisting of six items to measure manager performance ($\alpha = .90$). Respondents were instructed to think of work context requirements in terms of both those emanating from the respondent's formal prescribed tasks, duties, and responsibilities, and those going beyond that being of a more informal and discretionary nature. Sample items are: "I adequately answered all demands imposed by my work context", "I amply fulfilled all requirements as expected by my work context", "I failed to effectively meet essential demands of my work" (reversed item). The items were measured on a seven-point scale (1 = 'strongly disagree' to 7 = 'strongly agree').

We assessed the convergent validity of the performance scale in two ways. First, we compared the scores of the scale with a separate self-reported single-item scale of 'overall-job performance' (1 = 'very low' to 7 = 'very high') applied by various scholars (Dalal et al., 2009: 1060; Mitchell & Liden, 1982: 249). The

correlation between the study's scale and the overall-job performance scale is positive and significant ($r = .61, p < .001$) suggesting evidence for convergent validity. Second, we also collected performance data of managers by the organization's annual performance review ratings of managers (Dokko et al., 2009). The performance review and the survey data refer to the same year. The overall performance review score ('1' is the lowest score obtainable and '5' the highest one) is based on the extent to which the manager has met the performance goals corresponding to the manager's formal position, and the manager's score on more general criteria relating to, for instance, leadership, communication, and team work. 57 managers agreed to provide us with their performance review. We compared the overall score of the manager on the performance review with the score on the study's performance scale. The correlation between the study's scale and the overall performance review scores is positive and significant ($r = .52, p < .001$) providing further evidence of the convergent validity. We realize that managers who have a relatively high performance review score may be more willing than others to provide us with their performance review score. However, such a possible bias would be expected to lower the correlation between the survey performance scale and the performance review scores rather than increase it.

The self-reported performance scale, the self-reported scale of 'overall-job performance', and the performance appraisals, all refer to the same year as the managers' ambidexterity scale and the scales for uncertainty and interdependence. While studies on firm- or unit-level performance typically use time-lagged performance data, studies on individual-level performance tend not to do so, as individual performance is typically evaluated in terms of the extent to which the individual's behaviors conducted during a certain period of time has enabled that person to meet the requirements imposed on them during that same period of time (e.g., Griffin et al., 2007; Janssen, 2001).

Managers' ambidexterity. To measure a manager's ambidexterity, we adopted a two-step approach that has been used by other scholars as well (Cao, Gedajlovic, & Zhang, 2009; Lubatkin et al., 2006). First, we captured the extent to which managers engaged in exploration and exploitation activities during the last year. The seven items for exploration ($\alpha = .90$) as well as seven items for exploitation ($\alpha = .88$) were adopted from Mom et al. (2007; 2009). Managers were instructed to indicate "To what extent did you, last year, engage in work related activities that can be characterized as follows:" (1 = 'to a very small extent' to 7 = 'to a very large extent'). Sample exploration items include: "Focusing on strong renewal of products/ services or processes", "Activities requiring you to learn new skills or knowledge", "Activities that are not (yet) clearly existing company policy". Sample exploitation items include: "Activities which serve existing (internal) customers with existing services/ products", "Activities primarily focused on achieving short-term goals", "Activities which you can properly conduct by using your present knowledge".

To check for convergent and discriminant validity of both scales, we performed exploratory and confirmatory factor analyses. Exploratory factor analysis with Varimax rotation with all 14 items revealed that two summated scales could be constructed; one exploration scale with the seven exploration items and one exploitation scale with the seven exploitation items. Eigenvalues for each factor were greater than 3.9, all items loaded on their appropriate factors at greater than .72, and no cross-loadings greater than .09. We also conducted confirmatory factor analysis (CFA) to check for discriminant validity of the constructs. Results indicate that the two-factor model fits the data well: $\chi^2 = 235.9$, d.f. = 76, CFI = .93, NNFI = .92, and RMSEA = .079. Moreover, a comparison of a one-factor model with a two-factor model shows a significant improvement in fit ($\Delta\chi^2$ significant at $p < .001$) providing evidence of discriminant validity (Bagozzi & Phillips, 1982).

As a second step in constructing the measure for managers' ambidexterity, we multiplied the exploration and exploitation measures (see also

Cao et al., 2009; Mom et al., 2009). We followed the procedures recommended by Edwards (1994), which are also followed by Lubatkin et al. (2006) to assess the accuracy of the measurement approach. That is, if measures are combined into a single index, we first need to know whether each component of the final index contributes uniquely to predicting outcomes or if only one component does so, and second, whether there is no significant loss of information by combining the indices into a single index (Lubatkin et al., 2006: 656). Regarding the first issue, following Edward's (1994) procedures, we ran an unconstrained regression equation in which performance was the dependent variable and exploration and exploitation were treated as separate independent variables. Both exploration ($\beta = .25, p < .001$) and exploitation ($\beta = .21, p < .001$) appear to contribute uniquely to performance. Regarding the second issue, we ran the constrained regression equation in which exploration and exploitation were combined into a single index by multiplying them. Following Edwards (1994), we subsequently calculated F - values based on R^2 differences of the constrained and the unconstrained model. The F -test showed no significant loss of information of the constrained model compared to the unconstrained model. These results from Edwards's (1994) tests confirm the accuracy of the multiplying approach for combining our measures of exploration and exploitation. We mean-centered the exploration and exploitation scales before multiplying them to lessen the potential for multicollinearity (Cao et al., 2009).

Work context: Uncertainty and interdependence. We measured the features of the work context using the scales developed by Van de Ven and Delbecq (1974) and Van de Ven et al. (1976). These scales have been widely applied and further validated by other scholars (e.g., Dean & Snell, 1991; Gupta et al., 1994; Withey, Daft, & Cooper, 1983). In line with the conceptualization of uncertainty, the 12 item *uncertainty scale* represents its two main aspects: complexity and variability (Dean & Snell, 1991; Van de Ven et al. 1976). The six complexity items measure the extent to which the manager's work context was

last year characterized by the lack of a knowledge base that provides guidelines for meeting requirements, unclearness about alternatives for action, and unclearness about these actions' effectiveness for meeting requirements. The six variability items assess the extent to which the manager's work context was last year characterized by differences in requirements encountered, the variety in methods needed for effectively meeting different requirements, exceptional or novel circumstances and events that had to be dealt with, and problems and demands that were difficult to anticipate. The six item *interdependence scale* ($\alpha = .88$) assesses the extent to which the work context is characterized by the need to rely on or collaborate with others for effectively meeting the demands the manager faced.

We performed a CFA with the 18 items to test whether a model with the 3 factors plus one second-order factor for the two uncertainty factors fitted the data. The fit indices show that the data fits the model well: $\chi^2 = 428.1$, d.f. = 131, CFI = .91, NNFI = .90, and RMSEA = .082. Moreover, the fit is significantly better than a 3-factor model without the second-order factor ($\Delta\chi^2 = 28.7$, d.f. = 2, $p < .001$). Given these results, and because our conceptual model is concerned with uncertainty in a general sense, we follow others (e.g., Dean & Snell, 1991; Van de Ven et al. 1976) by averaging the complexity and variability items to create a single index for uncertainty ($\alpha = .87$).

Organizational and functional tenure. Organizational tenure was measured by the length of time spent in the firm expressed in months. Functional tenure was measured by the length of time spent in the current function, also expressed in months. This does not necessarily refer to the time spent in a given unit, department, or team. It typically refers to the time a manager has been managing a certain unit, department, or team, or to the time the manager has been having main responsibility for a certain area like a market, product, or technology. We obtained data for both measures by asking the respondent to indicate the year

and month he or she entered the firm and the year and month he or she first started in the current function.

Control variables. Socio-demographic differences among managers such as age and educational level are associated with increasing cognitive abilities to process complex information (Papakandis, Lioukas, & Chambers, 1998) which is expected to positively relate to individuals' performance (Wright, Kacmar, McMahan, & Deleeuw, 1995) and ambidexterity (Kang & Snell, 2009). We therefore included *age* in years and *educational level* using two dummy variables; one reflecting managers with Master degrees or higher, and another reflecting managers with Bachelor degrees, making managers with degrees below Bachelor level the reference group. Organizational-level features may also affect individuals' ability and willingness to perform well (Sonnetag & Frese, 2002) and to divide their time between exploration and exploitation (Gibson & Birkinshaw, 2004). To control for firm specific factors, we included a dummy variable *firm* as control variable (1 = Firm A; 0 = Firm B). Like Griffin et al. (2007: 336), we also controlled for aspects related to a manager's *hierarchical level* by including a measure for hierarchical level which is based on the system of position classifications used in both firms. The measure ranges from 1 ('operational level manager') to 5 ('senior executive').

Validation. We conducted factor analyses including all items of this study's constructs, i.e. those measuring performance, exploration, exploitation, and the features of work context, to assess construct validity of the measures. Results of the exploratory factor analysis (extraction method: principal component analysis; rotation method: varimax with Kaiser normalization) indicate that the measures were appropriately constructed; eigenvalues for each factor were greater than 2.2, all items loaded on their appropriate factors at greater than .73, and no item cross-loading was greater than .22. Moreover, using confirmatory factor analyses, a comparison of a one-factor model with a two-factor model for every pair among the factors shows a significant improvement in fit for each of the 15

pairs ($\Delta\chi^2$ significant at $p < .001$) providing evidence of discriminant validity (Bagozzi & Phillips, 1982).

3.4 Analyses & Results

Table 3.1 reports the descriptive statistics and correlations of all study variables. To examine multicollinearity, we calculated variance inflation factors (VIF) for each of the regression equations. VIF factors are between 2.53 and 1.08, which is below the rule-of-thumb cut-off of 10 (Neter, Wasserman, & Kutner, 1990); issues of multicollinearity seem not to be a problem. The significant positive correlations between the features of the work context are consistent with earlier findings (e.g., Dean & Snell, 1991; Van de Ven & Delbecq, 1974).

Insert Tables 3.1 and 3.2 about here

Table 3.2 presents the results of the hierarchical regression analyses for managers' ambidexterity (Models 1 and 2) and performance (Models 3, 4, and 5). Regarding managers' ambidexterity, among the control variables, the full model – Model 2– shows that managers with Bachelor or higher degrees are more ambidextrous than those with degrees below Bachelor. Hierarchical level is positively related to ambidexterity as well indicating that the higher the hierarchical level of a manager the more ambidextrous that manager tends to be. Age is negatively related to managers' ambidexterity. Finally, managers of firm A tend to be less ambidextrous than those of firm B. Model 2 adds the tenure variables to test the first two hypotheses. Regarding the organizational tenure of a manager, we predicted a positive relationship with this manager's ambidexterity. As Model 2 shows, the coefficient for organizational tenure is positive and significant ($\beta = 0.25, p < 0.001$) thereby supporting *Hypothesis 1*. Hypothesis 2 predicted a negative moderation effect of functional tenure on the relationship

between organizational tenure and ambidexterity. The interaction coefficient between organizational and functional tenure is negative, but not significant ($\beta = -0.06$, n.s.) thereby not *supporting Hypothesis 2*. Instead, Model 2 shows that the coefficient of functional tenure is significantly negative ($\beta = -0.15$, $p < 0.01$) indicating a direct negative effect of functional tenure on ambidexterity which is independent of organizational tenure.

Regarding managers' performance, we use Cao's et al. (2009) and He and Wong's (2004) approach by including both exploration and exploitation in all of the estimates. Similar to their firm-level findings, our individual-level results show that exploration ($\beta = 0.27$, $p < .001$), exploitation ($\beta = .21$, $p < .001$), and ambidexterity ($\beta = .11$, $p < .05$) all positively relate to performance (Model 4). Among the control variables, the full model –Model 5– shows that managers with Bachelor or higher degrees have higher levels of performance than those with degrees below Bachelor. Model 5 adds the interaction terms to Model 4. The results of entering the interactions individually and those of entering them as a block are highly consistent, suggesting that the interactive relationships reported are robust across alternative model specifications. We note that, consistent with Cao's et al. (2009: 789) findings, the main effect of ambidexterity loses its significance when the interaction terms are included (see Model 5) suggesting that there are significant interaction effects in which ambidexterity is involved. The interaction term between a manager's ambidexterity and uncertainty is positive and significant ($\beta = 0.24$, $p < 0.01$), supporting *Hypothesis 3*. To plot this interaction and to conduct simple slope analyses, performance, ambidexterity and uncertainty took the values of one standard deviation below (i.e. low level) and above (i.e. high level) the mean. The plot is shown in Figure 1. It shows a positive relationship between ambidexterity and performance when uncertainty is high (gradient of simple slope = 0.20; $p < .05$), and a negative relationship when uncertainty is low (gradient of simple slope = -0.26; $p < .01$). The interaction term between a manager's ambidexterity and interdependence is positive and

significant as well ($\beta = 0.14, p < .05$), thus supporting *Hypothesis 4*. The plot of this interaction in Figure 2 shows a positive relationship between ambidexterity and performance when interdependence is high (gradient of simple slope = 0.11; $p < .10$), and a negative relationship when interdependence is low (gradient of simple slope = -0.17; $p < .10$).

3.4.1 Post-Hoc Analyses

We conducted post-hoc analyses to further assess the validity of our findings. First, we verified whether firm specific characteristics were driving our results, as the sample's managers can be grouped into two firms. To do so, we created five interaction coefficients with the firm dummy variable: one with organizational tenure, one with functional tenure, one with ambidexterity, one three-way interaction coefficient with uncertainty*ambidexterity and another with interdependence*ambidexterity. Then, we included the first two mentioned interaction terms in model 2. Similarly, we included the other three interaction terms in model 5. None of the interaction terms are significant, and including them does not result in a significant improvement of model fit. Furthermore, the hypothesized effects reported in Models 2 and 5 remain significant after inclusion of the firm interaction terms. These procedures and their results (Aiken & West, 1991; Jaccard & Turrisi, 2003) indicate that possible firm specific characteristics are not driving the results as presented in Table 3.2.

Second, we conducted regression analyses with an alternative measurement of ambidexterity, i.e. by adding the measures of exploration and exploitation (Jansen, Tempelaar, Van Den Bosch, & Volberda, 2009; Lubatkin et al., 2006). The repeated tests of the hypotheses using this alternative measurement found the same results in terms of hypotheses being supported or rejected as those reported in Table 3.2. The coefficient for organizational tenure using the alternative ambidexterity measure is positive and significant ($\beta = 0.24, p < 0.001$; supporting Hypothesis 1). The interaction coefficient between organizational and

functional tenure is negative, but not significant ($\beta = -0.07$, n.s.; not supporting Hypothesis 2) while the coefficient of functional tenure is significantly negative ($\beta = -0.19$, $p < 0.01$). Furthermore, like in Table 3.2, the interaction term between a manager's ambidexterity and uncertainty is positive and significant ($\beta = 0.21$, $p < 0.01$; supporting Hypothesis 3) as well as the interaction term between a manager's ambidexterity and interdependence ($\beta = 0.18$, $p < .01$; supporting Hypothesis 4).

Third, although we measure ambidexterity as a multiplicative term, we theorize of it as a distinct and integral concept (see also Cao et al., 2009). As a way to alleviate concern about whether the ambidexterity interaction terms explain variance above and beyond the four possible two-way interactions between the work context characteristics and exploration and exploitation, we conducted additional tests to complement the regression analyses. Adding the two ambidexterity-interaction coefficients to a model similar to Model 4 which includes the four two-way interaction coefficients significantly increases model fit (F improvement of fit = 6.65, $p < .01$). Hence, the ambidexterity interaction coefficients contribute to the explained variance above and beyond the four exploration and exploitation two-way interactions. Moreover, in such a model which includes the four exploration and exploitation two-way interactions, the two ambidexterity-interaction coefficients are significant (uncertainty*ambidexterity: $\beta = .12$, $p < .10$; interdependence*ambidexterity: $\beta = .13$, $p < .10$).

3.5 Discussion & Conclusion

Despite the general observation that ambidextrous organizations may need ambidextrous managers (O'Reilly & Tushman, 2004, Raisch & Birkinshaw, 2008), current insights lacked a thorough understanding about when managers may need to act ambidextrously to be most effective and how they actually may

be able to do so. We advanced insight into these issues by developing a human resource perspective on managers' ambidexterity. As such, we created insights into the cognitive and behavioral skills and motivations underlying a manager's ambidextrous behavior. We not only explained why some managers behave more ambidextrously than others due to differences in their organizational and functional tenure, but also revealed how the effectiveness of a manager's ambidexterity is contingent upon the extent of uncertainty and interdependence of his or her work context. Our findings have important implications for theory and management practice.

While current studies have treated HRM practices and ambidexterity as firm-level phenomena (Kang & Snell, 2009; Patel et al., 2013; Prieto & Santana, 2012), our results point to the importance of taking a more nuanced individual-level perspective on the development of managers' ambidexterity as well as on its performance implications. That is, the results of our study would imply that the HRM practices shaping the cognitive and behavioral skills and motivational aspects underlying ambidextrous behaviors should not necessarily be applied to all managers, but particularly to those who will benefit from performance gains, i.e. to those whose work context is characterized by high degrees of uncertainty and interdependence. As one of the overarching goals of HRM is to create a fit between a person's skills and abilities and the requirements of the job, our study stresses the importance of creating a fit between a manager's ambidexterity and the extent to which his or her work context is uncertain and/ or interdependent. Furthermore, while practices and decisions regarding, for instance, attracting and retaining managers and their internal mobility affect managers' organizational tenure as well as their functional tenure (Lepak & Snell, 1999), our research shows that these two kinds of tenure differently relate to their ambidexterity.

Tenure is one of the most salient demographic characteristics in studies in management research (Sturman, 2003; Ng & Feldman, 2010), though it has been linked to other outcomes than ambidextrous behaviors. We explained several

cognitive processes, skills and motivations which ambidextrous managers have in common and which lay at the foundation of their ambidextrous behavior. We focused on tenure as an antecedent of ambidexterity as it is found to be one of the most significant predictors of managerial behaviors by shaping their cognitive processes, skills, and motivations (e.g., Guile & Griffiths, 2001; Tesluk & Jacobs, 1998; Sturman, 2003; Taras et al., 2010).

Our results on organizational and functional tenure suggest that it matters, for the development of managers' ambidexterity within organizations, that HRM practices concerning the flow of people take into consideration the opposing effects of the two different types of tenure. Our findings indicate that when staffing positions, units or teams that require ambidextrous behaviors, firms should select those managers with long organizational tenure, but with a relatively low functional tenure. As such, our study implies that management development programs aimed at fostering managerial ambidexterity should include job rotation or at least cross-functional interactions in teams or projects to allow managers to broaden their expertise, develop their network, and increase their identification with the firm (Datta et al., 2005; Hekman, Bigley, Steensma, & Hereford, 2009).

While we argued that functional tenure may reduce the positive effects of organizational tenure on managers' ambidextrous behaviors we did not find such a moderating effect. Instead, we found that functional tenure is directly negatively related to manager' ambidexterity. This interesting finding may suggest that organizational and functional tenure are each linked to managers' ambidexterity through distinct underlying mechanisms. For instance, one of our explanations, based on previous research, suggested that organizational tenure is associated with increased flexibility while functional tenure may decrease such flexibility. However, as indicated by the negative correlation between functional tenure and exploration, an alternative explanation could be that managers new to their function are more required to gain knowledge pertaining to the new domain as

compared to managers with high functional tenure. Another explanation for the direct linkage between functional tenure and managers' ambidexterity may be rooted in the fact that experience shapes not only cognition and skills, but also attitudes and personal identification (Tesluk & Jacobs, 1998). When the functional tenure of managers increases, they may tend to identify themselves more with their profession and specific functional area rather than with their organization (Riketta, 2005). This lack of goal alignment may reduce their receptiveness to ideas outside the own professional domain (Chusmir & Koberg, 1986) which can undermine their ability and motivation to effectively handle contradictory agendas and integrate seemingly paradoxical messages and goals (Leana & Barry, 2000). Furthermore, functional tenure may be limiting the desire to act ambidextrously as a function-specific 'tunnel-vision' develops (Buyl, Boone, Hendriks, & Matthyssens, 2011). As such, with increasing functional tenure grows the ambition to strengthen the power of one's own function rather than spanning boundaries and embracing diverging stakeholder opinions (Whitney & Smith, 1983). Moreover, the strong association with one's profession's values and principles and micro-political activism bolstering the functional agenda, may reduce the inclination of managers with high functional tenure to resolve conflicting tasks and to fulfill multiple roles in the interest of the broader organization (Birkinshaw & Gibson, 2004; Hekman et al., 2009; Organ, 1988).

In addition to revealing the individual-level determinants of managers' ambidexterity, scholars have also called for a much better understanding about the conditions under which ambidexterity may lead to individual performance (Junni et al., 2013; Lavie et al., 2010; Raisch & Birkinshaw, 2008). While scholars still debate about the hierarchical level at which the ambidextrous behavior of managers is most beneficial (Birkinshaw & Gibson, 2004; Raisch et al., 2009), our findings indicate that in demanding work contexts in terms of high uncertainty and interdependence, a manager may increase his or her performance by behaving ambidextrously. On the other hand, our findings suggest that in certain

and non-interdependent work contexts ambidextrous behavior may not be beneficial. To shed more light on the hierarchical level debate, we included as a post-hoc analysis in our regression (Model 5) a coefficient which assesses the interaction between the manager's hierarchical level and ambidexterity. This coefficient was not significant while the two work context interaction coefficients remained significant. This suggests that not the manager's hierarchical level as such matters in understanding whether the manager should be more or less ambidextrous for performance, but rather the level of uncertainty and/ or interdependence in his/ her work context. In that sense, our study provides a more fine-grained explanation about when managerial ambidexterity may be more beneficial. While the positive correlation between hierarchical level and uncertainty and interdependence suggests that when the hierarchical level of a manager increases that manager should behave more ambidextrously in order to improve performance, our study suggests that managers at other positions which are characterized by high uncertainty and or interdependence like managers at cross-functional interfaces or at corporate venture units (Burgers, Jansen, Van Den Bosch, & Volberda, 2009; Hill & Birkinshaw, 2012; Mom et al., 2009) should behave more ambidextrously as well in order to improve performance.

Overall, with respect to managers' ambidexterity, our findings suggest a career planning and management development approach that takes into consideration the levels of uncertainty and interdependence managers have to deal with, and that nurtures talent from inside the organization but instills a broad perspective through both horizontal moves and a vertical sequence of career steps. Exposure to different functions through internal mobility fosters the ambidextrous behavior of managers and prepares them to perform in the face of uncertain and interdependent work contexts. In that sense, it is not surprising that large sample studies show that organizations appointing insiders to the CEO job significantly outperformed those that do not (Bower, 2007; Collins, 2001). By adopting such HRM strategies organizations can blend the advantage of outsiders who may see

the need to change with the advantage of home-grown managers' understanding of the firm and its people in valorizing existing and novel capabilities (Bower, 2007). Moreover, by promoting from the inside rather than from the outside, selection issues caused by information asymmetry can also be avoided (Zajac, 1990).

Also at levels below the C-suite theories of specific skills and their portability (Groysberg, Lee, & Nanda, 2008; Huckman & Pisano, 2006) as well as incomplete information suggest that promoting from within has advantages over hiring externally (Bidwell, 2011). Managers promoted internally differ from external recruits in terms of their skills, especially those to effectively address the unique challenges the organization faces (Sonnenfeld & Peiperl, 1988; Lepak & Snell, 1999). Outsiders may no longer be able to benefit from their former firms' support structure, resources, networks, and colleagues which played a crucial role in their behavioral repertoire and associated performance (Groysberg et al., 2008). Familiarity with organizational practices and intra-firm networks takes time to develop, yet is crucial for ambidextrous behaviors. Hence, "getting up-to-speed" is necessary for outsiders, but it may take up to two years (Bidwell, 2011). Moreover, due to uncertainty about external talents' abilities, those with stronger observable skills are frequently hired and also accordingly paid more than internal candidates for similar positions. Bidwell (2011) confirmed this alongside weaker performance and higher turnover rates of external hires, which always incurs additional costs for organizations (Dess & Shaw, 2001). Thus, in line with our findings that long tenured managers are more ambidextrous and that those managers are better equipped to perform well in face of uncertainty and interdependencies prevalent at higher levels in the hierarchy, we would recommend internal promotion over external hiring. Such an HR strategy may not only prove to be more cost effective (Bidwell, 2011), but promoting internally will also signal to organization members that there is a path up the corporate ladder, thereby boosting morale, persistence, and loyalty across the workforce.

3.5.1 Limitations and Future Research

First of all, to shed first light on how work-experience may relate to ambidexterity we focused on the two most commonly investigated types of work experience (*cf.* Quinones et al., 1995). However, we reckon that the level of ambidexterity of a manager may also be influenced by other types of work experience like the prior experiences in other organizations and industries in which a repertoire of cognitions, skills, and habits may have been acquired (Beyer & Hannah, 2002; Dokko et al., 2009). We suggest future research in this area to take into consideration the whole work history of each manager.

Second, the study involves cross-sectional, single informant data and uses perceptual scales highlighting issues of common method bias and causal reciprocity. We performed Harman's one-factor test on items included in the regression models. If common method bias was a serious problem in the study, we would expect a single factor to emerge to account for most of the covariance in the dependent and independent variables (Podsakoff & Organ, 1986). We did not find such a single factor. As indicated, we also assessed the convergent validity of the performance scale by comparing it with objective performance data in terms of managers' performance appraisals. Common method bias could further be addressed in future studies by measuring ambidexterity at the managerial level-of-analysis using objective measures. Furthermore, our methods are suited to establish relationships between the constructs, but not causality. To create more insight in the direction of causality, future studies may adopt a longitudinal design to increase insight into how changes in work context features and changes in managers' ambidexterity causally relate to changes in performance.

Third, we applied in this paper a broad conceptualization of managers' performance, i.e. about the extent to which a manager fulfills the requirements of his/ her work context; i.e. requirements emanating both from the manager's formal core tasks central to the job and from more contextual and informal factors (Campbell, McCloy, Oppler, & Sager, 1993; Griffin et al., 2007). Future studies

could extend our model by distinguishing and focusing on specific aspects of the individual performance domain such as task and contextual performance (Borman & Motowidlo, 1993).

Fourth, given the debate about the hierarchical level at which the ambidextrous behavior of managers is most beneficial (Birkinshaw & Gibson, 2004; Raisch et al., 2009) and the positive relationship between hierarchical level and ambidexterity as shown in this study, it might be interesting to further investigate these issues in other contexts. Specifically, in SMEs there may be fewer slack resources to develop and maintain a diverse portfolio of skills and behaviors across hierarchical levels (DeVoe & Pfeffer, 2011). Therefore, the demands to pursue different role behaviors may be strongly pronounced for all employees, also challenging operational and other lower level managers to exhibit ambidextrous behaviors. Future research could uncover the extent to which managers across the hierarchy of SMEs are ambidextrous and what equips them to perform well on a variety of tasks.

Finally, although we discuss possible factors that may explain the effect of tenure on ambidexterity, we do not test for these effects. Future research may increase insight into why tenure drives ambidexterity by investigating mediators such as cognitive and motivational processes (Smith & Tushman, 2005), skills and individual repertoires of knowledge (Probst et al., 2011), and characteristics of the manager's network (Birkinshaw & Gibson, 2004). Related to this, future research could investigate further why our hypothesis on functional tenure was not supported. To test the identification and alignment logics we offered as alternative explanations, future studies may investigate the circumstances under which highly specialized operational managers, i.e. those with high functional tenure, can be more ambidextrous than others with broader organizational experience. For instance, this could be the case as long as these specialized managers are able to create alignment between their individual and functional level goals and behaviors and those at the organization level (Griffin et al., 2007), or when they

occupy central positions in networks which cut across functional domains (Birkinshaw & Gibson, 2004).

Despite these limitations, our study has clarified the properties of ambidexterity, i.e. the behavioral commonalities, at the individual manager level, and has indicated why some managers behave more ambidextrously than others as well as the conditions under which such behaviors are more beneficial (Nosella et al., 2012). This allowed us to provide implications for theory and practice around HRM practices which as a strong body of evidence has shown matter for influencing workforce characteristics in terms of skills, commitment, and opportunities and thereby firm performance (Jiang, Lepak, Hu, & Baer, 2012). By doing so, we hope to have contributed to both theoretical and empirical foundations of a more comprehensive framework for understanding ambidexterity research (Raisch et al., 2008; Simsek, 2009) and HRM in large global firms (Becker & Huselid, 2006; Patel et al., 2013).

Figure 3.1: Interaction Effects Managers' Ambidexterity and Uncertainty/Interdependence

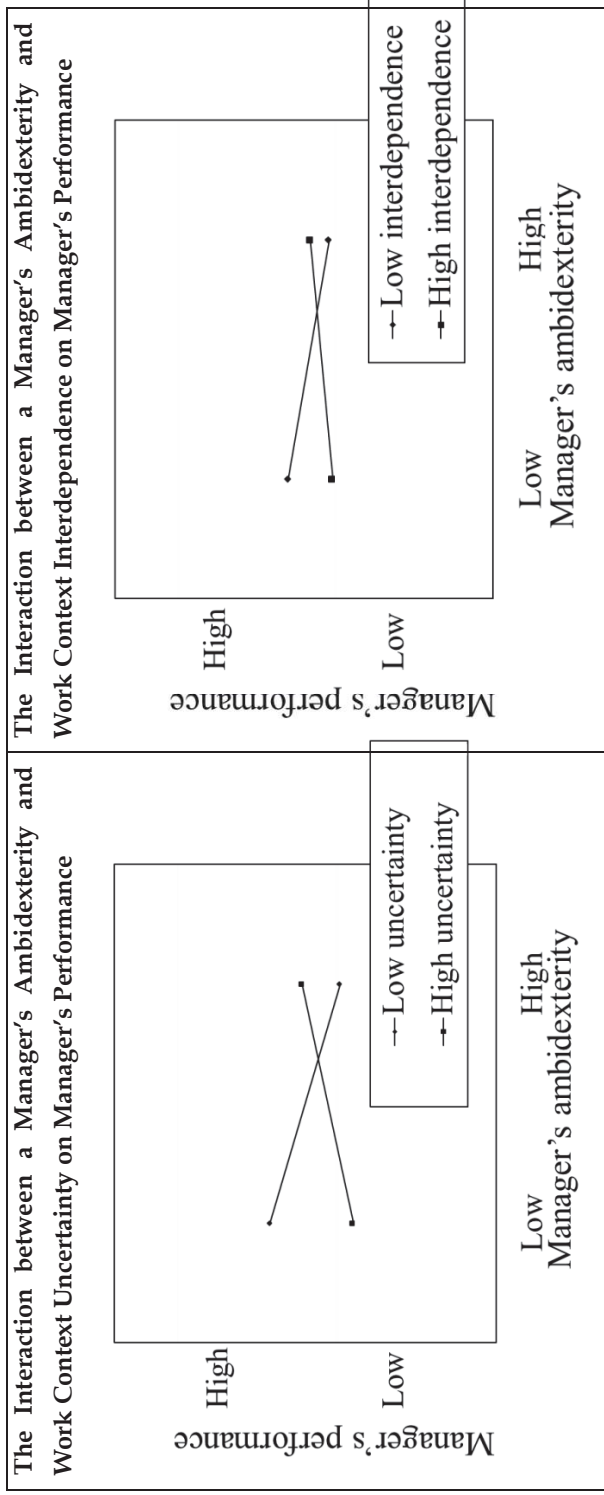


Table 3.1 Means, Standard Deviations, Minimum and Maximum Values, and Correlations^a

	Mean	St. dev.	Min.	Max.	1	2	3	4	5	6	7	8	9	10	11	12	
1 Manager performance	5.11	1.21	1.00	7.00													
2 Manager ambidexterity	21.50	6.97	4.29	45.00	.33												
3 Organizational tenure (months)	96.86	75.94	1.00	436.0	.16	.22											
4 Functional tenure (months)	52.12	35.74	1.00	189.0	.07	-.12	.21										
5 Uncertainty	4.22	1.21	1.33	7.00	.05	.42	.17	.02									
6 Interdependence	4.26	1.31	1.17	7.00	.04	.28	.17	.00	.30								
7 Age	40.01	8.78	24.00	64.00	.10	.07	.47	.21	.08	.14							
8 Education: Master or higher	.48	.50	.00	1.00	.07	.00	-.05	-.01	-.06	.01	-.03						
9 Education: Bachelor	.34	.47	.00	1.00	.05	.10	-.02	-.04	.10	.07	.07	-.69					
10 Firm	.59	.49	.00	1.00	.00	-.10	-.22	-.04	-.17	.05	-.08	.23	-.06				
11 Hierarchical Level	2.35	1.20	1.00	5.00	.10	.23	.23	.12	.20	.22	.39	.03	.10	.06			
12 Exploration activities	4.40	1.14	1.43	7.00	.24	.79	.10	-.13	.37	.21	.07	.03	.10	-.04	.30		
13 Exploitation activities	4.90	.91	2.00	7.00	.20	.56	.17	-.08	.15	.14	-.01	-.01	.02	-.07	-.02	-.05	

^a N = 337; All correlations at or above |.14| are significant at p < .01, All correlations at or above |.12| are significant at p < .05 (2-tailed)

Table 3.2 Results of Hierarchical Regression Analyses: Manager Ambidexterity and Manager Performance

	Manager's Ambidexterity				Manager's Performance			
	Model 1	Model 2	Model 3	Model 4	Model 5			
	b (s.e.)	b (s.e.)	b (s.e.)	b (s.e.)	b (s.e.)			
Intercept	22.14 (2.08)	23.98 (2.12)	4.63 (0.37)	4.58 (0.37)	4.68 (0.35)			
Age	-0.03 (0.05)	-0.09 (0.05)	0.00 (0.01)	0.00 (0.01)	.00 (0.01)			
Education: Master or higher	2.02 (1.06)	2.24 (1.03)	0.43 (0.18)	0.45 (0.18)	.39 (0.17)			
Education: Bachelor	2.52 (1.10)	2.83 (1.08)	0.41 (0.19)	0.42 (0.19)	.38 (0.18)			
Firm	-2.06 (0.78)	-1.53 (0.77)	0.03 (0.14)	0.07 (0.14)	.01 (0.13)			
Hierarchical level	1.35 (0.34)	1.23 (0.33)	-0.01 (0.06)	0.00 (0.06)	.02 (0.06)			
Uncertainty	0.23 ***	0.22 ***	-0.09 (0.06)	-0.11 (0.06)	-.07 (0.06)			
Interdependence			-0.05 (0.05)	-0.07 (0.05)	-.04 (0.05)			
Exploration activities			0.30 (0.06)	0.29 (0.06)	.20 (0.06)			
Exploitation activities			0.30 (0.07)	0.28 (0.07)	.17 (0.07)			
Manager Ambidexterity			0.23 ***	0.21 ***	0.13*			
Tenure			0.11*	0.11*	-0.03 (0.07)			
Functional tenure		-0.03 (0.01)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)			
Organizational tenure (Hypothesis 1)		0.02 (0.01)	0.10*	0.00 (0.00)	0.00 (0.00)			
Org. tenure * Functional tenure (Hypothesis 2)		0.00 (0.00)	-0.06	0.09	0.09			
Work Context								
Uncertainty*Ambidexterity (Hypothesis 3)					0.19 (0.06)			
Interdependence*Ambidexterity (Hypothesis 4)					0.10 (0.05)			
R-squared	0.08	0.15	0.15	0.16	0.25			
Adjusted R-squared	0.07	0.13	0.12	0.13	0.21			
F improvement of fit	6.04 ***	8.27 ***	5.29 ***	4.13*	17.59 ***			

* Centered data; Unstandardized and standardized coefficients are reported, standard errors in parentheses; N = 337; † p < .10; * p < .05; ** p < .01; *** p < .001

Chapter 4. Study 3: Interpersonal Processes of Middle Managers and the Emergence of Ambidexterity within Business Units³

4.1 Introduction

As industry dynamics and competition often unfold at the business unit level, business units need to be flexible and innovative without losing the benefits of efficiency and accumulated experience (Jansen, Simsek, and Cao, 2012; Smith, 2014). Consequently, a growing stream of research suggests that business units need to be ambidextrous to survive and succeed (Gibson and Birkinshaw, 2004; Hill and Birkinshaw, 2012; Jansen et al., 2012). Ambidextrous units engage in two different and even conflicting strategic and learning orientations: they exploit the value from leveraging and refining existing positions, products, and competencies, while exploring new opportunities and competencies to enhance future competitiveness (Gibson and Birkinshaw, 2004; Raisch and Birkinshaw, 2008). Despite generating performance benefits (O'Reilly & Tushman, 2013), the emergence of ambidexterity entails challenging contradictions within business units because of the coexistence of different performance goals, contrasting mindsets, and dual control systems (Bledow, Frese, Anderson, Erez, and Farr, 2009; Gupta, Smith, and Shalley, 2006; March, 1991).

Scholars have suggested structural separation and more recently domain separation to buffer the development of new capabilities from ongoing operations (Gilbert, 2005; Lubatkin, Simsek, Ling, and Veiga, 2006; O'Reilly and Tushman, 2011; Stettner and Lavie, 2013; Tushman and O'Reilly, 1996). That said,

³ This study has been developed together with Tom Mom, Justin Jansen, and Quy Huy and will soon be submitted to the *Strategic Management Journal*.

organizations that have business units focusing exclusively on exploration or exploitation risk underperforming (Wang and Li, 2008) and the exploration-exploitation duality may fractionate the organization (Argyris, 1993). However, ambidexterity at the unit level is particularly challenging to achieve as the tradeoffs between exploration and exploitation are “more severe and restrictive”, conflicts over mindsets “reinforcing the notion of bi-polarity” (Simsek, Heavey, Veiga, and Souder, 2009: 868), and structural solutions likely are not feasible (Boumgarden, Nickerson, and Zenger, 2012).

To reach a better understanding about how business units can become ambidextrous, scholars have examined organizational contextual factors that support employees in dividing their time and balancing their efforts among exploratory and exploitative activities (Gibson and Birkinshaw, 2004; Patel, Messersmith, and Lepak, 2012). These earlier studies have highlighted the indirect role of middle managers (MMs) – i.e. those in charge of business units – in fostering the ambidextrous nature of their units by developing the appropriate organizational context. Curiously, we still have an incomplete understanding about how and under what conditions MMs may contribute to their unit’s ambidexterity in a more direct way. This seems surprising since numerous studies have shown that MMs may play a crucial role in shaping their business unit’s strategic and learning orientations, particularly by interacting with other parts of the organization (e.g., Nonaka, 1994; Wooldridge, Schmid, and Floyd, 2008). Building on research about information processing and personal interactions (Floyd and Lane, 2000; MacNeil, 1974; Ring and Van de Ven, 1994; Schulz, 2001), we develop and examine a theoretical framework about how MMs’ interpersonal processes influence ambidexterity in their units. In so doing, we contribute to earlier research in at least two ways.

First, although research on organizational learning and strategy making has emphasized the importance of horizontal interactions between MMs (Hansen, 1999; Pappas and Wooldridge, 2007; Tsai, 2001), we do not know sufficiently how

these interactions foster learning orientations that are specifically associated with ambidexterity. Horizontal interactions allow knowledge exchange, which includes exchange of best practices and problem-solving information among MMs who belong to different units (Cummings, 2004; De Luca and Atuahene-Gima, 2007; Hansen, 1999). We seek to contribute to the ambidexterity literature and unit level strategy formation research by illuminating how MMs influence their unit's ambidexterity directly through their horizontal interactions (Raisch and Birkinshaw, 2008; Rogan and Mors, 2014). The idea of applying interpersonal processes to questions of ambidexterity is not new (Floyd and Lane, 2000). But to date, such notions have been applied either to the inter-firm (Tiwana, 2008) or individual level (Rogan and Mors, 2014; Mom, Van Den Bosch, and Volberda, 2007). However, unit level ambidexterity presents distinct challenges (Gupta et al., 2006; Simsek et al., 2009) and thus warrants a theoretical and empirical examination of relationships between MMs' interpersonal processes and unit ambidexterity. Furthermore, by specifying and testing the effects of MMs horizontal interactions on unit ambidexterity we also extend research on cross-unit collaboration. While this research has demonstrated the positive effects of cross-unit collaboration on unit and firm performance (Bowman and Helfat, 2001; Martin and Eisenhardt, 2010), it has largely ignored investigating the specific mechanisms that can enable such performance effects like unit ambidexterity (Brettel, Heinemann, Engelen, and Neubauer, 2011; Jansen et al., 2012).

Second, we propose that the effectiveness of MMs' horizontal knowledge exchange to foster business unit ambidexterity is shaped by the quality of their vertical interactions with top managers (TMs). While some prior studies did note cursorily that unit strategy formation and learning depends on the interplay of horizontal and vertical interpersonal processes (e.g., Bartlett and Ghoshal, 1993; Hedlund, 1994; Nonaka, 1994; Schulz, 2001; Wooldridge et al., 2008), there are hardly any empirical studies which have examined their joint impact. We examine this joint interaction through two dimensions of vertical interpersonal processes:

integrative bargaining and cognitive flexibility (Raes, Heijltjes, Glunk, and Roe, 2011).

Integrative bargaining refers to the extent to which mutual influencing processes in TM-MM interaction are characterized by seeking common and complementary interests benefitting both parties (Fisher, Ury, and Patton, 2011; Walton and McKersie, 1965). Cognitive flexibility refers to the extent to which the information exchange between the TMs and MMs is characterized by embracing diverse perspectives, being able to change opinions, and developing a large variety of interpretations (Martin and Anderson, 1998; Spiro, Feltovich, Jacobson, and Coulson, 1992). Recent research posits that vertical interactions characterized by these two qualities could generate benefits such as reduced information asymmetries, improved resources allocation, and interest alignment (Bouquet and Birkinshaw, 2008a; Raes et al., 2011; Shimizu, 2012).

Research has remained equivocal about whether vertical TM-MM interactions influence positively or negatively the impact of horizontal knowledge exchange on learning and strategy making. Some scholars have argued that their interplay is beneficial for learning and strategy making (Nonaka, 1994; Schulz, 2001) while others have highlighted potential trade-offs between horizontal and vertical interpersonal processes (Balogun and Johnson, 2004). Our research seeks to advance the ambidexterity literature by revealing a more fine grained set of boundary conditions related to vertical interactions on the utility of MMs' horizontal exchanges for unit ambidexterity (Birkinshaw and Gupta, 2013; Raes et al., 2011).

We collected multisource data from TMs and MMs in 148 direct reporting relationships in twelve publicly listed central European manufacturing and service organizations to test our hypotheses. We find that the horizontal exchange of knowledge between MMs positively relates to unit ambidexterity. Interestingly, integrative bargaining among TMs and MMs strengthens these horizontal effects, whereas cognitive flexibility in vertical interpersonal processes – contrary to our

expectation – weakens them. Overall, our study provides much needed theoretical understanding and empirical validation of the mechanisms underpinning managers’ personal interactions in strategy formation and learning (Floyd and Lane, 2000; Raes et al., 2011).

4.2 Theory & Hypotheses

4.2.1 Unit Ambidexterity and Middle Managers’ Interactions

An ambidextrous strategic orientation increases a unit’s performance by enabling the focal unit to innovate and adapt, yet realize the benefits of incremental learning and process improvements (Gibson and Birkinshaw, 2004; Jansen et al., 2012). This is increasingly important in times when competition occurs at the unit level, which urges large firms to pass responsibilities to act ambidextrously to their units (Gatignon, Tushman, Smith, and Anderson, 2002). However, ambidexterity is difficult to achieve for a business unit (Boumgarden et al., 2012). The main reason is that a simultaneous pursuit of exploration and exploitation demands addressing inherent tensions between the two (Gupta et al., 2006; Lavie, Stettner, and Tushman, 2010). Exploitation demands an administrative, cost-reduction mindset, thrives in formal and mechanistic structures and systems, relies on risk-averse behaviors, and produces short-term, certain results (March, 1991; Raisch, 2008). Conversely, exploration is associated with an entrepreneurial and growth mindset, loose and adaptive structures and systems, risk-seeking behaviors, and long-term, uncertain results (O’Reilly & Tushman, 2004).

Both exploration and exploitation have self-reinforcing tendencies (Levinthal and March, 1993; March, 1991). Hence, units run the risk of not achieving ambidexterity due to accelerating cycles of exploitation or exploration. They might fall into the competence (success) trap – i.e. conducting exploitation at the expense of exploration reducing the ability to adapt to changes in the

marketplace – or into the renewal (failure) trap – i.e. endlessly exploring without realizing any benefits (Levinthal and March, 1993; Wang and Li, 2008). MMs can benefit from horizontal knowledge exchange in order to prevent their unit from falling into a trap of accelerating exploitation or exploration cycles – by strengthening exploratory initiatives when their unit tends towards the success trap or by boosting exploitation when the failure trap looms (Levinthal and March, 1993). As MMs of different units have access to different pools of information, their lateral personal interactions are crucial to exchange, connect, interpret, and integrate insights and best practices of other units for balancing exploration and exploitation in their own unit.

Moreover, theory on business unit ambidexterity emphasizes the need for MMs to reconcile the tensions between exploration and exploitation and to treat the two as complementary learning trajectories rather than competing ones (Gibson & Birkinshaw, 2004; Martin, 2007; Smith, 2014). Scholars have noted that balancing unit exploration and exploitation requires difficult-to-develop managerial competencies such as integrative or paradoxical thinking (Martin, 2007; Smith and Tushman, 2005). To develop these competencies MMs cannot rely exclusively on their own experience. Indeed, numerous studies have shown that MMs' key role in shaping their business unit's strategic and learning orientations depends most notably on their interactions with other parts of the organization (e.g., Ahearne, Lam, and Kraus, 2014; Nonaka, 1994; Wooldridge et al., 2008). Interacting with colleagues from different backgrounds can provide novel ideas that the focal MMs can apply to harness challenging contradictions in their own unit (Martin, 2007).

In sum, unit ambidexterity can be associated with different, frequently opposing learning tendencies and strategic challenges for MMs in charge of units. Birkinshaw and Gupta (2013) have emphasized that resolving tensions between exploration and exploitation and treating them as complementary demands managerial processes and competencies, yet that insights into the nature and

effectiveness of competencies in fostering ambidexterity at different levels are scarce. For unit ambidexterity to thrive, MMs' ability to find remedies to accelerating cycles of exploration and exploitation and expertise in resolving the underlying tensions are important (Smith, 2014).

Horizontal knowledge exchange among MMs of different units is expected to foster unit ambidexterity by enabling units to better balance or rebalance exploration and exploitation activities, and to develop managerial competencies that enable integrating both types of activities.

Past success leads to increased commitment to the strategic positions, competencies, products and markets associated with that success, even if the competitive context of a business unit demands renewal (March, 1991; Tripsas and Gavetti, 2000). Horizontal knowledge exchange can help MMs avoid this competence trap by alerting and convincing them that exploration is needed and feasible, and by enabling the unit to nurture the needed renewal trajectories. Access to knowledge, information, and ideas from their counterparts in other units with experience in different markets and technologies (Hansen, 1999, 2002) increase MMs' awareness of new developments in technological, market, and competitive domains which may affect their own units (Mom et al., 2007). This awareness may provide early warning to convince MMs of the urgency of exploration in their own unit. The risks of exploration can be reduced and action feasibility enhanced through potential cooperative actions with other units such as co-development, cross-fertilization, tapping into ongoing trial and error learnings (Galunic and Eisenhardt, 2001; Tsai, 2001), or joint acquisition of complementary assets (Taylor and Helfat, 2009). Finally, horizontal knowledge exchange can also help making sense of tacit knowledge to overcome its stickiness and make it accessible for unit members (Nonaka and von Krogh, 2009; Szulanski, 1996). Such knowledge transfers and integration processes are particularly relevant in developing radically new unit competencies (Leonard and Sensiper, 1998; Zhou and Li, 2012).

Beyond the risk of success trap, business units also risk falling into the failure trap. Most innovative efforts tend to fail and as a result search efforts are intensified (Levinthal and March, 1993). Before trying other uncertain new ideas, MMs can use horizontal exchanges to search for proven knowledge or business models in other units (Hansen, Mors, and Lovas, 2005). Horizontal exchanges provide a medium for MMs to showcase and get early feedback on their unit's discoveries from other unit experts (Nahapiet and Ghoshal, 1998), thereby reducing the economic and technological risks of exploration. Moreover, horizontal knowledge exchanges between line and staff functions can help MMs integrate other functions' logics. To illustrate, understanding various units' cost structures can facilitate implementing effective cost management systems (Byrne and Pierce, 2007; Nulty, 1992), which allow units to reap the benefits of new product development (Sathe, 1982).

In addition, horizontal knowledge exchange improves MMs' integrative thinking, which refers to synthesizing and recombining the elements underlying conflicting strategic thrusts (Martin, 2007). When MMs are exposed to new ideas and uncomfortable complexity when collecting new knowledge horizontally (Schulz, 2001), they are likely to learn to integrate – rather than discard – relevant, yet challenging factors that cause tensions or which may be outside their own expertise. Thus, they can develop a clearer understanding of the causality of tensions (Martin, 2007). Increased breadth (variety) of MMs' knowledge helps them appreciate a broad range of interests, viewpoints, and emotional tones (Brass, Galaskiewicz, Greve, and Tsai, 2004). MMs achieve a more holistic understanding of the ambidexterity challenges in their units and can thus devise more appropriate solutions. Indeed, Pappas and Wooldridge (2007) show that MMs spanning unit boundaries are more likely to devise and try divergent, innovative solutions to balance and integrate exploration or exploitation activities in their units.

Hypothesis 1: Horizontal knowledge exchange is positively related to unit level ambidexterity.

4.2.2 Horizontal and Vertical Interpersonal Processes

Horizontal knowledge exchange on its own may not be always sufficient to foster unit ambidexterity. It is important for MMs to have the resources for leveraging ideas and best practices sourced horizontally and the autonomy for deciding to what extent exploratory and exploitative activities are pursued (Gatignon et al., 2002; Tushman and O'Reilly, 2013). Exploration and exploitation not only produce different outcomes, but they are conflicting activities because they demand different resources (Bledow, Frese, Anderson, Erez, and Farr, 2009; Gupta et al., 2006; Levinthal and March, 1993). Thus, adequate resourcing at the unit level is essential to implement best practice or competence that MMs become aware of horizontally. Adequate resourcing generally depends on the consent of TMs.

Furthermore, to implement best practices and novel ideas sourced horizontally, MMs and TMs need to collectively make sense of complex, ambiguous information, and to mutually influence each other to make decisions and conduct activities that seem opposing to each other in terms of mindset and allocation of resources (Raes et al., 2011). TMs have the authority to allocate organizational resources to some units to implement new knowledge acquired horizontally (Bower, 1970; Mantere, 2008; Noda and Bower, 1996). TMs also validate and legitimize new ideas and give MMs adequate autonomy to implement them (Shimizu, 2012).

In terms of vertical interpersonal processes we focus on integrative bargaining (Edmondson, 2003; Sebenius, 1992) and cognitive flexibility (Martin and Rubin, 1995), which have been highlighted by research on information processing and personal interactions as critical to the effectiveness of TM-MM interactions (Raes et al., 2011).

Integrative bargaining. The effects of horizontally exchanging and combining knowledge on unit ambidexterity can be strengthened by vertical integrative bargaining in TM-MM interactions. As noted, integrative bargaining refers to TM-MM interaction characterized by pursuing complementary interests and seeking joint-value (Raes et al., 2011).

First, integrative bargaining increases the odds of MMs obtaining adequate resources to implement new ideas – acquired horizontally – for both exploration and exploitation (Wilson and Doz, 2012; Gupta et al., 2006). These new ideas still need to be linked to the overarching organizational strategy to achieve better integrative coordination and resource allocation among various units, and reduce unnecessary resource duplication or harmful inter-unit competition (Tsai, 2002). Moreover, slack resources are necessary to absorb new knowledge and integrate it with existing knowledge (George, Kotha, and Zheng, 2008) and for trial-and-error learning (Rerup and Feldman, 2011). While TMs may be inclined to reduce slack to boost short-term profits or redistribute to other more needy parts of the organization (Foss, Foss, and Nell, 2012), integrative bargaining enables TMs to explain the pressure for reducing slack resources and gives MMs an opportunity to convince their bosses why it is in the overall organization’s best interest to maintain slack in their unit and give MMs the autonomy to redeploy these resources based on knowledge acquired through horizontal interactions (Huy, 2001; Kraatz & Zajac, 2001).

Second, presumed best practices can be scrutinized and refined in light of unit operating idiosyncrasies. Through integrative bargaining, vertical exchanges between top and MMs validate and enrich knowledge acquired in horizontal exchange; open dialogue on the relevance and utility of new knowledge reduces doubt and risk of acceptance and implementation (Schulz, 2001: 661; Shamir, House, and Arthur, 1993). Potential knowledge transfer problems (Szulanski, 1996) can be mitigated with the help of TMs. As new ideas need to be framed and legitimized to obtain collective support through a MM’s unit, collective

sensemaking of problems and solutions with TMs can help increase MMs' self-confidence and motivation (Weick, 1995) to deal with the tensions between exploration and exploitation (Smith and Tushman, 2005; Martin, 2007). Legitimizing support from TMs also helps MMs reassure their subordinates that ambidextrous activities are beneficial to the future of the unit and likely increase their job security (Huy, 2002). TMs' validation thus generates confidence among MMs and their employees and emboldens them to act on the exchanged knowledge (Hansen, 1999).

Third, integrative bargaining enables MMs to obtain adequate autonomy from TMs so that they can prioritize strategic activities as per best practice learned from other units, adapt them to their units' idiosyncrasies, and accordingly refocus on exploration and/ or exploitation. This oftentimes involves making select changes in work processes, incentives, structures and systems, and MMs need sufficient unit autonomy to implement exploration and exploitation activities effectively (Huy, 2001; Smith, 2014; Shimizu, 2012). Integrative bargaining with TMs can help resolve disputes with other units' leaders about contentious issues such as mandate to develop new ideas or sharing of intellectual property development costs (Raes et al., 2011), thus freeing more time to MMs to focus on maintaining a dynamic balance between exploration and exploitation.

Hypothesis 2: The positive relationship between horizontal knowledge exchange and unit ambidexterity is moderated by TM-MM interpersonal processes characterized by integrative bargaining in such a way that it is stronger high when integrative bargaining is high.

Cognitive flexibility. Cognitive flexibility in the interaction of TMs and MMs refers to both parties listening to and embracing different perspectives, being able to change opinions, and developing a large variety of interpretations and solutions (Martin and Anderson, 1998; Raes et al., 2011). Hence, we argue that cognitive flexibility in the interaction between top and MMs strengthens the

impact of horizontal knowledge exchange by enhancing MMs' horizontally-sourced ideas to balance exploration and exploitation (Levinthal and March, 1993) and by increasing MMs' awareness of tensions associated with unit ambidexterity.

Open and generative discussions with TMs also promote creativity and paradoxical cognition, which are vital to developing new solutions to organizational tensions (Smith and Tushman, 2005). TMs interact with MMs from various units and can garner a wide and varied knowledge base of various challenges and best practices related to managing various units' ambidexterity. For example, MMs can combine insights from their peers as to how tensions in their unit may be managed with TMs' knowledge of organizational culture and competencies and their experience e.g. in modifying systems and processes to manage a dual learning orientation (Smith and Tushman, 2005). Furthermore, cognitive flexibility could reinforce the benefits of horizontal knowledge exchange because TMs can provide MMs with advice, direction, and help sustain momentum when a unit faces complexities and difficult choices (Kownatzki, Walter, Floyd, and Lechner, 2013). TMs' broad knowledge base allows them to compare and contrast different units' operational challenges and enable a more informed, customized, and rich discussion with the focal unit's MM. MMs might benefit from TMs' comprehensive knowledge in evaluating alternative paths that blend exploration and exploitation (Buyl, Boone, Hendriks, and Matthyssens, 2011). Thus, by leveraging both their own and TMs' knowledge bases, MMs refine and increase the quality of knowledge obtained from other units in the organization. They can better leverage organizational competencies to integrate complex organizational processes and recombine the contradictory forces of exploration and exploitation (Crossan and Hurst, 2006; Gebert, Boerner, and Kearney, 2010).

While MMs may sense new opportunities for their units and obtain novel insights through horizontal interaction with his or her peers (Taylor and Helfat, 2009), the underlying ideas, options, and constraints need to be filtered, assessed,

and related to wider organizational strategies (Schulz, 2001). As vertical exchanges with cognitive flexibility between TMs and MMs validate knowledge acquired in horizontal exchange, some uncertainties can be resolved (Schulz, 2001). MMs become more confident in implementing new knowledge acquired from other units' MMs to balance exploration and exploitation.

Hypothesis 3: The positive relationship between horizontal knowledge exchange and unit ambidexterity is moderated by TM-MM interpersonal processes characterized by cognitive flexibility in such a way that it is stronger high when cognitive flexibility is high.

4.3 Methods

4.3.1 Sample and Data Collection

The proposed direct relationships and moderation effects were tested among a sample of business units of twelve publicly listed European manufacturing and service organizations. The units are responsible for competing in their respective strategic domains with the product lines or services they offer. In order to obtain multisource data two surveys were developed. They targeted as the respondents TMs (e.g., CFOs, COOs, EVPs, SVPs), who are top management team or executive committee members, and a subset of MMs responsible for a unit. The latter reported directly to one of the TMs. MMs are defined as positioned two or more levels below the CEO and at least one level above first line supervisors (Huy, 2002), i.e. they "supervise supervisors and are supervised by others" Dutton and Ashford (1993: 398). We approached TMs and HR managers to obtain individual contact data for TM-MM 'pairs.' We collected the data pertaining to MMs' horizontal knowledge exchange and the vertical TM-MM interpersonal processes from MMs because these interactions can better be judged by the less powerful exchange participants (Sethi, Iqbal, and Sethi, 2012). To separate the collection of data on the independent and dependent variables as to

mitigate common method biases (Podsakoff and Organ, 1986), TMs reported on the ambidexterity measure and provided objective data for factual control variables.

The focal organizations are listed on major European stock exchanges and active in a diverse range of manufacturing and service industries such as automobiles, aviation, consumer goods, media, mining, and IT. According to interviews with the TMs all studied units are confronted with pressures to explore due to changes in technologies, competition, customer demands, and regulation, and thus face pressures to exploit due to short term competitive and shareholder pressures demanding an increased focus on efficiency and emphasizing the importance of economies of scale (cf. Banker, Chang, and Natarajan, 2005, Barnett and King, 2008). The sample includes units that vary substantially in terms of age and size. To ensure confidentiality, we agreed not to reveal any survey results from MMs to their TMs and had the completed surveys returned to us independently by both TMs and MMs, i.e. without interference of corporate or human resource management.

The survey was digitally administered and sent to 366 MMs and 175 TMs of whom 191 and 108, respectively, responded. Pair-wise deletion of cases due to incomplete top-middle manager pairs or due to missing values resulted in a final sample of 148 units, represented by 148 MMs and 87 TMs, some of whom reported on multiple units under their span of control. These usable responses correspond to effective response rates of 40.4 percent and 49.7 percent, respectively. To test for non-response bias we examined differences between units for which responses were available and for which none were received. T-tests revealed no significant differences ($p < 0.05$) between responding units and units for which no response was received in terms of unit size, unit age, and industry. This indicates that the distribution of the units from which responses were available does not significantly deviate from the population's distribution. With the assumption in mind that those who responded late may be similar to non-respondents

(Armstrong and Overton, 1977) we also compared responses of early and late responding units (before and after 5 weeks) in terms of our focal variables and found no significant differences (t-test; $p < .05$) between these groups.

Measures and validation. Wherever possible, existing measures of constructs were used. For the new measures a pool of items was created based on the existing literature. Pre-testing in one manufacturing and one service organization was used to optimize the survey instruments according to established procedures (Groves, Fowler, Couper, Lepkowski, Singer, and Tourangeau, 2004). The authors ascertained if the measures covered the construct domain. As part of the pre-testing in-depth interviews were held with seven of the TMs and nine MMs to gauge their interpretation of the items in each measure. These interviews generated valuable feedback to revise and refine the questionnaire before administering it to the full sample. We refrained from using including political statements which may evoke biased or socially desirable responses (Buchanan and Badham, 2008). The traditionally used control variables pertaining to unit size, age, industry, and the unit context in terms of dynamism and centralization are included in this research (Lechner and Floyd, 2012; Mom et al., 2009).

Unit ambidexterity. To measure unit ambidexterity, we adopted a two-step approach that has been used by other scholars (Cao, Gedajlovic, and Zhang, 2009; Lubatkin et al., 2006). First, we asked TMs to assess the extent of exploration and exploitation activities that specific units under their span of control engaged in. The seven items for exploration as well as seven items for exploitation were taken from Jansen and colleagues' (2012) business unit level study. Each top manager was instructed to rate exploration and exploitation activities on a seven-point scale (1 = 'strongly disagree' to 7 = 'strongly agree') for a specific unit led by MM "A" (and, if applicable, also for a second unit led by MM "B"). Sample exploration items include: "this unit accepts demands that go beyond its existing products and services", "this unit frequently utilizes new opportunities in new

markets (internally, if applicable)", and "this unit regularly searches for and approaches new clients or (internal) stakeholders." Sample exploitation items include: "this unit frequently refines the provision of its existing products and services", "this unit regularly implements small adaptations to existing processes, products, or services", and "this unit increases economies of scales in existing markets."

We performed exploratory and confirmatory factor analyses to check for convergent and discriminant validity of the two scales. Exploratory factor analysis with Varimax rotation with all 14 items revealed that two scales with seven items each could be constructed; Eigenvalues for each factor were greater than one, all items loaded on their appropriate factors at greater than .7, and no cross-loadings exceeded .4. The exploration ($\alpha = .97$) and exploitation ($\alpha = .98$) scales are both highly reliable. We also conducted confirmatory factor analysis (CFA) to assess discriminant validity of the constructs. Results indicate that the two-factor model fits the data well: NFI = .984; CFI = .992; and RMSEA = .085. Moreover, comparing a one-factor model with a two-factor model indicates a significant improvement in fit ($\Delta\chi^2$ significant at $p < .001$) serving as evidence for discriminant validity (Bagozzi and Phillips, 1982).

In existing research exploration and exploitation are combined to form an ambidexterity measure (Gibson and Birkinshaw, 2004; He and Wong, 2004; Lubatkin et al., 2006). Accordingly, the second step in constructing the measure for ambidexterity at the unit level involves multiplying the exploration and exploitation measures. We follow Gibson and Birkinshaw's study at the unit level in terms using the multiplicative interaction approach (see also Cao et al., 2009; Mom et al., 2009).

Horizontal knowledge exchange. We used the scale of Collins and Smith (2006) in order to measure knowledge exchange with a seven item scale ($\alpha = .96$). It reflects both the ability and motivation of managers to exchange and combine knowledge across different units (Argote, McEvily, and Reagans, 2003; Martin and

Eisenhardt, 2010). The items pertaining to the horizontal interaction of MMs across different units were measured on a seven-point Likert scale (1 = 'strongly disagree' to 7 = 'strongly agree'). Sample items asked the MMs about the extent to which they "exchange and combine ideas with colleagues across different units," "feel that at the end of the day we learn from our colleagues by exchanging ideas," are capable of sharing and transferring expertise to bring new projects or initiatives to fruition," and "are proficient at combining and exchanging ideas across this BU in order to solve problems or create opportunities."

Integrative bargaining. The integrative bargaining construct captures the extent to which the interaction of TMs and MMs is characterized by seeking joint value creation (Raes et al., 2011). The measure was based on Bazerman, Magliozzi, and Neale (1985) and further refined based on Sebenius (1992) and Schurr and Ozanne's (1985) work on integrative interactions. The six item scale assesses on a seven point Likert-scale (1 = 'strongly disagree' to 7 = 'strongly agree') joint value creation at the TM-MM interface, i.e. the extent to which objective criteria and organizational interests rather than personal positions and problems are at the heart of negotiation and discussion when TMs and MMs interact (Lax and Sebenius, 1986; Sebenius, 1992). Cronbach's alpha indicated good reliability ($\alpha = .87$) and the scale was constructed based on the mean of the six items. Specifically, the items measure the degree to which TMs and MMs' interaction is characterized by "focusing on interests and not positions," "focusing on inventing options for mutual gain," "insisting on objective criteria for evaluation of performance," "focusing is set on cultivating shared interests," "searching for opportunities to leverage resources effectively," and "dovetailing or reconciling differences."

Cognitive flexibility. The original cognitive flexibility scale of Martin and Rubin (1995) was used and adapted to the TM-MM interaction context. We used a seven point Likert-scale (1 = 'strongly disagree' to 7 = 'strongly agree') and dropped items that were related less to a work and more to a general "real life" context (Martin and Rubin, 1995: 624). The remaining seven items of the cognitive

flexibility scale ($\alpha = .90$) assess the extent to which the interaction between the responding MM and the manager he/she reports to is characterized by (a) dialogue about and awareness of multiple options and alternatives in the situation or problem at hand, (b) willingness to be flexible, to work on creative solutions, and adapt to the situation, and (c) self-efficacy and confidence in being flexible (Martin and Rubin, 1995). The items capture the extent to which TM-MM interaction is characterized by “communication of ideas in many different ways,” “willingness to work on creative solutions to problems,” “the ability to act appropriately in any given situation,” “behaviors as a result of conscious decision-making,” “having many possible ways of behaving in any given situation,” “willingness to listen and consider alternatives for handling a problem,” and “having the self-confidence necessary to try different ways of behaving.”

Control variables. To mitigate effects attributable to unit characteristics, the organizational context, and MMs’ competences we included several control variables directly in the multivariate analyses. The literature suggests that unit level features such as size and age may affect the pursuit of exploration and exploitation within each unit (Hill and Birkinshaw, 2012; Lechner and Floyd, 2012; Wang and Li, 2008). As units increase in size they can be expected to have a wider range of options to leverage their ambidexterity (Jansen et al., 2012). Conversely, unit age may influence rigidity, formalization, and the ability to adapt in ways that potentially undermine ambidextrous undertakings (Autio, Sapienza, and Almeida, 2000). In this study we measured unit size in terms of the annual revenues of a unit and unit age, i.e. the duration of unit existence, in months. On average, the units had annual revenues of US\$95.5 million (s.d. = 303.7 million) in 2013 and they existed for 32.5 months (s.d. = 40.1 months).

In addition, we included an established eight item dynamism scale (Jansen, Van Den Bosch, and Volberda, 2006) that taps into the degree to which changes occur in the unit’s external environment as well as the extent to which these are unforeseeable ($\alpha = .85$). Sample items include: “In our kind of business,

customers' preferences change quite a bit over time," "it is very difficult to forecast where the technology will be in the next two to three years," and "it is very difficult to predict any changes in the marketplace for our products and services."

Next, we control for centralization as it may constrain creative or integrative processes (Hirst, van Knippenberg, Chen, and Sacramento, 2011). We included the original scale of Aiken and Hage (1968), which was validated by Dewar, Whetten, and Boje (1980) and captures the formal work context in terms of degree of delegation of decision-making authority at the unit level in five items ($\alpha = .91$). Sample items are: "Even small matters have to be referred to someone senior level for a final answer" and "business unit heads have to be consulted before almost anything." We also control for dynamism in the business environment as it has been identified as a factor that provides incentives for achieving higher levels of exploration and/or ambidexterity (Jansen et al., 2012; Uotila, Maula, Keil, and Zahra, 2009).

Finally, we control for psychological safety as this measure captures how MMs perceive the work context in terms of being a climate facilitating the adoption and implementation of innovation (Baer and Frese, 2003). A positive effect of psychological safety on unit ambidexterity can be expected based on Gibson and Birkinshaw (2004) who posit and find that a supportive work context, captured here by MMs' perceived psychological safety, is conducive to unit ambidexterity. The seven items ($\alpha = .92$) adopted from Baer and Frese (2003) capture MMs' comfort to act freely, to take risks, and the perceived degree of support and trust (cf. Gibson and Birkinshaw, 2004). They include "in our BU some employees are rejected for being different (inverted)," "when people in our BU make mistakes, it is often held against them," "no one in our BU would deliberately act in a way that undermines others' efforts," "it is difficult to ask others for help in our BU (inverted)," "in our BU everyone is free to take risks,"

“the people in our work group value others’ unique skills and talents,” and “as a member of our BU one is able to bring up problems and tough issues.”

We ran a factor analysis with all items pertaining to the focal variables, i.e. those measuring exploration, exploitation, horizontal knowledge exchange, integrative bargaining, cognitive flexibility, dynamism, centralization, and psychological safety to assess construct validity. Exploratory factor analysis results (extraction method: principal component analysis; rotation method: varimax with Kaiser normalization) suggest that the measures were constructed appropriately; eigenvalues for each factor exceed one, all items loaded on their appropriate factors at $>.7$, and no item cross-loading was $>.4$. Moreover, using confirmatory factor analyses, comparing a one-factor model with a two-factor model for every pair among the factors showed a significant improvement in fit for each of the 28 pairs ($\Delta\chi^2$ significant at $p < .001$), thus confirming discriminant validity (Bagozzi and Phillips, 1982).

4.4 Analysis & Results

Table 4.1 presents the descriptive statistics and correlations of all variables included in this study. To examine multicollinearity, variance inflation factors (VIF) for each of the regression equations were calculated. VIF factors range from 1.05 to a maximum of 2.44, which is well below the rule-of-thumb cut-off of 10 (Neter, Wasserman, and Kutner, 1990); thus, issues of multicollinearity seem not to be a problem.

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Table 4.2 presents the results of the hierarchical regression analyses for unit level ambidexterity (Models 1, 2, and 3). The upper section of Table 4.2 reports the effects of the control variables and the lower part showcases the effects

of the horizontal exchanges and the moderation effects of the vertical interpersonal processes between TMs and MMs. Model 1 captures the effects of only the control variables. Model 2 adds the variable capturing horizontal knowledge exchange. The moderating effects of integrative bargaining and cognitive flexibility in vertical TM-MM interactions are added in model 3. As expected, the control variables centralization ($\beta = -0.14, p < 0.05$) and psychological safety ($\beta = 0.142, p < 0.10$) have significant negative and positive effects, respectively, although the latter is rather weak. The negative effect of centralization is in line with significant correlations found in studies that linked its effects to similar dependent variables (Hirst et al., 2011; Jansen et al., 2012). The coefficients of the direct effects of integrative bargaining ($\beta = 0.28, p < 0.01$) and cognitive flexibility ($\beta = 0.17, p < 0.05$) are both positive and significant. Each of the three models presents a significant increase in the amount of unit ambidexterity variance explained.

The first hypothesis suggests that the relationship between horizontal knowledge exchange and unit ambidexterity is positive. The results in Model 3 confirm this relationship ($\beta = 0.24, p < 0.01$), thereby supporting *Hypothesis 1*. Next, the second hypothesis anticipates a positive moderation effect of integrative bargaining at the interface of TMs and MMs on the relationship of horizontal knowledge exchange and unit ambidexterity. In Model 3 we find that the interaction coefficient between integrative bargaining and knowledge exchange is positive and significant ($\beta = 0.28, p < 0.01$), thereby supporting *Hypothesis 2* and confirming positive reinforcement among MMs' vertical and horizontal interpersonal processes. Finally, the third hypothesis also suggests a positive moderation effect of cognitive flexibility in interpersonal processes of TMs and MMs on the positive relationship of horizontal knowledge exchange and unit ambidexterity. Surprisingly, we find that in Model 3 the interaction coefficient between cognitive flexibility and horizontal knowledge is negative and significant

($\beta = -0.18, p < 0.1$), thereby not only refuting *Hypothesis 3*, but even providing modest support for a negative moderation effect.

4.5 Discussion

Since Chandler's (1962) seminal work on the multi-business (M-form) structure, a diverse body of research has developed on the management of this type of organizations. In diversified multi-business organizations effective processes that enable organization members to work together – such as knowledge sharing and transfer and the TM-MM interface – are particularly important (Collins and Smith, 2006; Raes et al., 2011; Tsai, 2001). Moreover, achieving ambidexterity at the unit level has been shown to improve a unit's performance by enabling innovation and flexibility that is vital to compete in strategic business domains (Jansen et al., 2012; Smith, 2014), while not missing out on the benefits of experience and efficiency (Gibson and Birkinshaw, 2004).

Research on organizational ambidexterity has theorized about appropriate strategies and structures that might enable firms to simultaneously pursue exploratory and exploitative activities (Lavie et al., 2010; O'Reilly and Tushman, 2004; Raisch and Birkinshaw, 2008). For instance, scholars have suggested that organizations may resolve paradoxical challenges by structurally separating exploration from exploitation across various units, advocating the role of senior leaders (Duncan, 1976; Tushman and O'Reilly, 1996; Smith and Tushman, 2005). This macro approach relies on structural differentiation and senior team integration to buffer the development of new capabilities from existing competencies and activities (Gilbert, 2005; Tushman, Smith, and Binns, 2011). However, organizations that have business units focusing exclusively on exploration or exploitation risk missing out on the performance benefits of unit ambidexterity (Gibson and Birkinshaw, 2004; Jansen et al., 2012).

Another perspective suggests that paradoxical demands can also be tackled effectively within units, which is important as business units are increasingly made accountable to be both more competitive through efficiency and innovation at the unit level (Smith, 2014). Thus, paradoxes and tensions need to be tackled effectively at different hierarchical levels (Andriopoulos and Lewis, 2009; Simsek, 2009). However, ambidexterity at the unit level is not easy to achieve as the tensions between exploration and exploitation are particularly pronounced at lower levels of analysis because within units typically the same individuals involved are in the pursuit of both exploration and exploitation (Simsek et al., 2009) and structural buffers are either impractical or unavailable (Boumgarden et al., 2012). Despite the performance implications of and the challenges in realizing unit ambidexterity, research on its drivers, particularly MMs' interpersonal processes and competencies is scarce (Birkinshaw and Gupta, 2013). Beyond research into BU managers indirect influence through shaping a supportive context for the emergence of unit ambidexterity (Gibson and Birkinshaw, 2004), very little is known about the factors enabling or constraining MMs in overcoming the challenges associated with realizing unit ambidexterity.

Departing from a traditional focus on structural and contextual approaches to ambidexterity, our study focused on the quality of interpersonal processes between two key groups of managers, TMs and MMs. By examining horizontal knowledge exchange among MMs across units and the moderating effects of MMs vertical interactions with TMs through an information processing and interpersonal process perspective (MacNeil, 1974; Raes et al., 2011 Schulz, 2001), we advance the ambidexterity literature by revealing a more fine grained set of boundary conditions related to the impact of integrative bargaining and cognitive flexibility in vertical TM-MM interactions on the utility of MMs' horizontal exchanges for unit ambidexterity. We complement research that has focused on business unit managers' indirect facilitation of ambidexterity by contextual means (Gibson and Birkinshaw, 2004) or dual structures which aim at

separating exploration and exploitation activities at higher levels rather than stimulating a joint pursuit at lower levels (Duncan, 1976; Jansen, Tempelaar, Van Den Bosch, and Volberda, 2009; Tushman, Smith, Wood, Westerman, and O'Reilly, 2010).

Our study suggests that MMs' engagement in horizontal knowledge exchange likely allows for best practice transfers and knowledge flows that improve their units' ambidexterity (Cummings, 2004; Schulz, 2003). We contend that due to the self-reinforcing nature of exploration and exploitation activities (March, 1991), it is pivotal for MMs in charge of units to be aware of and counteract both success and failure traps (Levinthal and March, 1993). Doing so can enable MMs to dynamically balance exploration and exploitation. The empirical evidence confirms these expectations and thus extends not only ambidexterity research with insights at lower levels (Andriopoulos and Lewis, 2009; Birkinshaw and Gupta, 2013), but also the literature on the impact of cross-unit knowledge sharing (e.g., Ancona and Caldwell, 1992; Hansen, 2002; Brass et al., 2004).

We find strong evidence for a positive moderation effect of integrative bargaining on the relationship of knowledge exchange on unit ambidexterity. Exchanging and combining ideas horizontally can be complemented by engaging in integrative bargaining to validate these ideas and obtain resources and autonomy to implement them (Bower, 1970; Mintzberg and Waters, 1985; Noda and Bower, 1996). In all likelihood MMs often need to compete with their peers in charge of other units for resources and support from TMs to realize their unit's goals (Bouquet and Birkinshaw, 2008a; Burgelman and Grove, 2007; Dutton and Ashford, 1993). Thus, the interaction of integrative bargaining and knowledge exchange enables a higher level of ambidexterity within units.

Surprisingly, contrary to our third hypothesis, we found a negative (rather than a hypothesized positive) interaction effect among cognitive flexibility in vertical exchanges and horizontal knowledge exchange. Intriguingly, cognitive

flexibility in vertical interpersonal processes weakens the positive relationship between horizontal knowledge exchange and unit ambidexterity. The effects of the two qualities related to vertical interpersonal processes thus seem to work through different mechanisms.

Raes and colleagues (2011) contend that vertical interface mechanisms are a panacea in organizational strategy formulation and implementation without considering the joint effects of vertical and horizontal interpersonal processes. Their conceptual model does not fully acknowledge that MMs might find it difficult to effectively use both their boundary-spanning horizontal and vertical interactions in parallel (Balogun and Johnson, 2004; Huy, 2001). As such, Raes and colleagues' (2011) model might be too idealistic in that no potential dysfunctional cognitive or emotional effects are considered. Although we have initially hypothesized a positive reinforcing effect of vertical interaction on horizontal interpersonal processes in fostering unit ambidexterity, the significant negative moderation effect forces us to reflect more deeply: What explains the downsides of cognitive flexibility in TM-MM relations, thereby reducing the positive effect of horizontal knowledge exchange? Given the challenges in realizing unit ambidexterity, we considered three different socio-cognitive mechanisms that could explain this surprising finding.

First, social network research suggests that unique knowledge sources that reside in the network of MMs may provide more valuable insights than TM sources known and shared by all organization members (Burt, 1992; Granovetter, 1973). The value of best practices tapped through horizontal knowledge exchange among MMs could be undermined by generating and evaluating too many alternatives through cognitive flexibility in vertical interactions. To the extent that bounded cognitive processing among MMs is acute (Leroy, 2009; Simon, 1957), gathering knowledge both horizontally and vertically may cause information overload, confusion, slowed action or inaction due to considering too many alternatives. To the extent that the issues considered are complex and time

consuming, intense cognitive processing of one issue reduces the attention processing, time, and energy to investigate other complex issues as thoroughly (Leroy, 2009). Not every bit of information will be equally relevant; redundant information or incompatible solutions complicate interpretation and assimilation in the focal unit (Cohen and Levinthal, 1990). In sum, trying to assimilate knowledge gathered from both vertical and horizontal interactions can increase information overload and impair cognitive processing, which reduces task performance (Kanfer and Ackerman, 1989). Moreover, gaps and inconsistencies between what TMT members advise and what MMs deem as appropriate for their units based on their horizontal exchange with colleagues are not uncommon (Huy, 2002, 2011).

Second, high cognitive flexibility in vertical exchange combined with high horizontal knowledge exchange could also create a felt obligation to implement TMs' ideas and thus exacerbate role conflict (Kahn, Wolfe, Quinn, Snoek, and Rosenthal, 1964; Katz and Kahn, 1978). The value of different ideas from multiple sources may not only be hard to ascertain, but even create more tensions for MMs (Floyd and Lane, 2000). Social-psychological research has shown that higher levels of boundary-spanning can lead to higher levels of role overload and role conflict (Kahn et al., 1964; Katz and Kahn, 1978). Based on their interactions with MMs, through cognitive flexibility TMs may establish more ambitious performance objectives for MMs when they perceive new market opportunities and potential room for stretching MMs' efforts (Walker, Churchill, and Ford, 1975). TMs' increased pressure on MMs not only creates more tensions among MMs, but likely prompts them to become more risk averse in considering knowledge gathered horizontally, potentially introducing a bias towards exploitation. To exacerbate matters further, to protect themselves MMs may become more reticent to exchange knowledge freely with their MM peers as they might become afraid that their colleagues might compete covertly and share incomplete or low value knowledge with them so as to maintain a higher performance for their own units

(Ellemers, De Gilder, & Haslam, 2004). Risk averse, defensive behaviors manifested in the usual Not-Invented-Here arguments are likely to proliferate and reduce exploration (Tortoriello, Reagans, & McEvily, 2012; Katz and Allen, 1982), and thus ambidexterity.

Third, to the extent that unit MMs feel threatened by TMs' evaluating their abilities and performance when interacting with them, they may interpret TMs' advice and involvement through cognitive flexibility as too much patronizing and interference in their autonomous management (Deelstra, Peeters, Schaufeli, Stroebe, Zijlstra, & van Doornen, 2003; Hackman, 1987), and worse, as a manifestation of distrust in their own abilities (Burke, 1986; Culbert & McDonough, 1986). Such distrust reduces MMs' confidence in horizontal knowledge exchange, fearing that TMs are monitoring closely the horizontal knowledge exchange and evaluating units who seem to have better practices than others. These perceived threats likely reduce MMs' unfettered horizontal sharing of quality knowledge on the sender's side and increase defensive behavior to dismiss the sender knowledge as not good or appropriate for the unit on the receiver side. As a result, MMs' knowledge and confidence to deal with various tensions associated with exploration and exploitation are reduced (Smith & Lewis, 2011).

Nevertheless, our findings also validate beneficial direct effects of both vertical interpersonal processes, consistent with prior works (Bouquet and Birkinshaw, 2008a; Raes et al., 2011; Schulz, 2001). The direct influence of integrative bargaining processes among TMs and MMs can be ascribed to MMs ability to openly voice to TMs their concerns about seemingly inconsistent activities and goals within their respective units, and based on their local and more textured knowledge of product-markets and business unit operations, ask their superiors for adequate autonomy to decide upon the appropriate proportion of exploration and exploitation activities and the appropriate resources so that

they can be performed effectively during any given time period (Gibson and Birkinshaw, 2004).

Moreover, managing ambidexterity within units involves identifying and understanding various tensions and contradictions, many of which can appear unfamiliar and unexpected to both TMs and MMs (Raes et al., 2011; Smith and Tushman, 2005). Cognitive flexibility in the interaction between top and MMs should facilitate recognizing the tensions between exploration and exploitation and seeking new combinations among the related activities (Martin, 2007; Tushman et al., 2011). Open and generative discussion promotes creativity and paradoxical thinking, which are vital to developing solutions to these challenges (Marginson, 2002; Foldy, Goldman, and Ospina, 2008; Smith, 2014; Smith & Tushman, 2005). These results suggest that for facilitating unit ambidexterity, cognitive flexibility in vertical exchanges may need to be used with caution, if MMs are also engaging in horizontal knowledge exchange.

This implies that cognitive flexibility on its own may be an alternative to horizontal knowledge exchange as TMs can also provide MMs with advice (Kownatzki et al., 2013), e.g. in form of behavioral solutions as to how the conflicting logics and the bi-polar nature of hosting exploration and exploitation activities within a unit can be addressed (Simsek et al., 2009). MMs might benefit from TMs' generalist experience in identifying alternative paths that blend exploration and exploitation (Buyl, Boone, Hendriks, and Matthyssens, 2011). By leveraging both their own and TMs' knowledge bases, MMs can integrate complex unit processes and recombine the contradictory forces of exploration and exploitation more proactively (Crossan and Hurst, 2006; Gebert et al., 2010).

As such, our study tentatively suggests important managerial implications for the management of unit ambidexterity. TMs of large, diversified firms should encourage both TM-MM interactions characterized by joint value creation and horizontal knowledge exchange among MMs to foster blending the paradox of efficiency and innovativeness at the unit level. Given that we find a negative

interaction effect of cognitive flexibility in vertical exchanges and horizontal knowledge exchange, cognitive flexibility needs to be nurtured and employed more selectively than the other interpersonal processes. Furthermore, the results imply that future research on self- and team-efficacy (Bandura, 1997; Gully, Incalcaterra, Joshi, and Beaubien, 2002) could explain differences in when and how units deal with contradictions. Members of efficacious teams are more committed and confident towards the tasks they face (West, Patera, and Carsten, 2009) and thus are more likely to exert increased efforts in embracing challenging contradictions or opposing courses of action – even when receiving different signals and advice both TMs and MMs.

Both TMs and MMs can reduce the negative effects of cognitive flexibility on horizontal knowledge exchange by exercising restraint in overdoing strategic analysis and knowledge acquisition and processing. More broadly, providing autonomy for MMs and a honest assessment of resource allocation choices are important parts of a constructive debate between TMs and MMs, and this is vital in nurturing efficiency and variance reduction as well as variance increasing, experimental activities (Gupta et al., 2006). Hence, it is important that MMs can be honest and defend their units' interests openly with TMs and do not simply comply to their leaders' wishes because they feel insecure or micro-managed (Alvesson and Sveningsson, 2003). MMs' horizontal interaction can be strengthened by seeking resources and reassurance (Huy, Kraatz, and Corley, 2014) through integrative bargaining with TMs.

4.5.1 Boundary Conditions

More decentralized organizational structures (Burgers, Jansen, Van Den Bosch, and Volberda, 2009) and units dispersed globally (Cannella, Park, and Lee, 2008) with autonomy and managerial discretion means that strategic responsibility is passed to MMs (Takeuchi, Shay, and Jiatao, 2008). As this happens the interpersonal processes between TMs and MMs become more

important. When organizations increase in size and diversify it is natural for asymmetries of information and interests to spike as well as for temporal and physical constraints to arise, making contact between TMs and MMs rarer and more challenging (Bouquet and Birkinshaw, 2008a; Hambrick, Finkelstein, and Mooney, 2005; Tengblad, 2002). Furthermore, as TMs' attention for individual MMs decreases in large, diversified organizations, the latter may start to engage in political behaviors that could undermine mutual trust and effective interaction (Bouquet and Birkinshaw, 2008b; Raes et al., 2011). As such, our model of vertical and horizontal interpersonal processes is particularly relevant for large global firms consisting of many different divisions and units – not only from the perspective of leveraging competencies and resources within MMs' units, but also in order to forestall dysfunctional political behaviors.

4.5.2 Limitations and Future Research

Although our study was designed to avoid some threats to its validity, it does not come without limitations. As the data is cross-sectional, it does not capture causality. Based on the logic of the necessity of information, top management attention, and resource access for the realization of ambidexterity at the unit level in large diversified organizations, the assumption is made that vertical and horizontal interface mechanisms are drivers of ambidexterity. However, it cannot be ruled out that MMs who are in more ambidextrous units interact more openly or at least differently with their superiors than MMs who lead less ambidextrous units. A longitudinal research design would be preferable to uncover the causal effects with certainty and it could potentially also capture mediators that help us understand better how, i.e. through which mechanisms – information, attention, resources, skills, or possibly motivational ones – the vertical and horizontal interpersonal processes influence the simultaneous pursuit of exploration and exploitation.

Second, while our study displays some generalizability as the sample covers several leading European manufacturing and service firms, and we did control for the industry types as well as the level of dynamism in the business environment and the overarching work context, other firm or country specific effects cannot be ruled out. These limitations provide avenues for future research. In addition, cross-level research could illuminate how unit level ambidexterity aggregates into higher level performance outcomes, i.e. the financial, growth, and innovation performance of the whole organization. This could help assess whether the benefits outweigh the costs associated with implementing the complex systems and processes that nurture ambidexterity at lower levels. Arguably, given limited time, attention, and information processing capacity of managers at all levels, there should also be limits to the extent to which horizontal interactions are beneficial. If these limitations are not understood and managed actively, paralysis by analysis may result and delay even simple, exploitative projects – assuming that less dialogue is needed for well-defined and less uncertain exploitative projects than for explorative projects (March, 1991). This warrants specifically studying the utility of MMs interpersonal processes in the execution of different projects.

Third, although unit ambidexterity refers to the synchronous pursuit of both exploration and exploitation within a business unit, some research seems to point out that the proportion between exploration and exploitation activities may need to vary across different units of an organization depending on the industry in which each unit operates (Nagji & Tuff, 2012); this proportion shifts as the industry evolves (Jansen et al., 2006). For instance, Jansen et al. (2006) and Uotila et al. (2009) showed that when industry dynamism increases a relative increase of exploration delivers better performance. Because MMs are closer to product-market domains and their subordinates' work, they are best placed to assess how their units can undergo change and to what extent their employees can be stretched without breaking their psychological balance and task effectiveness

(Huy, 2002). Hence, MMs should be better equipped than the TMs to make informed decisions about the optimal allocation of efforts towards exploration and exploitation (Jansen et al., 2012; O'Reilly & Tushman, 2008). Thus, it may be worthwhile developing a deeper understanding of the link between MMs involvement in strategy formation through interpersonal processes and both unit fit with the business environment as well as commitment of subordinates to the chosen strategy.

Finally, it may be useful to unpack and analyze the impact of other factors such as different types of skill and motivation, high performance work practices, training and development, or incentive systems at the unit level (Kang and Snell, 2009; Patel, Messersmith, and Lepak, 2012; Prieto and Santana, 2012). These factors have been shown to relate to ambidextrous behaviors at the firm level, and need to be investigated whether they are equally applicable at lower levels of the organization (Becker and Huselid, 2006). Knowing this could generate useful managerial guidance to decision-makers in large global firms that use increasingly decentralized structures, pushing down more responsibilities to simultaneously explore and exploit to units or even project teams.

4.5.3 Conclusion

Our empirical study starts to illuminate the interaction of horizontal and vertical interpersonal processes in fostering unit ambidexterity. We thus complement research that has focused on managers' indirect influence ambidexterity at lower levels by means of a supportive context (Gibson and Birkinshaw, 2004). MMs recognize the need to adapt strategic initiatives and manage forces for stability and change within their units; i.e. MMs try to align as far as possible to achieve coherence and stability for the colleagues in their units who desire consistency (Huy, 2002), but they also have to prepare their units for the future - which is pivotal for large global firms as their business units compete in their respective strategic domains. Consistent with research identifying positive

impact of interactions among MMs across business units (Hansen, 1999; Tsai, 2001, 2002), we find that horizontal knowledge exchange fosters unit ambidexterity. We provide evidence that integrative bargaining with TMs reinforces the positive effect of horizontal knowledge exchange on ambidexterity. However, contrary to our hypothesis, cognitive flexibility in vertical interpersonal processes negatively reinforces horizontal knowledge exchange’s impact on unit ambidexterity. Reasons for this interesting revelation may include that high degrees of cognitive flexibility in TM-MM interactions increase MMs’ cognitive load (Leroy, 2009), exacerbate their perceived role conflict (Floyd and Lane, 2000; Katz and Kahn, 1978), and a demotivating lack of trust in MMs’ abilities (Burke, 1986; Culbert and McDonough, 1986).

Appendix

Figure 4.1: Conceptual Model

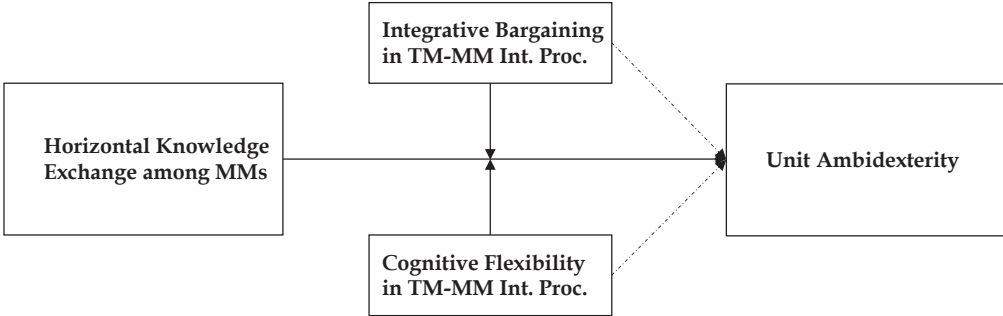


Table 4.1^a: Means, Standard Deviations, Minimum and Maximum Values, and Correlations

	Mean	St. Dev.	Min.	Max.	1	2	3	4	5	6	7	8	9
1 Unit Ambidexterity	27.097	10.106	2.20	47.00									
2 Unit Size	95.467	303.719	0.40	2200.000	.013								
3 Unit Age	32.50	40.057	7	220	.064	.227							
4 Industry Manufacturing	.6824	.467	0	1	.016	-.095	.068						
5 Dynamism	4.3554	.890	2.40	6.90	.226	-.098	-.147	-.015					
6 Centralization	3.0770	1.612	1.00	6.80	-.195	-.019	-.140	-.074	-.066				
7 Psychological Safety	5.1649	1.216	1.40	6.60	.400	-.015	.104	.156	.121	-.082			
8 Integrative Bargaining	5.3311	1.223	1.50	7.00	.493	-.005	.060	-.093	.235	-.131	.354		
9 Cognitive Flexibility	5.2038	1.084	2.00	7.00	.480	-.076	-.052	.048	.249	-.106	.424	.568	
10 Horizontal Knowledge Exch.	5.0320	1.429	1.20	7.00	.441	.267	.020	-.125	.260	.024	.282	.372	.385

^a N = 148; All correlations at or above |.14| are significant at p < 0.10. All correlations at or above |.195| are significant at p < .05 (2-tailed)

Table 4.2^a: Results of Hierarchical Regression Analyses: Controls, Main Effect, & Interaction Effects

	Unit Ambidexterity					
	Model 1		Model 2		Model 3	
	b	(s.e.)	β	b	(s.e.)	β
Intercept	-5.471	(5.229)		-6.007	(5.061)	
Unit Size	0.001	(0.002)	0.032	-0.002	(0.002)	-0.045
Unit Age	0.007	(0.018)	0.029	0.008	(0.018)	0.033
Industry Manufacturing	-0.143	(1.518)	-0.007	0.443	(1.479)	0.021
Dynamism	0.973	(0.810)	0.087	0.445	(0.800)	0.040
Centralization	-0.685	(0.433)	-0.110	-0.827	(0.421)	-0.133 [*]
Psychological Safety	1.634	(0.646)	0.197 ^{**}	1.332	(0.632)	0.160 ^{**}
Integrative Bargaining	2.137	(0.708)	0.261 ^{***}	1.810	(0.692)	0.221 ^{**}
Cognitive Flexibility	1.992	(0.816)	0.216 ^{**}	1.447	(0.807)	0.157 [*]
Main Effect						
Horizontal Knowledge Exchange				1.834	(0.565)	0.260 ^{***}
Interaction Effects						
Integrative Bargaining * Hor. Knowledge Exchange						1.252 (0.455)
Cognitive Flexibility * Hor. Knowledge Exchange						-1.030 (0.564)
Model Summary						
R-squared			0.353			0.399
Adjusted R-squared			0.315			0.359
F improvement of fit			9.466			10.532
Significance F Change			0.000 ^{***}			0.001 ^{***}

^a Centered data; Unstandardized and standardized coefficients are reported, standard errors in parentheses; N = 148; * $p < .10$; ** $p < .05$; *** $p < .01$



Chapter 5. Study 4: Strategic Agility in MNEs: Managing Tensions to Capture Opportunities across Emerging and Established Markets⁴

5.1 Introduction

Given the increasing saturation of established markets and the impact of the financial crisis on many industries in developed economies, it is becoming more and more important for organizations to achieve a strong position in emerging markets.⁵ As argued by Harold Sirkin, managing director of the Boston Consulting Group, “going global is no longer a choice, [...] if you don’t capture the large emerging markets you will miss tremendous scale benefits and if you don’t capture the learnings you will remain behind your competitors.”⁶ For example, Microsoft has established a think-tank called ‘The Technology for Emerging Markets Group’ to foster timely responsiveness in emerging markets and to reap benefits for its global new product development operations for both emerging and established markets.⁷ In addition, GE Healthcare has re-evaluated and retooled its value chain, and started to design, develop, and produce its MRI machines in India and China for their emerging markets as well as the US.

⁴ A version of this paper – co-authored with Justin Jansen and Tom Mom – was published in the Spring 2014 issue of the *California Management Review*.

⁵ Emerging markets, a term coined by the International Finance Corporation in 1981, are defined as economies with fast growth and quickly emerging opportunities on the backbone of the needs of a growing middle class. Furthermore, local idiosyncrasies and institutional voids increase transaction costs above and beyond those in established markets. (<http://www.forbes.com/2010/05/27/winning-in-emerging-markets-opinions-book-excerpts-khanna-palepu.html>).

⁶ Knowledge@Wharton Presentation, University of Pennsylvania (Philadelphia, PA, November 2008).

⁷ Microsoft seeks to address the needs and aspirations of people in the world's developing communities in terms of access to IT infrastructure, affordable and reliable mobile services, education, and healthcare. The software giant is trying to be proactive in emerging markets in order to secure its leading position in operating systems and revitalize its competitive advantages on a global scale.

However, succeeding in both emerging and established markets is challenging. It requires large global firms to deal with substantial heterogeneity and volatility, institutional challenges, and global and growing local competitors. Such challenging conditions require MNEs to develop strategic agility in order to sense and seize opportunities within and across emerging and established markets.

The purpose of this study is to develop a framework that will guide decision-makers of large global firms in emerging and established markets to create and embed strategic agility within their organization (see Figure 5.1). Our insights draw upon our ongoing research in several Fortune 500 MNEs, such as Bertelsmann Group, BMW, GE, Philips, Siemens, Unilever, and Volkswagen, and enable us to contribute to current research in at least three important ways.

Strategic Agility of MNEs in Emerging and Established Markets

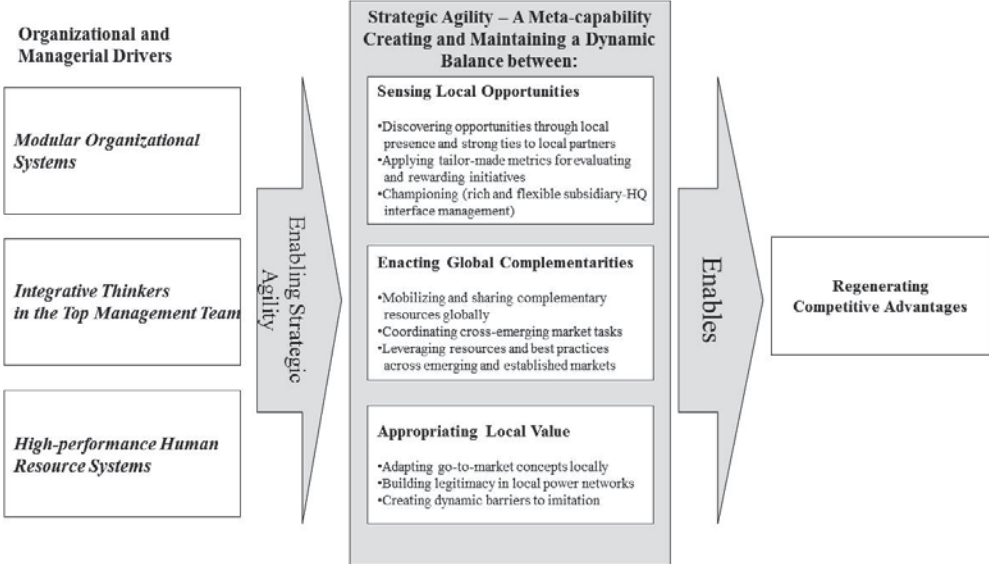


Figure 5.1: Foundations and Drivers of MNEs’ Strategic Agility

First, our study brings together research on strategic agility, dynamic capabilities, and global business to give a clearer understanding of the idiosyncratic nature of strategic agility across different contexts. It has been suggested that strategic agility emerges from a combination of dynamic capabilities – strategic sensitivity, leadership unity, and fluidity of resources– which enable firms to make strategic commitments while staying nimble and flexible.⁸ Research has indicated that such dynamic capabilities may be non-substitutable across contextual domains and may differ in form and detail.⁹ Based on this, we propose that the manifestation of strategic agility in MNEs may have idiosyncratic features and requires the examination of disparate foundations. However, insights into the varied nature of strategic agility are still lacking. As large global firms face context-specific circumstances when operating within emerging and established markets, they may deploy their strategic agility in specific ways. Drawing on insights from our case companies, we identify three key dynamic capabilities – sensing local opportunities, enacting global complementarities, and appropriating local value – and their associated organizational practices and managerial activities. We illustrate how these dynamic capabilities enable MNEs to operate successfully within both emerging and established markets. By identifying and specifying these dynamic capabilities as foundations of strategic agility of MNEs, our study provides insights into how environmental settings may explain why strategic agility is heterogeneous in its foundations, and into how managerial action can be used to develop and deploy it.

⁸ Please note the two foundational papers on strategic agility: Y. L. Doz and M. Kosonen, “The Dynamics of Strategic Agility: Nokia’s Rollercoaster Experience,” *California Management Review*, 50/3 (Spring 2008): 95-118 and Y. L. Doz and M. Kosonen, “Embedding strategic agility: A leadership agenda for accelerating business model renewal,” *Long Range Planning*, 43/2-3 (2010): 370-382.

⁹ K. M. Eisenhardt and J. A. Martin, “Dynamic Capabilities: What Are They?” *Strategic Management Journal*, 21/10-11 (October/November 2000): 1105-1121. Please see the section on “Commonalities in key features, idiosyncrasies in details among dynamic capabilities” on pages 1108-1110.

Second, we build a dynamic perspective and broaden the theoretical interpretation of strategic agility. While current research associates strategic agility with the continuous and simultaneous deployment of a set of dynamic capabilities,¹⁰ our insights indicate that maintaining such a static balance may compromise the organization's efficiency and effectiveness. Most successful MNEs utilize a more dynamic approach. Due to resource constraints and demands for greater efficiency, and in order to respond to changing environmental conditions, MNEs change the relative emphasis on each of the dynamic capabilities over time. Hence, we extend the current notion¹¹ of strategic agility and define it as *a meta-capability that creates and deploys a dynamic balance between sensing local opportunities, enacting global complementarities, and capturing local value over time.*

Third, our study contributes to research on strategic agility and paradox theory by uncovering organizational tensions. Moreover, we highlight managerial and organizational responses that can be effective in resolving these tensions.¹² Although scholars have argued that strategic agility has become a challenging contradiction for corporate leaders and management teams,¹³ insights into the locus and nature of organizational tensions, and viable solutions for addressing them, are still lacking. Our study indicates that the development and implementation of sensing local opportunities, enacting global complementarities, and appropriating local value gives rise to a number of specific organizational tensions between these capabilities. It is imperative for senior executives in MNEs to recognize and resolve these tensions in order to build strategic agility within their organizations. However, suggestions as to how to manage organizational tensions like those associated with strategic agility are scarce. This study identifies

¹⁰ Y. L. Doz and M. Kosonen (Spring 2008), op. cit. and Y. L. Doz and M. Kosonen (2010), op. cit.

¹¹ Y. L. Doz and M. Kosonen (Spring 2008), op.cit.

¹² W. K. Smith, and M. W. Lewis, "Toward a theory of paradox: A dynamic equilibrium model of organizing," *Academy of Management Review*, 2 (2011): 381-403; W. K. Smith and M. L. Tushman, "Managing strategic contradictions: A top management model for managing innovation streams," *Organization Science*, 16/5 (2005): 522-536; R. Martin, "How Successful Leaders Think," *Harvard Business Review*, 85/6 (June 2007): 60-67.

¹³ Y. L. Doz and M. Kosonen (Spring 2008), op. cit., p. 95.

and embeds in the literature specific responses in terms of organizational systems, leadership attributes, and human resource systems.¹⁴

All seven MNEs from which we gathered qualitative data have extensive experience in emerging markets and have made substantive investments in these markets in recent years (*cf.* Appendix 1 and the associated Table 5.1). The MNEs are relevant because they are similar to other MNEs that currently operate in both emerging and established markets. Their local presence goes beyond sales and includes major investments in production and R&D facilities in multiple emerging markets. Furthermore, their emerging market investments and activities have become increasingly important over the years for their financial and growth performance. We identify and explain common patterns and insights across our focal firms, which are active in diverse industries (for example, cars and motorcycles, consumer goods, healthcare, infrastructure, and media), and have headquarters in both the United States and Europe.

5.2 MNEs Operating in Emerging and Established Markets

General Electric's CEO Jeffrey Immelt recently commented on GE's growth and investments and noted that 50% of GE's business and 70% of its backlog comes from Brazil, China, and other emerging markets.¹⁵ A senior manager at BMW also said: "In 2000 about 8% of all passenger vehicles were sold in emerging markets. Nowadays the share has risen to 37%. We sold more cars in China than in the UK in 2010." By 2012, China had surpassed the USA as BMW's largest market, and local production capacity will be doubled by investing another

¹⁴ R. Sanchez, "Modular Architectures in the Marketing Process," *Journal of Marketing*, 63 (1999): 92-111; M. L. Tushman, W. K. Smith, and A. Binns, "The Ambidextrous CEO," *Harvard Business Review*, 89/6 (June 2011): 74-80; P. C. Patel, J. G. Messersmith, and D. P. Lepak, "Walking the Tight-rope: An Assessment of the Relationship between High Performance Work Systems and Organizational Ambidexterity," *Academy of Management Journal*, 56/5 (2013): 1420-1442.

¹⁵ Jeffrey R. Immelt interviewed by Fareed Zakaria for CNN, September 18th, 2011, <http://transcripts.cnn.com/TRANSCRIPTS/1109/18/fzgps.01.html>.

US\$600 million, according to BMW's CEO Norbert Reithofer.¹⁶ In terms of profitability, serving Chinese and Latin American clients allows the Bertelsmann Group to command margins five times higher than those from traditional CRM operations. But, as a manager from Bertelsmann's outsourcing services and solutions division conceded, "offering these services is demanding. It requires speed and the flexibility to depart from ordinary service blueprints." Indeed, despite the potential benefits, operating in emerging and established economies is – even for experienced global firms – very challenging.

First, large global firms face substantial heterogeneity and volatility when operating in both emerging and established markets. The world they face may be seen as running at two speeds, with relatively slow or even declining growth patterns in developed economies, and rapid but unstable growth conditions in emerging markets.¹⁷ Indicators suggest that major emerging economies may differ in annual growth rates too, ranging from about 3% in Brazil, for instance, to 9% in China.¹⁸ Furthermore, the growth rates of several large Latin American and Asian countries exhibit substantial volatility which contributes to environmental uncertainty. In 2009, for instance, quarterly growth rates of Brazil ranged from -4.2% to 2.5%, and those of Turkey from -7.6% to 6.7%.¹⁹ Disparities across and even within emerging markets are caused not only by economic and cultural heterogeneity, but also by differences in terms of mobility, energy supply and in the availability of food, healthcare, and telecommunication services. Hence, the purchasing and consumption patterns and the competitive dynamics differ substantially – not only between established and emerging markets – but also across and within emerging markets.

¹⁶ BMW verdoppelt Kapazitäten in China, *Die Zeit*, May 24th, 2012.

¹⁷ The Boston Consulting Group and Knowledge@Wharton Special Report, "Rethinking Operations for a Two-speed World," University of Pennsylvania (Philadelphia, PA, February 2011).

¹⁸ Economic and financial indicators, *The Economist*, February 11th, 2012.

¹⁹ Economic Indicators provided by Trading Economics, www.tradingeconomics.com.

Second, MNEs encounter institutional challenges when operating in emerging and established markets.²⁰ Administrative procedures are distinctive to particular sectors and countries, which may make the execution of generic business plans difficult. Furthermore, in emerging markets fluctuations of members of governing bodies and changing regulations within a short space of time create uncertainty in terms of the political and regulatory landscapes.²¹ Additionally, capital markets in emerging markets, and unequal access to these markets, may not only restrict MNEs in terms of local financing,²² but can also create financial constraints for their clients.²³ Moreover, in BRIC²⁴ countries the car and other 'strategic' industries are heavily protected, and the protection of intellectual property rights may be challenging.²⁵ For example, when Siemens and ThyssenKrupp were leading the consortium to build Shanghai's high-speed magnetic levitation train system, they learned that the intellectual property developed by the German companies over a period of more than 20 years had been copied.²⁶ "The consortium leaders have learned the hard way that the local partnerships were not built to last and that IP theft is a real threat," a Siemens manager explained. The difficulty to protect intellectual property rights in emerging markets may also put a strain on local co-development partnerships.

²⁰ R. S. Vassolo, J. O. De Castro, and L. R. Gomez-Meija, "Managing in Latin America: Common Issues and a Research Agenda," *Academy of Management Perspectives*, 25/4 (2012): 22-36; T. Khanna, K. G. Palepu, and J. Sinha, "Strategies That Fit Emerging Markets," *Harvard Business Review*, 83/6 (June 2005): 63-76.

²¹ R. S. Vassolo, J. O. De Castro, and L. R. Gomez-Meija, op. cit.; T. Khanna, K. G. Palepu, and J. Sinha, op. cit.

²² T. Yu, M. Subramaniam, and A. A. Cannella Jr., "Competing globally, allying locally: Alliances between global rivals and host-country factors." *Journal of International Business Studies*, 44/2 (2013): 117-137; L. Leachman, V. Kumar, and S. Orleck, "Explaining Variations in Private Equity: A Panel Approach," *Duke Journal of Economics*, 14 (2002): 1-39.

²³ T. Khanna and K. Palepu, "The Right Way to Restructure Conglomerates in Emerging Markets," *Harvard Business Review*, 77/4 (July-August 1999): 125-134.

²⁴ Brazil, Russia, India, and China.

²⁵ T. Yu and A. A. Cannella Jr., "A Comprehensive Review of Multimarket Competition Research," *Journal of Management*, 39/1 (2013): 76-109.

²⁶ D. Deckstein, M. Dettmer, F. Dohmen, S. Ramspeck, and W. Wagner, "Product Piracy Goes High-Tech: Nabbing Know-how in China," *Der Spiegel*, 8 (February 2006).

Third, large global firms face tough competition from both local and global competitors, sometimes even from their local allies.²⁷ In the contest for market share, Western MNEs may lack local knowledge and well-established competitive positions relative to local incumbents in emerging markets. Hence, those Western MNEs cannot rely on existing insights, expertise, and brand names that have been developed in established markets. For example, against strong competition the French retail giant Carrefour has seen recent revenue declines in growing Latin American markets: a drop of around 14% in Argentina, 3% in Brazil, and 4% in Colombia.²⁸ Mercedes-Benz, once among the best performing auto brands in the Chinese market, has lost its cachet among the affluent consumer tier and is now lagging behind its competitors in terms of sales growth and profit margins.²⁹ Moreover, competitors from BRIC countries have quickly expanded internationally, creating innovative products with global appeal at high speed and low cost. In 2012, these developments led Philips to divest all of its audio and multimedia businesses, selling its television business to the Chinese TP Vision.

Although opportunities for accelerating growth and improving overall performance may seem abundant, operating in emerging and established markets should not be considered as capturing low-hanging fruit.³⁰ In order to succeed, MNEs need to respond to challenges within and across emerging and established markets in a committed, yet flexible way.

²⁷ T. Yu and A. A. Cannella Jr., *op. cit.*

²⁸ The Latin 500: The Biggest, the Best, & the Brightest in Latin America, *Latin Trade*, 20/4 (July/August 2012): 16-40.

²⁹ S. Rein, "Mercedes Needs to Rethink its China Market," *Businessweek*, (October 2012), <http://www.businessweek.com/articles/2012-10-25/mercedes-needs-to-rethink-china>.

³⁰ T. London and S. L. Hart, "Reinventing strategies for emerging markets: Beyond the transnational model," *Journal of International Business Studies*, 35/5 (2004): 350-370.

5.3 Dynamic Capabilities of MNEs in Emerging and Established Markets

How do MNEs respond effectively to the intensifying challenges when operating in emerging and established markets? As summarized in Table 5.2, the emerging insights from our qualitative data indicate that sensing local opportunities, enacting global complementarities, and appropriating local value form the foundations of MNEs to behave strategically agile and to develop tailor-made competitive responses in fundamentally different market environments.

Insert Table 5.2 about here

5.3.1 Sensing Local Opportunities

First, a common pattern we found in our research is that MNEs discover opportunities in emerging markets *by creating local presence and maintaining strong ties with local partners*. Firms like Philips, Siemens, and Unilever have set up local R&D facilities in collaboration with local partners in order to tap quickly into new opportunities in emerging markets. Philips calls this the ‘Design in and for’ approach. “By marrying our R&D spending with a targeted and local approach to consumer needs, we continue to sense new business opportunities in emerging markets,” explained Gottfried Dutiné, a member of the Philips executive team.³¹ The approach has led the company to discover new opportunities, and to create products radically different to those it sells in developed economies. Examples include switches which compensate for fluctuations in the local electricity supply, small-scale water purifiers and disinfectors, and solar-powered lighting devices for consumers without access to electricity.

In addition, forming strong ties with local partners provides an important mechanism for sensing opportunities and learning in advance of potential regulatory changes or economic developments. Such relationships enabled

³¹ Philips India “Philips Set to Capture Opportunities in Emerging Markets” Press Release, August 3rd, 2009.

Bertelsmann to spot an opportunity to expand one of its service lines from a product focus (i.e. offset printing) to an integrated print solution that included direct delivery. The integrated service provision increased the value proposition by approximately 35% in Latin American countries and changed the competitive dynamics of the sector as its clients and their readers now expect timely delivery of media publications. Expatriate managers from Bertelsmann made clear that a key step in discovering new opportunities was to “build strong local ties which help us reflecting on our ‘imperialist mindset’ and recognize the needs and wants at all levels of the socioeconomic pyramid to address existing and potential customers.” It would be a pivotal mistake to assume that local demands in emerging markets are similar to those in developed economies and to offer standardized Western service and product solutions globally. This may lead companies to miss out on opportunities, particularly in markets further down the pyramid.³²

Second, successful MNEs *assess new opportunities by applying tailor-made metrics for evaluating and rewarding initiatives from emerging markets*. Managers at corporate headquarters need to understand that “what works in a low-growth world will not necessarily work in a high-growth world,” as a senior Unilever manager put it. Consistent with recent leadership literature, successful global firms need to differentiate by using adaptive systems that allow them to evaluate and reward new initiatives in different markets.³³ Rather than focusing on profit and standard efficiency measures from developed markets, they must understand that appropriate metrics for new initiatives in emerging markets should focus primarily on growth and speed – that is, on how the growth prospects of an initiative match local market growth and what scope there is for outpacing competitors in terms of development time and access to market. Our observations show that goals and performance metrics for evaluating new projects in emerging

³² C. K. Prahalad and K. Lieberthal, “The end of corporate imperialism,” *Harvard Business Review*, 76/4 (1998): 68-79.

³³ M. L. Tushman, W. K. Smith, and A. Binns, op. cit.

markets have been decoupled from the traditional system of assessment used by the focal companies. Under the 'Towards One Philips Program,' launched by Philips' former CEO Gerard Kleisterlee, there was a tendency to align incentive and compensation plans throughout the whole company. On some occasions, however, this resulted in business unit managers with responsibility for emerging markets being rewarded for achieving growth rates that were below those of the local market. Today, Philips uses a differentiated incentive and reward system in developed and in emerging markets in order to nurture localized innovation. It motivates executives in emerging markets to speed up market access and growth that is equal to or higher than local market growth.

Third, MNEs *champion local initiatives by flexibly managing the interface between local subsidiary managers and senior executives*. When experimenting with new initiatives and evaluating the potential of products before commercial launch, subsidiary managers need to play devil's advocate in order to reduce potential in-group biases. After local evaluation, shepherding, and testing, local champions funnel information to senior management at headquarters to gain support and access to vital resources. For instance, at Siemens regional managers for emerging markets started to develop products which cost about half of the company's traditional ones. They are intended for low- and mid-level technology markets. "Getting support from Munich is difficult, if you cannot prove the technical and economic viability," said a Siemens project manager, explaining that senior managers at headquarters identified the company with high-price, high-tech products. The tactic was therefore to develop, test, and pilot-sell products without initially informing headquarters. When sales increased and future growth prospects appeared to be promising, the championing efforts of regional managers resulted in a shift in mindset at Siemens. As a result, this type of approach is now part of Siemens' corporate strategy in form of its SMART-strategy³⁴ which focuses

³⁴ The SMART acronym stands for: Simple, Maintenance-friendly, Affordable, Reliable and Timely-to-market.

on designing, producing, and selling products in emerging markets that are tailored to local end-user requirements. This also illustrates how leading MNEs rely on evaluating, assessing, and testing new ideas or initiatives together with foreign partners such as suppliers, distributors, and customers. Furthermore, to appeal to the intrinsic motivation of local managers, companies such as Bertelsmann, Philips, Siemens, and Unilever frame local new initiatives – such as implementing mobile payment systems for rural areas or public-private partnerships in infrastructure projects – as personal development and career progression opportunities for managers.

5.3.2 Enacting Global Complementarities

We found that MNEs create cross-market strategies in which specific local resources are shared and integrated into a more globalized system. Such strategies enable companies like BMW, Philips, Siemens, and Volkswagen to serve multiple emerging markets as well as established markets at lower cost. Due to such integration efforts, “success in developing countries is a prerequisite for vitality in developed ones,” Jeffrey Immelt of GE stresses.³⁵

First, successful MNEs that are active in emerging and established markets tend to *mobilize and share complementary resources across the globe*. For instance, each of the local Philips R&D centers has global leadership responsibilities for developing specific cross-market applications from new technologies. Together with the company’s headquarters in Europe, the R&D centers share responsibility for mobilizing and sharing the applications so that they are made available throughout the company’s global R&D network and can be reconfigured for any established or emerging market as needed. Investment decisions such as those to develop the innovation campus in Bangalore are based mainly on whether a country has appropriate high-tech clusters. Bangalore – India’s Silicon Valley – is a vibrant innovation hub for IT- and electronics-related

³⁵ J. R. Immelt, V. Govindarajan, and C. Trimble, “How GE is Disrupting Itself,” *Harvard Business Review*, 87/10 (October 2009): 4-15, quote on p. 4.

technological developments. Having a pool of local talent adds the required flexibility to Philip's multi-region R&D network and enables the company to respond adequately to the differing needs of both mature and emerging markets.

Second, *coordinating cross-market operations and tasks* is also important for maintaining flexibility while adhering to quality standards and keeping the overall costs of the global production network low. Successful companies like Siemens have built and coordinated a network of production platforms in selected established and emerging markets to serve their specific needs and to source local materials at low cost. Volkswagen has developed an integrated cross-market production strategy by operating several plants in Brazil, Mexico, China, and India for local markets and for export into other emerging and established markets. Synergies between these plants are created through shared production of common components used in many models that are themselves unique to specific markets. Whereas the usage of local labor forces may keep production costs relatively low, coordinating the usage of common components across multiple markets increases the agility of the manufacturing network in terms of ramping up volume and extending model variety. Companies such as Volkswagen, Philips, and Siemens coordinate technological and manufacturing tasks across emerging markets in order to realize the market potential for global products as well as products specific to emerging markets.

Third, successful MNEs pay careful attention to *leveraging resources and best practices across emerging and established markets* in order to enact global complementarities. For instance, a BMW product development manager sees emerging markets as "demanding real-life test facilities for car features which we may want to offer in our traditional markets." Due to poor conditions of some roads, extreme temperatures, and underdeveloped maintenance networks, the durability of parts and ease of maintenance are particularly important characteristics of vehicles in emerging markets. Solutions to these particular issues may also give vehicles a competitive edge in established markets because of lower

costs of ownership and reduced maintenance hassle. That may be why “refining existing mobility concepts in emerging markets and offering the improved, more robust versions for sale in developed regions is proving a more and more relevant strategy,” as was claimed by a senior executive of BMW. BMW also intends to leverage knowledge it has acquired from introducing new mobility solutions such as affordable electric vehicles in China and roll this out to established markets. In terms of enhancing organizational processes, BMW applies expertise and resources from emerging markets throughout its production sites. To benefit on a global scale from a talent pool distributed across the world, an employee rotation program has been established across its network of 25 production sites in 14 countries in order to disseminate best practices and increase the flexibility and open-mindedness of its engineers.

5.3.3 Appropriating Local Value

To capture value in emerging markets, MNEs must be able to adapt their go-to-market concepts to regional market conditions in terms of customer preferences and infrastructure, build legitimacy in local power networks, and create dynamic barriers to imitation.

First, MNEs *adapt go-to-market concepts to the specific characteristics of the local market*. For instance, although Unilever’s traditional go-to-market model involves scaling up distribution and marketing, the conditions in emerging markets demand the distribution of small quantities of goods to a large number of different locations and the design of distribution approaches that are unique to each market. In India, Unilever has its products delivered to almost eight million retail outlets, of which about two-thirds are located in rural areas.³⁶ Unilever’s long-term distribution strategy in India has been designed to allow it to evolve as the market and competition changes. The company started by serving modern retail chains in large cities with products in standard store formats. As a next step,

³⁶ See also for instance: Hindustan Unilever Limited, “Annual Report 2008-2009” (2009).

it developed a local network of partners such as stockists and distributors to serve about seven million stores throughout India. For the most part, Unilever replaced its go-to-market model of scaling up with one of scaling out that involves a wide range of local partners. To reduce the risk of local suppliers falling short on quality standards and process excellence, the company started to offer development plans to help local suppliers build the necessary know-how. To increase its ability to capture local value, Unilever used its local strengths and tried to penetrate rural markets by working with women's self-help groups. Women from these groups were invited to become direct-to-consumer sales distributors for Unilever's products.³⁷ Unilever did not overestimate the value of its brand and marketing campaigns and did not rely on a uniform global approach to brand and distribution management. As mobility and communication channels differ widely across emerging markets, the go-to-market approach in terms of marketing, sales, and distribution needs to be tailored to local conditions.

Second, MNEs *build legitimacy in local power networks*. By complying with local regulations and supporting local government initiatives, MNEs try to minimize the chances of expropriation or infringements of rights in emerging markets. Such efforts increase the likelihood that if there is conflict over rent appropriation, the key local decision-makers will side with the company. A fair balance of power and equitable distribution of value are vital for the long-term viability of alliances and joint ventures since MNEs that enter emerging markets are in some jurisdictions forced to start out as minority partners. Building trusted, reciprocal social relationships with local stakeholders facilitates rent appropriation in project implementation. BMW's CEO Norbert Reithofer is keen on developing sound relationships with local decision-makers and improving his organization's reputation by contributing to job creation in local communities. Similarly, Volkswagen Mexico engages in community outreach helping local children and

³⁷ See also for instance: "Unilever Sustainable Living Plan: Progress Report 2011," (London, UK: Unilever PLC, 2012).

has taken measures to protect the environment in the area around its Puebla plant. Successful MNEs continuously reinforce this sort of localized commitment and pair it with brand recognition to increase legitimacy.

Third, MNEs appropriate local value in emerging markets by *creating dynamic barriers to imitation*. Our data indicate that global firms protect their intellectual capital in emerging markets and prevent competitors from gaining commercial benefits from it. For instance, an effective strategy for avoiding imitation is to destabilize resource endowments by increasing the fluidity of technologies, people, and intellectual property. Ever-changing resource constellations create natural barriers to imitation while making local operations more adaptive to developments in their business domain. For instance, breaking up value chain activities and locating them across different emerging markets may not only bring local sourcing advantages, but may make copying a whole system of activities very difficult, if not impossible. Car manufacturers such as BMW and Volkswagen maintain core R&D activities and production of essential components such as powertrain and engine parts in countries which they consider to have more reliable institutions. In addition, MNEs can create dynamic barriers to imitation by staying one or two development cycles ahead of their competitors.

5.4 Strategic Agility of MNEs in Emerging and Established Markets

Our study has revealed that sensing local opportunities, enacting global complementarities, and appropriating local value are three key dynamic capabilities that form the foundations of strategic agility. They enable large global firms to operate successfully within and across emerging and established markets. These firms not only invest in long term strategic resource commitments, but they stay nimble and flexible as well by (re-)configuring resources and thereby

introducing innovative products, novel organizational practices, and flexible go-to-market approaches.

While each of our sample firms created and deployed all of the three capabilities, interestingly, they changed the relative emphasis on each of them over time. The BMW Group, for instance, focused on the appropriation of local value by importing vehicles into emerging markets until the early 2000s. “At that time, we saw that things started to change. Chinese buyers became more demanding. We lacked a strong local presence to really understand the market,” as a BMW business development manager explained. Because of these changes, and the increasing import tariffs, BMW started to expand its production at foreign locations. In 2003, it established a joint venture with Brilliance Auto in order to produce locally in China. This strategic change shifted the importance of appropriating local value towards the sensing of local opportunities. While this shift helped to regenerate their competitive advantages, the impetus gravitated back towards appropriating local value as the joint venture matured according to Ian Robertson, BMW’s head of sales and marketing.³⁸ “Protecting the know-how developed over many years of R&D from our local partners becomes more and more important,” as a production strategy manager worried. “They started having their own ambitions to build low-emissions vehicles.” As a response to increased demands for quality and cost-effectiveness, BMW again adjusted the relative emphasis among the three dynamic capabilities. The car manufacturer increasingly focused on its capability to enact global complementarities in order to ensure that global quality standards were adhered to and to help lessons learned to be transferred more effectively across markets. For instance, the company launched a program to optimize the assembly of Completely Knocked Down (CKD) vehicles. As a BMW planning and logistics manager explained: “To offer BMWs at competitive prices in different protected markets, the complex

³⁸ Dr. Ian Robertson interviewed by Jamie Butters for *Bloomberg* at the New York International Auto Show, April 4th, 2012.

production and logistics concept 'CKD' emerged as sets of car components can be imported at favorable conditions." Today, BMW continuously refines the planning and design of its current and future CKD vehicle assembly at plants across multiple emerging markets using insights gathered at the initial CKD plants.

Bertelsmann shifted its impetus away from sensing local opportunities to enacting global complementarities due to increasing demands from clients to expand the scope of services across multiple markets. "Our clients operate globally. We need to serve them everywhere," said a Bertelsmann manager, summarizing the need to deliver business process outsourcing services globally. Bertelsmann introduced cross-market feedback and capability-sharing mechanisms in order to "generate and utilize valuable feedback from local markets that allows us to continuously improve our [global] position vis-à-vis the competition," the manager further explained. Most recently, however, strengthening local presence has regained momentum as Bertelsmann's CEO Thomas Rabe has opened the organization's new Corporate Center in Sao Paulo. It provides a platform for developing new local partnerships to sense and develop opportunities in the region. The investment also signals commitment towards Latin American business leaders with respect to value capture in the long run.

Other companies, like Philips also changed the relative emphasis on each of the three dynamic capabilities over time. A bit more than a decade ago, pushed by the need to compete on a global scale in a more efficient way, Philips increasingly focused on the enactment of global complementarities. They did so by launching several company-wide integration and synergy-creation programs like 'Towards One Philips.' When each of the product markets served by Philips' divisions were gaining more and more momentum in Asia and Latin America and consumer needs became more differentiated, it shifted its emphasis to sensing local opportunities. For instance, to tap into local opportunities quickly, the divisions were allowed to act more independently and increasingly designed, developed, and manufactured products locally. Today, in face of increasing local

competition, the company raises its relative efforts to appropriate local value. For instance, as a local product manager explained: “Our local competitors in emerging markets are growing quickly and expanding everywhere. So, it is not enough anymore to serve just the very large cities. What we need now to compete is rural distribution.” The company also nearly doubled its marketing efforts over the last two years and renewed its logo to improve the local awareness of its brand.

As shown in the examples above, successful MNEs do not maintain a static balance between the three dynamic capabilities; a dynamic approach enables them to adjust the balance between them to fit the particular situation.³⁹ When facing changing conditions and dealing with resource constraints, an organization that has a static balance among the capabilities may compromise both its efficiency and effectiveness. Resource constraints and demands for greater efficiency may limit the extent to which firms are able to allocate resources continuously to the simultaneous development and implementation of all three capabilities. Moreover, changing environmental conditions may require MNEs to rethink their strategies over time.⁴⁰ Hence, the relative importance of the three dynamic capabilities may shift. MNEs need to develop a meta-capability – or strategic agility – that enables them to balance the three capabilities dynamically in order to sustain high performance levels and to succeed in emerging and established markets over time. As such, strategic agility refers not only to MNEs’ commitment of resources in order to create and deploy each of the three dynamic capabilities. It also captures the ability to remain flexible and efficient by changing over time the relative emphasis on sensing local opportunities, enacting global complementarities, and appropriating local value. As such, strategic agility of MNEs in emerging and established markets refers to a meta-capability that creates

³⁹ P. Boumgarden, J. Nickerson, and T. R. Zenger, “Sailing into the wind: exploring the relationship among ambidexterity, vacillation and organizational performance,” *Strategic Management Journal*, 33/6 (2012): 587-610.

⁴⁰ P. Boumgarden, J. Nickerson, and T. R. Zenger, op. cit.

and deploys a dynamic balance between sensing local opportunities, enacting global complementarities, and capturing local value over time.

5.5 Strategic Agility and Organizational Tensions

Although MNEs mastering strategic agility create and deploy a dynamic balance between the three dynamic capabilities over time, organizational tensions may arise between these capabilities. “More and more we got internally confronted with conflicting interests, mindsets, and propositions. Our success depends on our ability to deal with this situation, to unite these conflicts,” a Volkswagen corporate manager explained.

First, organizational tensions may arise because the orientation of the dynamic capabilities ranges from local to global. When trying to execute globally-oriented and locally-focused dynamic capabilities simultaneously, differences between corporate mindsets and preferences and those of subsidiaries become apparent. Such tensions have been referred to as ‘tensions of belonging’ which manifest themselves between the individual or group and the collective, as individuals and groups seek both homogeneity and distinction.⁴¹ Sensing local opportunities and appropriating local value spur the development of group focus, identity, and emotions at subsidiaries as they seek to retain their distinctiveness. In contrast, the enactment of global complementarities is often seen as a reinforcement of the power base at headquarters through global integration, and this can intensify the alienation and de-identification felt by subsidiary managers

⁴¹ Q. N. Huy, “How middle managers’ group focus emotions and social identities influence strategy implementation,” *Strategic Management Journal*, 32/13 (2011): 1387–1410; P. Jarzabkowski, J. K. Le, and A. Van de Ven, “Responding to competing strategic demands: How organizing, belonging, and performing paradoxes coevolve,” *Strategic Organization*, (2013): 1-36; L. Lüscher and M. W. Lewis, “Organizational Change and Managerial Sensemaking: Working through Paradox,” *Academy of Management Journal*, 51/2 (2008): 221-240.

in relation to the global corporate base.⁴² This may cause “mistrust between headquarters and subsidiaries,” according to a Unilever manager, “that leads to not sharing data which prevents senior managers at HQ from taking smart, informed decisions.” Tensions of belonging may be experienced quite profoundly, as illustrated by a Bertelsmann manager in Latin America: “We do stick with our local leaders as they care for us; what comes from headquarters is often at odds with what our local GM says works here and what local customs intuitively suggest. We cannot trust people at headquarters if they continue to make arbitrary decisions based on an incomplete understanding of our market.”

Second, a common thread in our data was that organizational tensions between the three dynamic capabilities exist because they are associated with different strategic logics and goals. These are so-called ‘performing tensions.’⁴³ Whereas the sensing of local opportunities is associated with a long-term logic and growth-related goals, the appropriation of local value is typically associated with a short-term logic and profit-oriented goals. The enactment of global complementarities is driven by the logic of realizing global synergies and associated with goals of cost reduction. Furthermore, the enactment of global complementarities to realize synergies and disseminate know-how can create friction among managers in subsidiaries, keen to capture value locally and meet agreed targets. This dilemma for subsidiary managers “can lead to heated debates and considerable frustration,” according to one emerging market project leader. “Integrating activities and establishing best practices under the global corporate umbrella is in many instances very difficult and even resented by subsidiary managers.” This issue is intensified by the fact that enacting global complementarities is often uncertain and will take more time to materialize. Hence, corporate managers have to try hard to encourage and realize capability

⁴² J. Birkinshaw, “Overcoming the mothership syndrome: The story of Irdeto,” <http://www.managementexchange.com/story/overcoming-mothership-syndrome-story-irdeto> (2010).

⁴³ W. K. Smith & M. W. Lewis, op. cit.

transfer and to avoid the creation of islands of expertise that are not conducive to synergies.

Third, pursuing all three dynamic capabilities means that one has to manage multiple organizational sub-systems and the inherent organizational contradictions. In the literature structural tensions of this kind are typically termed 'organizing tensions'⁴⁴ which occur between local empowerment and direction as well as between collaboration and competition. While the sensing local opportunities capability is associated with local empowerment and flexibility to cater for distinct markets at subsidiaries, it stands in contrast to the directional approach from headquarters used by MNEs to orchestrate global R&D and coordinate resources across markets when they are enacting global complementarities. Yet, leveraging local opportunities in global systems may "inhibit experimentation," according to one Philips manager who feared that it might "suffocate local creative endeavors and therefore leave the search for the 'next big thing,' like a radical breakthrough that makes the current offering obsolete, to competitors." Organizing tensions also become apparent when one examines how partnerships evolve in emerging markets. Focusing both on the local sensing capability and on appropriating value gives rise to tensions between collaboration and competition, i.e. between benefitting from partners vs. protecting against them. "When you chose local partners who are able to make a tangible contribution in the exploration of opportunities, then the down-side is that they may also be capable of capturing your intellectual property or reverse-engineer your products, however complex they may be," pointed out a Siemens manager who had been involved in the high-speed train consortium led by Siemens and ThyssenKrupp.

⁴⁴ P. Jarzabkowski, J. K. Le, and A. Van de Ven, op. cit.

5.6 Enabling Strategic Agility: Organizational and Managerial Drivers

Given the emergence of tensions, MNEs and their leaders need specific responses to resolve them. We build on existing management research and our data to highlight responses in terms of organizational aspects, leadership attributes, and human resource systems.

5.6.1 Modular organizational systems

Research on organizational design and ambidexterity⁴⁵ suggests that organizations need to establish modular organizational systems that can be used to manage and resolve organizational contradictions. As an 'either/or' approach is insufficient to respond effectively MNEs may create modular organizational systems by breaking down their global product and process architectures into relatively independent components and by specifying standard interfaces.⁴⁶ Modular organizational systems may be used to address the organizing tensions because they are malleable, and may incorporate inconsistent and contradictory processes, products, and distribution channels.⁴⁷ Rather than using generic architectures and processes to cater to local and global demands, successful MNEs realize that total standardization would reduce the benefits provided by multiple, distributed sub-systems since potential local opportunities might be overlooked, misunderstood, or poorly integrated. To effectively integrate modular components into orchestrated actions, global firms may develop standardized interfaces. "Modular systems afford us with flexibility at the component level. They facilitate addressing different demands," said a Volkswagen executive. "Developing

⁴⁵ R. Sanchez, op. cit; M. L. Tushman and C. A. O'Reilly, "Ambidextrous Organizations: Managing Evolutionary and Revolutionary Change," *California Management Review*, 38 (1996): 8-29; Z. Simsek, C. Heavey, J. F. Veiga, and D. Souder, "A Typology for Aligning Organizational Ambidexterity's Conceptualizations, Antecedents, and Outcomes," *Journal of Management Studies*, 46/5 (2009): 864-894.

⁴⁶ R. Sanchez, op. cit.

⁴⁷ M. W. Lewis, "Exploring paradox: Toward a more comprehensive guide," *Academy of Management Review*, 25/4 (2000): 760-777.

standardized interfaces is key,” he went on, because these interfaces enable “smooth integration and transfer of processes and competences across our global production network.”

Standardized interfaces may also activate mutual learning opportunities across hierarchical levels, fields of expertise, and even firm boundaries.⁴⁸ BMW, Unilever, and Volkswagen encourage boundary-spanning activities and involve key suppliers and distributors, which are co-located at their own facilities, in solving problems together and addressing conflicting goals. These companies run formal workshops with suppliers and distributors and idea contests in which supplier staff can participate and can judge the feasibility of new initiatives or design new modules. They also offer plenty of opportunities for informal networking. “At lunch and breaks everyone is discussing ideas and projects all the time. It's somewhat manic. But it makes things move faster,” said BMW’s chief designer Adrian van Hooydonk.⁴⁹ When there are standardized interfaces, not is only internal dialogue more structured, but interactions with external partners are also easier to manage.

5.6.2 Integrative thinkers in the top management team

Research on leadership and paradox has stressed that the main responsibility of senior leadership is to resolve organizational tensions⁵⁰ and has suggested that senior executives in the C-suite need to excel at integrative thinking.⁵¹ This matters particularly for managing performing and organizing tensions. Rather than dwelling on the apparently conflicting strategic logics and mindsets needed for emerging and established markets, senior executives need to work on creative solutions for pursuing contradictory goals and organizing

⁴⁸ W. K. Smith, A. Binns, and M. L. Tushman, “Complex business models: Managing strategic paradox simultaneously,” *Long Range Planning*, 43 (2010): 448 – 461.

⁴⁹ The Secret of BMW’s Success, *Businessweek Magazine*, October 15th, 2006.

⁵⁰ M. L. Tushman, W. K. Smith, and A. Binns, op. cit.

⁵¹ W. K. Smith and M. L. Tushman, op. cit.; R. Martin, op. cit.

approaches simultaneously.⁵² At BMW “scarcity [of resources] encourages leaders to identify complementarities in projects, despite goals that are at face value contradictory,” according to a project leader. Senior leaders need to know when guidance is required for global integration, but also when to grant autonomy to allow the use of unique approaches for sensing and capturing local value in emerging markets. Because of resource constraints, they need to take responsibility for maintaining a delicate balance when allocating scarce resources such as talent and capital to each of the three dynamic capabilities. Without ownership of this kind being taken by the top management, resource allocation processes may result in “turf battles.”⁵³ Such conflicts may intensify tensions and stifle the organization’s ability to tap into local opportunities, enact global complementarities, and appropriate local value. Senior executives need to allocate resources in a balanced way, integrating subsidiary managers’ demands and considering the implications of their decisions for cross-market strategies.

5.6.3 High-performance human resource systems

Research on human resource management (HRM) has pointed to the role of HRM practices that affect both the ability and motivation of people to embrace tensions within an organization.⁵⁴ HRM practices may be particularly suited to addressing tensions of belonging and performing. For instance, to reconcile differences between identities and mindsets at the corporate and subsidiary level, MNEs may benefit from using employee selection and career development practices to create a balanced mix of expatriate and local managers in key positions. According to a Unilever manager a balanced mix results in “people being less likely to take local institutions and traditions for granted, and in local colleagues prompting expatriates to adapt to them quickly.” Conversely, it helps

⁵² R. Martin, op. cit.

⁵³ M. L. Tushman, W. K. Smith, and A. Binns, op. cit., p. 78.

⁵⁴ P. C. Patel, J. G. Messersmith, and D. P. Lepak, op. cit.; I. M. Prieto, & M. P. Santana, “Building ambidexterity: The role of human resource practices in the performance of firms from Spain,” *Human Resource Management*, 51 (2012): 189-212.

to make expatriates better at understanding local needs and framing local initiatives in the context of MNEs' global strategy. Having a mix of expatriate and local managers within subsidiaries across subsidiaries fosters mutual understanding of the different beliefs that co-exist in MNEs and that give rise to tensions of belonging. It may help to avoid group polarization and to curtail power struggles which could lead to dysfunctional conflicts.⁵⁵ By making HR choices of this kind, organizations can – as Bertelsmann, Philips, and Unilever have done – overcome tensions of belonging and increase their capacity to respond to local customs without being too detached from corporate-wide operations.

Large global firms have to think carefully about team composition, empowerment, and dynamics. Based on our data, we recommend that organizations set up empowered cross-functional teams at various interface positions. Furthermore, large global firms have to encourage openness and constructive dissent among the team members.⁵⁶ This will help them to find creative solutions that reconcile tensions inherent in global-local dynamics. MNEs have to make sure these teams consist of members with diverse backgrounds so that they can readily identify and act upon new opportunities and have a wide range of analogies to draw on in resolving organizing tensions. Empowered teams may instill a sense of potency among organization members, i.e. “fostering a can-do attitude and strong belief in team capabilities,” which a Unilever manager recommended pairing with “the discretion to pursue novel problem-solving approaches monitored through self-control.” Being trusted to do this can also engender a sense of local and global belonging without any pressure to follow the ideals of one particular subgroup in the organization.

Empowered cross-functional teams are important for addressing performing tensions as well. For instance, the seemingly paradoxical targets that

⁵⁵ M. W. Lewis, *op. cit.*

⁵⁶ D. J. Snowden and M. E. Boone, “A leader's framework for decision-making,” *Harvard Business Review*, 85/11 (November 2007): 68-76.

are pursued in BMW's EfficientDynamics program – i.e. improving driving pleasure, efficiency, and safety – demand empowered cross-functional teams. These teams benefit from fast-paced and idea-generating exchanges between engineers and managers in product development and production as well as in design and marketing. “These exchanges are vital to understand and embrace the different goals that each function has,” explained a business development manager from BMW. MNEs also have to consider performance assessment and motivation carefully so that people will be willing to deal with contradictory, and potentially frustrating, demands. They need to motivate and assess their employees, both individually and as teams, based on performance goals that take into consideration the specific issues that divisions face in emerging and established markets. They should use local incentive structures that are aligned to regional market conditions and reward systems for innovation units that reflect the nature and time-horizon of their specific projects.⁵⁷

5.7 Discussion and Conclusion

Our study is a first attempt to uncover and clarify the origins and components of strategic agility of MNEs operating across emerging and established markets. It bridges research on strategic agility, dynamic capabilities, and global business in order to develop insights about the idiosyncratic as well as dynamic nature of strategic agility across different contexts. Our insights imply that strategic agility is a meta-capability that captures not only the ability of large global firms to act strategically by allocating sufficient resources to the development and deployment of all three dynamic capabilities, but also their capacity to stay agile by balancing those capabilities dynamically over time. This balancing act is crucial because such firms face unprecedented heterogeneity and unpredictable changes as they operate across established markets and emerging

⁵⁷ M. L. Tushman, W. K. Smith, and A. Binns, *op. cit.*

markets. By reassessing the relative emphasis to be put on each dynamic capability, large global firms regenerate their competitive advantages over time.

Although our framework shares commonalities with Doz and Kosonen's⁵⁸ model, our dynamic capabilities differ in form and detail because they address the context-specific challenges experienced by global firms that are active in emerging markets and established markets. As pointed out by Eisenhardt and Martin, commonalities as well as distinctive features may arise as "there are more and less effective ways of dealing with organizational [...] challenges," i.e. some aspects of a dynamic capability may be fungible across contexts while others need to be modified or added.⁵⁹ This is echoed by Ambrosini and colleagues who argue that dynamic capabilities need to be context-specific in order for them to be effective in regaining competitive advantages.⁶⁰ For instance, while Doz and Kosonen⁶¹ focused on the "thoughtful and purposive interplay on the part of top management" in the quest for business model renewal, our research highlights that the local-global and the two-speed world orientations call for the involvement of actors beyond the top management team. Thus, in our context both senior and middle/subsidiary managers have important roles to play in developing and maintaining organizational flexibility and in nurturing knowledge and resource transfers in pursuit of global integration strategies. Furthermore, while fast execution matters in the face of intensifying competition, as Doz and Kosonen point out,⁶² our model stresses the need for effective ways of capturing value in response to specific market and institutional challenges in emerging markets. These responses are reflected in the appropriating local value capability. In sum, insights show that strategic agility manifests itself differently across unique environmental contexts because of the unique challenges that global firms

⁵⁸ Y. L. Doz and M. Kosonen (Spring 2008), op. cit. and Y. L. Doz and M. Kosonen (2010), op. cit.

⁵⁹ Eisenhardt and Martin, op. cit., p. 1108.

⁶⁰ V. Ambrosini, C. Bowman, and N. Collier, "Dynamic capabilities: An exploration of how firms renew their resource base," *British Journal of Management*, 20/S1 (2009): 9-24.

⁶¹ Y. L. Doz and M. Kosonen (2010), op. cit., p. 371.

⁶² Y. L. Doz and M. Kosonen (Spring 2008), op. cit. and Y. L. Doz and M. Kosonen (2010), op. cit.

face and have to deal with.⁶³ Our study provides important managerial implications about how MNEs may develop and deploy sensing local opportunities, enacting global complementarities, and capturing local value in order to develop the strategic agility needed to survive and succeed within and across emerging and established markets.

Moreover, so far research on strategic agility has provided a static perspective.⁶⁴ In contrast, our study proposes a dynamic perspective in which we suggest that most successful global firms change the relative emphasis on each of the three dynamic capabilities over time. Given changing market demands as well as the emergence of new competitors, our data indicate that global firms require a dynamic approach in deploying sensing local opportunities, enacting complementarities, and capturing local value in different markets. Maintaining a static balance and keeping the allocation of scarce resources to each of the three dynamic capabilities stable at all times may compromise the overall efficiency and effectiveness of the whole organization. As such, our study underscores the importance of broadening the concept's theoretical interpretation and applicability as to capture not only the idiosyncratic foundations of strategic agility in different contexts, but also its dynamic nature in regenerating competitive advantages over time.

In addition to improving our understanding of what strategic agility is, we also provided insights into the locus and nature of the organizational tensions that emerge between the three capabilities. Our insights support large global firms in understanding these organizational tensions. Moreover, we provide various recommendations as to how MNEs and their leaders can address specific tensions by adopting specific ways of organizing, thinking, and managing human resources. As such, our study provides important managerial implications about

⁶³ Eisenhardt and Martin, *op. cit.*

⁶⁴ Y. L. Doz and M. Kosonen (2010), *op. cit.*

how global firms may embrace organizational tensions and resolve them effectively.

Nuances may exist in terms of the attention and effort that need to be dedicated to some of the specific organizational practices and managerial activities underlying the three dynamic capabilities. For instance, diversified organizations may allow more flexibility in how to approach emerging markets, but diversification may also add complexity to enacting global complementarities. Further specifying and explaining contingencies such as organization type or structure may be an interesting avenue for future research. Another promising direction for future research could be the application of complementary perspectives such as organization learning, exploration-exploitation, or ambidexterity.⁶⁵ This may generate further insights into how MNEs may deal with creating and maintaining strategic agility.

In conclusion, success across a heterogeneous set of emerging and established markets can be traced to the focal MNEs' ability to blend commitment to global strategic thrusts to leverage insights and realize synergies with the flexibility to offer products and services catered to local market demands.

⁶⁵ For more on organizational learning as well as the dynamics and tensions between exploration and exploitation please consult: J. G. March, "Exploration and Exploitation in Organizational Learning," *Organization Science*, 2/1 (1991): 71-87, and D. Levinthal and J. G. March, "The Myopia of Learning," *Strategic Management Journal*, 14 (1993): 95-112.

5.8 APPENDIX 1 – Data Sources and Research Methods

We collected data by means of in-depth interviews in seven MNEs (*cf.* Table 5.1 below) and triangulated these with company-specific documents and reports. Before visiting a company we gathered publicly available secondary data about the firm. Through our data collection and analysis, we gained a fine-grained understanding of the challenges that these companies face when competing in multiple emerging markets and in established markets. We also aimed at understanding the capabilities and underlying organizational skills and management practices they have developed to address these specific challenges.

To create this understanding we conducted 43 interviews lasting between 60 and 90 minutes. We used a short standardized interview guide to drive the interviews. The interview guide contained broad, “grand tour” questions that enabled the interviewees to formulate the emerging market and corporate challenges their company and/or subsidiary face as well as the organizational and managerial processes, skills, and practices they have developed to address these challenges. We also asked what they considered strategic agility to be and how to cultivate it across emerging markets as well as across emerging and established markets. Besides these broad questions, we allowed topics to emerge from each interview and acknowledged the unique aspects of each company. The interview guide evolved with the research project as the challenges and capabilities and their context-specificity crystallized. Hence, we were able to include more specific questions to help us in inducing greater insights into specific challenges and capabilities.⁶⁶

⁶⁶ A. Strauss and J. Corbin, “*Basics of Qualitative Research: Grounded Theory Procedures and Techniques*,” (Newbury Park, CA: Sage Publications, 1990).

We pursued a “synthetic strategy” to analyze the qualitative data.⁶⁷ First, we conducted multiple rounds of coding, starting with open-coding of the interview transcripts to uncover patterns that allowed us to label the key themes. Next, we searched for similarities across pairs of interviews to see if what emerged in the first stage of coding held true. Finally, we used company documents and reports and secondary sources available online such as press articles to validate the interview data. Findings were further validated by having several interviewees review the patterns we unearthed.

⁶⁷ For more details please see A. Langley, “Strategies for theorizing from process data,” *Academy of Management Review*, 24/4 (1999): 691-710, and M. B. Miles and A. M. Huberman, *Qualitative Data Analysis*, (Thousand Oaks, CA: Sage Publications, 1994).

Table 5.1: Company and Interviewee Characteristics

Company	Characteristics	Short Profile ⁶⁸ of Activities & Investments in Emerging Markets	Data Interviews	Collection ⁶⁹ :
Bertelsmann	Diversified media company active in broadcasting, publishing, music, media services, and business process outsourcing (BPO services). Headquartered in Germany.	<p>Scope/Nature:</p> <ul style="list-style-type: none"> Besides sales of existing BPO services, Bertelsmann's Arvato division is co-developing new custom-tailored service solutions with clients from emerging markets in media, energy, and commercial aviation <p>Importance/Success:</p> <ul style="list-style-type: none"> About 15% of total Group revenues generated in emerging markets Margins in emerging markets up to 5 times higher than those from established markets Majority of outsourcing services offered from 70 locations in emerging markets Outsourcing services increasingly offered to clients from emerging markets 	<p>15 Interviews:</p> <ul style="list-style-type: none"> 3 senior managers at corporate headquarters 11 local and expat managers in emerging markets in sales, sourcing, and finance 1 interview with the CEO of a local business partner in Latin America 	
BMW	Car and motorcycle manufacturer focusing on the premium segment; also offering financial services. Headquartered in Germany.	<p>Scope/Nature:</p> <ul style="list-style-type: none"> Besides sales also major production and assembly facilities in Asia and Africa Currently negotiating terms for opening major production facilities in Latin America <p>Importance/Success:</p> <ul style="list-style-type: none"> Approximately 37% of all cars sold in emerging markets Decreasing sales in the European Union markets offset by growth in emerging markets, specifically in China (37.7% year on year growth in number of vehicles sold) and BRIKT countries⁷⁰ (about 30%) 	<p>8 Interviews:</p> <ul style="list-style-type: none"> 3 senior corporate managers 5 middle managers working on business development, global marketing strategy, and global production strategy projects 	

⁶⁸ Unless reported otherwise, all figures apply to year 2011.

⁶⁹ Besides the interview data, we collected and analyzed for each company press releases, company documents and reports, and publicly available secondary data.

GE	<p>Conglomerate active in markets such as aviation, energy infrastructure, transportation, healthcare, and financial services.</p> <p>Headquartered in the USA.</p>	<p>Scope/Nature:</p> <ul style="list-style-type: none"> Besides sales, major production and R&D activities in multiple emerging markets. For instance, GE invested \$2bn in the past two years in China alone including \$500m on R&D, establishing six Customer Innovation Centers <p>Importance/Success:</p> <ul style="list-style-type: none"> Revenues in emerging markets accounting for almost 50% of total revenues, 70% of industrial order backlog from emerging markets Industrial emerging market revenues increased by 25% year on year, driven by double-digit growth in BRIC countries 	<p>1 Interview:</p> <ul style="list-style-type: none"> Emerging market project manager
Philips	<p>Diversified company active in the markets of healthcare, consumer lifestyle, and lighting.</p> <p>Headquartered in the Netherlands.</p>	<p>Scope/Nature:</p> <ul style="list-style-type: none"> Besides sales, also major production and R&D facilities in Asian emerging market countries and major production facilities in Latin America <p>Importance/Success:</p> <ul style="list-style-type: none"> 33% of total sales generated in emerging markets Sales in emerging markets increased last five years by 29%, as compared to 0.7% in other markets Nearly all sales growth of the group (4.1%) was accounted for by the sales growth in emerging markets (11.1%) 	<p>5 Interviews:</p> <ul style="list-style-type: none"> 2 senior managers at corporate headquarters 3 emerging market product technology managers
Siemens	<p>Diversified German company providing solutions in infrastructure, energy, and healthcare as well as industrial and household</p>	<p>Scope/Nature:</p> <ul style="list-style-type: none"> Besides sales also local production and R&D centers in Asian and Latin American emerging markets <p>Importance/Success:</p> <ul style="list-style-type: none"> 33% of total revenues generated in emerging markets Year on year growth of 11% in BRIC countries, significantly outpacing overall revenue growth (6.6%) 	<p>4 Interviews:</p> <ul style="list-style-type: none"> 2 senior corporate managers 2 infrastructure project managers in emerging markets

⁷⁰ Brazil, Russia, India, Korea, and Turkey.

Unilever	<p>equipment.</p> <p>Diversified consumer goods company, including food, beverage, home care, and personal care products.</p> <p>Headquartered in the UK and the Netherlands.</p>	<p>Scope/Nature:</p> <ul style="list-style-type: none"> Besides sales also major production and R&D facilities in Asian emerging market countries Pursues a fast local capacity expansion strategy in emerging markets, investing US\$2.7bn in 2011, including a new dedicated training facility for emerging market operations in Singapore <p>Importance/Success:</p> <ul style="list-style-type: none"> 54% of total sales generated in emerging markets Nearly all sales growth of the group (6.5%) was accounted for by the sales growth in emerging markets (11.5%) 	<p>5 Interviews:</p> <ul style="list-style-type: none"> 3 senior leaders at corporate headquarters 2 sales and marketing managers of emerging markets
Volkswagen	<p>Manufacturer of passenger and commercial vehicles active in all segments of the industry; also offering financial services.</p> <p>Headquartered in Germany.</p>	<p>Scope/Nature:</p> <ul style="list-style-type: none"> Besides sales, also major production facilities for full vehicle lines in Latin American and Asian emerging markets Investing approximately US\$17.5bn (through joint ventures) for production facilities in China until 2016 <p>Importance/Success:</p> <ul style="list-style-type: none"> 52% of Group passenger vehicle sales generated in emerging markets 2.3 million passenger vehicles sold in China (up 17.4% year on year) – and profits rising by 30%; currently building 4 of the 10 most sought-after vehicles in China Sales growth exceeding 50% in Russia and India; Argentina +29.5%, South Africa +36.6% 	<p>5 Interviews:</p> <ul style="list-style-type: none"> 2 corporate managers 3 emerging market project managers

Table 5.2: Organizational Practices and Managerial Activities

		Sensing local opportunities	Enacting global complementarities	Appropriating local value
<i>Organizational practices and managerial activities</i>		<ul style="list-style-type: none"> Discovering opportunities through local presence and strong ties to local partners Applying tailor-made metrics for evaluating and rewarding initiatives Championing at the subsidiary-HQ interface 	<ul style="list-style-type: none"> Mobilizing and sharing complementary resources globally Coordinating cross-emerging market tasks Leveraging resources and best practices across emerging and established markets 	<ul style="list-style-type: none"> Adapting go-to-market concepts locally Building legitimacy in local power networks Creating dynamic barriers to imitation
Bertelsmann	Description	Using local ties established through active participation in the NASSCOM trade association to recognize demand for new service solutions for clients in emerging markets (EM). Testing new ideas in informal settings. HR continuously updating evaluation and performance measurement criteria.	Sharing and transferring insights across markets initially a challenge and seen as a distraction, but now incentivized. Coordinating global media strategy across EM and established markets (ES). Implementing cross-market feedback mechanisms to pool expertise of local groups.	Offering co-development of ancillary services to local clients in media, telecommunications, and healthcare. Adapting BPO solutions to local clients' demands and capabilities, helping local clients integrate IT, sales, logistics, and CRM, but managing this integration as a service to keep expertise in-house.
BMW	Description	Strong presence in local markets through joint-ventures and major production and assembly facilities. Opportunity evaluation metrics assessed project by project. Subsidiary-HQ relations: reporting in line with data availability, but subsidiary-HQ conference calls at regular intervals in which candid feedback is welcomed by both sides and a devil's advocate is assigned.	Use EM as development and testing grounds for new mobility solutions across the globe. Global supply chain integration for added flexibility, also in terms of exploiting sourcing advantages. Employee rotation program implemented to share insights through socialization and integration processes and to benefit globally from engineering and management talent.	Adapting local dealer network, service plans, and warranties to preferences of car owner preferences in each market. Going beyond compliance with local regulations through involvement in local initiatives aimed at regional economic development. Innovation of crucial mechanical and electric components remains in developed countries with reliable IP safeguards.

GE	<p>Description</p> <p>Nurturing political and business ties, sometimes facilitated by the support of the US government.</p> <p>GE Energy Financial Services is co-financing energy projects in India with local governments to open up opportunities.</p> <p>Reward systems blend local and global 'expat' standards, taking local growth rates as well as costs of living into consideration. Championing made part of performance evaluation criteria.</p>	<p>Increasingly globalized R&D architecture with technology centers in India, China, and Brazil.</p> <p>Developing and launching GE Healthcare products in EM and subsequently offering them also in ES as cost-competitive options.</p> <p>Employee rotation (Experienced Commercial Leadership Program) to establish a common ground and nurture global identification, instill global leadership skills, and a sense of accountability.</p>	<p>Constant alignment with alterations of the local governance landscape.</p> <p>Engagement in local communities, providing awards to outstanding volunteers.</p> <p>Using patenting in alternative energy solutions (such as wind turbines) to valorize innovation through licensing.</p>
Philips	<p>Description</p> <p>'Design in and for approach' - local R&D facilities in EM established in collaboration with local partners.</p> <p>Tailor-made metrics aligned with market and industry growth rates replacing aspects of the 'Towards One Philips Program.'</p> <p>Pushing responsibility for product development further down in the organization, particularly for EMs.</p>	<p>R&D centers with global leadership responsibility for developing and mobilizing resources and technologies across markets. Accessing local talent and leveraging these resources and competences globally.</p> <p>Cross-market coordination and alignment programs for design, engineering, and manufacturing.</p>	<p>Development of new leadership competencies which put a premium on both the ability to seize new opportunities.</p> <p>Increased attention for rural distribution with local partners and the local repositioning of the global brand.</p> <p>Continuous reduction of time needed to go from product development to sales in order to stay ahead of growing local competitors.</p>
Siemens	<p>Description</p> <p>Scoping options for market access through local government and business ties, for instance with China Mobile and China Unicom.</p> <p>HR implementing career development related incentives for developing public-private partnerships.</p> <p>SMART Strategy - develop, test, and pilot-sell products designed for EM</p>	<p>Coordination of global technology development and manufacturing operations across EM and ES.</p> <p>Leveraging expertise, especially insights gathered during difficult implementation of infrastructure projects to hone global best practices.</p> <p>Implementing employee mobility programs at different hierarchical</p>	<p>Not only showcasing reliability in executing complex infrastructure projects, but also offering reliable service which is key to be awarded and maintain long-term service contracts.</p> <p>Nurturing trust and reciprocity with local (governmental) power networks to avoid the infringement of rights.</p> <p>Shortened product development</p>

Unilever	Description	<p>locally to prove the concept before generating buy-in at HQ.</p> <p>Local presence and partnerships for each of the main functional areas including R&D and production. Tailor made metrics for EM and ES to evaluate new projects and reward local initiatives.</p> <p>HQ-subsidiary relations characterized by open, rich, and constructive communication.</p>	<p>levels, and ICT infrastructure to share best practices and improve manufacturing processes.</p> <p>Global coordination of cross market tasks - sourcing, production, packaging, logistics. Training and socialization programs stressing the importance of common ground for leveraging resources and sharing best practices across EM and ES.</p>	<p>cycles and faster go-to-market to build dynamic barriers to imitation.</p> <p>Tailor made go-to-market concepts to fit local conditions. Change in distribution and sales: from scaling-up to scaling-out involving a wide range of local partners, close relationships, and training and development programs.</p>
Volkswagen	Description	<p>Strong local presence: major production facilities for full vehicle lines in Latin America and Asia, including major joint-ventures in China.</p> <p>Decision parameters for each major market reconsidered periodically.</p> <p>Stimulating championing efforts by decentralizing decision-authority and freeing up individuals to work on new ideas and initiatives.</p>	<p>Integrated cross-market production strategy: leveraging common components, shared platform utilization, labor, energy, and input material sourcing/logistics advantages on a global scale.</p> <p>Global component sourcing strategy to lower input and logistics costs as well as decrease supplier reliance.</p> <p>Specialized programs and social platforms to identify and transfer best practices across functions and locations.</p>	<p>Involvement in social initiatives concentrating on deprived children in the vicinity of the Puebla plant - "A day for the future" and "Casa del Sol," an orphanage financed by VW Mexico and its staff.</p> <p>Building reciprocal, long-term relations with local suppliers and other partners.</p> <p>Nurturing trust, yet being aware that core technology development activities related to engine and powertrain parts should be dispersed to curtail imitation.</p>

Chapter 6. Summary of Findings & Contributions

In this dissertation I have tried to investigate in the first study which and how contingencies drive the association of exploration and exploitation. The subsequent studies build on this theory extending meta-analysis (Combs et al., 2011) to advance the organizational learning and paradox literature with fine-grained insights at different levels-of-analyses and in different contexts, paying attention to idiosyncratic mechanisms that enable or constrain managing the contradictions associated with exploration and exploitation (Smith, 2014).

The second study provides insights into who should be ambidextrous by illustrating the work contexts in which such behaviors matter for managers' performance, and how managers may be prepared for mastering jobs that require ambidexterity through long tenure paired with a broad multi-functional exposure. Then I investigated pairs of senior and middle managers to conceptually and empirically assess how horizontal interpersonal processes influence unit ambidexterity, which enables units to be innovative and flexible without compromising efficiency (Jansen et al., 2012). Specifically, the third study shows how middle managers can leverage intra-firm relationships with different actor groups for their units to become more ambidextrous, recognizing both advantages and pitfalls of vertical interpersonal processes in shaping horizontal interactions among MMs across units. Finally, the firm level study zooms in on how strategic agility enables global strategic integration and local differentiation within the realm of large global firms that face demands and pressures from both emerging and established markets. Capturing opportunities across these markets by blending global strategic thrusts to leverage best practices as well as to cater to local demands requires strategic agility, a meta-capability that balances the relative focus an MNE sets on sensing local opportunities, enacting global complementarities, and capturing local value.

This dissertation contributes to and extends the exploration-exploitation framework and ambidexterity research by assessing the underlying assumption and addressing core debates (Lavie et al., 2010). It reveals a ‘necessity’ vs. ‘ability’ dilemma as organizations need to be able to simultaneously pursue both exploration and exploitation for survival and prosperity (March, 1991), but idiosyncratic challenges appear at different levels and in different contexts as the meta-analysis in Chapter 2 suggests. Particularly at lower levels-of-analysis because contradictory elements cannot be easily separated (Gupta et al., 2006). Therefore, I conceptually and empirically investigated challenging contradictions and solutions at different levels and in different contexts in order to uncover specific mechanisms that enable or constrain the pursuit of competing strategic thrusts such as exploration and exploitation (Smith, 2014). Hence, this dissertation not only extends ambidexterity research, but also contributes to paradox theory by establishing the nature and locus of organizational tensions, how they are experienced, and how they can be effectively managed (Smith & Lewis, 2011).

Each chapter of this dissertation has been crafted with the explicit objective to derive novel insights and viable pathways that can help organizations and their decision-makers become more innovative and to more effectively manage change processes without compromising operational efficiency. This is crucial in a world of scarce resources and fast moving targets (O’Reilly & Tushman, 2013). Using meta-analytic techniques I addressed three debates concerning fundamental assumptions and interpretations of the exploration-exploitation framework, which pose threats to the generalizability and applicability of findings this research has generated. Literature reviews point to differences in conceptualization, level-of-analysis, and study context that explain mixed results in terms of the association between exploration and exploitation (Gupta et al., 2006; Lavie et al., 2010; Raisch et al., 2009). These insights are essential for coherent future development of the exploration-exploitation framework and accurate interpretation of the results of primary studies.

6.1 'Necessity' vs. 'Ability' to Host Challenging Contradictions

The results of study 1 imply that it is vital for researchers to be thoughtful and explicit about their conceptualization choices, i.e. whether they conceptualize and measure exploration and exploitation in terms of 'behaviors' or 'outcomes.' Adopting either of these two frequently found categorizations (Crossan & Apaydin, 2010; Li et al., 2008) has implications for how studies compare and how the findings should be interpreted as well as evaluated in light of studies having taken similar approaches. Achieving outcomes or enacting behaviors may be driven by very different motives and propelled in different settings. Thus, if decision-makers wish to accomplish radical innovation, they should look into dual structures, systems, and contexts which support and incentivize realization of projects aimed at such outcomes (Jansen et al., 2009; O'Reilly & Tushman, 2011). In contrast, to instill ambidextrous behaviors, different career-development related mechanisms may be more appropriate as the second study in this dissertation reveals.

Next, scholars have started to debate about the locus of the paradox between exploration-exploitation and have considered at which level the tensions are most pronounced and more difficult to be resolved (Gupta et al., 2006; Lavie et al., 2010). The findings in the meta-analysis point to the impact and scope of the tensions between exploration and exploitation as becoming stronger, the lower the level-of-analysis. This suggests that the mechanisms to reconcile the contradictory forces are idiosyncratic and challenges and solutions to enable an ambidextrous pursuit of both activities need to be considered accordingly by researchers, lecturers, and practitioners (Turner et al., 2013). The other three studies in this dissertation contain insights as to how ambidexterity can be developed and deployed throughout the organization by nurturing the exploration and exploitation, embracing the duality of these concepts, and instilling behaviors and capabilities required to cope with the tensions at the individual, unit, and firm level.

To what extent are organizational units and their managers able to facilitate the emergence of (radical) innovation and – even more difficult – balance this desire for innovation and change with a continued focus on operational excellence? This remains a pivotal question in management research. Multiple, inconsistent goals can give rise to ambivalence among employees (Merton & Barbar, 1976; Pradies & Pratt, 2010) and confrontation between subgroups or coalitions (Glynn, 2000). Such conflicts are exacerbated when competing identity claims are reinforced by these goals (Fiol, Pratt, & O'Connor, 2009; Smith, 2014). Moreover, inertial forces may emanate from structures (Henderson & Clark, 1990), routines, or the underlying cognitive frames and competencies (Gilbert, 2005; Leonard-Barton, 1992; Tripsas & Gavetti, 2000). Notwithstanding these issues, unit ambidexterity is crucial for diversified firms using more decentralized structures, passing more responsibilities to simultaneously explore and exploit to the unit level (Ancona & Caldwell, 1992; Anderson & West, 1998; Hülshager, Anderson, & Salgado, 2009) or for SMEs (Lubatkin et al., 2006). Recently, Birkinshaw and Gupta (2013) recommended more research that conceptually develops and tests the management capabilities and qualities that are needed to address these particular challenges inherent in pursuing ambidextrous strategies within organizational units or smaller entities.

Third, the findings in this dissertation confirm the notion that organizations' ability to accomplish a parallel pursuit of two competing strategic and organizational learning orientations such as exploration and exploitation is exceptionally difficult in turbulent environments. In light of these performance implications in such environments (*cf.* Jansen et al., 2006), a 'necessity' vs. 'ability' dilemma emerges. Study 4 corroborates these findings. Facing heterogeneous challenges and opportunities in both established and emerging markets, the strategically agile MNEs investigated in study 4 face tensions of belonging, performing, and organizing between the capabilities that enable their success. Large global firms operating with strategic agility face more contradictory

challenges compared to firms lacking strategic agility. While managing the global and local dynamics with strategic agility enables MNEs to regenerate competitive advantages, it is particularly challenging in the contexts where a dynamic balance among the underlying capabilities is most valuable.

6.2 Individual Level & HRM Implications

Previous studies on organizational learning (Cohen & Levinthal, 1990; Crossan, Lane, & White, 1999), strategic renewal (Floyd & Lane, 2000; Rajagopalan & Spreitzer, 1996), and technological innovation (Duncan, 1976; Tushman & O'Reilly, 1996), indicate that strategic renewal or ambidexterity originates from individuals' paradoxical cognition and behaviors (Smith & Tushman, 2005); e.g., from managers who "explore new opportunities even as they work diligently to exploit existing capabilities" (O'Reilly & Tushman, 2004: 74). Rare insights into the microfoundations of ambidexterity have recently been provided by Rogan and Mors (2014) who show that density, contact heterogeneity, as well as tie informality are levers for senior managers' ability to behave ambidextrously. Yet, research on how and under what circumstances individual managers are able to deal with seemingly paradoxical demands is still in its infancy (Mom et al., 2009). Very little is known about who should be ambidextrous, i.e. when managers' ambidexterity translates into individual performance (Junni et al., 2013).

While studies on human resource management (HRM) have investigated how HRM practices may assist firms in promoting ambidexterity in the workforce as a whole (Kang and Snell, 2009; Patel et al., 2013; Prieto & Santana, 2012), and despite the general observation that ambidextrous organizations may need ambidextrous managers (O'Reilly & Tushman, 2004, Probst et al., 2011, Raisch & Birkinshaw, 2008), current literature lacked a thorough understanding about when and why managers may need to act ambidextrously to be most effective and how they actually may be able to do so.

Study 2 provides evidence that the personal effectiveness of managers' ambidextrous behaviors is contingent upon the extent of uncertainty and interdependencies in their work context (Griffin et al., 2007) and explains why some managers are more able than others to behave ambidextrously due to differences in their organizational and functional tenure (Tesluk & Jacobs, 1998). Resonating with leadership and cognition research, the upper echelons benefit more from ambidextrous behaviors (Smith & Tushman, 2005; Martin, 2007). Senior leaders are the ones facing uncertainty and interdependencies. This suggests challenges for preparing lower level managers for promotion as they may perform fine in their current function with low degrees of ambidextrous behaviors and training them for future uncertain and interdependent challenges may distract them from their current duties.

The insights on the nuanced effects of different types of tenure on managers' ambidexterity generated by this study also shed more light on the ambiguity which exists in the current ambidexterity literature about whether work experience forms a valuable asset to managers' ambidexterity – for instance through individual learning and through network effects (O'Reilly & Tushman, 2008), or a liability – for instance due to self-reinforcing triggers of exploitation and cognitive constrains (March, 1991). While having managers longer in specific functions or positions may decrease their ambidextrous behavior over time, having them longer in the organization, while keeping their functional tenure low may actually increase their ambidexterity.

6.3 Unit & Firm Level Implications

Since Chandler's (1962) seminal work on the multi-business (M-form) structure, a diverse body of research has developed on the management of such organizations. Given the empirical setting of studies 2, 3, and 4 in this dissertation, it contributes to this literature. Contemporary organizations simultaneously

pursue exploration and exploitation in order to master both incremental and radical changes and thereby respond effectively to escalating contextual demands and shifts in dominant technologies (Benner & Tushman, 2003; Birkinshaw & Gibson, 2004; Christensen, 1997; March, 1991). These organizations and their units cannot afford to fall victim to success (competence) and failure (renewal) traps (Levinthal & March, 1993). This is especially true in increasingly pervasive multiunit firms (Usher, 1999), which face the risky, but potentially fruitful option to decentralization and delegate exploration and exploitation to lower levels in order to compete more effectively in multiple strategic domains (Porter, 1985; Smith, 2014). Thus, the third study in this dissertation investigates how units can become more ambidextrous and thereby stronger competitors in their respective strategic domains (Gibson & Birkinshaw, 2004; Jansen et al., 2012). Particularly studies 3 and 4 in this dissertation show that middle managers' work and horizontal as well as vertical relationships should not be discounted as they are key actors in integrating knowledge domains and leveraging resources and social connections for their units – and thereby their overarching organizations – to become entrepreneurial and agile (Floyd & Wooldridge, 1997) and more effective in face of market and technological changes (Barreto, 2010; Burgelman, 1994).

Scholars have suggested that organizations may resolve paradoxical challenges by structurally separating exploration from exploitation across different units (Tushman & O'Reilly, 1996; O'Reilly & Tushman, 2011). This approach relies on structural differentiation and senior team integration to buffer the development of new capabilities from ongoing operations (Gilbert, 2005; Tushman et al., 2011). While structural separation is feasible in systems of multiple units (Gupta et al., 2006), it comes with integration challenges and the downside that if units focus exclusively on exploration or exploitation tensions and problems will be unavoidable – they have to be addressed by senior leaders (Smith & Tushman, 2005) and may undermine cooperation, integration, and synergy realization across organizational units (Birkinshaw & Gupta, 2013).

Gibson and Birkinshaw (2004: 212) summarize this by drawing on paradox theory: "Suppressing one side of a polarity within a given business unit intensifies pressure from the other (Lewis, 2000)." Consequently, this approach may fractionate the organization and actors have to face the discomfort of tensions and frustration in the quest for alignment and adaptability.

Another perspective suggests that paradoxical demands can also be tackled effectively within units by establishing a supportive context, thereby avoiding quarrels at the organizational level and achieving alignment and adaptability within units, which comes with significant performance benefits (Gibson & Birkinshaw, 2004; Jansen et al., 2012). Research advocates seeing flexibility and cost-efficiency not as contradictory (DeMeyer, Nakane, Miller, & Ferdows, 1989; MacDuffie, 1995). However, this is not easy as the tensions between exploration and exploitation are particularly strong at lower levels-of-analysis (as study 1 showed).

Hence, the emergence of unit ambidexterity comes with challenging organizational tensions that need to be recognized and resolved by middle managers (Andriopoulos & Lewis, 2009). However, beyond research into senior business unit managers' indirect influence through shaping a supportive context for the emergence of ambidexterity (Gibson & Birkinshaw, 2004; Patel et al., 2013) very little is known on the factors enabling or constraining ambidexterity within units as well as the activities and competences of MMs in charge of these units in shaping ambidextrous strategies (Junni et al., 2013; Raisch & Birkinshaw, 2008). This is surprising as studies on learning and strategy formation indicate that these learning and strategic decision processes of MMs rely on interpersonal interactions with their colleagues in other units (e.g., Cummings, 2004; Pappas & Wooldridge, 2007; Wooldridge et al., 2008). As unit ambidexterity requires a high level of knowledge exchange and interpreting tendencies towards success or failure traps, and coordination to act decidedly and in a timely manner to rebalance exploration and exploitation activities (March, 1991; Puranam, Alexy, &

Reitzig, 2013; Tushman & O'Reilly, 1996), not only horizontal knowledge exchange and combination is vital for MMs. Rather, the influence of horizontal knowledge exchange is also shaped by the quality of vertical interactions between MMs and TMT (e.g., Huy, 2011).

Recent research pinpoints to reasons such as reduction of information asymmetries, attracting leaders' attention, enabling resource access, validating and legitimizing unit level choices, and generating commitment through interest alignment, which make direct TMT-MM interactions vital in executing complex strategies and projects (Bouquet & Birkinshaw, 2008a; Raes et al., 2011; Shimizu, 2012). We follow Raes and colleagues (2011) in adopting theories of information processing and interpersonal processes to explain the boundary-spanning mechanisms middle managers can use to stimulate unit ambidexterity. Upper echelons theory and research on middle managers have developed as two separate streams in the literature (Raes et al., 2011). The research in this dissertation in studies 3 and 4 confirms that in large global firms processes that enable these organizational actors to work together – such as integrative bargaining and cognitive flexibility at the TMT-MM interface (Raes et al., 2011) – influence the innovativeness and responsiveness of middle managers' units.

By advancing the understanding of the drivers of unit level ambidexterity, we shift the attention to mechanisms at this rarely covered, yet coveted lower level-of-analysis (Burton et al., 2012; Jansen et al., 2012; O'Reilly & Tushman, 2013). The third study also adds insights to strategy process research (e.g., Bartlett & Ghoshal, 1993; Floyd & Lane, 2000; Van Cauwenbergh & Cool, 1982), which advocates the importance of vertical hierarchy-spanning exchanges, yet offers only very little empirical scrutiny and almost no insights on their pitfalls (Hoon, 2007; Raes et al., 2011).

On a related note, the fourth study investigates interpersonal processes linking subsidiaries in emerging markets and headquarters in established markets to enable communication, coordination, and better understanding among

organizational actors (Aldrich & Herker, 1977; Allen, 1977). The boundary-spanning activities of senior and middle managers are important to connect diverse types of information and structural areas (Martin & Eisenhardt, 2010; Thompson, 1967), for leveraging and sharing competencies and resources intelligently (Raes et al., 2011; Taylor & Helfat, 2009), and for better performance of organizational subunits (Tsai, 2001; Tushman & Katz, 1980).

From an upper echelons' perspective study 3 outlines alternative avenues through which TMT members can leave a mark on their organization at the unit level, specifically by cultivating and using cognitive flexibility and integrative bargaining as they interact with the middle managers reporting to them. Thereby, it addresses calls for new avenues of TMT influence (Carpenter et al., 2004; Hambrick, 2007) that goes beyond explaining antecedents of strategic choices (e.g., Chin, Hambrick, & Treviño, 2013) or intra-TMT processes (e.g., Ling, Simsek, Lubatkin, & Veiga, 2008; Lubatkin et al., 2006). Moreover, by scrutinizing intra-firm interactions, this work is complementary to a vast body of research on the interaction of TMT members with external stakeholders (Collins & Clark, 2003; Geletkanycz & Hambrick, 1997; Yoo, Reed, Shin, & Lemak, 2009).

For those involved in recruiting, training, or consulting, this research suggests to carefully consider the functions and functioning of the TMT-MM interface. Predominantly existing research has been biased towards having the 'best' CEO or TMT composition or 'excellent' intra TMT processes (Edmondson & Smith, 2006; Kets de Vries, 2005; Tushman, Smith, & Binns, 2011). Thinking beyond C-Suite processes and skills generates additional, complementary insights and recommendations for training existing as well as future leaders. It helps prepare future leaders by involving them early on in strategy making and execution processes. From the patterns of relationships and interactions inside an organization – not just from the fact that charismatic leaders sit at the top – managers can make sense of organizational change and executing strategies as well as failure to do so (Weick, Sutcliffe, & Obstfeld, 2005). It is this very

interaction that can give important clues as to the impact the TMTs can have on their organizations' performance. Ideally, the vertical interface functions in a way that is automatic and natural as this will prove essential in particularly challenging situations, e.g. power and personal interest-laden changes such as restructurings with layoffs or shifts of budgets from one unit or technology to another.

In the fourth and final study we provide a framework that informs decision-makers of MNEs how to create and embed strategic agility within their organization. Our insights draw upon our ongoing research in several Fortune 500 MNEs, such as Bertelsmann Group, BMW, GE, Philips, Siemens, Unilever, and Volkswagen, and advance strategic agility research in the unique and increasingly important context of operating in both emerging and established markets.

Managing the tensions which emerge when keeping sensing local opportunities, enacting global complementarities, and appropriating local value in a dynamic balance is pivotal for large global firms to succeed in a heterogeneous and uncertain business environment. We illustrate viable pathways that senior and middle managers can follow to nurture strategic agility by maintaining a dynamic balance and responding effectively to the organizational tensions that emerge in this quest. Overall, this dissertation is aimed at informing decision-makers how to manage contradictions that become evident in the exploration-exploitation framework and when operating with across heterogeneous markets that demand local differentiation and global integration. By applying the insights generated by the four studies in this dissertation they may have better chances to outperform competitors by exploring activities in new markets and experimenting with new technologies and business models without compromising global efficiency and leveraging existing competencies (Markides, 2013).

Table 6.1 presents a summary of the core insights and implications.

Table 6.1: Summary of Core Insights & Implications

	Core Insights	Implications
<i>Study 1</i>	<p>Research Questions</p> <p>What is the association between exploration and exploitation? Which and how do contingency factors influence this association?</p> <ul style="list-style-type: none"> • Due to less ambiguity and fewer interdependencies outcome-based conceptualizations show a stronger association of exploration and exploitation than behavior-based conceptualizations. • The tensions between exploration-exploitation become stronger the lower the level-of-analysis - making a simultaneous pursuit of both activities harder. • The relationship of exploration and exploitation is stronger in slow clockspeed business environments than in high-clockspeed environments. 	<p>Implications</p> <p>This study provides an important step in finding answers to key outstanding questions and further contributes with a fine-grained, empirically validated understanding about the validity and impact of key assumptions in exploration-exploitation research. It reveals an interesting 'necessity' vs. 'ability' dilemma and helps interpret and assess the assumptions of primary studies in ambidexterity research.</p>
<i>Study 2</i>	<p>Research Questions</p> <p>How do organizational and functional tenure relate to managers' ambidexterity? How does the work context - in terms of uncertainty and interdependence - influence the managers' ambidexterity-performance relationship?</p> <ul style="list-style-type: none"> • Longer organizational tenure is associated with higher levels of managers' ambidexterity. • Functional tenure does not moderate this relationship, rather higher functional tenure decreases managers' ambidexterity. • The managers' ambidexterity-performance relationship is positively moderated by both uncertainty and interdependence in the work context. • Hierarchical level has the same moderating effect and is significantly correlated with these work context features. 	<p>Implications</p> <p>This study provides fine-grained individual level analysis as to how ambidextrous behaviors can be nurtured and under which conditions they matter most. From the findings we derive HRM implications for manager selection, career development, training, and succession planning purposes.</p>

Table 6.1: Summary of Main Findings & Implications (continued)

Research Question	Main findings	Implications
<p><i>Study 3</i></p> <p>How does horizontal knowledge exchange among middle managers across units influence unit ambidexterity?</p> <p>How is this relationship contingent upon integrative bargaining and cognitive flexibility in vertical TMT-MM interpersonal processes?</p>	<ul style="list-style-type: none"> • Horizontal knowledge exchange among middle managers in different units is positively related to unit ambidexterity. • The interaction effects of horizontal knowledge exchange with integrative bargaining in TMT-MM relations are positive in relation to unit ambidexterity, while the interaction effects with cognitive flexibility are negative. • The effects of interpersonal processes are in addition to effects of a work context previously found conducive to the emergence of unit ambidexterity. 	<p>This study reveals and tests new insights into how horizontal interactions among MMs foster unit ambidexterity. It tries to reach consensus about the effectiveness of interpersonal processes and whether complementarities or tradeoffs exist among horizontal and vertical interpersonal processes. It extends research on MMs' and unit strategy formation and learning processes.</p>
<p><i>Study 4</i></p> <p>What are the foundations and drivers of strategic agility of large global firms competing across emerging markets and established markets?</p> <p>How can the contradictions associated with strategic agility be managed?</p>	<ul style="list-style-type: none"> • Strategic agility is a meta-capability that creates and deploys a dynamic balance between sensing local opportunities, enacting global complementarities, and capturing local value over time. • Tensions of belonging, performing, and organizing arise in the quest of developing and deploying the three dynamic capabilities that form the foundations of strategic agility. • These challenging contradictions can be addressed through modular organizational systems, integrative thinkers in the TMT, and high-performance human resource systems. 	<p>The manifestation of strategic agility in MNEs operating across emerging and established markets has idiosyncratic features. Strategic agility is pivotal to success in heterogeneous markets as it enables blending global, synergy-realizing strategic thrusts with the flexibility to offer differentiated products and services that cater to local demands.</p>

6.4 Future Research Agenda

6.4.1 Dynamic Perspectives on Exploration, Exploitation, and Ambidexterity

The emerging ambidexterity literature posits primarily static perspectives on the tensions between exploration and exploitation and how to handle them. Most studies have concentrated on identifying and examining different approaches as well as identifying important organizational attributes and managerial aspects that enable organizations to pursue exploratory and exploitative efforts simultaneously. Given the nature of prior studies, the meta-analysis at the start of this dissertation has been limited to static lenses on the exploration and exploitation typology. Resonating with the findings from the studies in this dissertation more scholarly work providing insights into a dynamic perspective on how firms organize for exploration and exploitation would be desirable (Nosella et al., 2012; Birkinshaw & Gupta, 2013). To realize such dynamic ambidexterity the structures and systems in which different constellations of exploration and exploitation flourish need to be considered (Raisch, 2008). Hence, this research could develop theory on when and how firms shift the relative emphasis on exploration and exploitation and how they promote such strategic shifts by alternating structures, systems, processes, and training which either support exploration or exploitation (Boumgarden et al., 2012).

First, scholars need to develop a better understanding about the feasibility and applicability of more dynamic approaches to balance exploration and exploitation, uncovering how organizations manage ambidexterity dynamically. For instance, how they shift the relative emphasis on exploration or exploitation over time in response to external contingencies such as economic declines (Hubbard & O'Brian, 2010). Thus, organizations may not choose to pursue exploration and exploitation to the same extent at all times. In response to intra-industry cycles of innovation they may use more dynamic approaches by

emphasizing and deemphasizing exploration or exploitation over time in line with the pace of innovative activity within particular competitive domains (Nagji & Tuff, 2012). Future research may uncover the consequences and viability of such approaches by overcoming the cross-sectional design limitations of this dissertation and adopting longitudinal data collection procedures. Then, research may uncover forms of temporal switching between exploration and exploitation (Boumgarden et al., 2012) and changes in the relative exploration orientation, which can be used to avoid misfits with the business environment (Uotila et al., 2009; Wang & Li, 2008).

Second, empirical evidence suggests that recalibrating the balance between explorative and exploitative activities in line with environmental developments is positively related to firm performance. Such effects are particularly pronounced in dynamic environments (Grewal & Tansuhaj, 2001; Jansen et al., 2006; Nadkarni & Narayanan, 2007). The ability to shift the balance between exploration and exploitation is of particular importance in times of decline or crisis, which represent a rare, yet high impact threat to organizational survival (Lee & Makhija, 2009; Walrave, Oorschot, Langerak, & Romme, 2013). However, striking the right balance between exploration and exploitation is not easy and both cyclical and counter-cyclical responses are possible (Raisch et al., 2009). That said, very little is known about whether and how firms respond to adverse market changes and economic fluctuations by adapting their exploration and exploitation efforts (Lavie et al., 2010). It remains a pivotal question both for scholars and practitioners, since these strategic changes affect organizational profitability and market valuation (Benner, 2009; March, 1991; McGahan & Porter, 1999). I recommend conducting research on how organizations cope with decline and what the long- and short-run performance implications of such strategies are.

Existing studies have attempted to analyze the relationship between market changes or economic fluctuations and firms' propensity to innovate. On the one hand, pro-cyclical arguments suggest that firms reduce exploratory

activities during phases of economic decline due to more limited resources and higher perceived uncertainty associated with exploration (Abernathy & Utterback, 1978; Anderson & Tushman, 1990; Berchicci, Tucci, & Zazzara, 2013), shrinking markets for sophisticated products (Sorensen & Stuart, 2000), and more distant and uncertain payoffs (Benner, 2009; March, 1991). Furthermore, as competition intensifies in face of decreased munificence in the marketplace, a premium is put on exploitation (Jansen et al., 2006). Firms facing external threats engage in actions to preserve the status quo and avoid risk taking by focusing more on exploitation (Staw, Sandelands, & Dutton, 1981; Greve, 2007). However, while a relatively stronger focus on exploitation seems most likely to boost short-run performance in such scenarios, it may come with potential perils in the long-run.

On the other hand, countercyclical arguments suggest that during crisis times organizations can also invest more in exploration efforts in face of less lucrative ongoing activities and hence relatively low opportunity costs (Arrow, 1962; Geroski & Walters, 1995; Isaacson, 2011). Additionally, prospect theory predicts that organizations facing the impending losses should embrace risk taking (Kahnemann & Tversky, 1979). Empirical evidence suggests that in turbulent market conditions it is vital to explore and maintain flexibility (Auh & Menguc, 2005; Kogut & Kulatilaka, 2001). Managers face difficult choices of how to balance relative exploitation and exploration (Uotila et al., 2009) in more or less severely declining markets and further research is necessary to understand the performance consequences in both short- and long-run. Moreover, how intra-firm outcomes such as commitment of managers and employees at lower levels and their identification with the company change in light of pro- and counter-cyclical strategies would be an insightful future research avenue. Such research could not only help advance a more 'dynamic' exploration-exploitation research agenda, but would inevitably also provide decision-makers with a better understanding of the consequences of shifting the exploration-exploitation balance.

6.4.2 Multilevel Perspectives on Exploration, Exploitation, and Ambidexterity

Next, I also encourage more multilevel research on organizational ambidexterity to develop a deeper understanding of the emergence of ambidexterity within units or teams and about how both managerial capabilities as well as organizational factors contribute to this emergence. Secondly, multi-level research could show how ambidexterity at lower levels of analysis manifests in terms of performance outcomes at higher levels, e.g. at the business unit or firm level.

I argue in study 3 that units do not only pursue one-sided exploration or exploitation efforts. Rather, units are increasingly exposed to business domain changes and need to be able to master alignment and adaptability (*cf.* Smith, 2014), they extend their own competencies and develop new ones through, sometimes using own resources, other times tapping into those generated in other parts of the organization. This resonates with Birkinshaw and Gupta (2013), who explained for ambidexterity to be better understood insights into how it can be realized at lower levels in the organization are crucial. This means investigating alternatives to structural solutions such as those proposed by Duncan (1976) and Tushman and O'Reilly (1996), which are not the only remedy to the ambidexterity challenge. While structural separation of exploration and exploitation activities is feasible in systems of multiple, ideally loosely coupled units (Gupta et al., 2006), it comes with integration challenges and the downside that if units focus exclusively on exploration or exploitation tensions and problems will be unavoidable and may undermine cooperation across organizational units (Birkinshaw & Gupta, 2013). Moreover, Argyris (1993) argued that – using structural differentiation spurs tensions as ambiguous messages divide the organization at the firm level. As such, tackling the ambidexterity challenge at the firm level, simply creates a “new set of dilemmas at the operational unit level, with the unit managers having to decide for themselves what the relative balance should be between exploration and exploitation” (Birkinshaw & Gupta, 2013: 15). Gibson and Birkinshaw (2004) put

forward the contextual approach as a solution enabling middle and operational level managers to blend explorative and exploitative orientations. But this is not the complete story – multi-level research is required to understand how managerial characteristics, capabilities, and interactions among managers – both laterally and vertically – contribute to managing tensions and trade-offs associated with a dual pursuit of exploration and exploitation – because ultimately, through managerial behaviors ambidexterity is achieved or not achieved as an organizations and their units may succumb to success and failure traps (Levinthal & March, 1993).

As the ambidexterity challenge can be pushed through the organizational hierarchy, it suggests that ambidexterity is a nested concept which applies across different levels (Birkinshaw & Gupta, 2013) and it demands idiosyncratic solutions for different levels as study 1 showed, also resonating with Turner et al. (2013). While there have been studies at different levels, only very few have considered multiple levels (e.g., Jansen et al., 2012). Hence, there is a lack of research about how these different level-specific solutions interact across levels. More theory needs to be developed and tested about how organizations can nurture ambidexterity among its units, teams, and managers – recognizing there may be complementarities and trade-offs across levels of analysis. Scholars need to fill this gap with multi-level research that develops connected ideas as to how exploration and exploitation can be blended at and across different levels-of-analyses.

Moreover, future multi-level research may point to important task- and motivation-related contingencies explaining under what organizational circumstances units or teams can be more or less effective in facilitating ambidexterity. Given the multilevel nature of unit processes and team functioning – nested in organizations, yet comprised of individuals – and the importance of individual-level skills and motivation of managers who do not operate in a vacuum (Mom et al., 2009), it would be interesting to examine the role of individual-level competence, abilities, and motivation in contributing to team or

unit level ambidexterity. These bottom-up effects could be complemented or undermined by top-down leadership behaviors of senior managers. Uncovering such cross-level interactions is essential to develop a more holistic understanding of the emergence of ambidexterity across different levels.

A related and particularly promising avenue is to consider different modes for balancing exploration and exploitation building on the cross-level work of Stettner and Lavie (2013) and extending Hess and Rothaermel's (2011) insights into how downstream alliances complement the contribution of talent inside the organization. Multi-mode approaches to exploration and exploitation can allow for shifting the emphasis more easily and also to address the 'necessity' vs. 'ability' dilemma by buffering tensions through organizing contradictory activities in different modes. Such research may generate insights that support and extend emergent research on vacillation which suggests that high performing organizations seem to constantly redesign themselves by alternating between different ways of stimulating exploratory and exploitative activities (Brown & Eisenhardt, 1997; Boumgarden et al., 2012; Nickerson & Zenger, 2002).

6.4.3 Senior and Middle Managers in Strategy Implementation

While I show that horizontal and vertical relations interact in shaping unit level strategy formation, I recommend looking into how vertical senior-middle manager interactions influence firm as well as individual level outcomes. Raes et al. (2011) made important first steps in conceptualizing the relevance of senior-middle manager interactions for strategy implementation. The latter is a difficult, yet crucial organizational adaptation process (Beer & Nohria, 2000; Kotter, 2007; Levinthal & March, 1993; O'Reilly & Tushman, 2004). Whereas effective strategy implementation narrows the gap between intended and realized strategy (Jarzabkowski, 2008), poor strategy execution leads to squandered resources (Miller & Friesen, 1982), maladaptation (March, 1994), or even organizational

failure (Hickson, Miller, & Wilson, 2003; Nutt, 1999). Strategy implementation processes are often dynamic in nature featuring adaptations on-the-go as co-dependent decision-makers across organizational levels translate abstract strategic intentions into concrete organizational actions (Balogun & Johnson, 2004; Huy, 2002).

Strategy implementation is a pluralistic, multi-level affair driven by the interrelated managerial activities across multiple hierarchical levels as new initiatives become institutionalized in form of new practices, rules, and routines (Dutton, Ashford, O'Neill, Hayes, & Wierba, 1997; Noda & Bower, 1996). Recent research has indicated that interaction processes across management levels are crucial for how effectively organizations can respond to conflicting demands and implement strategic actions (Floyd & Lane, 2000; Raes et al., 2011). Yet, thus far implementation research has focused primarily on interactions within hierarchical levels and particular roles pertaining to actor groups to explain content and outcome variables related to implementation. Rather, top and middle managers interpret and broker information in vertical interactions, learn from their actions' consequences, negotiate resource allocation – thereby escalating and deescalating commitment to emergent strategies (Noda & Bower, 1996). However, detailed and validated theory on how explicit boundaries such as those between headquarters and subsidiaries and implicit boundaries between senior and middle managers are being bridged is still scarce, but vital to understand why and how both organizational and subsidiary/unit level strategies emerge and are implemented in a particular form.

Thus far, two actor-centric traditions stand out in strategy formation research (Raes et al., 2011) – upper echelons theory (Carpenter, Geletkanycz, & Sanders, 2004) and the middle management perspective (Wooldridge et al., 2008). Previous research has focused on either top or middle management in separation (Dutton & Ashford, 1993; Eisenhardt, Kahwajy, & Bourgeois, 1997; Wooldridge et al., 2008). In the third study of this dissertation I have tried to measure the quality of

the interaction among these groups. This is a first step in the direction of a joint-consideration. Further research could uncover which capabilities enable effective boundary-spanning across hierarchical levels or more specifically between corporate headquarters and subsidiaries in MNEs.

Also middle managers deserve to be put more into the spotlight. Middle managers rarely receive the recognition they deserve from academics and practitioners alike, despite their responsibilities as corporate entrepreneurs and communicators (Huy, 2001). They inherit complex projects and new strategic initiatives from senior leaders and are responsible for their implementation (Balogun, 2003; Luescher & Lewis, 2008; Mantere, 2008), yet simultaneously they are more constrained in terms of resource access and decision-making powers than TMT members and have to stay attuned to their subordinates' needs and abilities (Huy, 2002, 2011). Given these challenges middle managers are prime suspects to share their expertise with colleagues and to seek support from their senior leaders. Not surprisingly, recent conceptual work indicates the importance of integrating upper echelons and middle management research in order to better understand the effects of interface mechanisms linking senior and middle managers (Raes et al., 2011; Shimizu, 2012). In this regard a particularly promising area for future research concerns the quality of the interplay of senior and middle managers in executing complex projects and pursuing radical innovation (*cf.* Huy, Kraatz, & Corley, 2014).

Upper echelons theorists have emphasized senior leaders' impact through articulating the strategic direction of the organization and highlighted intra-team mechanisms related to strategic consensus and persistence, leadership style, and cognitive and affective conflict that may enable or impair decision-making processes (*cf.* Cannella & Monroe, 1997; Finkelstein & Hambrick, 1990; Finkelstein, Hambrick, & Cannella, 1996). However, these are all indirect influences of senior leaders in strategy execution as they cover only the strategy formulation part. Moreover, often during the implementation phase legitimacy judgments shift and

support for change at lower levels turns into resistance (Huy et al., 2014), or the implementation fails for lack of feasibility reasons (Hickson et al., 2003; Nutt, 1999). Accordingly, middle management proponents in turn have elucidated dynamics within the cadres below top management and shown how middle managers might “support and accelerate strategy implementation, or reduce the quality of implementation, delay it, or even sabotage it” (Raes et al., 2011: 102). Given the lack of a conceptual and empirically-validated integration of both actor groups in strategy implementation research (Certo, Lester, Dalton, & Dalton, 2006; Wooldridge et al., 2008), studying the cross-hierarchical interpersonal processes between senior and middle managers bears significant promise in enriching and extending theoretical and practical insights with respect to both firm and unit level strategy execution and performance.

In addition to studying the outcomes of high quality interpersonal processes linking senior and middle managers, I encourage more research into the drivers of high quality interactions across an organization’s hierarchy. Studying overlap and complementarities of the characteristics, mindsets, and capabilities of senior leaders and middle managers may be a fruitful avenue for future research (*cf.* Bantel & Jackson, 1989). For instance, research indicates that subordinates perceive similar superiors as more competent, reliable, and trustworthy (McAllister, 1995; Vecchio & Brazil, 2007) and are more likely to respond to intentions and information passed down the hierarchy as an opportunity rather than a threat (Dutton & Ashford, 1993). A cross-level diversity fit theory might illustrate that similar levels of diversity enable better mutual understanding among both actor groups and reveal insights into how to manage heterogeneous organizational actor groups that differ in terms of composition across the organizational hierarchy.

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Chapter 7. Executive Summaries

As traditional sources of sustainable competitive advantage are very rare in today's heterogeneous and hypercompetitive global business environment, my research addresses why some firms are innovative and agile whereas others stagnate due to falling victim to success or learning traps. In this dissertation I draw on organizational learning theory and paradox theory as I try to explain how senior leaders and middle managers at headquarters and across subsidiaries can jointly contribute to the continued vitality of their respective organizations by exploring and exploitation, and by developing strategic agility to compete effectively across both emerging and established markets.

7.1 Summary - Study 1: An Exploration-Exploitation Meta-analysis

To start off my PhD research and gain in-depth insights into the exploration-exploitation and ambidexterity literature I worked on a meta-analysis together with Justin Jansen and Bernardo Lima in which we try to address fundamental debates in exploration-exploitation research by scrutinizing the impact of conceptual, research design, and contextual contingencies that influence the association between exploration and exploitation. Despite burgeoning research over the past two decades, scholars interested in the interplay of exploration and exploitation still face a number of unanswered questions. To a greater or lesser degree, what these core debates have in common is a focus on the boundary conditions driving the association between exploration and exploitation. We use advanced meta-analytic methods to shed light on three of these debates. First, due to the broad application of the two focal concepts conceptualizations vary substantially in extant research and our results indicate that the association

between exploration and exploitation is stronger for outcome than for behavior based operationalizations. Second, while the tensions between exploration and exploitation have been widely covered, conclusive evidence on the level-of-analysis at which the tensions are most pronounced remains elusive. We find that in line with expectations drawing on systems theory the opposing nature of exploration and exploitation becomes less pronounced at higher levels-of-analyses. Third, the association between exploration and exploitation is higher in slow clockspeed industries as the tensions are more manageable when not under time pressure. In this piece we not only advance conceptual clarity, but also elucidate research design choices and their implications for academics and practitioners alike.

7.2 Summary - Study 2: Antecedents and Consequences of Managers' Ambidexterity

As suggested by the results of the meta-analysis contradictory demands emerging from the concomitant pursuit of exploration and exploitation are most pronounced at lower levels-of-analyses. To create a deeper understanding of this important issue my research portfolio also includes one conceptual and one quantitative study at the individual level-of-analysis. The former paper, not included in this dissertation, synthesizes role and paradox theory to conceptualize middle managers' role conflicts that arise in strategic renewal processes in terms of paradoxical cognitive and behavioral demands. I propose middle managers' learning, problem solving skills, and motivation as mechanisms to reconcile and master cognitive and behavioral role conflicts. However, giving credence to the embeddedness of middle managers' behaviors, these mechanisms are contingent upon structural and relational dimensions of their social capital.

The quantitative study with my mentors Justin Jansen and Tom Mom sheds light on the drivers of managers' ambidexterity and the conditions in which

it is particularly valuable in organizations. First, survey results from a Big 4 accounting firm and a Fortune 500 chemicals firm indicate that organizational tenure is linearly positively related to managers' ambidexterity. The expected dampening moderating effect of functional tenure on this relationship is not confirmed. Instead, functional tenure is directly negatively related to managers' ambidexterity. Second, results confirm positive interaction effects between managers' ambidexterity and uncertainty and interdependence in their work context on managers' performance. This bears important implications for management training and development, succession planning, and other human resource practices that can prepare organizations to cope with increasingly turbulent and competitive business environments. This paper is has been accepted for publication in the *Human Resource Management* journal.

7.3 Summary - Study 3: Top and Middle Managers Interpersonal Processes and Unit Level Ambidexterity

In an increasingly turbulent and competitive business environment effectively managing change processes is essential for organizational prosperity. Also large enterprises need to be entrepreneurial to prosper. A central tenet in this dissertation is that alignment and adaptability result from the interaction of co-dependent decision-makers across organizational levels. Middle managers are pivotal boundary-spanners who translate abstract strategic intentions into concrete organizational activities. I uncover interpersonal processes connecting top and middle managers that allow for best practice transfers and unit learning as well as intelligent mobilization of resources and generation of autonomy across hierarchical levels. For practitioners the studies in this dissertation offer actionable insights on how to initiate and execute change initiatives, manage human resources in these processes, and design the organizational context facilitating both efficiency and innovation.

This paper draws on multisource data collected in strategic business units of publicly listed European manufacturing and service organizations. My co-authors and I argue that unit level ambidexterity hinges on the effectiveness of horizontal knowledge exchange among middle managers of different units and the the interface mechanisms linking hierarchical levels. We find – as expected – that middle managers’ horizontal knowledge exchange is positively related to ambidexterity in their units. Next, we reveal complementarities and tradeoffs among horizontal and vertical mechanisms. Our results suggest that the interaction among integrative bargaining between senior and middle managers and horizontal knowledge exchange has a significant positive impact on unit ambidexterity, while curiously the interaction effect of cognitive flexibility at the vertical interface and horizontal knowledge exchange is negative and significant. These results bear important implications for theoretical development around the conjoint involvement of top and middle managers in devising and executing complex strategies in multi-unit organizations. Moreover, this study provides recommendations for practitioners to leverage the complementarities while avoiding the pitfalls of engaging in both vertical and horizontal boundary-spanning activities. The study has been very well received by the distinguished audience at the 2013 Strategic Management Society Conference.

7.4 Summary - Study 4: MNEs’ Strategic Agility across Emerging and Established Markets

As it becomes increasingly important for large global firms to prevail in emerging markets, I investigate together with Justin Jansen and Tom Mom the underpinnings and drivers of strategic agility as MNEs try to sense and seize opportunities across emerging and established markets. We trace the success of seven Fortune 500 MNEs at mastering challenges and seizing opportunities in these markets. Drawing on qualitative data, we identify and illustrate three

dynamic capabilities – sensing local opportunities, enacting global complementarities, and appropriating local value – by which MNEs are able to operate successfully across emerging and established markets. We define strategic agility as the meta-capability that over time deploys these capabilities in a dynamic balance. As in this quest tensions of belonging, performing, and organizing arise, our paper concludes by providing insights into how leaders of large global firms can embrace these tensions by adopting novel ways of organizing, thinking, and managing human resources. This multiple case study has been published in the Spring 2014 issue of the *California Management Review*.

7.5 Personal Reflection & Related Studies

Following this summary of the four main chapters of this dissertation I would like to share a few words on my motivation for and approach to research. I view the research dimension of academic work as a conversation about ideas that can help improve the sustainable functioning of organizations, thereby contributing to the creation of long-term economic and social value. I approach academia as a ‘people business’ and have enjoyed exchanging ideas and engaging in thoughtful with my colleagues, friends, students, and also practitioners. The interactive component of academic life is particularly appealing to me and I cherish and nurture all my relationships with scholars and practitioners, many of whom have become friends.

There are two related studies which I have co-developed that are not part of this dissertation, but fit into this stream of research. The first scrutinizes the impact of the locus of change initiation and change management on commitment at lower levels in the hierarchy. Developed in collaboration with Mariano Heyden from the University of Newcastle (Australia), Shahzad Ansari from the University of Cambridge (UK), and Bas Koene from RSM Erasmus University this study reveals that change initiated by middle managers and managed by top managers

engenders the strongest degree of employee support for organizational change – although this was the least common form of role involvement observed among these actors. The findings suggest that change initiatives expected to be sensitive to operational realities and employee concerns, paired with top managers’ legitimacy and resource access, are embraced with the strongest commitment. These results imply that traditional top-down models of change initiated by the top management team and passed down the hierarchy for implementation need to be considered with caution. Rather, considering top and middle managers jointly is pivotal in explaining the implementation of strategic change and the development of new organizational systems, procedures, and routines.

Second, drawing on the corporate entrepreneurship and social network literatures, a study together with Lotte Glaser from RSM Erasmus University examines the multifaceted impact of boundary-spanning at top and middle management levels on business units’ exploratory innovation. Analyses of multi-source and multi-level data, which Dr. Glaser collected from 72 top managers and 397 middle managers operating within 34 units of a multinational organization, indicate that boundary-spanning of top managers (TMs) is positively related to units’ exploratory innovation, but at the same time increases middle managers’ (MMs) role conflict. This role conflict results in a negative effect on units’ exploratory innovation and thus offsets some of the benefits gained through TM boundary-spanning activities. Unexpectedly, MMs’ boundary-spanning does not relate to exploratory innovation. However, we uncover a remedy to the cascading effects of TM boundary-spanning on MMs’ role conflict, as this link is weaker when MMs have overlapping ties with their TMs. Taken together, these findings provide new insights into the configuration of multi-level boundary-spanning in relation to unit level exploratory innovation.

About the author



Sebastian Peter Leonhard Fourné (b. Mönchengladbach, Germany, 1983) worked on this dissertation at the Department of Strategic Management & Entrepreneurship at Rotterdam School of Management, Erasmus University and at INSEAD (Singapore). He is a class of 2007 "*Cum Laude*" graduate of the Master of Science in Strategic Management program at Rotterdam School of Management, Erasmus University. During the Master's degree program Sebastian

completed an exchange to The Wharton School at the University of Pennsylvania with a 4.0GPA. In 2006 he obtained his BSc International Business Administration degree "*Cum Laude*" at the Erasmus University.

Sebastian's research takes a multi-method and multi-level approach to investigating drivers and dynamics of exploration, exploitation, and ambidexterity. He draws on organizational learning and paradox theory to study organizational tensions that arise in a dual pursuit of innovation and efficiency. He bridges upper echelons theory and research on middle management to investigate socio-political dynamics between top and middle managers in building ambidextrous organizations. Sebastian's second stream of research focuses on global strategy, particularly MNEs in emerging markets. Given the increasing saturation of crisis-shaken established markets he studies the quest of MNEs to enter and prevail in burgeoning, yet volatile emerging markets.

Furthermore, Sebastian is a prized reviewer of top journals and involved in company advisory projects in strategy formulation, implementation, and new business development. Prior to joining the Department of Strategic Management & Entrepreneurship, Sebastian worked on global corporate finance and strategy projects for the world's leading diamond company, De Beers, in London. Sebastian is a professional golfer and an expert skier. He enjoys most outdoor sports and likes to combine these sports with his other main hobbies traveling and photography.



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MANAGING ORGANIZATIONAL TENSIONS**A MULTI-LEVEL PERSPECTIVE ON EXPLORATION, EXPLOITATION, AND AMBIDEXTERITY**

This dissertation draws on organizational learning and paradox theory to develop fine-grained insights at the individual, unit, and organizational level that contribute to the theoretical development of the exploration-exploitation framework. The four studies included in this dissertation reveal the nature of the tensions emerging in pursuit of ambidexterity at different levels and examine based on quantitative and qualitative data how organizations and their members can manage these tensions effectively in order to foster ambidextrous behaviors, to balance exploration and exploitation, and to be strategic, yet agile across emerging and established markets.

First, using meta-analytic techniques I assess which and how contingency factors influence the association of exploration and exploitation and clarify how conceptual choices and study context influence the generalizability and interpretations of primary studies in ambidexterity research. Second, at the individual level antecedents and outcomes of managers' ambidextrous behaviors are uncovered and tested. This study indicates that tenure is a double-edge sword; organizational tenure increases managers' ambidextrous behaviors, while functional tenure undermines such behaviors. Managers' ambidexterity is particularly valuable when work contexts are characterized by uncertainty and interdependence. Third, I put forward a multi-actor model investigating middle managers' personal interactions with their peers in other business units and top managers in relation to unit ambidexterity. This study uncovers complementarities and trade-offs among middle managers' horizontal and vertical interpersonal processes. Fourth, at the organizational level I delve into the foundations and drivers of strategic agility and into how the inherent tensions can be managed in a multi-market context.

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