

OLI RADU MIHALACHE

Stimulating Firm Innovativeness

Probing the Interrelations between
Managerial and Organizational Determinants



**Stimulating Firm Innovativeness: Probing the interrelations between
managerial and organizational determinants**

**Stimulating Firm Innovativeness: Probing the interrelations between
managerial and organizational determinants**

Het stimuleren van firm innovativiteit: onderzoek naar de interrelaties
tussen manager en organisatorische determinanten

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PREFACE

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Oli Radu Mihalache

1 May, 2012

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CHAPTER 1

INTRODUCTION

1.1. Introduction

Innovation has been heralded as the engine of sustained organizational performance and is considered central to organizations' competitive advantage (e.g. Dutta, Narasimhan, and Rajiv, 2005; Hall, 2000; Geroski, Machin, and Reenen, 1993). In an environment characterized by continuously increasing rates of change, firms need to innovate in order to stay competitive. Mirroring the importance of innovation for firm performance and that most firms find innovation to be a challenging task, innovation research stands as a central pillar of the strategic management literature (c.f. Anderson, Carsten, and Nijstad, 2004). Innovation refers to the "production or adoption, assimilation, and exploitation of a value-added novelty in economic and social spheres; renewal and enlargement of products, services, and markets; development of new methods of production; and establishment of new management systems" (Crossan and Apaydin, 2010: 23).

Motivated by the importance of innovation, the thesis builds on this multidimensional definition of innovation and sets out to understand how firms can stimulate two types of innovation outcomes: (i) product and service innovation and (ii) management innovation. *Product and service innovation* refers to the introduction of products and services that are new to the firm (e.g. Damapour, 1991; Bell, 2005). Innovation in products and services is largely believed to stem from a firm's knowledge resources (e.g. Pennings and Harianto, 1992; Kotabe, Dunlap-Hinkler, Parente, and Mishra, 2007). However, inter-firms differences in innovation cannot be explained by looking only at differences in knowledge resources. In other words, a particular knowledge stock is not sufficient to guarantee a certain level of innovation. What

makes the difference between innovative and non-innovative firms is not only the difference in their knowledge resources, but also how they use them. Grant (1996) argues that a primary task of the firm is to integrate specialized knowledge and that there are important differences in the efficiency, scope, and flexibility of knowledge integration between firms. As such, furthering the understanding of what factors inhibit or enable access to knowledge and its transformation into new products and services can provide important insights into how firms can prosper over long periods of time.

In addition to their product offerings, firms can innovate in terms of their management. *Management innovation* refers to the introduction of management practices, processes and structures that are new to the firm and intended to further organizational goals (Mol and Birkinshaw, 2009: 1270). In other words, management innovations concern changes in the management activities of an organization. These include changes in organizational structure, administrative processes and human resources (Gopalakrishnan and Damanpour, 1997: 19). Extant research emphasizes the importance of management innovation for firms' competitive advantage. For instance, classical management innovations such as the introduction of the M-form organization (Chandler, 1962) or total quality management (e.g. Zbaracki, 1998) led to industry leadership. Mol and Birkinshaw (2009: 1269) refer to management innovation as "one of the most important and sustainable sources of competitive advantage for firms because of its context specific nature among others". Despite the surging evidence and agreement regarding the benefits of management innovation, the understating of how firms can bring about this change remains unclear as management innovation is a relatively under-researched topic. Surprisingly, management innovation represents only about 8 percent of innovation research (Crossan and Appaydin, 2004). Thus, this situation brings to the forefront the basic, yet fundamental, question of how can firms stimulate change in the way management does their work. Table 1 summarizes the two types of innovation considered in this dissertation.

In addition to differences in type, innovations also differ in terms of their degree of newness. Particularly, research differentiates between exploratory and exploitative innovation. Exploratory innovation refers to radical innovations that are aimed at the needs of emerging customers or markets (Benner & Tushman, 2003) and exploitative innovation refers to incremental innovation aimed at serving existing customers and markets (Danneels, 2002). This distinction is particularly important as recent research argues that while overall innovation is important, sustained performance requires firms to engage in both exploratory and exploitative innovation. March (1991) argues that where exploratory innovation prepares firms for changes in the environment, exploitative innovation allows firms to draw the benefits of their current capabilities. Exploiting current competencies while simultaneously exploring new ones permits organizations to capture benefits from both actions while avoiding traps associated with favoring one type of innovation over the other. In other words, introducing new products and services allows firms to respond to changes in their environment, while introducing modifications to the current product offering allows firms to reap the benefits of their investments. As such, sustained

performance is a function of firms' ability to engage in *both* exploration and exploitation (Gibson and Birkinshaw, 2004; He and Wong, 2004; Jansen, Van Den Bosch, and Volberda, 2006).

However, despite the benefits of high levels of exploration and exploitation, firms encounter considerable challenges in balancing these two types of innovation. Research has shown that this difficulty stems from the fact that exploratory and exploitative innovation require opposing conditions to emerge. While exploratory innovation requires decentralized decision-making and less formalized processes, exploitative thrives in settings characterized by centralized structures and strong formalization (Jansen et al., 2006). Tensions between exploration and exploitation also arise from the fact that the two activities compete for scarce organizational attention and resources (Burgelman, 1991; March, 1991; Gupta, Smith, and Shalley, 2006). Also, they have mutually constraining effects – adaptation to existing environmental demands may create structural inertia that reduces firms' capacity to prepare for future changes and experimentation may reduce firms' ability to refining current competencies (He and Wong, 2004). Thus, while engaging in both exploration and exploitation is important for sustained performance, firms face considerable obstacles in pursuing both activities. How can firms surmount these opposing pressures in order to develop new capabilities while also exploiting their current competencies?

Thus, for long-term performance, firms have to be able to innovate in their products and services offering, in their management, and also balance exploratory and exploitative innovation. As this task is highly complex and has such important consequences for firms, the dissertation sets out to advance current understanding of how firms can become more innovative.

Table 1. The types of innovation considered in this dissertation

Type of innovation	Definition	A few example of previous studies on the determinants of innovation
Products and services innovation	The introduction of products and services that are new to the firm (e.g. Damanpour, 1991; Bell, 2005)	<ul style="list-style-type: none"> • Damanpour (1991) • Cassiman and Veugelers, 2006 • Laursen and Salter (2006) • Leiponen and Helfat (2010)
Management innovation	The introduction of management practices, processes and structures that are new to the firm and intended to further organizational goals (Mol and Birkinshaw, 2009)	<ul style="list-style-type: none"> • Mol and Birkinshaw (2009) • Vaccaro, Jansen, Van Den Bosch, and Volberda (2012) • Bantel and Jackson (1989) • Damanpour (1987)

1.2. Research question of this dissertation

Within the broad theme of how firms stimulate innovation, several research streams have emerged. An important research direction focuses on the role of the *organizational determinants* of innovation. Studies analyze how various design elements such as centralization (Damanpour, 1991), connectedness (Atuahene-Gima, 2003; Sheremata, 2000), formalization (West, Smith, Feng, and Lawthom, 1998), specialization (e.g. Damanpour, 1991), complexity (Kinberly, 1981), or modularity (Ethiraj, Levinthal, and Roy, 2008) enable organizational members to access and integrate knowledge resources to engage in innovation.

A different stream of research considers *managerial determinants* of innovation. The top management team (TMT) comprises the CEO and the senior executives, which usually have positions at or above vice president (Carmeli & Halevi, 2009). Upper-echelon theories hold that TMT members play a key role in strategic decision-making and in supervising ongoing operations (Carpenter, Geletkanycz, & Sanders, 2004; Castanias & Helfat, 1991; Finkelstein and Hambrick, 1996; Hambrick & Mason, 1984). Building on this underlying logic, a major stream of research analyzes the role of TMT members in promoting organizational innovation. TMTs can influence innovation by providing support for experimentation (Damanpour, 1991; King et al., 1992; Nystrom 1990; West and Anderson, 1992), creating a learning environment that tolerates failed idea (Madjar et al., 2002; Shalley and Perry-Smith, 2001), or implementing risk-taking norms (King et al., 1992; West and Anderson, 1992). Research also considers how the composition and characteristics of the TMT is associated with organizational-level innovation (e.g. Bantel and Jackson, 1989).

Despite the considerable advances in the understanding of the determinants of innovation, important gaps remain. While both organizational and managerial factors are theorized as influencing innovation, these theoretical streams have evolved as largely independent literatures. This raises the question of how the effectiveness of managerial factors depends on organizational elements and vice-versa. The single-lens approaches that extant research predominantly employs may hide important complexities regarding the interplay between managerial and structural factors. In other words, the understanding of how firms can improve their innovativeness may be further advanced by analyzing the interface between TMTs and organizational structure. Consequently, this PhD project sets out to uncover how organizational and managerial factors contribute to achieving the full potential of firm's knowledge resources in terms of stimulating organizational-level innovation. That is, the research objective is:

This PhD dissertation aims to advance the understanding of the potential interrelations between managerial (TMT characteristics and processes) and organizational (structure and coordination mechanisms) determinants of organizational-level innovativeness.

1.3. Overview of the studies included in the dissertation

In order to advance the understanding of the interrelation between TMT and organizational factors in stimulating innovation, I conducted one theoretical and three empirical studies. These research projects approach the main topic from slightly different angles as they investigate different determinants of innovation as well as different types of innovation. The first two studies focus on the organizational structure as the determinant of innovation and analyze how TMT characteristics condition this relationship. Studies three and four consider TMT processes as antecedents of innovation and investigate their effectiveness under different organizational conditions. Also, the first two studies focus on the determinants of product and service innovation, study 3 explores how to stimulate management innovation, and the last study considers the ambidexterity dimension of product and service innovation (i.e. balancing exploratory and exploitative innovation). By addressing different aspects of organizational innovation, this dissertation acknowledges the complexities of an innovation strategy as it recognizes the importance of multiple types and dimensions of innovation.

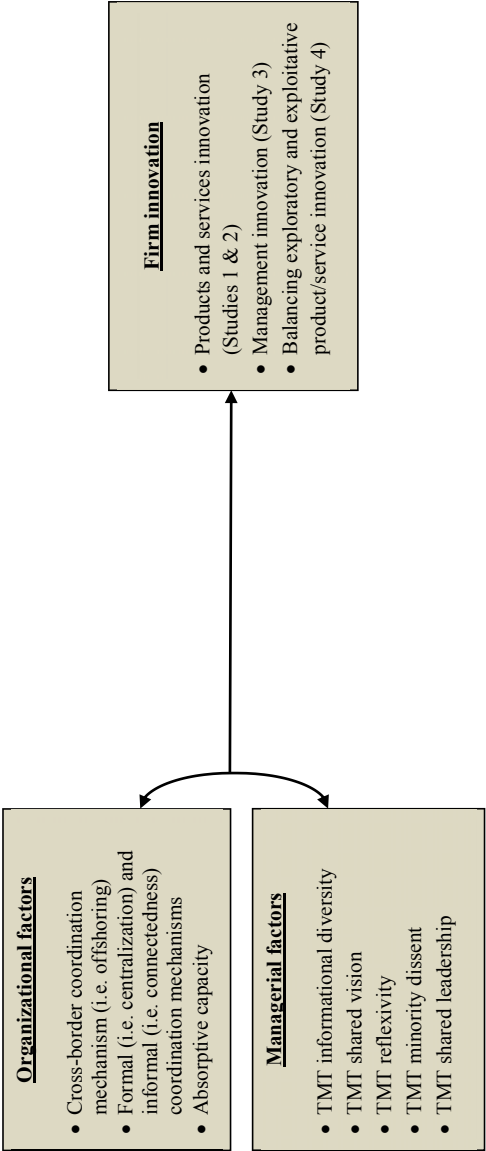
Figure 1 provides the overarching framework of this thesis.

1.4. Literature gaps and research questions addressed in this dissertation

1.4.1. Literature gaps for each of the studies included in the dissertation

While all four studies fit within the main topic of this dissertation, they address different literature gaps. *Studies one and two* address an important lacuna in the understanding of offshoring as an antecedent of innovation – i.e. the lack consensus regarding the consequences of for innovation. Offshoring refers to the assignment of business functions to locations outside of the firm's national borders in support of domestic rather than foreign business operations (Kenney et al., 2009; Levy, 2005; Lewin, Massini, and Peeters, 2009). Offshoring is an important element of organizational design representing the specification of the organizational structure along a geographical dimension (Contractor, Kumar, Kundu, and Pedersen, 2010). That is, as it involves the disaggregation of business processes across national borders, offshoring delineates the geographical boundary of the firm. Considering that information collection and

Figure 1. Research framework for the dissertation



processing is the integrating mechanism of organizational structure (Tushman and Nadler, 1978), offshoring is an important organizational design feature that reshapes the informational patterns of the organization in such a way that it provides access to wider informational networks in multiple countries, but it also raises important national and geographical barriers to knowledge flow. Acknowledging the importance of offshoring in organizational design, Lewin and Peeters (2006: 234) name offshoring a “new hybrid organizational form” in which the offshore affiliates share databases, systems, and business knowledge with the core firm and which allows a firm to use the services of multiple providers to create a meshed-up organization. Due to recent advances in information technology and trade liberalization, offshoring is experiencing an intensive growth. Despite offshoring’s growing importance, the consequences of relocating business functions to international locations for firms’ ability to introduce new products and services are still not well understood as the literature provides opposing views (Doh, 2005; Kotabe, 1990; Inkpen and Ramaswamy, 2006; Youngdahl, Ramaswamy, and Verma, 2008). While several studies highlight offshoring’s potential to stimulate innovativeness (Chung and Yeaple, 2008; Li *et al.*, 2008), others have argued that offshoring can actually dampen innovation performance (Chesbrough and Teece, 2002; Markides and Berg, 1988; Teece, 1987). Considering the growing pervasiveness of offshoring and the shift towards relocating high value-added functions, it becomes important to clarify how offshoring influences firms’ ability to introduce new products and services.

Study three addresses the need for a better understanding of how firms can stimulate management innovation. Mol and Birkinshaw (2009: 1269) argue that there is a stark paucity of studies at the firm level that attempt to understand the determinants of management innovation. In the same line of thought, other studies have pinpointed to senior managers as central actors of change and have called for a better understanding of their role in introducing management innovation (Birkinshaw, Hamel, and Mol, 2008). A notable exception is a recent study that finds empirical evidence that leadership style is related to the introduction of management innovation (Vaccaro et al., 2012).

In *study four*, I address the lack of research on TMT processes as antecedents of ambidexterity. While extant literature recognizes the role of senior executives in resolving the tensions between exploration and exploitation (c.f. Raisch & Birkinshaw, 2008), extant studies focus overwhelmingly on TMT characteristics rather than processes (e.g. Beckman, 2006; Carmeli & Halevi, 2009; Jansen, George, Van Den Bosch, & Volberda, 2008; Lubatkin et al., 2006; Tushman & O’Reilly, 1996). The oversight of TMT processes as antecedents of ambidexterity leaves open the question of what actions TMT members can perform in order to resolve the tensions between exploration and exploitation. This study proposes TMT shared leadership as a solution for the tensions between exploration and exploitation. Shared leadership is a team process where leadership is carried out by the team as a whole, rather than solely by a single designated individual.” (Enseley, Hmielesky, & Pearce, 2006: 220). This study also addresses an important gap in the leadership literature. Extant research on shared leadership has considered it mostly as a team-level construct. While there are theoretical studies proposing

shared leadership as a TMT-level construct, there is a need for empirical validation of the applicability of this construct for upper echelons.

Table 2, provides a summary of the research gaps I address in the four studies of this dissertation.

Table 2. The literature gaps addressed in this dissertation

Study	Gap
1. Offshoring and product/service innovation: the contingency role of TMT reflexivity	Extant research proposes contradictory arguments for the relationship between offshoring and innovation and there is little understanding of the differential effects of offshoring different groups of functions.
2. Offshoring and product & service innovation: the moderating role of TMT processes	Despite the rapid growth of offshoring, the understanding of how offshoring impacts firm innovativeness is not well developed as, despite the scarcity of research on this relationship, existing studies propose opposing effects.
3: TMT processes as antecedents of management innovation: the moderating role of organizational absorptive capacity	Considering the increasing evidence on the benefits of management innovation for firms' viability, the understanding of how firms can bring about management innovation is surprisingly limited and empirical studies are scarce.
4: TMT shared leadership and ambidexterity: the moderating role of organizational structure	While research abundantly considers TMT characteristics as antecedents of ambidexterity, there is a scarcity of studies analyzing how TMT processes influence firms' ability to concomitantly pursue exploration and exploitation.

1.4.2. Research questions for each of the studies included in the dissertation

Related to the above literature gaps, the studies of this dissertation answer several research questions. The diversity in research questions mirrors the importance of both product/service and management innovation.

Table 3 lists the main research questions addressed in the studies as well as the main study constructs.

Table 3. Research questions for each of the studies included in the dissertation

Study	Determinant	Dependent	Contingency	Research question
1	Offshoring	Product and service innovation <ul style="list-style-type: none">• <i>Focus</i>: the level of innovation	TMT reflexivity	<ul style="list-style-type: none">• Does offshoring influence innovation?• Is there a difference between the offshoring of knowledge intensive and labor intensive services in their influence on firm innovation?• What is the role of TMTs in offshoring? How does TMT reflexivity impact the relationship between offshoring and innovation?
2	Offshoring	Product and service innovation <ul style="list-style-type: none">• <i>Focus</i>: the level of innovation	TMT informational diversity and TMT shared vision	<ul style="list-style-type: none">• Does offshoring influence innovation and what is the nature of this relationship?• How do TMT characteristics affect firms' ability to enhance their innovativeness through offshoring?
3	TMT reflexivity and TMT minority dissent	Management innovation <ul style="list-style-type: none">• <i>Focus</i>: the level of innovation	Organizational absorptive capacity	<ul style="list-style-type: none">• How can firms enhance management innovation?• What TMT processes can stimulate the management innovation?• How does organizational absorptive capacity condition the effects of TMT processes in enhancing management innovation?
4	TMT shared leadership	Product and service innovation <ul style="list-style-type: none">• <i>Focus</i>: ambidexterity – i.e. the simultaneous pursuit of both exploratory and exploitative innovation	Organizational structure: centralization and connectedness	<ul style="list-style-type: none">• How can TMTs alleviate the tension between exploration and exploitation?• Is shared leadership within TMTs a viable solution for ambidexterity?• How does the organizational structure condition the effectiveness of TMT shared leadership in enhancing ambidexterity?

1.5. Methodologies used

This dissertation comprises one theoretical and three empirical studies. In the theoretical study, I put forward arguments for offshoring as an antecedent of product/service innovation. This research design allows me to theoretically carve out the distinctions of the conflicting arguments regarding the relationship between offshoring and innovation in the extant literature and to put forward a new conceptualization of the relationship. The second study builds on this theoretical effort and provides an empirical test of offshoring as an antecedent of product and service innovation. The remaining studies are also of an empirical nature as they attempt to find statistical evidence of the TMT processes that I propose to hold potential to enhance innovation.

The methodological choices of the three empirical studies complement existing research on the determinants of innovation in several ways. First, all the hypotheses of this dissertation are tested in samples of Dutch firms. An important advantage of using Dutch firms is that it contributes to the generalization of theory on innovation antecedents. As the overwhelming majority of previous studies focused on US firms, using a different population can add important support to the generalizability of theory.

Second, the studies of this dissertation use cross-industry samples. As the determinants of innovation proposed in this thesis are likely to be applicable in many settings, it is appropriate to test their ability to stimulate innovation in a sample that mirrors the theoretical domain of the theory. Put differently, by testing the proposed relationships in cross-industry samples may provide more confidence in the generalization of theory on these determinants of innovation. Therefore, the dissertation's empirical tests take place in cross-industry samples of Dutch firms.

Table 4 presents the methodologies used in the four studies of the dissertation.

Table 4. The research designs of the studies included in this dissertation

Study	Data collection	Sample	Sample size
1	n/a	n/a	n/a
2	Survey <ul style="list-style-type: none">• Independent: 2007• Dependent: 2008	<ul style="list-style-type: none">• Random sample of Dutch firms• Industry: cross-industry	<ul style="list-style-type: none">• 276 firms
3	Survey <ul style="list-style-type: none">• Independent: 2010• Dependent: 2010	<ul style="list-style-type: none">• Random sample of Dutch firms• Industry: cross-industry	<ul style="list-style-type: none">• 811 firms
4	Survey <ul style="list-style-type: none">• Independent: 2008• Dependent: 2009	<ul style="list-style-type: none">• Random sample of Dutch firms• Industry: cross-industry	<ul style="list-style-type: none">• 207 firms

1.6. Primary findings

This dissertation makes several important findings. The overarching finding across the studies is that both managerial and organizational factors as well as their interrelation influence firms' innovativeness. Contributing to this general insight, each study makes its own important findings.

Study one proposes offshoring as an antecedent of innovation in products and services and it theoretically disentangles between the effects of offshoring labor and knowledge intensive services. In addition, in this study I put forward theory regarding the role of TMT processes in international sourcing, arguing that TMT reflexivity may help firms realize higher levels of innovativeness through the offshoring of both labor and knowledge intensive services.

Study two finds empirical evidence that offshoring is an important determinant of innovation. I find that the offshoring of primary functions (i.e. manufacturing, R&D, and engineering) has a nonlinear (i.e. inverted U-shaped) influence on firms' ability to introduce new products and services. That is, increasing offshoring from low to intermediate levels is associated with an increase in innovativeness; however, increasing offshoring beyond intermediate levels is associated with a decrease in firms' ability to introduce new products and services. In addition, I find evidence that the characteristics of TMT members affect this relationship. When TMTs have high informational diversity, the inverted U-shaped relation between offshoring and innovation is steeper. In other words, TMT informational diversity is a double-edged sword as it not only enhances the positive effect of lower levels of offshoring, but it also the negative effect of higher levels of offshoring on innovativeness. Lastly, I find that TMT shared vision hampers the ability of firms to enhance innovation through lower levels of offshoring and that it helps reduce the negative effects of high levels of offshoring on innovation.

Study three finds evidence that TMT learning processes can enhance management innovation. Both TMT reflexivity and TMT minority dissent are associated with higher levels of management innovation. Furthermore, there is evidence of complementarity between these TMT learning processes and organizational learning processes, as organizational absorptive capacity positively moderates their influence on management innovation.

Study four proposes TMT shared leadership as a managerial solution to resolving the tensions between exploration and exploitation. I find empirical evidence of a positive association between TMT shared leadership and firm ambidexterity. In addition, the empirical results indicate that the effectiveness of TMT shared leadership depends on organizational characteristics. Specifically, TMT shared leadership is more effective in enhancing ambidexterity in organizations that have higher levels of connectedness and centralization of decision-making.

Table 5 provides a summary of the primary findings of this dissertation.

Table 5. Primary findings

Study	Description	Type of study	Main findings/propositions
1	Offshoring and product/service innovation: the contingency role of TMT reflexivity	Theoretical	<ul style="list-style-type: none">• Offshoring knowledge and labor intensive functions differently influence innovation – the former have a non-linear influence while the latter have a positive influence• TMT reflexivity allows firms to more extensively benefit from innovation-enhancing offshore opportunities
2	Offshoring and product/service innovation: the moderating role of TMT informational diversity and shared vision	Empirical	<ul style="list-style-type: none">• Offshoring primary functions has an inverted U-shaped influence on firms' ability to introduce new products and services• TMTs characteristics (i.e. informational diversity and shared vision) influence the relationship between offshoring and innovation
3	TMT processes as antecedents of management innovation: the moderating role of organizational ambidexterity	Empirical	<ul style="list-style-type: none">• TMTs engagement in learning processes such as reflexivity and minority dissent facilitates the introduction of management innovations within the organization• The effect of TMT learning processes is contingent on the organization's learning capability (i.e. absorptive capacity)
4	TMT shared leadership and ambidexterity: the moderating role of organizational structure	Empirical	<ul style="list-style-type: none">• Sharing the leadership task among the TMT members helps reduce the tension between exploratory and exploitative innovation• The effectiveness of TMT shared leadership for enhancing ambidexterity depends on organizational structures (i.e. centralization of decision-making and connectedness)

1.7. Contributions

The studies in this dissertation aim to contribute to a better understanding of how firms can stimulate their innovativeness. Acknowledging the multifaceted nature of innovation, the four studies attempt to advance theory on the antecedents of different types and dimensions of innovation. Table 6 provides an overview of the main contributions of each of the four studies included in this dissertation.

The individual contributions of the four studies build up towards the overarching contributions of this dissertation. Primarily, this dissertation contributes to the literature on *organizational change* (c.f. Armenakis and Bedeian, 1999; Street and Gallupe, 2009; Van de Ven and Poole, 2005) by advancing a contingency perspective of organizational innovativeness. I propose several organizational and managerial antecedents of innovation and I show that there are important interrelations between them. Most notably, I advance the understanding of offshoring as an antecedent of innovation as I reconcile existing contradictory perspectives. I do so by conceptualizing a non-linear relationship and finding empirical evidence that the effectiveness of offshoring to enhance innovation depends on TMT characteristics. The contingency perspective of organizational change is further developed by showing that not only product/service innovation, but also management innovation depends on the interplay between organizational and managerial factors. Specifically, this dissertation proposes TMT reflexivity and minority dissent as two managerial processes that hold great potential to enhance the introduction of new management practices, processes and structures. In line with the overall thesis of interactions between managerial and organizational factors, I find that these TMT learning processes are likely to be more strongly associated with management innovation when organizations have complementary organizational-level learning capacity.

The contingency perspective of organizational change put forward in this dissertation is further exemplified in the case of organizational ambidexterity. In a recent review of the ambidexterity literature, Raisch and Birkinshaw (2008: 381) find that “[m]ost of the reviewed studies focus on the structural antecedents and the effect of ambidexterity on firm performance. Findings on other relevant constructs or on more complex relationships moderated by additional variables are scarcer.” This thesis addresses this call for research in two ways. In Study four, I first propose a managerial, i.e. TMT shared leadership, determinant for ambidexterity and then I analyze its efficiency under various organizational elements. Suggesting that TMT shared leadership may help firms manage and overcome the contradictions between exploration and exploitation complements extant studies that proposed various ambidexterity-enabling TMT characteristics (Beckman, 2006; Lubatkin, Simsek, Ling, & Veiga, 2006; Smith & Tushman, 2005). Also, by considering the moderating role of coordination mechanisms, this study answers calls for a better understanding of how and under what conditions TMT leadership contributes to organizational ambidexterity (Smith and Tushman, 2005).

Table 6. Main contributions of the studies in this dissertation

Study	Description	Main contributions
1	Offshoring and product/service innovation: the contingency role of TMT reflexivity	<ol style="list-style-type: none">1. Advances the understanding of offshoring as an important determinant of innovation.2. Distinguishes between the effects of offshoring knowledge-intensive vs. labor intensive functions3. Further the understanding of the role of TMT processes (i.e. TMT reflexivity) in international sourcing as conditioning the influence of offshoring.
2	Offshoring and product/service innovation: the moderating role of TMT informational diversity and shared vision	<ol style="list-style-type: none">1. Reconciles existing opposing views on the consequences of offshoring for innovation by proposing and finding empirical evidence of an inverted U-shaped relationship between offshoring and innovation2. Advances understanding of the role of TMTs in international sourcing by showing how TMT informational diversity and shared vision affect the ability of firms to enhance their innovativeness through offshoring.
3	TMT processes as antecedents of management innovation: the moderating role of organizational absorptive capacity	<ol style="list-style-type: none">1. It contributes to innovation theory by proposing and finding empirical evidence for two TMT processes (i.e. TMT reflexivity and minority dissent) as antecedents of management innovation.2. Provides a contingency perspective of the effectiveness of TMT reflexivity and minority dissent in enhancing management innovation by considering the moderating role of organizational absorptive capacity.
4	TMT shared leadership and ambidexterity: the moderating role of organizational structure	<ol style="list-style-type: none">1. This study contributes to ambidexterity literature as it proposes a TMT solution (i.e. shared leadership) to the tensions between exploration and exploitation.2. Contributes to leadership theory as it proposes shared leadership as a TMT-level construct3. Answers a call for more research on the boundaries of the antecedents of ambidexterity by considering the moderating role of coordination mechanisms (i.e. centralization of decision-making and connectedness).

Furthermore, this dissertation advances knowledge in the field of *organizational design*. Tushman and Nadler (1978: 613) argue that the “[g]enerally accepted view of organizational design that has evolved that the structure of an organization should match or fit the characteristics of certain variables both inside and outside the organizational system”. This dissertation contributes to this idea by probing the effectiveness of organizational structure to enhance innovativeness under various internal conditions. Specifically, I consider the effectiveness of offshoring for enhancing innovativeness under the internal context of TMTs with different characteristics and levels of reflexivity. The empirical results provide strong support for a contingency perspective of organizational design, at least in the case of managerial contingencies.

This study also contributes to *upper echelon* literature. Primarily, this thesis reinforces the basic argumentation of upper-echelon theory that TMT characteristics affect firm outcomes (Hambrick and Mason, 1984; Wiersema and Bantel, 1992) by finding empirical evidence that TMT informational diversity and TMT shared vision influence the consequences of international sourcing. A related contribution is to the mixed findings in extant literature about the effects of demographic diversity. By finding that informational diversity in TMTs affects the effectiveness of international sourcing, this thesis joins the growing evidence supporting the importance of cognitive rather than demographic diversity in terms of influencing organizational outcomes (Miller, Burke, and Glick, 1998). A further contribution to upper echelon theory is that I show that TMT processes (i.e. reflexivity and minority dissent) affect innovation. This insight complements existing studies that focus primarily on the influence of TMT characteristics on organizational outcomes (c.f. Carpenter, Geletkanycz, and Sanders, 2004).

Overall, this thesis advances innovation research by proposing several organizational and managerial determinants of innovation and their interrelations. The contingency perspective of innovation advanced in this thesis warns against “cure-all” solutions for innovation as it shows that both organizational and managerial determinants need to be considered within the particular context of each firm.

1.8. Contents of the dissertation

The remaining of this dissertation is organized as follows. I first present the theoretical study, and then I continue with the three empirical pieces. Each study is presented in its completeness, i.e. theoretical developments, methods, analysis, and discussion. The final chapter of the dissertation provides a discussion of the overarching contributions, limitations, and avenues for future research of this thesis.

Table 7. Contents of the dissertation

Chapter	Title
Chapter 1	Introduction
Chapter 2	<p>Study 1 - Offshoring knowledge versus labor-intensive services and innovation: A contingency perspective</p> <p>*This chapter is published as: Mihalache, O., Mihalache, M., & Jansen, J.J.P. 2011. Offshoring knowledge vs. labor intensive services and entrepreneurial activity: A contingency perspective. In A. Verbeke, R. van Tulder, & A.T. Tavares (eds.), <i>Entrepreneurship in the Global Firm. Progress in International Business Research</i>, Vol. 6, p. 225-249.</p>
Chapter 3	<p>Study 2 - Offshoring and firm innovation: the moderating role of top management team attributes</p> <p>*This chapter will be published as: Mihalache, O. R., Jansen, J. J. P., Van Den Bosch, F. A. J., and Volberda, H. W. "Offshoring and firm innovation: The moderating role of top management team attributes" in <i>Strategic Management Journal</i>.</p>
Chapter 4	Study 3 – TMT processes as antecedents of management innovation: The moderating role of absorptive capacity
Chapter 5	Study 4 - TMT shared leadership and ambidexterity: The moderating role of coordination mechanisms
Chapter 6	Implications and conclusions

CHAPTER 2

STUDY 1 – OFFSHORING KNOWLEDGE VS. LABOR INTENSIVE SERVICES AND INNOVATION: A CONTINGENCY PERSPECTIVE*

Abstract

The purpose of this study is to analyze the influence of offshoring on innovation (i.e. the introduction of new products and services). We provide a theoretical framework that proposes that the offshoring of knowledge intensive services (KIS) and that of labor intensive services (LIS) will differentially influence the ability of firms to introduce new products and services. While the offshoring of KIS has an inverted U-shaped influence on innovation, the offshoring of LIS has a positive impact. In addition, we propose that these relationships are conditioned by organizational (i.e. governance mode) and managerial (i.e. TMT reflexivity) factors. Specifically, we argue that the degree of integration with the offshore affiliate and TMT reflexivity each moderate the nonlinear relationship between offshoring KIS and innovation in such a way that the positive effects of low levels of offshoring KIS will be stronger and the negative effects of high levels of offshoring KIS will be lower. In addition, we argue that the degree of integration constrains and TMT reflexivity enhances the relationship between offshoring LIS and innovation.

Keywords: *offshoring, innovation, governance mode, top management teams, reflexivity*

* This chapter was published as: Mihalache, O., Mihalache, M., & Jansen, J.J.P. 2011. Offshoring knowledge vs. labor intensive services and entrepreneurial activity: A contingency perspective. In A. Verbeke, R. van Tulder, & A.T. Tavares (eds.), *Entrepreneurship in the Global Firm. Progress in International Business Research*, Vol. 6, p. 225-249.

2.1. Introduction

Offshoring is “one of the most hotly debated topics in international business” (Mudambi & Venzin, 2010: 1510) and “the most important phenomenon transforming the workplace” (Youngdahl & Ramaswamy, 2008: 213). Offshoring refers to the relocation of business processes, or even entire functions, to locations outside of the organization’s national borders in order to support regular business operations (Levy, 2005; Manning, Massini, & Lewin, 2008; Venkatraman, 2004). It involves the disaggregation of the value chain and its cross-border dispersal (Contractor, Kumar, Kundu, & Pedersen, 2010). In other words, offshoring refers to the geographical reshaping of firm boundaries with the aim of enhancing overall system efficiency.

In the last decade, fuelled primarily by large labor cost differentials and advances in communication technology (Garner, 2004; Lewin & Peeters, 2006), the relocation of business operations to foreign locations has grown at an incredibly fast pace. Some statistics indicate that between 1992 and 2005, US firms tripled the value of services relocated to offshore locations (Liu, Feils, & Scholnick, 2011). McCarthy (2004), for instance, estimates that offshoring from the US is growing at a pace of about 200,000 to 300,000 jobs per year. While estimates vary, existing studies suggest that between 10 and 21 percent of US jobs are potential candidates for offshoring (Bardhan & Kroll, 2003; Blinder, 2006, 2006; Farrell and Rosenfeld, 2005; Garner, 2004; Jensen and Kletzer, 2005). Further estimates indicate that by 2015 about 3.4 million jobs worth about US\$151 billion will be relocated to foreign locations (Geewax, 2004). Similar developments have also been observed for the European Union (UNCTAD, 2004).

The increase in the magnitude of offshoring is intertwined with a growth in the array of the functions that firms relocate to cross-border locations (Lewin & Peeters, 2006; Youngdahl, Ramaswamy, & Verma, 2008). Initially, service offshoring consisted primarily of more routine processes that require a lower skill level such as customer service, payroll, or order fulfillment. While most offshoring still takes place in labor intensive services, firms are increasingly offshoring knowledge intensive services (Dossany & Kenney, 2003). Lewin and Peters (2006) find that an impressive 31 percent of offshoring firms also relocate knowledge-rich activities and that the offshoring of knowledge intensive services is expected to grow about 1.5 times faster than that of labor intensive services.

As innovation lies at the heart of competitive advantage and firm survival (Geroski, Machin, & Van Reenen, 1993; Hall, 2000), understanding how offshoring influences the ability of firms to introduce new products and services should be particularly high on the research agenda. So far, research has concentrated on offshoring’s influence on the level of employment (Kletzer, 2001), cost savings (Farrell, 2005), and short-term financial performance (Bhalla, Sodhi, & Son, 2008; Coucke & Sleuwaegen, 2008). The understanding of whether offshoring hurts or aids innovation is still blurred by a scarcity of research and incongruent findings (Doh, 2005; Li, Liu, Li, & Wu, 2008; Ramamurti, 2004; Youngdahl et al., 2008). This question is becoming increasingly important in the light of the overall increase in offshoring and the emerging trend of relocating knowledge intensive activities.

Accordingly, the underlying motivation of this paper is to further the understanding of the consequences of offshoring for innovation. To this end, we provide an encompassing framework that considers not only the main effect of offshoring on innovation, but also important managerial and organizational contingencies. First, while extant research predominantly focuses on the offshoring of specific functions, our study aims to consolidate these previous insights and develop theory about broader service categories. Specifically, we argue that the offshoring of knowledge intensive services (KIS) and labor intensive services (LIS) will have differential influences on the introduction of new products and services. The former category includes activities such as engineering, software development, or R&D and the latter category can include front-office activities such as customer service as well as back-office activities such as IT support, payroll, order processing, accounting, or human resources. So far, there is considerable divergence over the implications of offshoring for the introduction of new products and services. Offshoring KIS can contribute to an organization's innovativeness as it provides access to skilled labor at low costs (Quinn, 2000) and to a wide range of offshore knowledge sources (Li *et al.*, 2008), but it may also decrease firms' ability to transform new knowledge into innovations (Teece, 1987). Offshoring LIS can enhance the introduction of new products and services as it allows the firms to focus on knowledge-generating activities and it provides cost-savings that can be relocated to innovation-related activities. Thus, in this study we argue that offshoring goes beyond a simple cost-reduction strategy and that it raises important opportunities and threats for innovation.

Second, this study furthers the literature on the relationship between offshoring and innovation by providing a contingency perspective. Whether firms can take advantage of offshore opportunities and avoid its dangers depends on how the relationships with the offshore affiliates are structured and how top management teams (TMTs) oversee these relationships. An important aspect of offshoring is the governance mode employed at the foreign location (Gui, 2010; Mudambi & Venzin, 2010). Although the offshoring literature acknowledges the role of the governance mode (e.g. Venkatraman, 2004), there is a lack of research on the degree of integration with the offshore operations (Liu, Feils, & Scholnick, 2011). We complement previous studies that focus either on offshore outsourcing (e.g. Ellram, Tate, & Billington, 2008; Li *et al.*, 2008, Li, Wei, & Liu, 2010) or captive (i.e. full ownership) offshoring (e.g. Demirbag & Glaister, 2010) by assessing the effects of different governance modes. We argue that the degree of integration with the offshore affiliates¹ has important consequences for the relationship between offshoring and firms' ability to innovate as it influences the knowledge transfer from the offshore operations.

In addition, building on the idea that TMTs play a vital role in shaping the effectiveness of firm actions (e.g. Carpenter, Geletkanycz, & Sanders, 2004; Finkelstein & Hambrick, 1996), we argue that the way TMTs oversee the offshoring process will condition the consequences of offshoring KIS and LIS. As "in today's dynamic business environment managers are expected to

¹ We use the term "offshore affiliate" to refer to the operations at the foreign location. It does not imply any particular type of ownership with regards to the offshore operations.

monitor work division and integration continuously, rather than consider these issues as one-off design and decision problems” (Kumar, Fenema, & von Glinow, 2009: 643), we focus on the moderating role of TMT reflexivity. TMT reflexivity is defined as “the extent to which team members collectively reflect on and adapt their team’s objectives, strategies, and processes” (Tjosvold, Tang, & West, 2004: 542). It represents a systematic way in which TMTs question the performance and the suitability of the offshoring strategy for firms’ current needs. Through systematic monitoring, TMT reflexivity may bring to surface more ways to exploit the potential of offshoring and it may catch early warning signals about faltering innovation activities. By considering the moderating role of TMT processes, we complement recent findings that TMT attributes influence how firms exploit the potential of offshoring (Mihalache, Jansen, Van Den Bosch, and Volberda, 2012).

In summary, this study provides a comprehensive view of the influence of offshoring on innovation as it considers both managerial and organizational contingencies. We examine how firms can use offshoring to enhance their introduction of new products and services by strategically choosing the type of functions to offshore, the appropriate degree of integration, and monitoring processes. Fig.1 provides the theoretical framework.

2.2. Theoretical development

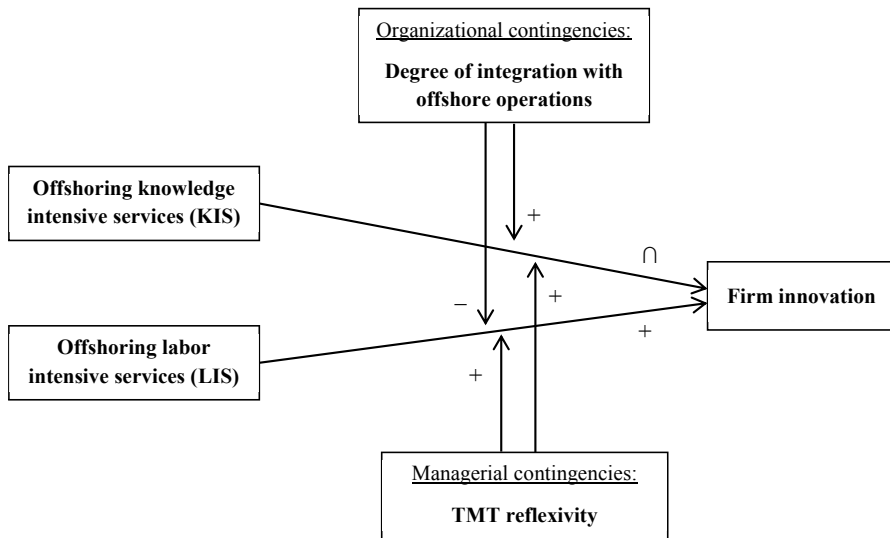
2.2.1 Offshoring

Offshoring refers to the relocation of processes or entire functions to locations outside of the organization’s national borders in order to support regular business operations (Levy, 2005; Manning, Massini, & Lewin, 2008; Venkatraman, 2004). “Offshoring, in a fuller sense, is the building of a global network whose strategic objectives go well beyond serving a local market, to a focus on global network efficiency and coherence” (Contractor et al., 2010: 1418). That is, the distinctive characteristic of offshoring is that its underlying aim is to support regular business operations. Thus, unlike internationalization (Buckley and Casson, 1976), offshoring is not primarily aimed at entering new markets in the pursuit of foreign sales, but at enhancing overall system efficiency (Jensen & Pedersen, 2010). To put it differently, whereas internationalization research is primarily concerned with downstream activities such as marketing and sales (Fletcher, 2001), offshoring concerns predominantly up-stream activities. By taking advantage of country specific characteristics, i.e. idiosyncratic combinations of skills, knowledge, and labor costs, offshoring can help firms leverage their own resources in order to enhance competitive advantage (McCann & Mudambi, 2005; Mudambi, 2007).

Offshoring can be considered a dynamic business model as it represents a new way to perceive the structure of the firm and develop efficient operational routines (Mason & Leek, 2008). Venkatraman (2004: 16) emphasizes that offshoring is “a business strategy issue and managers would do well to think rationally...about it”. However, based on survey data from the Offshore Research Network, Lewin and Peeters (2006: 230) find that, at present, “most companies have not articulated top-down strategies for planning and guiding the adoption of

offshoring”. Despite these findings, they expect that, as the bottom-up offshoring experiments increase in diversity, amplitude, and number of functions offshored, more companies will start developing top-down corporate-wide offshoring strategies. Such corporate-wide offshoring strategies can provide overarching guidelines for lower-level decision-makers regarding what tasks can be considered for offshoring, how to set-up offshore activities, and how to manage the ongoing operations. Lewin and Volberda (2011) note that there are wide variations in the offshoring decisions between firms and put forward an offshoring decision model to explain this variance. Their comprehensive model outlines the factors that affect the offshoring decision and it points out the intrinsic multilevel nature of offshoring as activity-, firm-, and environment-level factors affect offshoring operations.

Figure 2. Theoretical framework of Study 1



A particularly pertinent decision of the offshoring strategy is the choice of governance mode. While the location decision is closely intertwined with the ownership decision, offshoring and outsourcing are two clearly distinct aspects of a firm’s boundaries. Specifically, offshoring refers to the geographical location where a business function is performed and it does not imply a specific governance mode. The governance mode of offshore operations can range from captive (i.e. under the full ownership of the company) to outsourced (Lewin & Peeters, 2006). With such a wide range of governance options, it is surprising that extant research has predominantly been

silent about the interplay between offshoring and *degree* of integration. Existing studies largely focus on offshore outsourcing (e.g. Doh, 2005; Ellram et al., 2008; Maskell, Pedersen, Petersen, & Dick-Nielsen, 2007), thus leaving open the question of what combinations of offshore functions and governance modes are most conducive to the introduction of new products and services.

Despite the recent public interest in offshoring, the disaggregation of the value chain and relocation of services to foreign location is not a new phenomenon. Offshoring started more than half a century ago and, at the time, it encompassed mostly manufacturing and blue collar jobs (Lewin & Peeters, 2006). During this phase, the main motivation for offshoring was generating cost savings by leveraging high labor cost differentials between the advanced and developing countries (Farrell, 2005). Related to cost savings, offshoring was further encouraged by foreign governments' incentives such as tax advantages, reduced (or free) import duty for equipment, or financial assistance for training staff (Metters & Verma, 2008). Reducing costs still remains one of the main incentives to offshore with as much as 90 percent of offshoring companies considering cutting cost an important factor in their decision to relocate (Lewin & Peeters, 2006). This statistic is hardly surprising considering the magnitude of cost differentials. For instance, Garner (2004) notes that a computer programmer in India costs about nine times less than in the US and that for less qualified employees the cost differentials are even greater. In the 1990s, the economic liberalization and technological advancement in communication and computing fuelled the offshoring of services (Ramamurti, 2004). Access to highly skilled labor such as engineers, software developers, and scientists allowed companies to start offshoring innovation-oriented functions (Lewin & Peeters, 2006). That is, companies increasingly offshore to access specific knowledge and skilled labor in an effort to reduce developmental times and increase speed to market (Doz, Wilson, Veldhoen, Goldbrunner, & Altman, 2006; Lewin & Peeters, 2009).

The recent and expected spread of offshoring, especially in knowledge-generating functions, underlines the importance of shedding light on the impact of offshoring on innovation. In an effort to better understand the issues surrounding offshoring, research has analyzed a wide array of outcomes at the project, firm, and industry levels as well as a number of determinants of offshoring. Table 1 presents a summary of recent research on offshoring. However, notwithstanding the surge of research on offshoring, the understanding of the consequences of offshoring for innovation is still in an incipient phase as only few studies address this relationship. As indicated in Table 2, the few studies addressing this relationship have put forward contradictory theoretical argumentation and have found inconsistent empirical evidence. We aim to address these incongruences by distinguishing between two categories of offshored functions, i.e. knowledge and labor intensive services, and by considering boundary conditions.

Table 8. Example of recent studies about offshoring

Article	Level of analysis	Method/Sample	Function offshored	Governance mode	Outcome
Bhalla, Sodhi, & Son (2008)	Firm	Empirical / Fortune 500	Services (knowledge and labor intensive)	Various	Financial performance (no clear findings)
Coucke & Sleuwaegen (2008)	Firm	Empirical / Belgium	Not mentioned	Not mentioned	Firm survival
Di Gregorio, Musteen, & Thomas (2009)	Firm	Empirical / U.S.	Manufacturing and services (administrative and technical)	Outsourcing	Financial performance
Doh et al. (2009)	Project	Empirical / worldwide	Services	Not mentioned	Offshore location (as a function of country conditions and function knowledge-intensity)
Elfram et al. (2008)	Firm	Case study / Fortune 500	Services (professional)	Outsourcing	Offshoring (as a function of the extent of offshoring and function type)
Jengen & Pedersen (2010)	Project	Empirical / Denmark	Manufacturing and services (various)	Captive vs. outsourcing	Type of task offshored
Lewin & Peeters (2009)	Project	Empirical / U.S.	Services (product development)	Outsourcing vs. captive	Offshoring (as a function of offshoring drivers, offshoring experience, and labor availability in home country)
Liu, Feils, & Scholnick (2009)	Project	Empirical / U.S.	Services	Outsourcing	Offshoring location (as a function of function characteristics)
Metters (2008)	Project	Theoretical	Services (various)	Captive → outsourcing	Typology of offshoring
Stratman (2008)	Firm	Theoretical	Services (various)	Outsourcing	Extent of offshoring and cost savings through offshoring
Stringfellow, Teagarden, & Nie (2008)	Firm	Theoretical	Services (various)	Not mentioned	Offshore location choice
Youngdahl & Ramaswamy (2008)	Project	Theoretical	Services (knowledge and labor intensive)	Outsourcing vs. captive	Option for managing offshored operations

Table 9. Studies about the influence of offshoring on firm innovation

Article	Level of analysis	Method/Sample	Function offshored	Governance mode	Proposed influence on innovation
Chesbrough & Teece (1996)	Firm	Case study / various	Manufacturing and services	Outsourcing	Negative
Chung & Yeaple (2008)	Firm	Empirical / U.S.	Services (knowledge intensive)	Not specified	Positive
Fifarek, Veloso, & Davidson (2008)	Industry	Empirical / U.S.	Services (knowledge intensive)	Outsourcing	Negative
Li et al. (2008)	Firm	Empirical / various	Manufacturing and services (various)	Outsourcing	Positive
Markides & Berg (1988)	Firm	Case study / various	Manufacturing	Not specified	Negative
Mihalache et al. (2012)	Firm	Empirical / Netherlands	Manufacturing and service (knowledge intensive)	Not specified	Inverted U-shape

2.2.2. *Offshoring and innovation*

We argue that the offshoring of different types of functions will differentially influence the ability of firms to introduce new products and services. Using the level of knowledge embedded in a function as a delineator, we distinguish between knowledge and labor intensive services. Building on the idea that knowledge forms the basis of innovation (McGrath, 2001), we argue that the offshoring of functions that have different levels of knowledge may differently impact the ability of firms to introduce new products and services. Specifically, we argue that the relationship between offshoring KIS and innovation follows an inverted U-shape and the one between offshoring LIS and innovation is linear and positive.

Offshoring knowledge intensive services and innovation. The offshoring of KIS raises important opportunities and threats for firms' innovativeness. On the positive side, increasing offshoring KIS from low to intermediate levels allows firms to engage in co-creation of new knowledge with offshore affiliates in several ways. First of all, firms can leverage labor cost discrepancies between the home and developing countries to increase the magnitude of their knowledge generating activities. Offshoring allows firms to access highly educated and skilled employees at only a fraction of the cost of similar work in the home country (Quinn, 2000). For instance, Chung and Yeaple (2008) argue that the lower cost of international knowledge sourcing can serve as a springboard for firms' knowledge generating activities. Offshoring may also raise opportunities to address home country labor shortages and the prohibitive costs of highly specialized personnel (Lewin, Massini, & Peeters, 2009). As a result, firms can increase their research efforts and reduce developmental times.

Second, offshoring can promote the introduction of new products, services and processes as it connects firms to a wide array of knowledge sources, thus, enhancing the possibility that novel ideas emerge (Galunic & Rodan, 1998; Kogut & Zander, 1992). Offshoring provides access to knowledge and technologies that are either not available or less advanced in the home country than at foreign locations (Chung & Alcacer, 2002). In line with this argument, Li et al. (2008) argue that knowledge acquisition from offshore affiliates can accelerate the process of innovation. Thus, offshoring KS stands to enhance innovation as firms can increase the magnitude of their research efforts and can access unique knowledge sources.

However, when firms offshore high levels of their KIS the effect of offshoring on innovation may change and firms face the risk of reduced innovativeness. First, when knowledge intensive activities are located at various offshore locations, firms must overcome the difficulty of transferring the offshore knowledge. However, knowledge, and especially tacit knowledge, is not easily transferable as it requires a great amount of close interaction (e.g. Bresman, Birkinshaw, & Nobel, 1999). As such, firms may be in a situation in which they have access to knowledge and knowledge-enhancing opportunities, but may not be able to make use of that knowledge due to a lack of overlap in knowledge bases. As the ability to recognize the value of new knowledge and apply it to create new products and services depends on the existence of related knowledge (Cohen & Levinthal, 1990), firms whose knowledge resides with offshore

affiliates may have difficulty recognizing and responding to environmental changes (Teece, 1987). Thus, whether offshoring has a positive or a negative effect on innovation depends on the degree of offshoring (Mihalache, Jansen, Van Den Bosch, & Volberda, 2012). That is, increasing offshoring KIS will provide innovation-enhancing opportunities, but, beyond certain levels, offshoring may reduce innovativeness. Considering these arguments, we put forward the following relationship:

Proposition 1: *There is an inverted U-shaped relationship between offshoring KIS and the level of firm innovation.*

Offshoring labor intensive services and innovation. We expect the offshoring of LIS to have a positive influence on firm innovativeness as it creates several conditions that stimulate the introduction of new products and services. First, the offshoring of secondary functions enhances firm innovativeness as it allows firms to focus on knowledge-generating activities (Quinn, 1999; Venkatraman, 2004). By concentrating efforts and resources at the home location on innovation activities, firms can improve their responsiveness to customer needs and shorten development times (Quinn & Hilmer, 1994). Second, the geographical separation of secondary functions fosters innovation as it creates structural differentiation (Gilbert, 2005; Tushman & O'Reilly, 1996). Separating the efficiency-driven functions from innovation activities protects the development of new products and services from efficiency pressures and it permits the implementation of organizational conditions conducive to innovation such as decentralization or informal culture (Benner & Tushman, 2003; Jansen, Tempelaar, Van Den Bosch, & Volberda, 2009).

Third, the cost savings obtained from the offshoring of LIS can stimulate innovation as they contribute to the stock of organizational slack. Organizational slack is an important (or even an essential) catalyst of innovation as it relaxes financial controls and motivates the pursuit of uncertain innovative projects (e.g. Damanpour, 1991; Nohria & Gulati, 1996). In addition to generating a culture of safe experimentation (Bourgeois, 1981), the savings from offshoring LIS can also be reinvested to increase the magnitude of knowledge-generating activities (Agrawal, Farrell, & Remes, 2003; Farrell, 2005) by, for instance, increasing the number of knowledge workers at the home location (e.g. Feenstra & Hansen, 1999). Thus, we propose the following relationship between offshoring LIS and firm innovativeness:

Proposition 2: *There is a positive relationship between offshoring LIS and the level of firm innovation.*

2.2.3. The moderating role of the governance mode

The governance mode employed in offshoring can range from full ownership of the offshore affiliates to outsourcing arrangements (Ellram et al., 2008; Stratman, 2008). We argue that the *degree of integration* is an important factor of the offshoring strategy as it conditions the

influence of offshoring on the introduction of new products and services. Whereas previous studies have emphasized the role of governance mode primarily as a response to intellectual property appropriation concerns (e.g. Caves, 1996), we argue that the control over knowledge transfer associated with the degree of integration is of particular importance innovation. While high integration with the offshore affiliates, i.e. using a captive governance mode, holds certain advantages in terms of control over the knowledge transfer process, it also comes with associated financial, attention, and time costs. We argue that high integration can help the offshoring of KIS to stimulate innovation, but it may dampen the influence of offshoring LIS.

Governance mode and offshoring KIS. The governance mode affects the relationship between offshoring of KIS and innovation primarily through its effect on knowledge transfer from the offshore locations. By improving firms' control over knowledge transfer from cross-border operations, the degree of integration can enhance the positive effects of low levels of offshoring and reduce the negative effect of high levels of offshoring on firms' ability to introduce new products and services.

We argue that the degree of integration influences both the motivation to share knowledge and the extensiveness of communication channels between the offshore affiliate and the rest of the firm, which are two key elements for knowledge transfer (Gupta & Govindarajan, 2002). First, the offshore affiliate's motivation to share knowledge increases with the degree of integration for several reasons. Based on agency theory, a foreign affiliate may be reluctant to share knowledge as it can decrease its power in the relationship with the home organization (Bjorkman, Barner-Rasmussen, & Li, 2004). Following this argument, fully owned affiliates are less likely to be concerned about power struggles than those under shared ownership or outsourcing agreements. Furthermore, the motivation to share knowledge is positively influenced by a common organizational identity (Bjorkman et al., 2004; Hansen & Lovas, 2004) because knowledge transfer requires the willing involvement of the participants (Bresman, Birkinshaw, & Noble, 1999). High degrees of integration of the governance mode enable the implementation of a common organizational identity as the home organization has more control over the socialization mechanisms and the incentives schemes.

Second, a high degree of integration improves knowledge transfer because it facilitates the implementation of extensive communication channels. Extant research considers that interaction and communication are necessary for the acquisition and transfer of knowledge, especially tacit knowledge (Ahuja, 2000; Gulati, 1999; Stuart, 1998). When using high levels of integration, firms have greater control to set up, maintain, and adjust the communication channels with the offshore operations. Thus, by improving knowledge transfer, the degree of integration can augment the innovation-enhancing opportunities of low levels of offshoring and it can reduce the dangers of lower innovation associated with high levels of offshoring. This line of argumentation suggests the following proposition:

Proposition 3: *The degree of integration with offshore operations moderates the relationship between offshoring LIS and the level of innovation in such a way that it enhances the positive effect of low levels of offshoring and reduces the negative effect of high levels of offshoring on firm innovation.*

Governance mode and offshoring LIS. The governance mode also influences the relationship between offshoring LIS and innovation. We argue that a high degree of integration used for the offshore operations is associated with various costs that stand to detract from the benefits of offshoring LIS. An important downside of using high levels of integration for the offshore operations (e.g. captive centers) is that such governance modes have high fixed financial costs (Ellram et al., 2008; Oshri, 2011). These fixed costs may not be justified since offshore LIS are easier to monitor and, thus, require less control (Stratman, 2008). As one of the main ways in which offshoring LIS enhances innovation is by reinvesting the cost saving from offshoring in knowledge-generating activities, the high fixed costs of integration may reduce these benefits. Additionally, the complexities of managing offshored LIS under captive centers may prevent firms from focusing on knowledge intensive activities. Citing case evidence, Oshri (2011: 3) writes: "It takes a lot of overhead and management attention to manage internal facilities.... You're exposing yourself to a lot of administrative burden just to do back-office type work in lower cost-locations." Assuming that managers have bounded rationality and limited cognitive resources, the demanding tasks of supervising offshore captive centers may neutralize the benefits of offshoring LIS in terms of allowing firms to focus on knowledge-generation activities. Therefore, we propose that:

Proposition 4: *The degree of integration with offshore operations moderates the relationship between offshoring LIS and the level of innovation in such a way that offshoring LIS is associated with higher levels of innovation in firms that use lower degrees of integration.*

2.2.4. The moderating role of TMT reflexivity

The TMT comprises the CEO and the senior executives, which usually hold positions at or above vice president (Carmeli & Halevi, 2009). TMT members play a key role in strategic decision-making and in supervising ongoing operations (Carpenter, Geletkanycz, & Sanders, 2004; Castanias & Helfat, 1991; Finkelstein and Hambrick, 1996; Hambrick & Mason, 1984; Olie, 2010). TMTs are particularly important in offshoring as they are typically responsible for coordinating and controlling international operations and for stimulating knowledge transfer from foreign affiliates (Black et al., 1992). As TMT members are decision-makers and boundary-spanners, achieving the full potential of the opportunities associated with offshoring depends on how TMTs manage the global network (Ang & Inkpen, 2008). Mihalache et al. (2012) argue that TMTs' informational diversity and shared vision influence how senior executives perceive the

value of offshore opportunities and how firms capitalize on these opportunities. However, extant research has been silent about the role TMT processes in offshoring.

We propose that TMT reflexivity affects the influence of offshoring on firm innovativeness. TMT reflexivity refers to “the extent to which team members collectively reflect on and adapt their team’s objectives, strategies, and processes” (Tjosvold, Tang, and West, 2004: 542). It involves questioning, evaluating, debating, planning, and monitoring of internal and external environments and as such is both backward and forward-looking (MacCurtain, Flood, Ramamoorthy, West, and Dawson, 2010). Reflexivity stands to affect the relationship between offshoring and innovation as it influences the perception of offshore opportunities.

TMT reflexivity and offshoring KIS. TMT reflexivity can enhance firms’ ability to stimulate the introduction of new products and services through offshoring as it augments the knowledge-enhancing potential of low levels of offshoring and reduces the potential loss of expertise of high levels of offshoring. First, reflexive TMTs may identify a wider array of offshore opportunities and are more likely to choose promising alternatives. Research argues that TMTs that engage in high levels of reflexivity are likely to exhibit greater attention to detail and, as a consequence, identify more alternatives than teams that engage in lower levels of reflexivity (MacCurtain et al., 2010). Also, as they have the tendency to closely monitor the external environment (Hoegl & Parboteeah, 2006), reflexive TMTs are likely to be aware of and have access to more offshore knowledge sources.

In addition, as it enables TMTs to continuously assess the situation and form an accurate understanding of the current issue (Hoegl & Parboteeah, 2006), reflexivity may help TMT members to allocate firm efforts to more promising activities in terms of co-creating knowledge with the offshore affiliates. Moreover, reflexivity leads to greater information gathering and better communication between TMTs and external environment (Carter & West, 1998; Hoegl & Parboteeah, 2006). As a consequence, TMTs are more effective in anticipating and overcoming disruptions of the knowledge transfer, thus, reducing the issue of a loss of expertise associated with high levels of offshoring. Therefore, we propose that TMT reflexivity can enhance the positive effect of low levels of offshoring and it can dampen the negative effect of high levels of offshoring on the introduction of new products and services.

Proposition 5: *TMT reflexivity moderates the relationship between offshoring KIS and the level of innovation in such a way that it enhances the positive effect of low levels of offshoring and reduces the negative effect of high levels of offshoring on firm innovation.*

TMT reflexivity and offshoring LIS. TMT reflexivity also conditions the relationship between offshoring LIS and innovation. First of all, by stimulating the reframing of TMT members’ cognitive representations of tasks and the questioning of assumptions (Hirst & Mann, 2004), reflexivity can help TMTs acknowledge the need for a change in the product mix. Concurrently, research argues that reflexive teams are more likely to identify and prioritize the more important

issues (i.e. more relevant and urgent) than less reflexive teams (Hoegl & Parboteeah, 2006). Also, reflexive teams have the tendency to quickly address issues, whereas less reflexive teams are more likely to deny, hide or delay issues (Moreland & Levine, 1992). As a result, the cost savings achieved through the offshoring of LIS are more likely to be directed toward knowledge-generating activities at the home location. Thus, we propose the following relationship:

Proposition 6: *TMT reflexivity moderates the relationship between the offshoring of LIS and the level of innovation in such a way that offshoring is associated with higher levels of innovation in firms whose TMTs are more reflexive.*

2.3. Discussion and conclusion

In response to the rapid spread of offshoring, this study seeks to answer a call for more research on the consequences of the geographical disaggregation of business functions for firms' ability to introduce new products and services (Doh, 2005; Ramamurti, 2004; Youngdahl et al., 2008). We put forward a theoretical framework that considers not only the differential effects of offshoring KIS and LIS, but also important managerial and organizational contingencies.

Our study untangles the effects of offshoring KIS and LIS on innovation. Most studies to date focus either on the offshoring of particular functions (e.g. g. Ellram et al., 2008) or on aggregated measures of offshoring (e.g. Demirbag & Glaister, 2010). By disentangling the effects of offshoring KIS and LIS, we aim to provide a more thorough understanding of the effects of offshoring on innovation. We proposed that whether offshoring KIS has a positive or negative influence on innovation depends on the extent of offshoring. At low to intermediate levels, offshoring KIS raises important opportunities to enhance innovation by enhancing knowledge-generating activities (Quinn, 1999; Venkatraman, 2004) and providing access to offshore knowledge that is not easily available in the home country (Li *et al.*, 2008). However, we argued, at high levels, offshoring KIS may start lowering firms' ability to introduce new products and services as they become increasingly detached from their own operations and, consequently, may experience difficulty in recognizing and adapting to environmental changes (Teece, 1987). Furthermore, we proposed that the offshoring of LIS can enhance firm innovativeness by providing cost savings to reinvest in knowledge-generating activities and by focusing attention on innovation-related activities. By distinguishing between the effects of offshoring KIS and LIS, we aimed to propose a possible explanation for the inconclusive findings regarding the effects of offshoring on innovation (e.g. Li et al., 2008; Ramamurti, 2004). This distinction between function types based on the level of knowledge also advances the theoretical understanding of previous research that proposed a non-linear relationship between offshoring and innovation (Mihalache et al., 2012).

In addition, this study proposes that the influence of offshoring strategy on company innovativeness is contingent upon organizational and managerial moderators. Our study moves offshoring literature beyond the analysis of main effects by considering the moderating roles of

governance mode and TMT reflexivity. In this way, we answer a call for a more ‘sophisticated and nuanced’ (Doh, Bunyaratavej, and Hahn, 2009: 927) approach to offshoring research. Our contingency perspective highlights Lewin and Peeters’s (2006) contention of the significance of a corporate-wide offshoring strategy instead of pursuing bottom-up uncoordinated offshoring efforts.

Building on previous studies that emphasized the interconnectedness of the offshoring and governance mode decisions (Mudambi & Venzin, 2010), we propose that the degree of integration differently influences the effects of offshoring KIS and LIS on innovation. Departing from previous studies that focused primarily on safeguarding intellectual-property (e.g. Caves, 1996), we argued that the governance mode plays an important part in how firms can coordinate the knowledge transfer from offshore operations. As higher degrees of integration are more conducive to knowledge transfer, they are likely to enhance the effect of offshoring KIS on innovation. However, the costs associated with high integration may detract from the benefits of offshoring LIS. Thus, we propose that firms need to consider the function type and to balance the need to transfer knowledge against the associated costs, when deciding on the governance of offshore operations.

Third, we proposed TMT reflexivity as an additional important contingency factor. TMT monitoring may play an important role on the link between offshoring and innovation as senior executives can legitimize new knowledge and address emerging issues. By proposing TMT reflexivity as a contingency of offshoring, we contribute to furthering the understanding of how TMTs influence the effectiveness of sourcing across national borders in terms of enhancing knowledge processes (Foss and Pedersen, 2004). Our theoretical insights on the role of TMT processes complement recent empirical findings supporting the significance of TMT attributes in the relationship between offshoring and innovativeness (Mihalache et al., 2012).

2.3.1. Limitations and future research

The insights of this study on the relationship between offshoring and innovation are based on a knowledge perspective. However, using another theoretical lens may lead to different insights. For instance, from an institutional theoretical perspective (e.g. Scott, 1987), companies may not be free to choose the governance mode at the offshore location that is most conducive to knowledge transfer. Future studies may consider institutional restricting and analyze their interrelation with governance choice decisions for offshore operations.

In this study, we considered the effect of only one organizational moderator, i.e. governance mode, but future research could attempt to investigate other organizational factors. For instance, many studies mention the importance of the company-level capability to coordinate geographically dispersed operations (e.g. Levy, 2005); however, studies that specifically address how this capacity develops and how it affects the returns from offshoring are still lacking. Another particularly pertinent organizational issue for the success of offshoring in enhancing innovation is the timing of the offshoring action. The offshoring literature is surprisingly silent on the issue of strategically timing the relocation of business functions to foreign locations.

Such considerations may further elucidate the current inconclusive findings of the consequences of offshoring for innovation as the quality of offshore services may be influenced by the accumulation of earlier investments and their externalities (Dossani & Kenney, 2003).

In addition of our insights regarding TMT reflexivity, future studies could shed light on other managerial factors. For instance, research could also investigate the moderating effect of TMT contingency rewards as Jansen, Van Den Bosch, and Volberda (2008) find evidence of their influence on organizational exploratory and exploitative actions. In addition, future research can focus at the dyadic level and analyze the moderating role of shared visions between the home company and the offshore affiliates as ample research emphasizes the importance of matching visions between dyadic partners for knowledge transfer (Tsai and Ghoshal, 1998).

2.3.2. Conclusion

In conclusion, this study answers a call for more research on the consequences of offshoring for firms' innovativeness. In doing so, we contribute to extant literature primarily by proposing offshoring as an important antecedent of firm innovation. To this end, we provide a comprehensive framework that examines not only how offshoring KIS and LIS differently influence firm innovation, but also how managerial and organizational factors moderate these relationships.

CHAPTER 3

STUDY 2 – OFFSHORING AND FIRM INNOVATION: THE MODERATING ROLE OF TOP MANAGEMENT TEAM ATTRIBUTES*

Abstract

This study attempts to increase the understanding of how offshoring influences the introduction of new products and services. Focusing on the offshoring of those business functions that provide direct knowledge inputs for innovation (i.e. production, R&D, and engineering), we propose that offshoring has an inverted U-shaped influence on firm innovativeness. Additionally, we provide an upper-echelon contingency perspective by considering the moderating role of two top management team (TMT) attributes (i.e. informational diversity and shared vision). Using a cross-industry sample with lagged data, we find that offshoring has an inverted U-shaped influence on firm innovativeness and that this relationship is steeper in firms with high TMT informational diversity and in firms with low TMT shared vision.

Keywords: *firm innovativeness; offshoring; top management teams; TMT informational diversity; TMT shared vision*

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3.1. Introduction

Ample research emphasizes the positive consequences of innovation for firm performance and considers it central to firms' competitive advantage (e.g. Dutta, Narasimhan, and Rajiv, 2005; Hall, 2000; Geroski, Machin, and Van Reenen, 1993). However, introducing new products and services is challenging because it requires substantial new knowledge and financial resources (Sampson, 2007). Highlighted as a 'new platform for knowledge creation and innovation', offshoring has been suggested to provide fertile ground for firms to accumulate knowledge and increase their innovativeness (Kenney, Massini, and Murtha, 2009: 887).

Offshoring refers to the assignment of business functions to locations outside of the firm's national borders in support of domestic rather than foreign business operations (Kenney *et al.*, 2009; Levy, 2005; Lewin, Massini, and Peeters, 2009). Due to recent advances in information technology and trade liberalization, offshoring is experiencing an intensive growth. For instance, the number of offshore service workers grew from less than 35,000 worldwide in 1994 to over 350,000 in India alone in 2003 (Metters and Verma, 2008). This growing trend is expected to continue with estimates that, between years 2000 and 2015, over 3 million white-collar jobs worth annually more than US\$150 billion will be moved from the United States to offshore locations (McCarthy *et al.*, 2002). In addition to its overall magnitude, offshoring is also growing in terms of the variety of functions that firms relocate abroad, as firms start to offshore functions rich in product-related knowledge such as research and development (Lewin and Peeters, 2006). These developments have led some authors to consider offshoring 'the most important phenomenon transforming the workplace' (Youngdahl and Ramaswamy, 2008: 213).

Despite offshoring's growing importance, the consequences of relocating business functions to international locations for firms' ability to introduce new products and services are still not well understood as the literature is not only remarkably scarce¹ but it also provides opposing views (Doh, 2005; Kotabe, 1990; Inkpen and Ramaswamy, 2006; Youngdahl, Ramaswamy, and Verma, 2008). While several studies highlight offshoring's potential to stimulate innovativeness (Chung and Yeaple, 2008; Li *et al.*, 2008), others have argued that offshoring can actually dampen innovation performance (Chesbrough and Teece, 2002; Markides and Berg, 1988; Teece, 1987). Moreover, the empirical evidence for the offshoring-innovation linkage is largely absent, with most existing studies providing indirect arguments or anecdotal evidence. In light of the increasing practice of relocating business functions to foreign locations, understanding how to avoid the caveats and harness the benefits from offshoring for increasing innovativeness is central for firms' viability and competitive advantage.

This study seeks to explain how and under what conditions offshoring enhances firms' innovative performance. In doing so, this study contributes to offshoring, innovation and upper echelon literatures in several ways. First, we advance the understanding of offshoring as an important antecedent of firm innovation by providing an extensive analysis of how offshoring

¹ Most studies on the firm-level consequences of offshoring focus on financial outcomes such as cost savings (e.g. Ellram, Tate, Billington, 2008; Farrell, 2005) or overall performance (e.g. Bhalla, Sodhi, and Son, 2008).

those business functions that are the primary providers of knowledge (i.e. production, R&D, and engineering) contributes to generating new products and services (e.g. Teece, 1996)¹. These primary functions advance existing knowledge as where R&D and engineering deliver new designs, production provides crucial feedback that contributes to fine-tuning new technologies (Leiblein and Madsen, 2009; Markides and Berg, 1988). Supporting the role of these functions for the introduction of new products and services, Teece (1996) argues that innovation requires the continuous communication and adaptation between production and development. Thus, since these functions represent the direct linkage between offshoring and innovation, their relocation to foreign locations is particularly associated with potential benefits and drawbacks.

We suggest that the extent to which organizations offshore primary functions enables them to unleash unrealized potential for firm innovativeness as they may leverage specialized knowledge sources from foreign locations (Li *et al.*, 2008) and utilize wage-differentials (e.g. Chung and Yeaple, 2008; Ethiraj *et al.*, 2005; Venkatraman, 2004). Yet, we argue that the relocation of primary functions to foreign countries will exhibit a pattern of diminishing returns, eventually reversing itself at high levels when organizations may become detached from most of their primary operations and, consequently, experience difficulty in recognizing and responding to environmental changes (e.g. Cohen and Levinthal, 1990; Teece, 1987). By focusing on the distinct effects of offshoring primary functions and suggesting an inverted U-shaped relationship, our study advances current insights into the implications of offshoring for firm innovativeness as it extends, integrates and reconciles the opposing perspectives in extant literatures.

Second, our study contributes to establishing the link between upper echelon and innovation literatures by highlighting and clarifying the role of top management teams (TMT) in how firms may enhance innovativeness through international sourcing. While previous research has considered, albeit indirectly, the implications of offshoring for the introduction of new products and services, it has done so in isolation of the actors steering the relationship, i.e. the senior executives. This oversight is surprising considering the central role that top management teams play in setting strategic goals (Wiersema and Bantel, 1992), influencing international knowledge transfer (Fey and Furu, 2008), and legitimizing new initiatives (Sambharya, 1996).

In order to advance a deeper understanding of the relationship between offshoring and innovation, we provide an upper echelon contingency perspective that analyzes the strategic importance of TMT attributes. Influencing the perception and evaluation of alternatives (Hambrick and Mason, 1984), TMT attributes can alter the effectiveness of firm actions (e.g. Finkelstein and Hambrick, 1996; Vissa and Chacar, 2009). We consider the role of two TMT attributes: informational diversity and shared vision. We focus on these TMT attributes because they have distinct effects on team behavior – while diversity introduces divergence in senior

¹ We would like to thank the editor for suggesting the focus on offshoring primary functions, i.e. the primary providers of knowledge for generating new products and services: production, R&D, and engineering. The offshoring of other business functions (e.g. accounting, human resources, IT, or customer service) may also provide incentives for the development of new products and services. However, since these functions do not contain the knowledge underlying innovation, they are likely to provide only indirect stimuli (e.g. the accumulation of organizational slack). Thus, in this study we focus on the offshoring of primary functions while controlling for the extent of offshoring secondary functions.

executives' preferences, a shared vision facilitates convergence. These two TMT attributes are relevant for the understanding of the offshoring-innovation relationship as, while diversity enhances the array of ideas regarding the usefulness and potential applications of offshore alternatives (Ang and Inkpen, 2008), a shared vision influences the value perceptions regarding the application of offshore knowledge (von Krogh, Roos and Slocum, 1994). While offshoring raises a number of opportunities for innovation, we argue that TMT attributes influence the extent to which firms may capitalize on these opportunities. In this sense, our study advances upper echelon literature by emphasizing the importance of the *interplay* between TMT strategic choices and TMT attributes in determining a firm's ability to introduce new products and services; thus, complementing the existing view that TMTs are crucial to organizational outcomes (e.g. Cannella, Park, and Lee, 2008; Simons, Pelled and Smith, 1999). Specifically, by highlighting TMT attributes as important contingency factors, we answer a call for a better understanding of how senior executives influence the effectiveness of sourcing across national borders (Foss and Pedersen, 2004).

The remainder of this paper is organized as follows. The next section develops the arguments that lead to our hypotheses. Next, we present the methodology and the results. The paper concludes with a discussion of the main ideas, limitations, and opportunities for future research.

3.2. Hypotheses development

3.2.1. Offshoring and firm innovativeness

Innovativeness refers to the introduction of products or services that are new to the firm (Damanpour, 1991; Bell, 2005). Innovativeness originates from a firm's accumulated know-how, which forms the base for developing new ideas; that is, the higher the depth of the knowledge base, the higher the innovativeness (Pennings and Harianto, 1992). In addition to its depth, the breadth of the knowledge base is central for innovativeness as variety diminishes the possibility that firms remain blocked in existing technologies that might become obsolete (Kotabe *et al.*, 2007). We propose that offshoring primary functions influences the ability of firms to develop new products and services through its impact on firms' existing knowledge base yet the direction depends on the extent to which firms engage in offshoring.

Increasing the extent of offshoring from low to intermediate levels allows firms to enhance their innovativeness by leveraging the location-specific advantages and competencies of foreign countries. First of all, studies have shown that firms can capitalize on relatively lower labor costs in order to increase the depth of their knowledge generating activities. For instance, Quinn (2000) argues that offshoring provides access to the latest know-how at lower cost and risk than it would be possible in the home country and Chung and Yeaple (2008) propose that the lower cost of international knowledge sourcing can serve as a springboard for firms' knowledge generating activities. By offshoring to locations that provide cost advantages, firms can employ highly specialized personnel that would be too expensive in the home country (Lewin and

Peeters, 2006). As a result, they can increase the depth of the knowledge base to levels that would be unattainable with primary functions restricted to their home location. For instance, cost differentials permit General Electric to engage more than 15,000 people in knowledge-generating activities in India (Venkatraman, 2004) and firms such as IBM, Sapient and Accenture leverage the mix of high capabilities and low cost of the Indian software industry (Ethiraj *et al.*, 2005).

Second, offshoring primary functions enhances the breadth of the knowledge base by connecting firms with a wide variety of knowledge sources at offshore locations. Utterback (1971) argues that diverse contacts with external entities inspire idea generation and Dewar and Dutton (1986) show that exposure to diverse sources of knowledge enhances innovation adoption. As national environments hold idiosyncratic knowledge and technologies (Cantwell, 1994), offshoring allows firms to tap into new competencies. That is, offshoring provides access to knowledge and technologies that are either not available or less sophisticated in the home country than at foreign locations (Chung and Alcacer, 2002). For instance, offshoring enhances learning as it permits firms to enter offshore industry clusters since, according to Powell, Koput, and Smith-Doer (1996), the locus of innovation is the network, not the individual firm.

However, as offshoring of primary functions increases beyond a threshold, its benefits in terms of increased innovativeness are likely to diminish and offshoring can even hinder firms' ability to introduce new products and services. First, at high levels of offshoring firms may become 'hollow corporations', in the sense that they do not have significant contributions to their product or service value chain, and, as a result, their expertise might stagnate (Miles and Snow, 2002). This is a considerable threat to firms' innovativeness since the ability to recognize the value of new knowledge, assimilate it, and apply it to commercial ends depends on the existence of related knowledge (Cohen and Levinthal, 1990). That is, knowledge transfer from offshore locations requires a certain degree of overlap with the existing knowledge base (Van Wijk, Jansen, and Lyles, 2008; Yang, Mudambi, and Meyer, 2008); thus, excessive reliance on geographically dispersed knowledge-sources may inhibit further transfer of offshore knowledge and decrease firms' ability to transform new knowledge into innovations (Teece, 1987).

Second, a high extent of offshoring can dampen firm innovativeness since the geographical disaggregation of functions can make the integration of knowledge more difficult. This is particularly important since innovation requires continuous communication and mutual adjustment between primary functions (Leiblein and Madsen, 2009; Teece, 1996) and domestic knowledge can be more easily recognized and managed by the organization's existing routines and members (Rosenkopf and Almeida, 2003). When a high proportion of primary functions are performed at foreign locations, the knowledge transfer can be burdened by considerable geographical, cultural, and institutional barriers (Lane and Lubatkin, 1998; Markides and Berg, 1988). These complexities increase demands on managerial attention, leading to a dampening of offshoring's benefits (Chesbrough and Teece, 2002; Kotabe, 1990; Rothaermel, Hitt, and Jobe, 2006). In addition, due to the time costs involved in coordinating geographically dispersed operations, high levels of offshoring may impede firms in implementing timely changes to existing product lines (Markides and Berg, 1988). Considering these arguments, we propose an

inverted U-shaped relationship between the offshoring of primary functions and firm innovativeness:

Hypothesis 1: *The extent of offshoring primary functions has an inverted U-shaped relationship with firm innovativeness.*

3.2.2. The moderating role of TMT attributes: informational diversity and shared vision

In order to advance the understanding of the effectiveness of offshoring in influencing innovation, we analyze the contingency role of TMT attributes. Building on the idea that search and decision-making processes jointly influence innovation (Greve, 2003), we propose that while offshoring may provide important opportunities for developing new products and services, the attributes of TMTs influence how firms capitalize on these opportunities.

More specifically, we analyze the moderating role of two TMT attributes: informational diversity and shared vision. Both informational diversity and shared vision shape how senior executives perceive the value of the opportunities raised by offshoring and how they interact in implementing various alternatives. TMT informational diversity, or the heterogeneity in senior executives' knowledge bases and perspectives, influences idea generation regarding the usefulness and potential applications of offshore alternatives and TMTs' ability to make competent decisions (Ang and Inkpen, 2008). TMT shared vision, by promoting convergence in cognitive modes regarding the overall strategic direction of the firm (Tvorik and McGivern, 1997), influences how TMTs collectively perceive the value of knowledge generated through offshoring and how they deal with potential conflicts regarding the implementation of competing opportunities. Hence, while diversity creates variation in cognitive models, shared vision ensures that TMTs' decisions converge towards long-term firm goals. Next, we discuss in detail how each of these TMT attributes affects the impact of offshoring on firm innovativeness.

TMT informational diversity, offshoring, and firm innovativeness

TMT informational diversity captures the degree of heterogeneity in knowledge bases and perspectives that TMT members bring to the team (Jehn, Northcraft, and Neale, 1999; Pelled, 1996). Informational diversity arises from differences in individual characteristics such as educational background or previous functional roles (Jehn *et al.*, 1999). Informational diversity plays an important role in how senior executives perceive the opportunities presented by offshoring and how they interact during their implementation. We propose that the inverted U-shaped relationship between offshoring primary functions and innovation is steeper in firms with high TMT diversity than in those with low TMT diversity.

As varied knowledge structures augment TMTs' capacity to make novel linkages and associations (Cohen and Levinthal, 1990), informational diversity can enhance the ability to recognize the potential of opportunities that arise from relocating primary business activities to foreign locations. Informational diversity reduces the risks of strategic inertia by helping TMT members to overcome uniformity pressures (Lant, Milliken, and Batra, 1992; Wiersema and

Bantel, 1992). Thus, TMTs with high informational diversity may consider more ways to transform and exploit knowledge from offshore locations than TMTs with low informational diversity (Zahra and George, 2002). In addition, informational diversity can enhance TMTs' information processing capacity (Ancona and Caldwell, 1992). Higher cognitive capacity can improve TMTs' ability to manage internationally dispersed operations as it allows more accurate interpretations of foreign environments in terms of idiosyncratic institutional and cultural conditions (Black, Mendenhall, and Oddou, 1991; Roth, 1995). Furthermore, due to higher decision comprehensiveness (Simons *et al.*, 1999), heterogeneous TMTs are also more likely than homogeneous ones to pursue superior alternatives out of the potential opportunities from offshoring for introducing new products and services. As such, TMT informational diversity may enhance the potential opportunities derived from offshoring primary functions for increasing firm innovativeness.

However, TMT informational diversity may also augment the potential detrimental effect of high levels of offshoring on innovativeness, as the heterogeneity of perspectives compounds the difficulty of transferring and integrating knowledge from geographically dispersed operations. Research shows that TMT diversity is a 'double-edged sword'. While the distinct skills, views and information increase team creativity, they can also lead to more difficult communication and coordination within teams (Milliken and Martins, 1996; Williams and O'Reilly, 1998) and to increased dysfunctional conflict (Jehn *et al.*, 1999). These negative effects of diversity are especially likely to hinder the functioning of TMTs when dealing with complex situations such as managing high levels of offshore operations (Carpenter, 2002). The difficulty of reconciling different mental models and competing ideas adds to the hurdles of coordinating the knowledge transfer from high levels of offshore operations as it puts additional pressure on TMTs' cognitive capacity and time resources (Ancona and Caldwell, 1992). In line with this argument, research shows that knowledge integration is more difficult in teams with higher informational diversity as unproductive process conflict may delay decision making (Jehn *et al.*, 1999; Milliken and Martins, 1996; Van Der Vegt and Bunderson, 2005). Also, informational diversity may impede knowledge transfer and integration from high levels of offshore operations as the divergence in perspectives increases political activity and lowers the ability to commit to a particular course of action (Jarzabkowski and Searle, 2004). Thus, as the complexity of interactions between members within diverse TMTs may increase the challenges of transferring and integrating knowledge from geographically dispersed operations, TMT diversity may accentuate the negative relationship between high levels of offshoring primary functions and firm innovativeness. These arguments lead to the following hypothesis:

Hypothesis 2: TMT informational diversity moderates the inverted U-shaped relationship between the extent of offshoring primary functions and firm innovativeness in such a way that the inverted U-shaped relationship will be steeper in firms with high TMT informational diversity than in firms with low TMT informational diversity.

TMT shared vision, offshoring, and firm innovativeness

TMT shared vision represents the collective goals among TMT members regarding a common and desired strategic direction of the firm (Jansen *et al.*, 2008; Tsai and Ghoshal, 1998). A shared vision affects the relationship between offshoring primary functions and innovativeness as it influences how TMT members evaluate opportunities from offshoring and how they oversee knowledge transfer from offshore locations. We propose that a TMT shared vision may flatten the inverted U-shaped relationship between offshoring primary functions and innovation; that is, a TMT shared vision may dampen the positive effects of lower levels of offshoring, yet it may also reduce the potential downside effect of higher levels of offshoring.

A TMT shared vision may lead to a less pronounced positive relationship between lower levels of offshoring and innovativeness because strong consensus on the strategic direction of the firm may narrow the window of opportunities considered by TMTs. As knowledge that falls beyond a firm's search scope is likely overlooked (Cyert and March, 1963), firms with a high TMT shared vision are likely to capitalize on fewer of the offshore knowledge-enhancing opportunities than firms with a low TMT shared vision. In addition, TMTs with a high shared vision may value only a restrictive set of offshore knowledge as the lack of disagreement over the strategic direction may predispose them to the problem of groupthink (Janis, 1972; Wong, 2004). Since the shared understanding of the strategic direction provides TMT members with the same criterion for determining the quality of knowledge (Nonaka, 1994; von Krogh *et al.*, 1994), TMTs that have a high shared vision may base decisions about the value of new offshore knowledge on unchallenged assumptions (Dooley and Fryxell, 1999). In other words, a TMT shared vision can reduce receptivity to external knowledge and enhance the 'Not-Invented-Here' syndrome (Katz and Allen, 1982). Thus, a shared vision may restrict TMTs in leveraging the full potential of offshore knowledge as TMTs with high shared vision are likely to value a more limited set of options than TMTs with low shared vision.

However, a shared vision may also alleviate the potential negative effect of higher levels of offshoring primary functions on firm innovativeness. We argue that a TMT shared vision may lessen the hurdles that high levels of offshoring pose for knowledge transfer and integration. Shared cognitions and consensus on strategic goals encourage collaborative and integrative behaviors among TMT members (Oswald, Mossholder, and Harris, 1994; Pearce and Ensley, 2004) and provide a collective understanding of how to resolve contradictory agendas (Sinkula, Baker, and Noordewier, 1997). Thus, by reducing the disagreements among TMT members over resource allocation prevalent at high levels of offshoring, a shared vision provides the organizational support necessary for reducing potential problems associated with the implementation of innovative initiatives originating from offshore locations (Vissa and Chacar, 2009). A shared vision also reduces the cognitive demands that high levels of offshoring make on TMTs as the consensus on the strategic direction helps filter out the short-term opportunities from those opportunities that can aid firms develop distinctive competencies and achieve long-term goals (Lipton, 1996; Vissa and Chacar, 2009). As a result, a shared vision enables TMTs to

streamline monitoring (Hamel and Prahalad, 1989) and direct attention to maintaining and enhancing the knowledge that is relevant for the commonly-desired strategic direction (Ocasio, 1997). In light of these arguments, we propose the following hypothesis:

***Hypothesis 3:** TMT shared vision moderates the inverted U-shaped relationship between the extent of offshoring primary functions and firm innovativeness in such a way that the inverted U-shaped relationship will be flatter in firms with high TMT shared vision than in firms with low TMT shared vision.*

3.3. Methods

3.3.1. Research setting and data collection

In order to empirically test the proposed relationships, we identified a random sample of 4,000 Dutch firms using a database from a commercial provider. The sample covers a wide range of industries and includes private firms with more than 25 employees. We sent survey-participation requests to the executive directors of all firms in the sample. Since the data employed in this study regards details about the overall offshoring strategy, the executive directors were in the best position to provide such general information. To ensure that participants were interested and committed to providing accurate information, we guaranteed confidentiality and offered them a summary of the results.

In order to minimize potential problems of common method bias, we temporally separated the data collection for the independent and dependent variables by collecting data at two different points in time. The first round of data collection took place in 2007 and focused on the independent variables. Out of the 4,000 firms contacted, 1,150 executive directors returned completed questionnaires; a response rate of 29 percent. In 2008, approximately one year after the first round of data collection, we sent a second survey to the 1,150 executive directors who completed the first survey to assess their firms' innovativeness, the dependent variable. In this second round of data collection, 276 fully completed questionnaires were returned, representing 24 percent of the original response. The executive directors who responded to both surveys have a mean age of 47.65 years (standard deviation (s.d.) = 8.87) and a mean tenure of 13.78 years (s.d. = 10.44). The firms in the final sample have a mean age of 38.49 (s.d. = 32.20) years, a mean size of 216 (s.d. = 923.76) full-time employees and operate in various industries covering manufacturing (24%), professional services (31%), transportation (9%), construction (17%), food and forestry (8%), and other industries (11%). In order to assess the non-response bias, we compared the respondents with non-respondents for the final sample. Results of t-tests show that the respondents do not differ significantly ($p < 0.05$) from non-respondents in terms of firm age, firm size, total assets, and prior performance. Further, we examined differences between early and late respondents in terms of demographics and model variables. The finding of no significant differences ($p < 0.05$) indicates that non-response bias is not an issue.

3.3.2. Measurement and validation of constructs

The constructs employed in this study are operationalized using existing measures available in the literature.

Firm innovativeness

We measure *firm innovativeness* as the percentage of revenues over the past three years that is attributable to new products and services (e.g. Cassiman and Veugelers, 2006; Laursen and Salter, 2006; Leiponen and Helfat, 2010). This measure of innovativeness (mean = 0.10, s.d. = 0.10) shows the actual level of firm innovativeness as it assesses the end result of the innovation process. We validated the innovativeness measure with a separate four-item measure ($\alpha = 0.86$) adapted from Li and Atuahene-Gima (2002). The four-item measure asked respondents to indicate their agreement with the statements: ‘we introduced in the market many products and services that are completely new to us’, ‘our firm has launched several new lines of products’, ‘our firm places emphasis on product and process innovation’, and ‘we often experiment in the market with new products and services’. The high correlation ($r = 0.26$, $p < 0.001$) between the two measures provides evidence of measurement validity.

Extent of offshoring primary functions

To measure the extent of offshoring of various functions, we follow the widely-used procedure (e.g. Murray and Kotabe, 1999; Parmigiani and Mitchell, 2009; Poppo and Zenger, 1998; Weigelt, 2009) of asking the respondents to indicate what percentage of each of the following functions was offshored during the past three years: production, R&D, and engineering. The offshoring measure for each function is a continuous variable that ranges between 0 percent (the function is fully performed at the domestic location) and 100 percent (the function is fully performed at offshore locations). We focus on aggregate measures and consider the overall impact of offshoring primary functions. We calculate the extent of offshoring primary functions by summing the percentage offshored of the production, R&D, and engineering functions and dividing it by three. The range of values observed for offshoring primary functions in our data is between 0 and 70 percent.

TMT attributes

The measure for *TMT informational diversity* ($\alpha = 0.71$) represents the degree of variation in the TMT members’ educational background and work experience. We adapted the five-item measure of TMT diversity from Campion, Medsker and Higgs (1993). The scale asked whether the members of the management team have ‘diverse areas of expertise’, ‘a very diverse background’, ‘varied experiences’, ‘skills that are highly complementary’, and ‘great variety in training’. *TMT shared vision* ($\alpha = 0.87$) represents the degree of consensus among the TMT members regarding the future strategic direction of the firm and we measured it through a five-item scale adapted from Sinkula *et al.* (1997). We asked TMT members to indicate whether there is ‘agreement on

the firm's vision', 'commitment to the collective goals of the firm', 'enthusiasm about the collective ambition of the firm', 'a common goal within the firm', and whether 'the divisions within our firm have common objectives'. For both TMT diversity and TMT shared vision, respondents were asked to provide their degree of agreement where 1 = 'strongly disagree' and 7 = 'strongly agree'.

Control variables

In order to account for exogenous influences on firm innovativeness, our study includes relevant control variables: firm size, firm age, TMT size, R&D intensity, extent of offshoring secondary functions, and industry. *Firm size* can either dampen innovativeness as it creates inertia or it can enhance innovativeness as larger firms typically have more resources (c.f. Damanpour, 1992). We control for firm size by including the natural logarithm of the number of employees. We also accounted for *firm age* as older firms tend to be more inert (Hannan and Freeman, 1984), leading to lower levels of innovativeness than younger firms. We measured firm age as the natural logarithm of the number of years since the firm was founded. In line with previous studies (e.g. Siegel and Hambrick, 2005), we control for *TMT size*, which we measured as the natural logarithm of the number of senior executives who are responsible for important decisions about the future of the firm. Further, following existing literature (e.g. Kochhar and David, 1996), this study controls for *R&D intensity*, which we measured by asking the respondents to indicate how much their firms spent, on average, on R&D as a percentage of revenues over the previous three years. We also control for the *extent of offshoring secondary functions* in order to account for demands on managerial attention regarding the coordination of offshore operations. We calculate the extent of offshoring secondary functions by summing the percentage offshored of the accounting, human resources, IT, and customer service functions and then dividing by four. The theoretical range is between 0 and 100 percent and the observed range is between 0 and 60 percent. Lastly, in order to account for *industry* differences in the level of innovativeness (e.g. Kochhar and David, 1996), we created six dummy variables based on the Standard Industry Classification codes: manufacturing, professional services, transportation, construction, food and forestry (used as the base group), and other industries.

3.3.3. Construct and method validity

We assessed the discriminant and convergent validity of the TMT attributes constructs through exploratory and confirmatory factor analyses. Exploratory factor analysis of all items pertaining to TMT diversity and TMT shared vision clearly produced a two-factor structure with all items loading clearly on their intended factors (all factor loadings were above 0.62 and cross loadings below 0.34) and all factors had eigenvalues greater than one. Furthermore, results of confirmatory factor analysis of all items (restricted to load on the proposed constructs, i.e. on TMT diversity, or TMT shared vision) indicate a good fit with the data ($\chi^2/df = 1.68$ GFI = 0.97, CFI = 0.98, RMSEA = 0.05). Also, all item loadings on the proposed indicators were significant

($p < 0.01$). The results of the exploratory and confirmatory factor analyses show evidence in support of the constructs' discriminant and convergent validity.

To test for single respondent bias and to analyze reliability issues, we surveyed additional members of each TMT during each round of data collection in 2007 and 2008. We received completed questionnaires of additional TMT members (from one to three additional members) from 162 firms (or 15% of the 2007 sample) for both TMT diversity and TMT shared vision and from 31 firms (or 11% of the 2008 sample) for innovativeness. The average inter-rater agreement index (r_{wg}) (James, Demaree, and Wolf, 1993) is 0.88 for innovativeness, 0.86 for TMT diversity and 0.85 for TMT shared vision, indicating adequate agreement among the TMT members (LeBreton, and Senter, 2008). In addition, we calculated the intra-class correlations, ICC(1), which provide a measure of response convergence within TMTs. F-tests of the ICC(1) scores for innovativeness (0.90), TMT informational diversity (0.62), and TMT shared vision (0.85) show that all ICC(1) scores are significantly greater than zero (McGraw and Wong, 1996), indicating accurate agreement.

Regarding common method bias, we employed a procedural method to reduce the potential common method bias and we used statistical techniques to assess its likelihood. First, following Podsakoff *et al.* (2003), we temporally separated the collection of the independent and the dependent variables by one year. The temporal separation of measurement decreases the risk of common method bias because it reduces biases in the respondents' retrieval process, lessens the respondents' ability to use previous answers to fill in recollection gaps, and makes previous answers less salient (Podsakoff *et al.*, 2003). Second, we used statistical techniques to determine whether our data is likely to suffer from common method bias. We first performed Harman's one factor test (Podsakoff and Organ, 1986) by including all items of TMT diversity, TMT vision, and the answer for innovativeness in an exploratory factor analysis. The factor analysis clearly showed three factors with eigenvalues greater than one and the first factor accounts for less than 30 percent of the total variance. That is, there is no evidence of unidimensionality in our data. In addition, we followed Podsakoff *et al.*'s (2003: 894) approach to control for an unmeasured latent factor. That is, we performed a CFA analysis on which we let items load on both their theoretical constructs and on a latent common method variance factor. The fact that all item loadings on the theoretical constructs were still significant even after the inclusion of the latent factor indicates that common method bias is not a serious problem. In short, we incorporated in the study design methods to reduce the potential of common method bias and we used statistical techniques to show that it is not an issue.

3.4. Analysis and results

Table 1 presents the descriptive statistics for the model variables and Table 2 presents the results for the OLS regressions testing our hypotheses. Inspection of the plots of standardized residuals versus predicted values and the normal probability plot of standardized residuals indicates no serious violations of the major regression assumptions. In order to limit the potential

multicollinearity of interaction terms, we mean centered the independent variables before constructing the interaction terms (Aiken and West, 1991). Post-regression tests show that there is no evidence of multicollinearity as all variance inflation factors are below the cut-off value of 10 (Neter, Wasserman, and Kutner, 1990). Model 1 contains the control variables and the subsequent models add the main and moderating effects. We discuss the results of the full model, Model 4.

We find strong support for Hypothesis 1, which described an inverted U-shaped relationship between offshoring of primary functions and firm innovativeness, as the main effect of offshoring is positive and significant ($\beta = 0.50$, $p < 0.001$) and the extent of offshoring squared is negative and significant ($\beta = -0.46$, $p < 0.001$). In addition, the empirical results also support a moderating role of TMT informational diversity (Hypothesis 2) as the interaction term between the extent of offshoring squared and TMT diversity is statistically significant ($\beta = -0.31$, $p < 0.01$). In addition, the significance of the interaction term between the extent of offshoring squared and TMT shared vision ($\beta = 0.40$, $p < 0.01$) provides support for the idea that TMT shared vision moderates the relationship between offshoring primary functions and firm innovativeness (Hypothesis 3).

In order to gain more insights about how exactly the TMT attributes moderate the relationship between offshoring and firm innovativeness, we plot the moderating relationships (Aiken and West, 1991). We considered one standard deviation below and above the mean to represent the low and high values of TMT diversity and TMT shared vision. Figure 1 presents the moderating role of TMT informational diversity (Hypothesis 2). The interaction graph indicates that firms with high TMT diversity exhibit an inverted U-shaped relationship between the extent of offshoring and firm innovativeness. Interestingly, firms with low TMT diversity appear to experience a slightly decreasing relationship between the extent of offshoring and innovativeness, indicating that increasing the extent of offshoring may slowly decrease innovativeness. These results corroborate the expectations formulated in Hypothesis 2, which suggested that the inverted U-shaped curve is steeper in firms with high TMT informational diversity than in those with low TMT informational diversity.

Figure 2 depicts how TMT shared vision moderates the nonlinear relationship between the extent of offshoring primary functions and firm innovativeness (Hypothesis 3). In line with our expectations, firms that have a low TMT shared vision experience a steep inverted U-shaped relationship between offshoring and firm innovativeness. Also in line with Hypothesis 3, we find that firms with a high TMT shared vision experience a rather flat (i.e. less positive) relationship between lower levels of offshoring and innovation. Interestingly, we find that a high TMT shared vision not only dampens the detrimental effect of high levels of offshoring on innovation, but may lead to a slightly positive relationship. This means that the effect of TMT shared vision is in the hypothesized direction (i.e. it reduces the negative slope between high levels of offshoring and firm innovativeness), but its magnitude appears somewhat stronger than expected. Thus, these findings are largely in line with the relationships proposed in Hypothesis 3.

3.4.1. Robustness analysis

In order to verify the robustness of our findings regarding the inverted U-shaped relationship between the offshoring of primary functions and innovativeness, we performed several robustness tests. First, we allow more flexibility in the curve by including the cube of offshoring. We find that the cube of offshoring is not statistically significant, which provides evidence that an inverted U-shaped relationship fits data better than other specifications such as diminishing returns to scale or functions that revert to a positive trend (Li, Zhou, and Zajac, 2009). Second, following the procedure advanced by Aiken and West (1991), we conducted a simple slope analysis to test the statistical significance of various parts of the regression curve, especially the negative sections. We consider high and low levels of the moderator terms as one standard deviation above and below the mean and high and low levels of offshoring as one standard deviation above and below the inflection point of the regression curve. Results indicate that for high levels of TMT diversity, the simple slope of the regression curve is positive and significant at low levels of offshoring ($\beta = 1.95$, $t < 0.001$) and negative and significant at high levels of offshoring ($\beta = -0.65$, $t < 0.05$). We also find that for low levels of TMT shared vision, the simple slope of the regression curve is positive and significant at low levels of offshoring ($\beta = 2.08$, $t < 0.001$) and negative and significant at high levels of offshoring ($\beta = -0.56$, $t < 0.05$). These findings provide additional evidence in support of the inverted U-shaped specification. Also, in line with our hypotheses, for low TMT diversity and high TMT shared vision, the simple slopes are not statistically significant ($p > 0.10$).

Third, following Li *et al.* (2009) we reran the regression analysis using three randomly selected subsamples (90%, 80%, and 70% of the original sample) and we found that the empirical results are the same as when using the full sample. Fourth, we reran the regressions using an alternative operationalization of firm innovativeness, a four-item scale (Li and Atuahene-Gima, 2002) that we described in the Methods section. The results of this alternative regression are similar to the original ones. The findings of all these analyses provide additional confidence in the robustness of the inverted U-shaped relationship between the offshoring of primary functions and firm innovativeness.

Table 10. Descriptive statistics and correlations – Study 2

	Mean	s.d.	Min	Max	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1. Firm innovativeness	0.10	0.10	0.00	1.00	-													
2. Offshoring primary functions	0.05	0.10	0.00	0.70	0.07	-												
3. TMT diversity	5.27	0.87	2.60	7.00	0.07	0.05	(0.71)											
4. TMT shared vision	5.50	0.83	2.80	7.00	0.11	0.04	0.25	(0.87)										
5. Firm size ^a	4.05	1.06	3.00	8.34	0.04	0.15	-0.05	-0.02	-									
6. Firm age ^a	3.28	0.95	0.69	5.19	-0.13	0.06	-0.07	-0.06	0.23	-								
7. TMT size ^a	1.54	0.54	1.39	4.32	0.02	0.09	0.08	-0.02	0.27	0.08	-							
8. R&D intensity	0.04	0.07	0.00	0.90	0.28	0.07	-0.08	0.09	-0.09	-0.14	-0.02	-						
9. Offshoring secondary function	0.03	0.06	0.00	0.60	0.06	0.49	0.06	-0.01	0.12	0.03	0.03	0.08	-					
10. Manufacturing	0.24	0.43	0.00	1.00	0.10	0.07	-0.03	0.00	-0.08	0.23	-0.07	-0.02	-0.03	-				
11. Transportation	0.09	0.28	0.00	1.00	-0.01	-0.05	0.04	0.01	-0.10	-0.06	0.03	0.02	0.07	-0.18	-			
12. Construction	0.17	0.38	0.00	1.00	-0.06	-0.08	-0.05	-0.08	0.08	0.07	0.06	-0.12	-0.08	-0.25	-0.16	-		
13. Professional services	0.31	0.46	0.00	1.00	-0.04	-0.03	-0.03	0.12	-0.10	-0.31	-0.05	0.08	0.00	-0.34	-0.22	-0.29	-	
14. Food and forestry	0.07	0.26	0.00	1.00	-0.04	0.13	0.01	0.01	0.12	0.11	0.09	-0.05	0.05	-0.18	-0.12	-0.16	-0.21	-
15. Other industry	0.11	0.31	0.00	1.00	0.05	-0.02	0.09	-0.07	0.14	0.00	-0.02	0.08	0.02	-0.19	-0.12	-0.16	-0.22	-0.12

Notes: N=276. Correlation coefficients above |0.10| are significant at the $p < 0.05$. The Cronbach's alphas of the composite scales are presented in parentheses on the diagonal. ^a Firm Size, Firm Age, and TMT Size are the natural logarithms of the number of years since founding, employees, and members of the TMT, respectively.

Table 11. Results of the OLS regression analysis for firm innovativeness – Study 2

	Model 1	Model 2	Model 3	Model 4
<i>Control variables</i>				
Firm size	0.14 [*]	0.15 [*]	0.16 ^{**}	0.16 ^{**}
Firm age	-0.18 ^{**}	-0.18 ^{**}	-0.19 ^{**}	-0.18 ^{**}
TMT size	0.11 [†]	0.09	0.07	0.06
R&D intensity	0.08	0.08	0.05	0.14 [*]
Offshoring secondary functions	0.20 ^{***}	0.21 ^{***}	0.22 ^{**}	0.23 ^{**}
Manufacturing	0.18 [†]	0.17 [†]	0.16	0.15
Transportation	-0.05	-0.06	-0.05	-0.03
Construction	0.06	0.07	0.08	0.07
Professional services	0.03	0.03	0.06	0.05
Other industry	-0.01	-0.03	-0.02	-0.03
<i>Moderating variables</i>				
TMT diversity		0.17 ^{**}	0.16 ^{**}	0.33 ^{***}
TMT shared vision		0.03	0.02	-0.28 ^{**}
<i>Main effect</i>				
Offshoring primary functions			0.37 ^{**}	0.50 ^{***}
Offshoring primary functions squared (sqr)			-0.36 ^{**}	-0.46 ^{***}
<i>Interaction effects</i>				
Offshoring primary functions X TMT diversity				0.42 ^{***}
Offshoring primary functions X TMT shared vision				-0.56 ^{***}
Offshoring primary functions sqr X TMT diversity				-0.31 ^{**}
Offshoring primary functions sqr X TMT shared vision				0.40 ^{**}
R ²	0.13	0.16	0.20	0.26
ΔR^2	0.13 ^{***}	0.03 ^{**}	0.04 ^{**}	0.06 ^{***}
Adj. R ²	0.10	0.12	0.15	0.21

Notes: N=276. Standardized coefficients are reported. [†] p < 0.1, ^{*} p < 0.05, ^{**} p < 0.01, ^{***} p < 0.001.

Figure 3. The moderating effect of TMT informational diversity for the relationship between offshoring primary functions and firm innovativeness

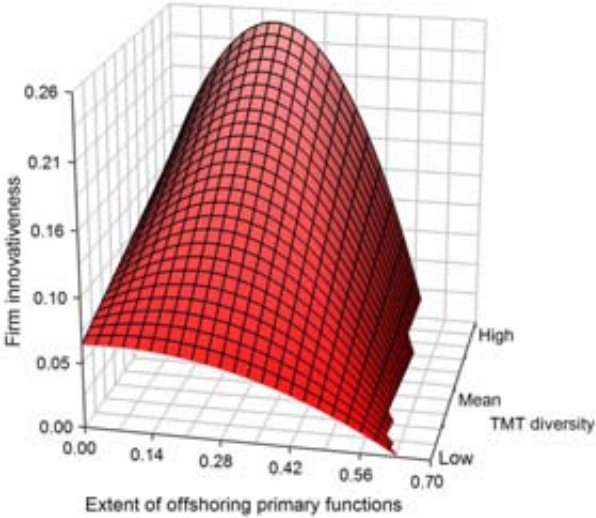
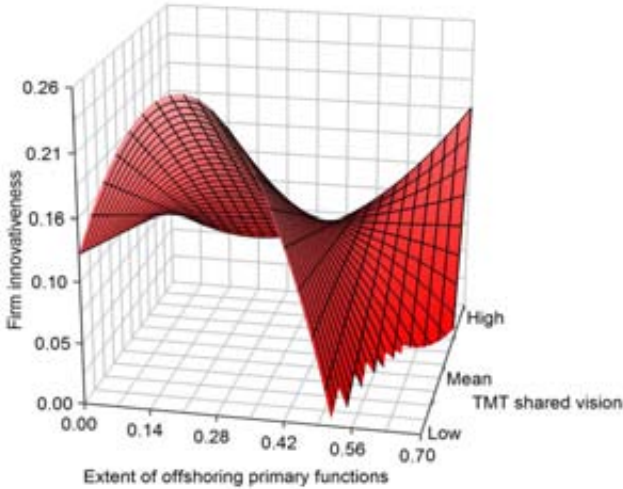


Figure 4. The moderating effect of TMT shared vision for the relationship between offshoring primary functions and firm innovativeness



3.5. Discussion and conclusion

Despite offshoring's increasing prominence in both practice and research, its role in a firm's ability to develop new products and services is not well understood as the few studies on the topic provide contradictory arguments (Doh, 2005; Youngdahl *et al.*, 2008). Considering the steady growth of offshoring in recent years, and its expected acceleration in the future, clarifying the relationship between offshoring and innovation is of primary importance for understanding how firms can benefit from relocating business functions to foreign locations. In this context, our study makes several important contributions to both theory and practice.

3.5.1. Theoretical contributions

Building on a large sample of firms operating in a wide range of industries, our study advances innovation literature as it takes a significant step in establishing offshoring as an important antecedent of innovation (e.g. Li *et al.*, 2008; Venkatraman, 2004; Teece, 1987). A major finding of this study is that the offshoring of primary functions (i.e. production, R&D, and engineering) can enhance firm innovativeness. The relocation of business operations to foreign locations may mitigate the high demands of innovation as it allows firms to capitalize on location-specific advantages of foreign countries (Cantwell, 1994). For instance, firms may not only leverage cost differentials to increase the magnitude of knowledge-generating activities (e.g. Lewin and Peeters, 2006), but may also directly access unique skills and competencies not available at their home location (Chung and Alcacer, 2002). That is, offshoring primary functions can be seen as an important mechanism to access valuable tangible or intangible resources that either augment or complement firms' existing resource stock. Allowing the sourcing of resources from those locations with relative advantages, offshoring provides improved resource management opportunities, thus, aiding firms in developing their combinative capabilities (Sirmon, Hitt, and Ireland, 2007). In this sense, offshoring primary functions enhances a firm's ability to recombine existing and newly acquired knowledge in order to develop new products and services (Teece, Pisano, and Shuen, 1997).

Although our study shows that offshoring has important benefits in terms of enhancing innovation, it also indicates that the relocation of primary functions exhibits decreasing returns to scale and eventually dampens innovative outcomes. When a relatively high proportion of primary functions are performed at foreign locations, firms may experience a decrease in their ability to transfer and assimilate new knowledge due to a lack of overlap with the existing knowledge at the home location (e.g. Van Wijk *et al.*, 2008). In this respect, our finding is consistent with the idea that knowledge at international locations is important only in so far as the firm can transfer and assimilate it successfully (Ghoshal, 1987). Also, synthesizing and integrating knowledge may become cumbersome as firms have to deal with geographical, cultural and institutional differences. The hurdles of coordinating internationally dispersed activities create pressures on managerial attention and communication (Kotabe, 1990) and may slow down the introduction of product changes (Markides and Berg, 1988). Thus, our research indicates that over-offshoring poses the risk of reduced innovative outcomes.

By providing theoretical arguments and finding empirical support for an inverted U-shaped relationship, this study reconciles previous positive (i.e. Li *et al.*, 2008) and negative (i.e. Chesgrough and Teece, 1996; Teece, 1987) assertions in extant literature about the influence of offshoring on innovation. Also, by focusing on offshoring primary functions, our study pinpoints the effects of relocating those business functions that provide direct knowledge inputs for a firm's innovation process. In this way, our study uncovers important new insights into how firms can harness the potential of offshoring to stimulate the successful introduction of new products and services. In a broader sense, this study advances the understanding of international sourcing as input for innovation and compliments Chung and Yeaple's (2008) investigation into the reasons of international knowledge sourcing. Also, our findings deepen our understanding of how the sourcing of knowledge from a wide range of sources is beneficial for innovation (Leiponen and Helfat, 2010), by emphasizing the benefits and drawbacks of sourcing from *foreign* locations.

In addition to the direct effects, our study proposes a contingency perspective suggesting that TMT attributes alter the effectiveness of offshoring in influencing innovation. Specifically, we find support for the moderating role of both TMT informational diversity and TMT shared vision. These findings make important contributions to the upper-echelon literature. While previous studies emphasize the role of TMTs in determining strategic choices (e.g. Bantel and Jackson; 1989; Wiersema and Bantel, 1992), our study complements such assertions by showing that TMT attributes impact the effectiveness of international sourcing strategies. TMT attributes provide important contingencies for strategic actions as they influence perceptions of the surrounding environment (Finkelstein and Hambrick, 1996) and dynamics among senior executives (Vissa and Chacar, 2009). Connecting theory on upper echelon and innovation, our study suggests that innovation depends on the *joint* effect of organizational search processes and managerial decision making (Greve, 2003). That is, where offshoring raises a number of opportunities for enhancing innovation, the extent to which firms introduce new products and services depends significantly on the ability of TMTs to choose viable options and to coordinate knowledge transfer across international borders. Moreover, TMT attributes are important moderating factors as they may influence how senior executives handle challenges inherent in offshoring such as integrating knowledge from geographically distant locations and coordinating operations across cultural and institutional barriers (Roth, 1995). In this sense, we answer a call for a better understanding of how senior executives influence the efficiency of transferring, combining and deploying knowledge from foreign locations (Foss and Pedersen, 2004).

Regarding the specific effects of TMT attributes, we find that the consequences of offshoring primary functions for the ability of firms to introduce new products and services depend on the level of TMT diversity. The relocation of primary functions to foreign locations enhances innovation the most in those firms that have diverse TMTs. Informational diversity may be an important managerial resource as the multiple perspectives allow TMTs to perceive and value more of the opportunities presented by offshoring (Waller, Huber, Glick, 1995). With relatively superior cognitive abilities, diverse TMTs may be better able to coordinate

internationally dispersed operations in a manner that uses location-specific competencies and captures synergies across locations (Roth, 1995). As such, our findings suggest that enhancing innovation through offshoring benefits from the variety of perspectives available to the TMT as it may allow senior executives to better negotiate and capitalize on cross-border opportunities. However, in line with the argument that diversity can be a double-edged sword (Milliken and Martins, 1996; Williams and O'Reilly, 1998), we find that TMT diversity can also exacerbate the negative effects of offshoring higher levels of primary functions. Differences in mental models may create relational conflicts among senior executives and lead TMTs to incongruent interpretations about what opportunities from offshoring to pursue (Knight *et al.*, 1999). For upper-echelon theory, the finding that TMT diversity steepens the inverted U-shaped relationship between offshoring and innovation is consistent with prior suggestions that heterogeneity has cognitive benefits in less complex environments but that, in more complex situations, these benefits are reduced by relational difficulties (Carpenter, 2002).

Our empirical findings also support the idea that a TMT shared vision moderates the relationship between the offshoring of primary functions and firm innovativeness. Our results indicate that firms with a low TMT shared vision can benefit more from lower levels of offshoring in terms of increased innovativeness than firms with a high TMT shared vision. This suggests that offshoring can be an important search mechanism as it allows firms without a clear strategic mission to connect to offshore knowledge sources and engage in multiple experiments (Leiponen and Helfat, 2010). In addition, we find that a high TMT shared vision can have important benefits as it mitigates the detrimental effect of high levels of offshoring primary functions. Our results (see Figure 2) suggest that these benefits may be even more pronounced as firms with a strong TMT shared vision might experience a slightly increasing relationship between high levels of offshoring and innovativeness. That is, a shared vision appears to be an important factor that helps firms surpass the difficulties of cross-border knowledge transfer at high levels of offshoring primary functions in order to maintain and even increase expertise. Underscoring the importance of convergence within the TMT regarding a firm's long-term strategic direction, this finding is in line with the idea that TMT consensus is important for strategy implementation (e.g. Floyd and Wooldridge, 1992; Homburg, Krohmer, and Workman, 1999). In this sense, our study advances the understanding of the role of TMT shared vision in how firms leverage external knowledge (Vissa and Chacar, 2009). Overall, by advancing the understanding of the contingency effect of a TMT shared vision on the influence of offshoring on the ability of firms to introduce new products and services, our findings complement existing insights regarding the implications of goal consensus among TMT members for firm performance (Dess, 1987; Priem, 1990).

3.5.2. *Managerial implications*

The main managerial implication of this study is that it suggests offshoring as a potential means to improve innovative performance. That is, offshoring provides opportunities to leverage wage differentials and competencies at foreign locations. However, our findings suggest that managers

should be cautious in offshoring primary functions as “over-offshoring” can be detrimental to innovation. Also, managers contemplating offshoring for other reasons such as cost savings need to consider the possible (negative) side effects on the introduction of new products and services. The moderating role of TMT diversity points out the benefits of a multitude of perspectives on the opportunities arising from offshoring in order to enhance the introduction of new products and services. The finding that firms with low TMT shared vision experience a steep inverted U-shaped relationship suggests that, when used in moderation, offshoring can be a useful means to explore strategic alternatives. Also, our results regarding the moderating role of TMT shared vision emphasize the importance of setting long term goals for the firm and building commitment to these goals among TMT members prior to engaging in offshoring, especially when firms intend to relocate a large portion of their primary functions.

3.5.3. Limitations and directions for future research

Although our study provides important insights regarding the role of offshoring as an antecedent of firm innovativeness, it can be extended in several ways. A limitation of this study is that we do not address the specific mediating role of knowledge transfer mechanisms. While we argue that offshoring provides access to a wide variety of offshore knowledge sources, we do not discuss the specific mechanisms through which the reverse knowledge transfer takes place. Researchers suggest a multitude of methods for stimulating knowledge transfer such as setting communication channels and personnel interaction (Inkpen, 2008), or implementing financial incentives (Fey and Furu, 2008); however, transferring knowledge is not easily achieved and the effectiveness of transfer mechanisms is highly contextual (e.g. Ambos and Ambos, 2009). Therefore, in order to fully benefit from offshoring in terms of enhancing innovativeness, firms need to set in place appropriate knowledge transfer mechanisms (Sidhu & Volberda, 2011). Related to this issue, future research could analyze the role of the governance mode employed at the offshore location. While offshoring does not imply a specific type of governance (Bunyaratavej, Doh, Hahn, Lewin, and Massini, 2011; Contractor et al., 2010), the governance and location decisions are closely interrelated (Hutzschenreuter, Lewin, and Dresel, 2011; Lewin and Volberda, 2011). As the governance mode employed at the offshore location can affect knowledge transfer to the home location, considering the implication of different governance modes would provide a more comprehensive understanding of the relationship between international sourcing and the introduction of new products and services (Nieto and Rodriguez, 2011). Furthermore, extant research highlights the importance of firms’ absorptive capacity for assimilating new knowledge (Lewin, Massini, and Peeters, 2011; Volberda, Foss, and Lyles, 2010). In the case of transferring and assimilating new knowledge from offshore affiliates, extant research shows that absorptive capacity plays a central role (e.g., Minbaeva, Pedersen, Björkman, Fey, and Park, 2003) and, as such, it stands to affect the relationship between offshoring and innovation. As it implies a readiness for new knowledge, it is likely that absorptive capacity may reduce the downsides associated with higher levels of innovation. Future research could provide

important complementary insights to his study by explicitly analyzing how absorptive capacity affects the influence of international sourcing on the ability of firms to introduce new products and services.

In addition, we analyze TMT diversity only in terms of informational diversity. However, recent research has incorporated other types of diversity such as cultural, racial, or gender diversity that also play an important role in influencing TMT actions (e.g. Richard *et al.*, 2004). Analyzing other types of diversity alongside informational diversity would provide a more complete understanding of how TMT diversity influences firms' effectiveness in enhancing innovativeness through offshoring. Also, although we temporally separated data collection for the dependent and independent variables, a longitudinal research design would provide additional confidence in the causal link between offshoring and innovativeness. Future studies could contribute by advancing our attempt to open the black box of managerial factors that moderate the offshoring-innovativeness relationship. For instance, future studies could investigate the moderating effect of TMT contingency rewards as Jansen *et al.* (2008) find evidence of their influence on TMTs' ability to reconcile conflicting agendas. In addition, the TMT can affect the relationship between offshoring and innovation by choosing to create a corporate-wide offshoring strategy. While extant research indicates that firms largely lack such strategies as most offshoring initiatives take place in a bottom-up fashion (Lewin and Peeters, 2006: 236), there is a growing recognition that a corporate strategy is needed to oversee the offshoring activities (Manning *et al.*, 2008; Venkatraman, 2004). The extent to which TMTs establish and promote offshoring strategies to guide the set-up and management of offshoring activities can have direct implication for the relationship between offshoring and innovation.

Another opportunity for future research arises from our implicit assumption that firms may choose the level of offshoring in order to satisfy certain innovation targets. However, research shows that, in addition to enhancing innovation, firms offshore for a multitude of reasons. For instance, firms offshore in order to reduce costs, as a response to competitive pressures, or due to a lack of labor availability in the home country (Lewin and Peeters, 2006; Lewin, Massini, and Peeters, 2009). However, trying to achieve different goals simultaneously implies certain trade-offs. An especially pertinent trade-off is the one between efficiency and innovation. As these two goals are often conflicting (e.g. Benner and Tushman, 2003), firms may have to find some compromise between them. Thus, in search of (or in response to pressures for) efficiency, firms may have to offshore a large proportion of their business processes at the cost of their innovativeness. Future research could consider the interdependence between offshoring goals in order to determine the degree of these trade-offs and ways in which to reconcile conflicting goals such as those between innovation and efficiency.

In conclusion, this study contributes to extant literature primarily by advancing the understanding of how firms can use offshoring in order to enhance their innovativeness. To this end, we examine not only how increasing the level of offshoring influences innovativeness, but also how TMT attributes moderate this relationship.

CHAPTER 4

STUDY 3 – TMT PROCESSES AS ANTECEDENTS OF MANAGEMENT INNOVATION: THE MODERATING ROLE OF ABSORPTIVE CAPACITY

Abstract

Management innovation refers to the introduction of managerial practices, products, and processes that are new to the firm. Despite numerous accounts showing its potential to lead to competitive advantage, the understanding of how and under what conditions firms introduce management innovations is still surprisingly limited. This study proposes that processes that influence the learning capacity of TMTs play an important role in stimulating management innovation. More specifically, we propose that TMT reflexivity and TMT minority dissent enhance management innovation as they provide a continuous check of the appropriateness of management practices for achieving firm goals. Furthermore, we argue that these managerial learning processes are more effective in enhancing management innovation in firms with a high level of absorptive capacity. Empirical testing on a cross-industry sample of Dutch firms provides support for the proposed relationships.

Keywords: *management innovation, TMT reflexivity, TMT minority dissent, absorptive capacity*

5.1. Introduction

In a recent literature review of innovation research, Crossan and Apaydin (2010) find that only 3 percent of studies focus on management innovation, while about 40 percent focus on product and service innovation. This high discrepancy is highly surprising considering that research shows that both types of innovation are important for firms' long-term survival. For instance, extant research documents how classical management innovations such as the introduction of the M-form organization (Chandler, 1962) or total quality management (e.g. Zbaracki, 1998) led to industry leadership. In addition, the importance of management innovation for firm performance has also received supporting empirical evidence in recent studies (e.g. Birkinshaw, Hamel, and Mol, 2008; Hamel, 2006).

In light of the mounting evidence of the importance of management innovation for firm performance, this study aims to advance the understanding of how firms can enhance management innovation. Management innovation refers to the introduction of management practices, processes and structures that are new to the firm and intended to further organizational goals (Mol and Birkinshaw, 2009: 1270). Considering the encompassing nature of change associated with management innovation (Birkinshaw, Hamel, and Mol, 2008), research has pointed out that the TMT plays a central role. For instance, Vaccaro et al. (2012) show that the leadership is associated with the level of management innovation.

In this study, we propose that TMT processes that introduce a system of challenging the status quo can stimulate management innovation. More specifically, we analyze the effects of two such processes: TMT reflexivity and TMT minority dissent. TMT reflexivity is defined as "the extent to which team members collectively reflect on and adapt their team's objectives, strategies, and processes" (Tjosvold, Tang, and West, 2004: 542). It represents a systematic way in which TMT question managerial best practices and it allows for the discussion of potential alternatives. TMT minority dissent refers to "instances in which a minority in a group publicly opposed the beliefs, attitudes, ideas, procedures, or policies assumed by the majority of the group." (De Dreu and West, 2001). It introduces a precipitating dynamic that raises the motivation for change. By considering the role of TMT processes in stimulating changes in managerial practices, our study answers a call to "increase the emphasis on human agency in management innovation" (Birkinshaw, Hamel and Mol, 2008: 829).

Our study further advances the understanding of the antecedents of management innovation by moving research beyond main effects. To this end, we propose absorptive capacity as an important organizational contingency for the effectiveness of TMT processes in introducing new management practices. Absorptive capacity is a firm's ability to "recognize the value of new, external information, assimilate it, and apply it to commercial ends" (Cohen and Levinthal, 1990: 128). It provides an organizational "readiness" to new knowledge that enhances the effects of TMT processes on management innovation as firms with high levels of absorptive capacity have the capabilities to support TMT reflexivity and minority dissent in the discovery and implementation of new managerial practices. While existing research has started to uncover the contingency role of absorptive capacity in the case of technological innovation

(e.g. Rothaermel and Alexandre, 2009; Stock, Greis, and Fischer, 2001), it considerably lacks behind in the case of management innovation. Thus, we not only advance the understanding of the contextual complexities of introducing new management practices, but we also contribute to the research on absorptive capacity by showing that the contingency role of absorptive capacity extends to the introduction of new managerial practices.

In order to test our proposed model, we collected data with a lagged design from a random sample of 811 firms from a wide range of industries. Empirical testing provides strong support for our model. The results indicate that both TMT reflexivity and minority dissent are associated with higher levels of management innovation and that these relationships are stronger in firms that have higher levels of absorptive capacity.

The remainder of this paper is organized as follows. The next section presents a literature review of the concept of management innovation and develops the arguments that lead to our hypotheses. Next, we present the methodology and the results. The paper concludes with a discussion of the main ideas, limitations, and opportunities for future research.

5.2. Literature review and hypotheses development

5.2.1. Management innovation

Management innovation refers to the introduction of management practices and processes or organizational structures that are new to the firm and intended to further organizational goals (Mol and Birkinshaw, 2009: 1270). Management practices are the daily activities of managers such as setting objectives and putting in place the procedures to achieve them (Vaccaro et al., 2010). Management processes are the routines that govern the work of managers and imply the transformation of management principles into day-to-day practices (Hamel, 2006). Examples of processes include strategic planning, capital budgeting, or employee assessment. Organizational structures refer to the organization of communication lines and how firms harness the efforts of their members (Vaccaro et al., 2012). In other words, management innovations concern the organizational structure, administrative processes and human resources (Gopalakrishnan and Damanpour, 1997: 19). For the sake of simplicity, throughout the paper we will use management practices to refer to all of the above facets of management innovation.

Another important aspect of management innovation is that it is intended to further an organizational goal. Building on the rational perspective of management innovation (Birkinshaw et al., 2008), we adopt the idea that management innovations are purposefully introduced by firms in order to address or prevent an organizational issue. In line with this idea, research argues that management innovation has the potential to provide long-term competitive advantage as it represents a resource that is valuable, rare, inimitable, and under the control of the firm (Mol and Birkinshaw, 2006). Existing evidence espouses the important role of management innovation for firm performance. Case accounts show how changes in managerial practices have contributed to the impressive success of companies such as Visa or Sun Microsystems (Hamel, 2006). Complementing this evidence, emerging empirical tests provide further validation of the positive

effects of management innovation on firm viability (e.g. Damanpour, Walker, and Avellaneda, 2009; Mol and Birkinshaw, 2009).

5.2.2. TMTs , TMT processes and management innovation

Daft (1979) argues that management innovations originate from the top of the organization because senior executives are in a position to identify managerial issues, and, as the experts in the field, are most sensitive to new ideas and possible solutions. Senior executives are key players in the introduction of management innovations as the scope of their responsibilities encompasses the identification of strategic issues and the discovery of solutions, while their legitimacy and power enable implementation. More specifically, TMTs are in a position in which they can influence all four phases of the innovation process (Birkinshaw et al, 2008: 831). As boundary spanning agents TMT members can sense the need for change, as management experts they can identify potential solutions, and as authority figures they can harness the necessary motivation for changing managerial practices.

In this sense, TMT members are in a superior position to recognize the need for change, initiate and supervise implementation as they are both the subject-matter experts and the holders of authority needed to supervise the introduction of new management practices.

Previous studies have also recognized the importance of top management teams for the introduction of management innovations. For instance, Vaccaro et al. (2010) analyze the direct effect of leadership style and find that both transactional and transformational leadership can enhance management innovation. In addition, Birkinshaw and Mol (2006) espouse the role of senior executives in the implementation of new managerial practices as senior managers are essential for creating internal support. Our study builds on these efforts to expand the understanding of the role of TMTs in the introduction of new management practices.

However, our study differs from previous efforts in the sense that we consider how top management team *processes* influence the introduction of management innovation. We specifically focus on TMT reflexivity and minority dissent. These TMT processes bring important learning dynamics that not only create awareness of the need for change, but also stir the long process of implementing managerial practices. TMT reflexivity and minority dissent are processes that can uncover “dissatisfaction” with the status quo. Specifically, through these processes, TMTs can identify, formalize, and prioritize organizational issues that need to be addressed with management innovation. Such issues can include strategic threats in the environment, organizational crises, or operational problems (Birkinshaw and Mol, 2006). In addition, since TMT reflexivity and minority dissent allow for continuous adjustment and change, they are particularly important during the lengthy implementation process of new management practices (Birkinshaw and Mol, 2006). In the next sections, we describe in detail how TMT reflexivity and minority dissent can influence the introductions of management innovations.

5.2.3. TMT reflexivity and management innovation

TMT reflexivity refers to “the extent to which team members collectively reflect on and adapt their team’s objectives, strategies, and processes” (Tjosvold, Tang, and West, 2004: 542). Reflexivity involves questioning, evaluating, debating, planning, and monitoring of internal and external environments and as such is both backward and forward-looking (MacCurtain, Flood, Ramamoorthy, West, and Dawson, 2010).

TMT reflexivity can stimulate the introduction of new management practices as it enhances the likelihood that TMTs become aware of the need for change, it enlarges the array of potential new management practices evaluated, and it increases the chances of successful implementation. First of all, by stimulating the reframing of TMT members’ cognitive representations of tasks and the questioning of assumptions (Hirst and Mann, 2004), reflexivity can help TMTs acknowledge the need to change managerial practices. Reflexive teams are more likely to identify and prioritize the more important issues (i.e. more relevant and urgent) than less reflexive teams (Hoegl and Parboteeah, 2006). This is particularly important for management innovation because, as Hamel (2006: 5) argues, “to maximize the chances of a management breakthrough, you need to start with a problem that is both consequential and soul stirring”. Also, reflexive teams have the tendency to quickly address issues, whereas less reflexive teams are more likely to deny, hide or delay issues (Moreland and Levine, 1992). In short, by analyzing the current organizational situation in view of existing and future environmental changes, TMTs that engage in reflexivity are more likely to identify organizational issues that can or that need to be addressed by introducing a new management practice.

Second, highly reflexive TMTs can identify a wider array of alternative managerial practices and are likely to choose more appropriate alternatives in response to organizational issues. Research argues that TMTs that engage in high levels of reflexivity are likely to exhibit greater attention to detail and, as a consequence, identify more alternative solutions than teams that engage in lower levels of reflexivity (MacCurtain et al., 2010). Also, as they have the tendency to monitor the external environment (Hoegl and Parboteeah, 2006), reflexive TMTs are likely to be aware and to have access to more managerial practices. Also, reflexivity may enhance the degree to which TMT members become aware of potential solutions from inside the company as they have to gather information from lower level employees. In addition, as reflexivity enables teams to continuously assess the situation and form an accurate understanding of the current issue (Hoegl and Parboteeah, 2006), TMTs that engage in higher levels of reflexivity can identify more appropriate solutions, i.e. new managerial practices.

Third, reflexivity can help TMTs during the implementation stage of new managerial practices. As the implementation of management innovation is a lengthy process characterized by high ambiguity (Birkinshaw et al., 2008; Birkinshaw and Mol, 2006), it is likely that the implementation to be hindered by various unpredictable disruptions. Reflexivity can help firms overcome such disruptions as it leads to greater information gathering and better communication both within the TMT and with organizational members at lower hierarchical levels. In line with this argument, research finds that reflexivity enhances team effectiveness (Carter and West, 1998; Hoegl and Parboteeah, 2006); thus, TMTs that engage in high levels of reflexivity are

more likely to find appropriate solutions to the various implementation issues that can arise. Therefore, we propose that reflexivity can stimulate the introduction of new management practices:

Hypothesis 1: There is a positive relationship between TMT reflexivity and management innovation.

5.2.4. TMT minority dissent and management innovation

TMT minority dissent refers to “instances in which a minority in a group publicly opposes the beliefs, attitudes, ideas, procedures, or policies assumed by the majority of the group” (De Dreu and West, 2001:1191). That is, it exposes the TMT to the different perspective of one or a few of its members. Minority dissent can change the perceptions of TMT and, thus, it enhances creative thinking, divergent thought and integrative complexity (De Dreu and West, 2001).

First, by bringing divergent points of view to the TMT, minority dissent can enhance recognition of need for change. Momscovici, Lage, and Naffrechoux (1969) show that minorities expressing a divergent point of view can influence the perceptions of the majority. Also, Nemeth and Staw (1989) argue that minority dissent can stimulate teams to re-evaluate the current situation and adapt their processes. Minority dissent enhances the courage of individual team members to resist pressures to conform (Nemeth and Chiles, 1988). Consequently, minority dissent can enhance the introduction of new management practices as it aids TMTs perceive the need for change and it ignites the break-away from status quo.

Second, minority dissent can increase the number of potential management practices identified by the TMT and may help choose those with most chances to be successfully implemented. Minority dissent can enhance divergent thinking and creativity for all team members (Van Dyne and Saavedra, 1996). As a result of the multiple perspectives considered, TMT members are likely to identify new management practices that could be implemented to solve the organizational issue. In line with this idea, Gruenfeld, Thomas-Hunt, and Kim (1998) find empirical evidence that minority dissent enhances integrative complexity, i.e. the ability of groups to recognize more alternatives. In addition, research shows that dissent can lead to higher decision quality (Dooley and Fryxell, 1999; Schwenk, 1990). For instance, Peterson (1997) argues that by trying to solve the tension created by minority dissent, teams engage in more divergent thinking to reach higher decision quality. In the case of management innovation, TMTs that engage in higher levels of minority dissent are more likely to select viable management practices. Therefore, these arguments lead to the following hypothesis:

Hypothesis 2: There is a positive relationship between TMT minority dissent and management innovation.

5.2.5. The moderating role of absorptive capacity

We propose that the degree to which TMT processes influence the introduction of management practices is contingent on the organizational context. Some related studies have started to find supporting evidence that the organizational context influences the effect of the antecedents of management innovation. For instance, research finds that organizational size is an important contingency for the effectiveness of change agents (Mol and Birkinshaw, 2009; Vaccaro et al., 2012). In addition, Mol and Birkinshaw (2009) argue that the quality of the workforce creates a context in which firms can be easily brought up to speed on management innovation. Our study builds on this latter study as we propose that organizational absorptive capacity provides the knowledge context that can assist TMT processes in facilitating the introduction of new management practices. Specifically, we propose that the effect of TMT reflexivity and minority dissent is stronger when firms have higher levels of absorptive capacity.

Absorptive capacity refers to “the ability of a firm to recognize the value of new, external information, assimilate it, and apply it to commercial ends (Cohen and Levinthal, 1990: 128). Zahra and George (2002) argue that absorptive capacity comprises the acquisition, assimilation, transformation, and exploitation of new knowledge. That is, the level of absorptive capacity allows firms to understand external knowledge and to use it by integrating it with internal knowledge (Volberda, Foss, and Lyles, 2010).

We propose that absorptive capacity is an important catalyst for the effects of TMT reflexivity and minority dissent on the introduction of management innovations as it prepares firms to acknowledge the need for change and it enhances the readiness to implement the new managerial practice. First, considering the important role of external information in adopting management innovation (e.g. Birkinshaw and Mol, 2006; Mol and Birkinshaw, 2009), absorptive capacity represents the structural context that allows firms to “sense” appropriate managerial tools in the environment and it provides the internal processes that allow firms to appropriate, adapt, and implement managerial practices and processes. As an important sensing mechanism (e.g. Malhotra, Gosain, and Sawy, 2005), absorptive capacity works to build up motivation for change by probing environmental developments. As a result, absorptive capacity enhances the processes of reflexivity and minority dissent as it can help TMTs identify a problem and sense developments in the environment that require a change in managerial processes.

Second, absorptive capacity creates the contextual conditions required for the implementation of TMT’s measures regarding new managerial processes. Specifically, absorptive capacity influences not only the degree to which TMTs sense the need for change but also whether this urgency is appropriately acknowledged throughout the organization. Absorptive capacity may influence the adoption process as it enables the validation of the new practice through internal and external sources. As Birkinshaw and Mol (2006) argue that internal acceptance is a crucial step for management innovation, absorptive capacity may help the new management practice gain internal acceptance as the organization has the processes and knowledge that predispose it to sense and absorb new ideas. Also, Birkinshaw et al. (2008) argue that when the organizational context is supportive of new thinking it enhances the degree of

freedom for internal change agents to pursue new ideas (Birkinshaw et al., 2008: 834). Absorptive capacity influences the likelihood that the proposed new managerial practice gains general acceptance in the organization, thus, aiding implementation of new managerial practices. In addition, higher levels of absorptive capacity indicate that firms have the learning capacity necessary to understand, adapt, and implement the new management practice. That is, where TMT learning processes uncover the need to change and suggest alternative management practices, absorptive capacity provides the necessary learning capacity at lower hierarchical levels to implement the change. These arguments lead to the following hypotheses:

Hypothesis 3: *Absorptive capacity moderates the relationship between TMT reflexivity and management innovation in such a way that the relationship is stronger for firms with higher rather than lower levels of absorptive capacity.*

Hypothesis 4: *Absorptive capacity moderates the relationship between TMT minority dissent and management innovation in such a way that the relationship is stronger for firms with higher rather than levels of absorptive capacity.*

5.3. Methods

5.3.1. Research Setting and Data Collection

We randomly identified a company sample (4000 firms) from the REACH database, the most comprehensive database of Dutch companies. The sample covers a broad range of industries and was restricted to private firms with at least 25 employees. We ensured that the informants were professionally interested and committed to providing accurate data by assuring them of confidentiality and by offering them a summary of the results. We sent survey participation requests to the executive directors of all companies. We received 811 fully completed questionnaires, representing a response rate of 20 percent. The executive directors in our final sample have a mean age of 47.45 years (standard deviation (s.d.) = 9.24) and a mean tenure of 13.61 years (s.d. = 10.35). Our final sample contains organizations with a mean age of 32.21 (s.d. = 29.97) years, a mean size of 189 (s.d. = 968.76) full-time employees and that operate in various industries covering food and forestry (11%), manufacturing (24%), professional services (29%), transportation (12%), construction (12%), and other industries (12%). In order to assess the non-response bias, we compared the respondents with non-respondents for the final sample. Results of t-tests show that the respondents do not differ significantly ($p < 0.05$) from non-respondents in terms of organizational age, organizational size, and prior performance. Further, we examined differences between early and late respondents in terms of demographics and model variables. The finding of no significant differences ($p < 0.05$) indicates that non-response bias is not an issue.

5.3.2. Measurement and Validation of Constructs

We measured the constructs of this study using multi-item scales that we adapted from existing literatures and whose reliability and validity we assessed through various analyses. All items were measured on a seven-point scale where 1='strongly disagree' and 7='strongly agree'. All questionnaire items are presented in the Appendix of this chapter.

Dependent variable

Management innovation ($\alpha = 0.80$) refers to the introduction of management practices, processes and structures that are new to the firm (Mol and Birkinshaw, 2009: 1270). In operationalizing management innovation we use the measure developed by Vaccaro et al. (2012) that taps into the three facets of management innovation. We used a six-item scale with two questions for each of management practices, processes, and organizational structure.

Independent variables

TMT reflexivity ($\alpha = 0.79$) refers to "the extent to which team members collectively reflect on and adapt their team's objectives, strategies, and processes" (Tjosvold, Tang, and West, 2004:542). Following Tjosvold et al. (2004), we used a five-item scale to assess the degree to which TMTs engage in reflexivity. *TMT dissent* ($\alpha = 0.71$) captures the degree to which a minority in the TMT publicly expresses beliefs, attitudes and ideas that are opposed to those of the majority (De Dreu and West, 2001). We measure *absorptive capacity* ($\alpha = 0.94$) using an 18-item scale adapted from Jansen et al. (2006) that taps into the four components of absorptive capacity emphasised by Zahra and George (2002): acquisition (7 items), assimilation (3 items), transformation (4 items), and exploitation (4 items).

Control variables

We account for exogenous influences on management innovation by including relevant control variables: firm size, age, TMT size, and industry. *Firm size* can influence the introduction of management practices as larger organizations may have more resources available yet may lack flexibility. We control for firm size by including the natural logarithm of the number of employees (c.f. Damanpour, 1992). As older organizations tend to innovate more than younger ones (Gilbert, 2005), we control for *firm age* by including the natural logarithm of the number of years since the firm was founded. In line with previous studies (e.g. Vaccaro et al., 2012), we control for *TMT size* by including the natural logarithm of the number of TMT members who are responsible for important decisions about the future of the firm. We also control for the level of *technological innovation*, which we measure as the percentage of revenues from new products and services in the last three years (Cassiman and Veugelers, 2006; Laursen and Salter, 2006; Leiponen and Helfat, 2010). Lastly, in order to account for *industry* differences in the level of management innovation, we created six dummy variables based on the Standard Industry Classification codes: food and forestry, manufacturing, professional services, transportation, construction (used as the base group), and other industries.

5.3.3. Construct and method validity

We assessed the convergent and discriminant validity of our constructs through exploratory and confirmatory factor analyses. Exploratory factor analysis of all items pertaining to our constructs (i.e. reflexivity, minority dissent, absorptive capacity, and management innovation) clearly showed the expected structure with all items loading (the lowest loading on the factor is 0.64 and the highest cross-loading is 0.18) on the appropriate factor⁴. In addition, we performed a confirmatory factor analysis on all items of our constructs (with items restricted to load on the proposed constructs). The results ($\chi^2/df = 1.45$, CFI = 0.93, IFI = 0.95, RMSEA = 0.04) indicate adequate fit. Thus, the exploratory and confirmatory factor analyses indicate that our constructs have discriminant and convergent validity. The results of the exploratory and confirmatory factor analyses show evidence in support of the constructs' convergent and discriminant validity.

To test for single respondent bias and to analyze reliability issues, we surveyed additional members of each TMT. We received completed questionnaires of additional TMT members (from one to three additional members) from 62 firms (or 8% of the sample). The average inter-rater agreement index (r_{wg}) (James, Demaree, and Wolf, 1993) is 0.89 for management innovation, 0.87 for TMT reflexivity, 0.84 for TMT minority dissent, and 0.87 for absorptive capacity, indicating adequate agreement among the TMT members (LeBreton, and Senter, 2008). In addition, we calculated the intra-class correlations, ICC(1), which provide a measure of response convergence within TMTs. F-tests of the ICC(1) scores for management innovation (0.88), TMT reflexivity (0.83), TMT minority dissent (0.85), and absorptive capacity (0.82) show that all ICC(1) scores are significantly greater than zero (McGraw and Wong, 1996), indicating accurate measurement.

Regarding potential common method bias, we performed several statistical tests to determine whether our data is likely to exhibit this issue. We first performed Harman's one factor test (Podsakoff and Organ, 1986) by including all items of our constructs in an exploratory factor analysis. The factor analysis clearly showed seven factors with eigenvalues greater than one and the first factor accounts for less than 30 percent of the total variance. That is, there is no evidence of unidimensionality in our data. In addition, we followed Podaskoff *et al.*'s (2003: 894) approach to control for an unmeasured latent factor. That is, we performed a CFA analysis on which we let items load on both their theoretical constructs and on a latent common method variance factor. The fact that all item loadings on the theoretical constructs were still significant even after the inclusion of the latent factor indicates that common method bias is an unlikely problem. In conclusion, statistical tests show that common method bias is not a serious issue in this study.

⁴ For absorptive capacity the exploratory factor analysis clearly replicated its four components: acquisition, assimilation, transformation, and exploitation.

5.4. Analysis and results

Table 1 presents the descriptive statistics for the model variables. Table 2 presents the results for the ordinary least squares regressions testing our hypotheses. There is no indication of multicollinearity as the highest variance inflation factor is 1.98, which is well below the commonly-used cut-off value of 10 (Neter, Wasserman, and Kutner, 1990). In order to prevent multicollinearity, we mean centered the independent variables before constructing the interaction terms entered in Model 4 (Aiken and West, 1991). Model 1 contains the control variables, Model 2 adds the main effects of TMT reflexivity and minority dissent, and Model 3 further adds the moderating effects of absorptive capacity. We discuss the results of Model 3, the full model.

Hypothesis 1 proposes that TMT reflexivity can enhance management innovation. Our results provide evidence in support ($\beta = 0.46$ $p < 0.001$) of the positive effect of TMT reflexivity. Regarding the positive effect of TMT minority dissent on management innovation (Hypothesis 2), the statistical analysis also finds supporting evidence since the regression coefficient is positive and significant ($\beta = 0.15$, $p < 0.001$). In addition, we argued that the degree to which these two TMT processes influence the introduction of new management practices depends on the level of ACAP. The analysis suggests that the effects of TMT reflexivity ($\beta = 0.19$ $p < 0.001$) and TMT minority dissent ($\beta = 0.15$ $p < 0.01$) are stronger in organizations with higher levels of ACAP since the coefficients of the interaction effects are positive and significant.

In order to aid interpretation of the interaction effects, we follow Aiken and West (1991) to provide a graphical representation. The high and low values of TMT reflexivity, TMT minority dissent, and ACAP are calculated as one standard deviation above and below the mean. Figure 1 shows that TMT reflexivity has more influence on management innovation in organizations with high ACAP than in those with low ACAP. Figure 2 corroborates our expectation that ACAP can enhance the positive relationship between TMT minority dissent and management innovation. Furthermore, it is interesting to note that firms that have both high levels of absorptive capacity and of TMT reflexivity or TMT minority dissent exhibit overall higher levels of management innovation.

5.5. Discussion and conclusion

Research shows that management innovation has the potential to help firms achieve competitive advantage (Mol and Birkinshaw, 2006, 2009; Volberda and Van Den Bosch, 2005). While ample research evidence points out the desirable consequences of management innovation for firm performance, the understanding of the factors that help firms introduce new managerial practices has considerably lagged behind. That is, our study compliments existing literature by advancing the understanding of the factors that facilitate the introduction of new management practices and of the organizational contingencies that influence this relationship. Building on Birkinshaw et al.'s (2008) plea to emphasize human agency in management innovation research,

Figure 5. The moderating effect of ACAP in the relationship between TMT reflexivity and management innovation

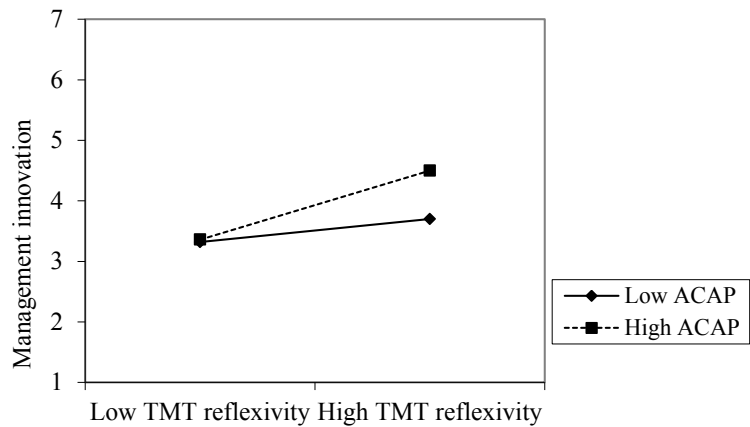


Figure 6. The moderating effect of ACAP in the relationship between TMT minority dissent and management innovation

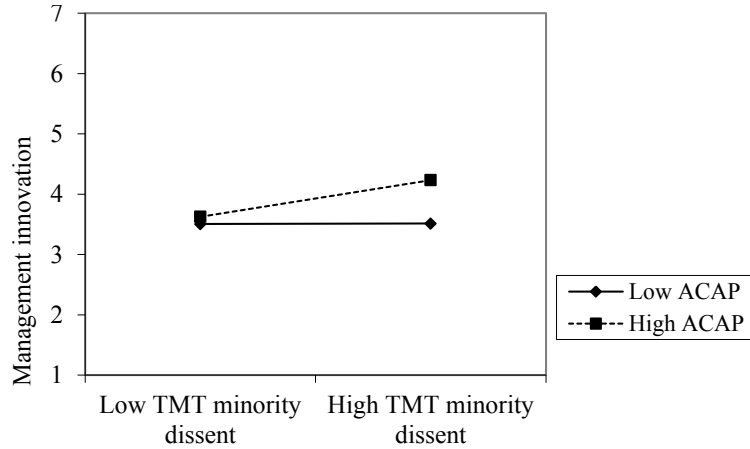


Table 12. Descriptive statistics and correlations – Study 3

	Mean	s.d.	1	2	3	4	5	6	7	8	9	10	11	12	13	14
(1) Management innovation	3.74	1.03	-													
(2) TMT reflexivity	4.81	0.94	0.43	-												
(3) TMT minority dissent	3.25	1.03	0.10	-0.12	-											
(4) ACAP	4.88	0.88	0.34	0.41	-0.12	-										
(5) Firm size ^a	4.09	1.15	0.06	0.00	0.07	-0.06	-									
(6) Firm age ^a	3.01	1.03	-0.07	-0.03	0.03	-0.07	0.17	-								
(7) TMT size ^a	1.64	0.54	0.17	0.04	0.13	0.08	0.27	0.07	-							
(8) Technological innovation	0.12	0.12	0.12	0.11	-0.08	0.19	-0.03	-0.13	-0.01	-						
(9) Manufacturing	0.30	0.46	-0.10	-0.06	-0.01	-0.03	0.06	0.18	-0.04	-0.01	-					
(10) Wholesale and retail	0.21	0.41	-0.01	0.04	0.01	0.01	-0.12	0.03	-0.06	0.02	-0.34	-				
(11) Transportation	0.06	0.24	0.01	0.03	0.03	-0.03	0.07	0.00	0.03	0.02	-0.16	-0.13	-			
(12) ICT	0.06	0.23	0.02	0.06	0.01	0.15	-0.06	-0.14	0.08	0.08	-0.16	-0.13	-0.06	-		
(13) Financial services	0.04	0.19	-0.09	-0.06	0.04	-0.07	0.04	-0.07	0.01	-0.03	-0.13	-0.11	-0.05	-0.05	-	
(14) Professional services	0.17	0.37	0.15	0.03	-0.02	0.03	-0.05	-0.22	0.01	0.01	-0.29	-0.23	-0.11	-0.11	-0.09	-
(15) Other industry	0.42	0.20	0.06	0.04	-0.02	0.02	0.09	-0.08	0.02	0.00	-0.14	-0.11	-0.05	-0.05	-0.04	-0.09

Notes: N=811. Correlation coefficients above |0.07| are significant at the $p < 0.05$. The Cronbach's alphas of the composite scales are presented in parentheses on the diagonal. ^aFirm size, Firm age, and TMT size are the natural logarithms of the number of years since founding, employees, and members of the TMT, respectively.

Table 13. Results of the OLS regression analysis for management innovation – Study 3

	Model 1	Model 2	Model 3
<i><u>Control variables</u></i>			
Intercept	3.06*** (0.21)	0.58* (0.26)	-0.22 (0.29)
Firm size (ln)	0.03 (0.03)	0.03 (0.03)	0.05 (0.03)
Firm age (ln)	-0.03 (0.04)	-0.03 (0.03)	-0.03 (0.03)
TMT size (ln)	0.31*** (0.07)	0.24*** (0.06)	0.22*** (0.06)
Technological innovation	0.01** (0.00)	0.01* (0.00)	0.01 (0.00)
Manufacturing	-0.09 (0.12)	-0.09 (0.11)	-0.11 (0.10)
Wholesale and retail	0.06 (0.13)	-0.03 (0.11)	-0.04 (0.11)
Transportation	0.05 (0.18)	-0.06 (0.16)	-0.04 (0.15)
ICT	0.05 (0.18)	-0.09 (0.16)	-0.19 (0.16)
Financial services	-0.41* (0.20)	-0.38* (0.18)	-0.35 (0.18)
Professional services	0.37** (0.14)	0.30* (0.12)	0.27* (0.12)
Other industry	0.32 (0.20)	0.20 (0.18)	0.20 (0.17)
<i><u>Direct effects</u></i>			
TMT reflexivity		0.46*** (0.03)	0.38*** (0.04)
TMT minority dissent		0.15*** (0.03)	0.15*** (0.03)
<i><u>Moderating effects</u></i>			
ACAP			0.23*** (0.04)
TMT reflexivity X ACAP			0.19*** (0.03)
TMT minority dissent X ACAP			0.15** (0.03)
R ²	0.08	0.26	0.30
ΔR ²	0.08***	0.18***	0.04***
Adj. R ²	0.07	0.24	0.29

Notes: N=811. Standard errors in parentheses.. * p < 0.1, * p < 0.05, ** p < 0.01, *** p < 0.001.

we propose that TMT processes play an important role in stimulating the introduction of new management practices. Specifically, we make the case for TMT reflexivity and minority dissent. These learning processes, by introducing precipitating dynamics, can help TMTs uncover the need to change management practices and through continuous adjustment they enhance implementation. In addition, we proposed that TMT processes are more effective in stimulating management innovation in those firms that have high rather than low levels of absorptive capacity.

Our findings show that TMT processes facilitate the introduction of new management practices. In this sense, our study contributes to prior research on the importance of TMTs as antecedents of management innovation. Specifically, our results indicate that when TMT members engage in reflexive behaviours such as debating, planning, and monitoring internal and external environments, firms are more prolific at introducing management innovations. TMT reflexivity provides TMT members with a systematic way of questioning the management practices used to achieve firm goals. In addition, we find that firms whose TMTs engage in minority dissent have higher levels of management innovation. Minority dissent exposes TMTs to a divergent point of view, leading managers to question the majority's opinion. This is particularly useful for stimulating management innovation, as it requires a challenging of the status quo (Hamel, 2006). As a result, TMTs may bring under scrutiny the appropriateness of entrenched management practices for achieving desired firm goals. Both reflexivity and minority dissent bring important learning dynamics to the TMT as senior executives are exposed to new ideas and analyze the current practices in light of changing internal and external circumstances.

The overall results regarding the role of TMT processes contribute to previous findings in the literature. For instance, we advance Vaccaro et al.'s (2012) finding that transformational and transactional leadership can enhance management innovation by showing that in addition to outward-oriented TMT behaviours, TMT processes aimed at internal team functioning also play an important role in introducing new management practices. In addition, our study provides complementary insights to Mol and Birkinshaw's (2009) idea that management innovation is the response to an organizational issue. Whereas they find empirical validation that management innovation is a response to a pressing issue, we propose and find empirical evidence of the processes that can help TMTs uncover the organizational issues that require management innovations.

Our findings regarding the moderating role of absorptive capacity advance the understanding of management innovation by moving existing research beyond main effects. In line with Birkinshaw et al. (2008: 833)'s contention that the organizational context affects the ability of internal change agents to introduce management innovation, we find empirical evidence of the contingency role of the organizational knowledge context. Specifically, our results indicate that TMT reflexivity and minority dissent are more effective in motivating the introduction of new management practices in firms that have high levels of absorptive capacity. Absorptive capacity provides the organizational readiness to perceive the need for change and to support implementation. Whereas TMTs identify and propose new management practices,

successful implementation depends on the willingness and ability of organizational members at lower hierarchical levels to carry out the implementation and to use the new tools available (Birkinshaw et al., 2008). Firms with high absorptive capacity have the knowledge context that supports the TMT learning processes in stimulating change in management practices. In this sense, our findings advance previous findings in the literature regarding the moderating role of organizational variables. Particularly, we extend the idea that the education of the workforce moderates the effect of internal sources of management innovation (Mol and Birkinshaw, 2009), by proposing the ability to recognize and use new knowledge at the organizational level as an important moderator of the managerial antecedents of management innovation. Overall, by considering the interaction between TMT processes and absorptive capacity in stimulating changes in managerial practices, our study answers a call to “increase the emphasis on human agency in management innovation while not losing sight of the contextual dynamics” (Birkinshaw, Hamel and Mol, 2008: 829).

In addition, our results also contribute to the literature on absorptive capacity. We advance the understanding of the contingency role of absorptive capacity as we show that, in addition to technological innovation (e.g. Rothaermel and Alexandre, 2009; Stock et al., 2001), firms’ learning ability is an important contingency factor also in the case of management innovation. In addition, our study provides a first step in distinguishing between learning capacity at the TMT level and the overall learning capacity of the firm (Volberda et al., 2010). Specifically, our results suggest a complementarity between learning that takes place at the level of the TMT and the overall firm learning capacity.

5.5.1. Limitations and future research

While our study makes important contribution to expanding the understanding of management innovation, there are several limitations that could be addressed in future research. A limitation of this study is that all variables were collected at a single point in time. While Harman’s one factor test (Podsakoff and Organ, 1986) and Podsakoff *et al.*’s (2003: 894) approach to control for an unmeasured latent factor indicate that common method bias is not a serious issue in this study, using longitudinal or, at least, temporally separated data collection would have improved confidence in the relationships proposed in this study. In addition, we consider an organizational level moderator (i.e. absorptive capacity). However, it would be interesting to also consider TMT level moderators, such as the level of TMT accountability. By enhancing the comprehensiveness of information-processing (Tetlock, 1983), accountability may influence the effectiveness of TMT reflexivity and minority dissent. On the other hand, accountability may make TMT more conservatives, thus, more risk-adverse to changes in management practices. Future research could analyze how the degree to which TMT members feel accountable for their actions may influence the effects of TMT learning processes on TMT. In addition, future studies could consider the effect of other organizational level variables on the association between TMT processes and management innovation. For instance, the level of trust

in the organization may influence the internal validation of new management practices, consequently influencing the implementation process.

Overall, our study advances the role of human agency in management innovation. Our results suggest the important role played by senior managers in changing managerial practices. Our findings indicate that firms with TMTs that engage in higher levels of reflexivity and minority dissent are associated with higher levels of management innovation and that this effect is stronger in firms that also have higher learning capacity. Thus, our study suggest an important interaction between TMT learning processes and the overall firm learning capacity for the introduction of management innovation.

APPENDIX 1

Questionnaire items – Study 3

Management innovation (Vaccaro et al., 2012)

Management practices:

Rules and procedures within our organization are regularly renewed.

We regularly make changes to our employees' tasks and functions.

Management processes:

Our organization regularly implements new management systems.

The compensation policy is regularly updated

Structures:

The intra- and inter-departmental communication structure within our organization is regularly restructured.

We regularly alter certain elements of the organizational structure (e.g. restructuring departments)

TMT reflexivity (based on Carter and West, 1998; Tjosvold, Tang, and West, 2004).

The TMT often reviews its objectives.

We regularly discuss whether the TMT is working effectively together.

The methods used by the TMT to get the job done are often discussed.

In this TMT we modify our objectives in the light of changing circumstances.

The TMT often reviews its approach to getting the job done.

TMT minority dissent (De Dreu and West, 2001)

Individuals disagree with the rest of the TMT.

TMT members go along with the majority opinion (reverse)

One or two TMT members disagree with the majority opinion.

Absorptive capacity (Jansen et al., 2006)

Our organization regularly integrates new technologies or skills from external sources

We continuously seek for new sources of knowledge

We regularly scan our market environment for new knowledge

We pay close attention to the changing trends in demand

Our employees regularly access external knowledge sources

We regularly take advantage of opportunities to acquire new knowledge

Our organization is thorough in gathering information about our industry

Knowledge is maintained within our organization

Our employees save knowledge for future use

We share expertise between divisions of our organization

We are experienced in transforming technological knowledge into new products

New knowledge is often combined with our new product ideas

We quickly recognize the benefits of new knowledge on existing competencies

Employees share their expertise to develop new products or services

We respond quickly to new market opportunities with our existing knowledge

We are proficient in the use of existing knowledge for new purposes

We quickly come up with new ways to serve our clients with existing knowledge

We make quick market analysis linking our existing skills

CHAPTER 5

STUDY 4 – TMT SHARED LEADERSHIP AND AMBIDEXTERITY: THE MODERATING ROLE OF ORGANIZATIONAL STRUCTURE

Abstract

While extensive research espouses the importance of ambidexterity for long-term organizational performance, organizations must overcome considerable hurdles in order to engage in both exploration and exploitation. Drawing on emerging leadership research, we propose TMT shared leadership as an important enabler of organizational ambidexterity and we argue that its effectiveness depends on the organizational structure. In particular, we suggest that the relationship between TMT shared leadership and organizational ambidexterity is contingent upon formal (i.e. centralization of decision-making) and informal (i.e. connectedness) structural elements. Using lagged data from 207 organizations from a variety of industries, our results indicate that organizations characterized by centralized decision-making and densely connected social networks benefit most from TMT shared leadership in terms of stimulating ambidexterity. We discuss how this study extends organizational ambidexterity and leadership theories and its main implications for practice.

Keywords: *ambidexterity, TMT shared leadership, organizational structure, centralization, connectedness*

4.1. Introduction

Ambidexterity has been suggested to be an important dynamic capability by enabling organizations to satisfy current demands while simultaneously being prepared for tomorrow's developments (Gibson & Birkinshaw, 2004; O'Reilly & Tushman, 2007). Various studies emphasize that excelling at both exploration and exploitation is important for long-term performance and survival (Feinberg & Gupta, 2004; He & Wong, 2004; Lubatkin, Simsek, Ling, & Veiga, 2006; Uotila, Maula, Keil, & Zahra, 2009). There is little doubt however that organizational ambidexterity is difficult to achieve as it requires paradoxical competences and capabilities (Benner & Tushman, 2003).

Literature increasingly recognizes the role of senior executives in resolving the tensions between exploration and exploitation (c.f. Raisch & Birkinshaw, 2008). So far, research has proposed that specific attributes of TMTs such as the demographical composition (Beckman, 2006), shared vision (Jansen, George, Van Den Bosch, & Volberda, 2008; Tushman & O'Reilly, 1996), and behavioral integration (Carmeli & Halevi, 2009; Lubatkin et al., 2006) can enhance organizational ambidexterity by allowing for a variety of perspectives to emerge while simultaneously facilitating collective action and strategic coherence (O'Reilly & Tushman, 2004). The focus on TMT characteristics rather than behaviors as antecedents of ambidexterity leaves open the question of what actions TMT members can perform in order to resolve the tensions between exploration and exploitation. In other words, the understanding of what leadership behaviors allow TMTs to reconcile the competing demands of exploration and exploitation is somewhat limited. A better understanding of leadership behavior as a solution to the tensions between exploration and exploitation can provide important insights into how firms can organize their upper echelons in order to attain organizational ambidexterity.

This study adds to the dialog on ambidexterity, strategic leadership, and organizational structure in several ways. First, drawing on emergent research in the leadership literature, we propose shared leadership within the TMT as an important enabler of organizational ambidexterity. Shared leadership refers to "the distribution of leadership influence across multiple team members" (Carson, Tesluk, & Marrone, 2010: 1218). Whereas the traditional form of leadership, i.e. vertical leadership, involves the downward projection of influence, TMT shared leadership refers to the exertion of lateral influence among the TMT members (Ensley, Hmielesky, & Pearce, 2006; Pearce & Sims, 2000). It is a practice in which the CEO and the rest of the TMT share the responsibility for and fully participate in the tasks of leadership such as goal-setting and motivating task behaviors (Carson et al., 2010; Yukl, 1989). We propose that sharing the task of leadership between the CEO and the other TMT members may aid the reconciliation of the opposing demands associated with pursuing exploratory and exploitative activities. Engaging in shared leadership may reduce the extent to which TMT members perceive conflicting situations by enabling the emergence of paradoxical cognitive frames and promoting collaborative behaviors (Smith & Tushman, 2005). Through its influence on the attitudes and dynamics of TMTs, shared leadership can enhance behavioral integration (Carmeli, Schaubroeck, & Tishler, 2011) and facilitate the selection of complex strategic options (Finkelstein and

Hambrick, 1996; Perry, Pearce, & Sims, 1999) thus enhancing the likelihood that firms pursue both exploration and exploitation. In this sense, our study advances ambidexterity literature by proposing a leadership solution to the difficulties that deter organizations from achieving high levels of exploration and exploitation.

Second, this study provides a rich understanding of the role of TMT shared leadership as an enabler of organizational ambidexterity by considering its effectiveness under different organizational structures. The understanding of how and under what conditions TMT leadership behavior contributes to organizational ambidexterity is far from complete and fundamental pieces are missing (Smith & Tushman, 2005). While previous research has emphasized the importance of leadership (e.g. Beckman, 2006; Lubatkin et al., 2006) and organizational structure (e.g. Tushman & O'Reilly, 1998; Jansen, Tempelaar, Van Den Bosch, & Volberda, 2009) for pursuing exploratory and exploitative activities, the understanding of how leadership behavior and organizational structure *jointly* determine the ability of organizations to achieve ambidexterity remains limited. As scholars have yet to build theory that incorporates such interrelations between leadership and organizational structure, we argue that the inattention to these interaction effects masks important subtleties.

Building on the idea that organizational structure has important implications for the effectiveness of leadership (e.g. Jung, Wu & Chow, 2008), we propose that the formal hierarchical structure (i.e. centralization of decision-making) and informal lateral relations (i.e. connectedness) influence the effectiveness of TMT shared leadership for stimulating ambidexterity. In focusing on centralization and connectedness we follow existing research arguing that these two organizational elements are a parsimonious way to represent the communication patterns across the organization (Ghoshal, Korine, & Szulanski, 1994; Tsai, 2002). As such, centralization of decision-making and connectedness influence the effectiveness of TMT shared leadership as they affect the dynamics among TMT members as well as those with and among organizational members at lower hierarchical levels. By analyzing the moderating role of the organizational structure, our study answers a call for more research on the boundary conditions concerning the determinants of organizational ambidexterity (Raisch & Birkinshaw, 2008). We emphasize that TMT shared leadership behavior is particularly effective in stimulating ambidexterity in organization with specific formal and informal structures.

We test the proposed model on temporally lagged data from a cross-industry sample of 207 organizations. Empirical analysis largely provides evidence in support of our predictions. We find strong empirical support for our proposition that TMT shared leadership is an important stimulant for ambidexterity even when controlling for structural differentiation, the classical solution for ambidexterity. Also, we find that TMT shared leadership is most effective for achieving ambidexterity in organizations characterized by centralized decision-making and densely connected social networks. Accordingly, our study advances the understanding of the emergence of organizational ambidexterity by proposing a leadership solution and by considering its organizational contingencies.

4.2. Literature review

4.2.1. Organizational Ambidexterity

Ambidexterity is defined as the simultaneous pursuit of exploratory and exploitative innovation (Benner & Tushman, 2003; He & Wong, 2004). Exploratory innovation refers to radical innovations that are aimed at the needs of emerging customers or markets (Benner & Tushman, 2003). Exploitative innovation refers to incremental innovation aimed at serving existing customers and markets (Danneels, 2002). A growing body of research espouses the importance of simultaneously excelling at both exploratory and exploitative innovation for long-term organizational success (e.g. Eisenhardt & Martin, 2000; Gibson & Birkinshaw, 2004; He & Wong, 2004; Lubatkin et al., 2006). Exploiting current competencies while simultaneously exploring new ones permits organizations to capture benefits from both actions while avoiding traps associated with favoring one type of innovation over the other. Organizations focusing on exploratory efforts may not fully capture benefits associated with commercializing existing competencies (Gupta, Smith & Shalley, 2006). Alternatively, organizations focusing primarily on exploitative efforts may enjoy short term profits yet face the risk of obsolescence as they become ineffective in responding to environmental changes (Levinthal & March, 1993).

Despite the benefits of achieving ambidexterity, various scholars have pointed at the challenges associated with the simultaneous pursuit of exploratory and exploitative innovation. Whereas exploration is associated with variation, search and trial and error, exploitation is associated with efficiency, improvement, and disciplined problem solving (Smith & Tushman, 2005). As a result, organizational mechanisms promoting each type of activity are conflicting - exploration requires decentralization decision-making and less formalized processes, exploitation thrives in settings characterized by centralized structures and strong formalization (Jansen et al., 2006). In addition, exploratory and exploitative innovations compete for limited resources (March, 1991). These tensions give rise to role ambiguities and conflicts among TMT members who not only perceive strategic priorities differently but must also compete to secure resources from a limited organizational pool (Floyd & Lane, 2000).

4.2.2. TMTs, Shared Leadership, and Organizational Ambidexterity

In order to make balanced resource-allocation decisions for exploratory and exploitative innovation, research has suggested that TMT members must overcome personal biases and perceived conflicts of interest (Smith & Tushman, 2005). Additionally, TMTs have been suggested to be an important source for recognizing and implementing valuable synergies among exploratory and exploitative actions (O'Reilly & Tushman, 2004). To enable such a salient role in achieving organizational ambidexterity, TMT members must develop appropriate mental schemas that allow them to consider exploratory and exploitative innovation as complementary rather than competing activities (Carmeli & Halevi, 2009; Smith & Tushman, 2005). Furthermore, TMTs may contribute to the emergence of ambidexterity by establishing proper organizational contexts or building social networks among employees (Cao et al., 2009) that support collaborative initiatives across hierarchical levels within the organization.

Drawing on emergent research on leadership theory, our study suggests that the processes associated with shared leadership can support the emergence of ambidexterity by aiding TMTs in making balanced decisions and by promoting collaborative behaviors across the organization. Shared leadership refers to the practice in which TMT members share the responsibility for and fully participate in the task of leadership (Ensley, Pearson, & Pearce, 2003). It implies that TMT members jointly decide on the organizational goals and priorities and motivate each other (Ensley et al., 2003; Perry et al., 1999). That is, the leadership task is distributed among the TMT members instead of being the duty of solely one person, i.e. the CEO (Carson et al., 2007). Shared leadership entails the exertion of lateral influence among the members of the TMT, whereas the traditional view of leadership, vertical leadership, involves the downward projection of influence from the chief executive to the rest of the TMT members (Cox, Pearce, & Perry, 2003; Ensley et al., 2006; Pearce & Sims, 2000). Following recent research (e.g. Avolio, Walumbwa & Weber, 2009; Carson et al., 2007; Gronn, 2002), we conceptualize TMT shared leadership as a degree, with the minimum extreme when the chief executive is the sole decision-maker and the maximum level when the entire TMT fully shares responsibility for the task of leadership. Emerging research suggests that shared leadership has important implications for team dynamics and performance as well as for organizational outcomes. As it implies negotiating and sharing of responsibilities, shared leadership stimulates information sharing between team members (Katz & Kahn, 1978). It is also associated with increased problem solving and team performance (Carson et al., 2007; Pearce & Sims, 2002; Perry et al., 1999) and behavioral integration (Carmeli, Schaubroeck, & Tishler, 2011). In turn, these team-level outcomes have important consequences at the organizational-level. Drawing from a larger pool of competencies, TMTs that engage in shared leadership exhibit superior performance in complex situations such as organizational restructuring (Waldersee & Egelson, 2002), strategic change (Denis, Lamothe, & Langley, 2001), and new venture growth (Ensley et al., 2006). Despite the proliferation of research analyzing the organizational-level consequences of shared leadership, the implications of TMT shared leadership for organizational ambidexterity still require elucidation.

4.3. Theoretical development

4.3.1. TMT Shared Leadership and Organizational Ambidexterity

By influencing TMT attitudes and dynamics, shared leadership holds great potential for reducing the tension between exploration and exploitation. We argue that TMT shared leadership can enhance organizational ambidexterity in several ways.

First, TMT shared leadership can enhance ambidexterity as it may reduce the perceived conflicts of interests between senior executives. Shared leadership enables TMT members to engage in ongoing negotiation and role sharing leading to the development of shared perceptions and commitment to aspire for team success (Manz & Sims, 1993). It may make TMT members experience shared emotions and a sense of membership and lead to the realization that both the success and failure of organizational actions is due to their collaborative effort (Gronn, 2002).

That is, shared leadership may help TMT members acknowledge the need to balance conflicting priorities by shifting the focus from individual priorities to those of the entire organization (Smith & Tushman, 2005). Accordingly, prior studies have found that shared leadership is associated with greater collaboration and cooperation among team members (Katz & Kahn, 1978; Manz & Sims, 1993). TMT members engaged in shared leadership experience higher commitment to the overall firm's success and are more likely to mobilize and integrate operational capabilities across units through identifying ways to encourage new combinations of exploratory and exploitative efforts (Tushman & O'Reilly, 1996). Consequently, the emergence of TMT shared leadership encourages them to seek opportunities and synergies for combining exploratory and exploitative activities (Smith, Smith, Sims, O'Bannon, & Scully, 1994).

Second, TMT shared leadership may help reduce the hurdles of balancing the demands of exploration and exploitation as it may lead to the development of paradoxical cognition among senior executives. Paradoxical cognitions refer to cognitive models that recognize and embrace strategic contradictions (Smith & Tushman, 2005). The participative decision-making inherent in shared leadership may help TMT members become aware of the needs in other parts of the organization and try to find ways to incorporate potentially disparate demands in resource-allocation decisions. Research shows that teams engaged in shared leadership communicate more information and also information of higher quality than teams with vertical leadership (Katz & Kahn, 1978; Netemeyer, Boles, McKee, & McMurrian, 1997). This increased communication can improve team members' ability to understand interdependencies and the importance of coordination (Perry et al., 1999). Also, the role-sharing implied by shared leadership helps the integration of disparate needs as it diminishes TMT members' selective attention (Gronn, 2002). In this sense, TMT members recognize and accept the simultaneous importance of the conflicting actions associated with organizational ambidexterity (Smith & Tushman, 2005). Therefore, by increasing collective awareness of the needs in multiple parts of the organization, TMT shared leadership can lead to the emergence of TMT paradoxical cognitions that may stimulate the emergence of ambidexterity.

Third, TMT shared leadership may enhance ambidexterity as it promotes collaborative behaviors also at lower hierarchical levels. Bass, Waldman, Avolio and Bebb (1987), for instance, referred to the effect of 'falling dominoes' when observing that organizational members at lower hierarchical levels get cues of appropriate behavior from the actions of senior executives. Such a cascading effect has been shown to apply to a wide range of TMT leadership behaviors such as transformational (Bass et al., 1987) and charismatic (Waldman & Yammarino, 1999) leadership, the use of threats and intimidations (Pearce & Sims, 2002), as well as antisocial behavior (Robinson & O'Leary-Kelly, 1998). TMTs' example influences the shared understandings throughout the organization regarding accepted and desired behaviors (Lyles & Schwenk, 1997). Accordingly, we argue that when TMT members engage in shared leadership, organizational members at lower hierarchical levels may emulate that behavior and also engage in information exchange and collaborative efforts. This behavior contributes to the achievement of ambidexterity as it promotes the integration or recombination of disparate competencies at

lower hierarchical levels (Garud & Nayyar, 1994; Postrel, 2002). Encouraged to replicate collaborative behavior, organizational members may find important synergies that result in new ways to combine exploratory and exploitative efforts.

Therefore, we argue that by facilitating the reconciliation of conflicting agendas and by promoting paradoxical cognitions among TMT members, shared leadership can ease the perceived tensions between exploration and exploitation. TMT shared leadership further encourages ambidexterity as members at lower hierarchical levels emulate the collaborative behaviors of TMT members. These arguments lead to the following hypothesis:

Hypothesis 1: *There is a positive relationship between the TMT shared leadership and organizational ambidexterity.*

4.3.2. The Moderating Role of the Organizational Structure

Research shows that the organizational structure is an important contingency for the effectiveness of leadership actions. The organizational structure affects the receptivity of the lower hierarchical levels to TMTs' actions as it determines communication patterns between leaders and organizational members (Bacharach & Aiken, 1977) and it enforces collective perceptions of appropriate leadership behavior (Dickson, Resick, & Hanges, 2006). In addition, the organizational structure influences the effectiveness of leadership as it provides the means by which organization members follow their leaders (Yukl, 2008). That is, the organizational structure influences the degree to which organizational members can engage in the prescribed behaviors as it determines the interaction patterns among organizational members (Ethiraj & Levinthal, 2004) and the location of information and competencies (Wolf & Egelhoff, 2002). While previous research provides evidence that the organizational structure alters the effectiveness of leadership behaviors for organizational outcomes (e.g. Jung et al., 2008; Shamir & Howell, 1999), the implications of the organizational structure's role in influencing the ability of TMT shared leadership to overcome the tensions between exploration and exploitation remain uncharted.

Existing research considers that the organizational structure encompasses both formal and informal elements (e.g. Gabraith, 1973). Tsai (2002) singles out the formal hierarchy of authority (i.e. centralization of decision-making) and informal social relation (i.e. connectedness) as important structural elements that influence the pattern of communication and coordination across different parts of the organization. Centralization of decision-making is a parsimonious way to represent the formal structure (Ghosal et al., 1994) and connectedness captures the informal communication flows inherent in the informal structure (Tsai, 2002). Following these previous studies, we argue that centralization of decision-making and connectedness shape the effectiveness of TMT shared leadership in enhancing organizational ambidexterity as they determine the information flows between TMTs and the rest of the organizational members.

Centralization of decision-making. Centralization refers to ‘the locus of authority to make decisions’ (Pugh, Hickson, Hinings, & Turner, 1968: 76). The more decision-making authority resides closer to the top management team rather than at lower hierarchical levels, the more centralized the organization (Lin & Germain, 2003).

We argue that TMT shared leadership is more effective in enhancing ambidexterity in organizations with higher levels of centralization. An important aspect of TMT shared leadership is that it helps TMT members negotiate trade-offs between exploratory and exploitative initiatives by reducing conflicting pressures. However, these balanced decisions need to be implemented at lower hierarchical levels, which still face conflicting tensions and opportunities. Centralization may ensure that organizational resources are allocated in such a way that initiatives that are in line with the outcome of the TMT shared leadership process receive the necessary organizational support (Burgelman & Grove, 2007). Without such oversight, the tensions and selection biases at lower hierarchical level may invalidate the resolutions of TMT shared leadership resulting in resources allocated to an array of incongruent projects (Bartlett & Rangan, 1986; Schein, 2003).

Moreover, by providing a clear authority structure for lower hierarchical levels, centralization may contribute to the efficiency by which outcomes of TMT shared leadership are implemented at lower hierarchical levels. Adler (1999) argues that centralization of decision-making may help avoid chaos, inconsistencies, and duplicated efforts within organizations. Conversely, decentralization slows down strategy implementation as lower hierarchical levels may engage resources in initiatives that are not in line with the collective strategic decisions of TMTs (e.g. Pierce & Delbecq, 1977; Sheremata, 2000). Hence, centralization allows decision-makers to select new combinations of exploratory and exploitative efforts that are more aligned with the outcomes of TMT shared leadership. These arguments lead to the following hypothesis:

***Hypothesis 2:** Centralization of decision-making moderates the relationship between TMT shared leadership and organizational ambidexterity in such a way that the positive effect of TMT shared leadership is stronger in organizations with higher levels of centralization.*

Connectedness. Connectedness refers to the relational density of social networks within organizations (Jansen et al., 2006; Sheremata, 2000). It involves direct contact among organizational members irrespective of hierarchical or functional position (Atuahene-Gima, 2003; Jaworski & Kohli, 1993). Connectedness can enhance the influence of TMT shared leadership on ambidexterity as it creates a context of trust and open sharing of information within the organization (Weingart, Bennet & Brett, 1993). That is, connectedness allows knowledge flows that augment TMT shared leadership in several ways.

First, connectedness can enhance the likelihood that the TMT joint decision-making process associated with shared leadership results in viable choices of exploratory and exploitative actions. By creating a cross-organizational network of lower level specialists who

can provide objective feedback on potential initiatives, connectedness may enhance TMTs' decision-making quality (Atuahene-Gima, 2003; Menon & Pfeffer, 2003). Second, as it allows for informal interaction and direct communication across hierarchical levels (Jaworski & Kohli, 1993), connectedness may aid TMT members engaged in shared leadership to identify synergies between exploratory and exploitative actions. Increasing the knowledge of the location of various skills and competencies within the organization (Gruenfeld, Mannix, Williams, & Neale, 1996), connectedness enhances the negotiation process associated with shared leadership as it may increase TMT members' ability to identify ways to recombine existing knowledge and resources. Thus, we propose that connectedness can enhance the outcomes of TMT shared leadership in terms of stimulating ambidexterity by bridging organizational units and hierarchical levels.

Hypothesis 3: *Connectedness moderates the relationship between the TMT shared leadership and organizational ambidexterity in such a way that the effect of TMT shared leadership is stronger in organizations with higher levels of connectedness.*

4.4. Methods

4.4.1. Data Collection

We identified a random sample of 4,000 firms using the Orbis database, the most comprehensive database of Dutch companies. The sample covered a broad range of industries and includes private firms with more than 25 employees. To reduce the potential issues of single-informant bias and common method bias, we followed Posadkoff et al. (1993) and we temporarily separated the measurement of our independent and dependent variables. In 2008, a survey assessing TMT shared leadership, centralization, and connectedness was administered to the executive directors of the companies in our sample. Executive directors of 889 companies returned their questionnaire, representing a response rate of 22 percent. In 2009, approximately one year after the first survey, we mailed a second questionnaire to these 889 executive directors to assess their organization's exploratory and exploitative innovation. We received 207 usable surveys, or 23 percent of the original response. Our final sample contains organizations with a mean age of 32.21 (s.d. = 29.97) years, a mean size of 189 (s.d. = 968.76) full-time employees and that operate in various industries covering food and forestry (11%), manufacturing (24%), professional services (29%), transportation (12%), construction (12%), and other industries (12%).

In order to assess the non-response bias, we compared the respondents with non-respondents for the final sample. Results of t-tests show that the respondents do not differ significantly ($p < 0.05$) from non-respondents in terms of organizational age and organizational size. Furthermore, we find no significant differences ($p < 0.05$) between early and late respondents in terms of demographics and model variables. These analyses indicate that non-response bias is not an issue.

4.4.2. Measurement and Construct Validation

We measured the constructs of this study using multi-item scales that we adapted from existing literatures and verified their reliability and validity through various analyses. All items were measured on a seven-point scale where 1='strongly disagree' and 7='strongly agree'. Appendix 2 presents all the measurement items used in this study.

Dependent variable. *Organizational ambidexterity* refers to the simultaneous pursuit of exploratory and exploitative innovation (e.g. Gibson & Birkinshaw, 2004; Lubatkin et al., 2006). In line with this conceptualization, we measure organizational ambidexterity as the multiplicative score of exploration and exploitation. We measured exploratory and exploitative innovation by adapting existing scales from Jansen et al. (2006). Exploratory innovation ($\alpha = 0.84$) was measured by a six-item scale that captured the extent to which organizations depart from existing knowledge and develop radical innovations aimed at emerging customers or markets. Exploitative innovation ($\alpha = .81$) refers to the extent to which organizations pursue incremental innovations that address the demands of existing customers and markets and we measured it using a six-item scale.

In order to ensure the validity of our measure of organizational ambidexterity, we performed two analyses. First, exploratory factor analysis replicated the expected two-factor structure (i.e. exploration and exploitation) with all items loading on the appropriate factor (all factor loadings were above 0.60 and cross-loadings were below 0.31). Second, we compared the scores for exploratory and exploitative innovation with a three-item scale of innovativeness assessing the extent to which organizations (i) introduce many new products and services, (ii) place emphasis on product and service innovation, and (iii) experiment in the market with new products and services (Covin & Slevin 1989; $\alpha = 0.89$). The finding that both exploratory and exploitative innovation measures were positively correlated with the scale for innovativeness ($r = 0.65$, $p < 0.001$ and $r = 0.33$, $p < 0.001$, respectively) provides further evidence for the validity of the two constructs.

Independent variables. We measured *TMT shared leadership* ($\alpha = 0.89$) using an eight-item scale adapted from Manz and Sims (1987) that captures the degree to which the leadership task is distributed among the members of the TMT. We adapted a six-item scale for *centralization of decision-making* ($\alpha = 0.73$) from Breaught (1985) that captures the degree to which decision-making is concentrated in the upper hierarchical levels of the organization. *Connectedness* ($\alpha = 0.70$) was measured with a four-item scale adapted from Jaworski and Kohli (1993) and refers to the degree to which organizational members are networked to various levels of the hierarchy in their organization.

In order to verify the discriminant and convergent validity of our independent constructs, we performed several analyses for TMT shared leadership, centralization, and connectedness. First, exploratory analysis replicated the expected three-factor structure with all items loading on the appropriate factor (all factor loadings are above 0.67 and cross-loadings are below 0.27). Second, the results of a confirmatory factor analysis on all items of the three constructs (with

items restricted to load on the proposed constructs) indicate adequate fit ($\chi^2/df = 1.37$, CFI = 0.96, IFI = 0.96, RMSEA = 0.03) and all items loading on the proposed indicators were significant ($p < 0.01$). The results of the exploratory and confirmatory factor analyses provide evidence in favor of our constructs' convergent and discriminant validity.

Control variables. We account for exogenous influences on organizational ambidexterity by including relevant control variables: organizational size, age, TMT size, structural differentiation, and industry. *Organizational size* may influence the achievement of ambidexterity as larger organizations may have more resources available yet may lack flexibility. We control for organizational size by including the natural logarithm of the number of employees. As older organizations tend to exploit more than younger ones (Gilbert, 2005), we control for *organizational age* by including the natural logarithm of the number of years since the firm was founded. In line with previous studies (e.g. Carson et al., 2007), we control for *TMT size* by including the natural logarithm of the number of TMT members who are responsible for important decisions about the future of the firm. As previous studies have emphasized the importance of structural differentiation for achieving ambidexterity (e.g. Gilbert 2005, Tushman & O'Reilly 1996), we also control for the degree of *structural differentiation*. Structural differentiation ($\alpha = 0.72$) refers to the extent to which organizations segment their operations in specialized units and we measure it with a five-item scale adapted from Jansen et al. (2009). Lastly, in order to account for *industry* differences in the level of ambidexterity (e.g. He & Wong, 2004), we created six dummy variables based on the Standard Industry Classification codes: food and forestry, manufacturing, professional services, transportation, construction (used as the base group), and other industries.

4.3.3. Method Validation

To test for single respondent bias and to analyze reliability issues, we surveyed an additional member of each TMT during each round of data collection in 2008 and 2009. We received completed questionnaires from a second TMT member for 22 firms (or 11 percent of our final sample) for exploratory and exploitative innovation and for 20 organizations (or 10 percent of our final sample) for the independent variables. The average inter-rater agreement index (r_{wg}) (James, Demaree, & Wolf, 1993) for exploratory innovation (0.80), exploitative innovation (0.92), TMT shared leadership (0.92), centralization (0.84), and connectedness (0.88) indicate adequate agreement among the TMT members (LeBreton & Senter, 2008).

In order to minimize the danger of potential common method bias, we employed procedural methods in our data collection. Following Podsakoff et al.'s (2003) advice, we temporally separated the collection of the independent and the dependent variables by approximately one year. The temporal separation of measurement can reduce potential common method bias as it decreases biases in the respondents' retrieval process, lessens the respondents' ability to use previous answers to fill in recollection gaps, and makes previous answers less salient. In addition, the model we propose is less likely to suffer from common method bias as it incorporates interaction effects (i.e. two of our hypotheses are about moderating effects).

Hypotheses about interaction effects are less subjective to common-method bias because it is less likely that the respondents have a certain theory about such moderating relationships that would systematically bias their responses (Aiken & West, 1991; Harrison, McLaughlin, & Coalter, 1996).

To verify the extent to which our data is likely to suffer from common method bias, we performed several ex post statistical analyses. First, we performed Harman's single-factor test (Podsakoff & Organ, 1986) by including all items of ambidexterity (exploration and exploitation), shared leadership, centralization, and connectedness in an exploratory factor analysis. As the first factor accounts only for 20 percent of the total variance, there is no evidence of unidimensionality in our data. Second, we analyzed the potential issue of common method bias by using Podsakoff et al.'s (2003: 894) approach of controlling for an unmeasured latent factor. We performed a CFA analysis of all items of our independent and dependent variables on which we let the items load on both their theoretical constructs and on a latent common method variance factor. The analysis shows that all items load significantly on their theoretical constructs even after the inclusion of the latent factor, thus, indicating that common method bias is not a serious problem. In sum, we used ex ante procedural methods in the study design to reduce potential common method bias and ex post statistical analyses indicate that common method bias is not likely in this study.

4.5. Analysis and results

We test the proposed relationships using Ordinary Least Squares regression (OLS). Pre-regression analyses of the plots of standardized residuals versus predicted values and the normal probability plot of standardized residuals indicate that there are no serious violations of the major regression assumptions. In order to prevent multicollinearity prevalent when testing moderating hypotheses, we mean centered the independent variables before constructing the interaction terms entered in the full model (Aiken & West, 1991). Post-regression statistics show that there is no indication of multicollinearity as the highest variance inflation factor (i.e. 2.7) is well below the commonly-used cut-off value of 10 (Neter, Wasserman, & Kutner, 1990). In Table 2 we present the descriptive statistics for the model variables and in Table 3 we present the regression results. We discuss the results of Model 4, the full model.

Table 14. Descriptive statistics and correlations^a – Study 4

	Mean	s.d.	1	2	3	4	5	6	7	8	9	10	11	12	13
1. Ambidexterity	24.05	8.26	-												
2. Shared leadership	5.25	0.88	0.30	-											
3. Centralization of decision-making	4.08	0.96	-0.17	-0.18	-										
4. Connectedness	5.49	0.78	0.16	0.44	-0.20	-									
5. Organizational size ^b	5.24	1.04	0.05	-0.05	-0.01	-0.11	-								
6. Organizational age ^b	3.47	0.78	0.01	-0.04	0.09	-0.08	0.06	-							
7. TMT size ^b	1.59	0.47	0.06	0.08	0.02	0.07	0.38	0.07	-						
8. Structural differentiation	4.28	1.21	0.24	0.21	-0.06	0.06	0.18	-0.10	0.26	-					
9. Food and forestry	0.11	0.32	0.20	0.07	0.03	0.03	0.09	0.20	0.00	0.03	-				
10. Manufacturing	0.24	0.43	0.01	-0.08	0.08	-0.19	0.04	0.10	-0.07	0.03	-0.20	-			
11. Transportation	0.10	0.31	-0.03	-0.09	0.02	-0.12	-0.13	0.04	-0.06	0.04	-0.12	-0.19	-		
12. Professional services	0.12	0.33	-0.07	0.08	-0.04	0.19	-0.01	-0.31	0.18	-0.05	-0.23	-0.37	-0.23	-	
13. Construction	0.30	0.46	-0.02	-0.05	-0.07	0.07	0.02	0.09	-0.02	-0.01	-0.13	-0.21	-0.13	-0.24	-
14. Other industries	0.12	0.33	-0.06	0.05	-0.03	0.00	-0.02	-0.01	-0.09	-0.03	-0.13	-0.21	-0.13	-0.24	-0.14

^a N=207. Correlation coefficients above |0.14| are significant at the $p < 0.05$.

^b Natural logarithm

Table 15. Results of the hierarchical regression analysis for organizational ambidexterity^a – Study 4

Variable	Organizational Ambidexterity			
	Model 1	Model 2	Model 3	Model 4
<i>Control variables</i>				
Organizational size ^b	-0.02	0.00	0.02	-0.01
Organizational age ^b	-0.02	0.00	-0.01	-0.01
TMT size ^b	0.01	0.01	0.00	0.05
Structural differentiation	0.23**	0.21**	0.17*	0.18*
Food and forestry	0.20*	0.21*	0.18*	0.21*
Manufacturing	0.03	0.08	0.06	0.07
Transportation	-0.02	0.02	0.02	0.00
Professional services	-0.03	-0.02	-0.04	-0.01
Other industries	-0.03	-0.02	-0.04	-0.03
<i>Moderating variables</i>				
Centralization of decision-making		-0.15*	-0.13 [†]	-0.14*
Connectedness		0.13	0.04	0.03
<i>Main effect</i>				
TMT shared leadership			0.22**	0.26***
<i>Interaction effects</i>				
TMT shared leadership X centralization of decision-making				0.14*
TMT shared leadership X connectedness				0.25***
R ²	0.10	0.14	0.18	0.25
Δ R ²	0.10	0.04	0.04	0.07
Adj. R ²	0.06	0.09	0.13	0.20

^a N=207. Standardized coefficients are reported.

^b Natural logarithm

* p < 0.05

** p < 0.01

*** p < 0.001.

Results show support for the proposed positive effect of TMT shared leadership on organizational ambidexterity, our Hypothesis 1, as the coefficient of TMT shared leadership is significant and positive ($\beta = 0.26$, $p < 0.001$). It is important to note that the effect of TMT shared leadership is statistically significant even though structural differentiation is included in the regression model. This suggests that TMT shared leadership is an importance antecedent of ambidexterity as its effect is in addition to that of structural differentiation, the classical solution to ambidexterity. Hypothesis 2 proposed that TMT shared leadership has a stronger positive effect on ambidexterity in organizations with higher degrees of centralization. Our results are in line with the proposed moderating role of centralization as the interaction coefficient is positive and significant ($\beta = 0.14$, $p < 0.05$). Lastly, the positive moderating role of connectedness proposed in Hypothesis 3 is statistically supported ($\beta = 0.25$, $p < 0.001$), indicating that TMT shared leadership is more effective in stimulating ambidexterity in organizations with higher levels of connectedness.

In order to aid interpretation, we plot the interaction effects (Aiken & West, 1991). The high and low values of TMT shared leadership and those of the moderating variables are calculated as one standard deviation above and below the mean, respectively. Figure 1 shows that TMT shared leadership is more effective in enhancing ambidexterity in organizations with high centralization than in those with low centralization. In other words, especially centralized organizations appear to benefit from TMT shared leadership in terms of ambidexterity levels. It is also important to note that organizations with high and low centralization can reach similar levels of ambidexterity when TMT members engage in shared leadership. Figure 2 corroborates our expectation that the positive influence of shared leadership on ambidexterity is greater in organizations with a high degree of connectedness among their members. The interaction graph also indicates that organization with high TMT shared leadership and high connectedness reach relatively high levels of ambidexterity.

4.5.1. Robustness Test

In order to further verify our findings, we performed a post-hoc analysis using the sum of the exploratory and exploitative innovation as an alternative measure for organizational ambidexterity (Lubatkin et al., 2006). The results of this additional analysis replicated previous findings and showed that TMT shared leadership is positively related to organizational ambidexterity ($\beta = 0.28$, $p < 0.001$). Moreover, this relationship is contingent upon centralization of decision-making ($\beta = 0.16$, $p < 0.05$) and connectedness ($\beta = 0.24$, $p < 0.001$).

4.6. Discussion and Conclusion

While research has shown that ambidextrous organizations may sustain financial performance, it also noted that balancing exploration and exploitation is difficult as it requires paradoxical capabilities (e.g. March, 1991). Drawing on emergent research in leadership theory, our study

Figure 7. The moderating effect of centralization of decision-making

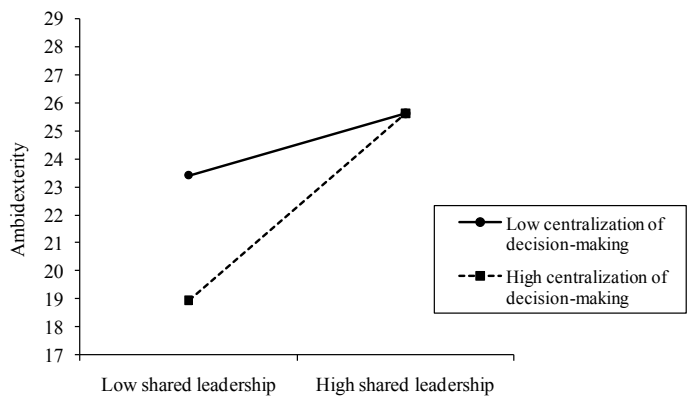
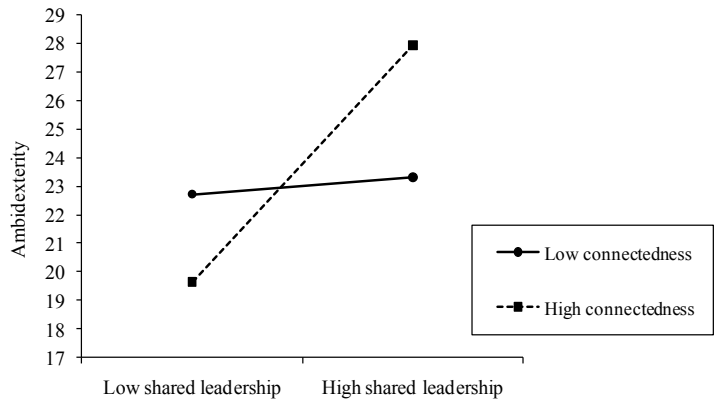


Figure 8. The moderating effect of connectedness



proposes TMT shared leadership as a potential solution for overcoming the tensions between exploration and exploitation. In addition, we suggest that organizational structure has important implications for the effectiveness of leadership behavior in achieving ambidexterity. Our study has several interesting and important implications both for theory and practice.

4.6.1. Implications for theory

The empirical findings support the idea that *TMT shared leadership* facilitates the achievement of organizational ambidexterity. By proposing TMT shared leadership as a solution for resolving the paradoxical demands between exploration and exploitation, our study contributes to prior understanding of the importance of TMTs for achieving ambidexterity (e.g. Carmeli & Halevi, 2009; Smith & Tushman, 2005; Tushman & O'Reilly, 1996). Accordingly, our study advances Smith and Tushman's (2005) notion that there are different implications for achieving organizational ambidexterity depending on whether the responsibility for resolving the tensions between exploration and exploitation resides with the chief executive or with the entire TMT. Our results indicate that when TMT members share the responsibilities of leadership such as deciding on strategic alternatives and motivating peers, they find it easier to reconcile conflicting demands associated with pursuing exploratory and exploitative innovation simultaneously. Shared leadership facilitates team dynamics that reduce TMT members' perceived competition among each other, and when the collaborative TMT behaviors are emulated at lower hierarchical levels, organizational members are encouraged to leverage synergies across exploratory and exploitative efforts. Implementing shared leadership behavior may engage TMT members in balanced decision-making and instill a sense of responsibility for the overall performance of the organization. Interestingly, we find that TMT shared leadership can complement the structural solution for ambidexterity (Benner & Tushman, 2003; Jansen et al., 2008) as both TMT shared leadership and structural differentiation had positive and statistically significant influences on organizational ambidexterity. This is an important finding because the main proposition of our study, i.e. that shared leadership can help reconcile the tensions between exploration and exploitation, appears compatible with previous solutions of ambidexterity. Also, our findings complement previous research that proposed TMT characteristics as antecedents of ambidexterity (e.g. Beckman, 2006; Carmeli & Halevi, 2009; Lubatkin et al., 2006) by focusing on TMTs' actions. That is, we show that there are specific actions in which TMT members can engage in order to reduce the perceived tensions between exploration and exploitation.

Our findings regarding the main effect of TMT shared leadership also contribute to leadership theory. Our study provides important theoretical insights and empirical evidence towards establishing shared leadership as a promising TMT-level construct (Enseley et al., 2006). In addition, our findings advance the understanding of organizational-level consequences of shared leadership (Denis et al., 2001; Enseley et al., 2003) by analyzing its potential to stimulate organizational ambidexterity.

In addition, our findings highlight *the contingency role of the organizational structure* in shaping the effectiveness of TMT shared leadership for achieving organizational ambidexterity.

While prior studies have considered leadership and organizational structure in isolation, our study provides a contingency perspective and reveals that formal and informal structures provide important boundary conditions for the effectiveness of TMT shared leadership in enabling organizational ambidexterity. By doing so, we answer recent calls for a better understanding of how and under what conditions managerial antecedents may lead to organizational ambidexterity (Raisch & Birkinshaw, 2008). More specifically, we delineate between formal and informal structural elements and argue that each has important implications for the impact of TMT shared leadership on the implementation of complex strategies across hierarchical levels.

Our empirical results provide support for the hypothesized positive moderating role of *centralization of decision-making*. That is, we find that TMT shared leadership is more effective in enhancing ambidexterity in organizations that are more centralized. However, it is important to note that although centralization positively moderates the effect of TMT shared leadership on ambidexterity, the main effect of centralization on ambidexterity is negative and significant. This result is in line with the idea that by restricting the autonomy of organizational members, centralization limits the quantity and quality of ideas generated (Sheremata, 2000). This double-edged sword nature of centralization emphasizes the importance of considering the *interplay* between leadership and formal structural elements for achieving ambidexterity. Thus, where more centralized organizations have lower levels of ambidexterity, TMT shared leadership appears to enhance their levels of ambidexterity to the same level of that achieved in decentralized organizations. In other words, our empirical findings suggest that centralized organizations would benefit more from implementing TMT shared leadership than less centralized organizations.

Our study also finds that *connectedness* enhances the effectiveness of TMT shared leadership in stimulating ambidexterity. This result highlights the importance of direct contact among organizational members at various hierarchical levels for achieving organizational ambidexterity. Building on the assertions that connectedness encourages the exchange of information (Jaworski & Kohli, 1993) and that it facilitates the integration of dispersed knowledge into collective action (Sheremata, 2000), our study's results suggest that connectedness creates a conducive context for the successful materialization in exploratory and exploitative innovation of the collaborative behaviors associated with TMT shared leadership. By doing so, our study advances the understanding of how direct relationships among organizational members influence the success of leadership actions as it points out that the success of TMT shared leadership requires a supportive network of relationships across the organization. In this sense our study reinforces existing assertions regarding the importance of informal relationships among organizational members for achieving desired organizational outcomes (e.g. Krackhardt & Hanson, 1993).

Overall, our study reveals that TMT shared leadership holds great potential to stimulate organizational ambidexterity and that its effectiveness depends on formal and informal structures. In this sense, our study emphasizes the importance of the interplay between leadership behavior and organizational structures. While previous studies proposed that leadership behavior

(e.g. Smith & Tushman, 2005) and organizational structure (e.g. Jansen et al., 2009; Tushman & O'Reilly, 1996) influence organizational ambidexterity, our study shifts attention to the interplay between the two.

4.6.2. Implications for practice

Our study has some interesting implications for practice. Extensive research suggests that while ambidexterity is important for long-term business performance, organizations find it difficult to engage in both exploration and exploitation (e.g. Gibson & Birkinshaw, 2004; He & Wong, 2004). Our study informs practice of a potential managerial solution for reducing or even overcoming the hurdles to achieving ambidexterity. We put forward and find empirical evidence for the idea that organizations with TMTs that engage in the practice of shared leadership may be able to achieve higher levels of both exploration and exploitation. Our results suggest that organizations that aim to become ambidextrous could implement measures at the TMT level that encourage behaviors associated with shared leadership such as joint decision-making and the exertion of mutual motivational influence. Perhaps, organizations could entice the *entire* senior team to participate in major strategic and operational decisions. In addition, organizations could invest in programs that prepare senior executives to motivate not only downwards but also laterally (i.e. motivate each other).

Particularly relevant for practice is that TMT shared leadership should not be considered an universal solution for achieving ambidexterity. That is, TMT shared leadership can achieve its full potential in organizations that have specific formal and informal structural elements. Our study suggests that TMT shared leadership is most effective in encouraging ambidexterity in organizations that have higher degrees of centralization and those whose members have high connectedness.

4.6.3. Limitations and future research

Although this study makes important contributions, there are several limitations that need to be considered and addressed in future research. First, a methodological limitation of this study is the measuring of TMT shared leadership by a single respondent, i.e. the chief executive, instead of collecting data from all TMT members. While we collected data from multiple respondents for about ten percent of the firms in our data and we found very high inter-rater agreement, it would have been preferred for the measurement to echo the fact that shared leadership is a group-level construct. However, previous studies that collected shared leadership data from multiple respondents have done so for groups at lower hierarchical levels, not for TMTs (Carson et al., 2007). Collecting data from TMTs is considerably more challenging than from individuals/groups at lower hierarchical levels in the organization (c.f. Cychota and Harrison, 2006). While collecting data from all TMT members may be desirable, some studies have actually raised questions about the added value of multiple respondents in TMTs. For instance, regarding measuring cognitive diversity in TMTs, Miller, Burke, and Glick (1998:52) found that

”obtaining perceptions of cognitive diversity from the chief executive yielded the same results as obtaining objective data from each executive and creating diversity measures from those data”.

Second, although we took great care to minimize common method and single-respondent bias by temporally separating data collection and we made use of multiple respondents, future studies could attempt to provide a longitudinal analysis in order to increase confidence in the causal claim of our model. Third, longitudinal research might also provide interesting insights into the life-cycle consequences of TMTs that engage in shared leadership in terms of achieving ambidexterity. Although several studies suggest that team life-cycle has important consequences for the performance of teams that engage in shared leadership, there is little understanding and a paucity of empirical evidence on this issue (Carson et al., 2007; Pearce & Conger, 2003).

Fourth, although existing research contends that TMT characteristics can play a key role in influencing TMTs’ ability to successfully engage in shared leadership, our study does not consider such contingencies. For instance, in a study of several cases of TMT shared leadership in large organizations, O’Toole, Galbraith, and Lawler (2003) argue that both the personalities and the area of expertise of the TMT members are crucial in the effectiveness of shared leadership. Analyzing how TMT composition and informational diversity alter the effectiveness of shared leadership for achieving organizational ambidexterity would provide interesting complementing insights to those of our study by advancing the understanding of the boundary conditions of shared leadership.

In conclusion, our study answers calls for a better understanding of how organizations can simultaneously pursue exploratory and exploitative innovations by proposing TMT shared leadership as an antecedent of organizational ambidexterity. In addition, our study provides important insights regarding the effectiveness of TMT shared leadership in stimulating ambidexterity in various organizational structures.

APPENDIX 2
Questionnaire Items – Study 4

Exploratory innovation (Jansen et al., 2006)

- (1) Our organization accepts demands that go beyond existing products and services
- (2) We invent new products and services
- (3) We experiment with new products and services in our local market
- (4) We commercialize products and services that are completely new to our organization
- (5) We frequently utilize new opportunities in new markets
- (6) Our organization regularly uses new distribution channels

Exploitative innovation (Jansen et al., 2006)

- (1) We regularly implement small adaptations to existing products and services
- (2) We introduce improved, but existing products and services for our local market
- (3) We improve our provision's efficiency of products and services
- (4) We increase economies of scales in existing markets
- (5) Our organization expands services for existing clients
- (6) Lowering costs of internal processes is an important objective

Shared Leadership (Manz and Sims, 1987)

- (1) TMT members call on each other to draw on common goals
- (2) TMT members jointly determine the implementation of new business
- (3) TMT members are jointly responsible for setting strategic objectives
- (4) TMT members encourage each other to high expectations in the work
- (5) TMT members call each other to make critical decisions
- (6) TMT members encourage each other to jointly evaluate business performance
- (7) TMT members encourage each other to mutually cooperate
- (8) TMT members collectively determine the planning of major operations

Centralization of decision-making (Breaught, 1985)

- (1) Employees can develop their own work procedures ®
- (2) Employees are free to choose what methods work takes place ®
- (3) Within our organization, employees cannot affect the scheduling of major activities
- (4) Employees cannot adjust their goals independently
- (5) Within our organization, employees can affect what goals should be achieved ®
- (6) Employees have influence on how our performance is evaluated ®

Connectedness (Jaworski & Kohli, 1993)

- (1) In our organization, there is ample opportunity for informal "hall talk" among employees
- (2) Employees from different departments feel comfortable calling each other when the need arises
- (3) People around here are accessible to each other
- (4) In this organization, it is easy to talk with virtually anyone you need to, regardless of rank or position

Structural differentiation (Jansen et al., 2009)

- (1) Our business units are specialized in specific functions and/or markets
- (2) We serve our customers' needs from separate departments
- (3) The line and staff departments are clearly separated within our organization
- (4) Our organization has separate units to enhance innovation and flexibility
- (5) We have units that are either focused on the short term or the long term

^a All items are measured on a seven-point scale where 1 = strongly disagree and 7 = strongly agree; ® reversed item

CHAPTER 6

DISCUSSION AND CONCLUSION

6.1. Introduction

Innovation is particularly important for firms' long-term performance and competitiveness (e.g. Geroski, Machin, & Van Reenen, 1993; Hall, 2000). In an effort to understand how to enhance innovativeness, extant research has considered not only various types of innovation, but also various dimensions of innovation. This dissertation acknowledges and contributes to this multifaceted conceptualization of innovation by considering two types of innovation – (i) product/service and (ii) management innovation. In addition, this dissertation considers several dimensions of innovation: (i) magnitude of both product/service and management innovation in Studies 1, 2, and 3, and (ii) newness in Study 4, which considers exploratory and exploitative innovation. Acknowledging and furthering this multifaceted conceptualization of innovation is particularly important in stimulating further research to fine-tune the concept and in highlighting the importance for firms to develop an innovation strategy that deals with the complex decisions regarding innovation.

In addition, this dissertation attempts to advance the understanding of the antecedents of innovation by investigating managerial and organizational antecedents and especially their interrelation. Extant research proposes organizational (e.g. Atuahene-Gima, 2003; Sheremata, 2000; West et al., 1998) and managerial (e.g. Damanpour, 1991; King et al., 1992; Madjar et al., 2002; Nystrom 1990; West and Anderson, 1992) determinants of innovation, but it has primarily considered each type of determinant in isolation. By considering the interrelation between organizational and managerial determinants, I aim to advance a more nuanced understanding of the factors that influence innovation. The four studies included in the dissertation approach this main research question from different angles. While studies 1 and 2 propose organizational

antecedents of innovation and investigate the contingency role of managerial factors, studies 3 and 4 consider managerial determinants of innovation and propose organizational moderators. These studies aim to suggest that the factors affecting innovation are highly contextual and, from a managerial perspective, firms should not consider any one antecedent as a panacea for their innovation programs but rather analyze various antecedents based on a firm-wide analysis of structure and management.

In the next section, I will summarize the main findings and contributions of each of the four studies and then I will highlight the overarching theoretical contributions of this dissertation. I continue with a presentation of the managerial implication of this dissertation. Then, I discuss the main overall limitations of the dissertation and the potential avenues for future research. Finally, I provide a brief conclusion of this dissertation.

6.2. Summary of the findings and contributions

6.2.1 Study 1

In the context of an ever-increasing popularity of offshoring as firms strive to increase cost savings, Study 1 points out that offshoring can act as a mechanism to enhance firms' ability to introduce new products and services, but it also has the potential of harming firms' innovativeness. In other words, Study 1 contributes to a better understanding of the antecedents of innovation by putting forward theoretical arguments for offshoring as an important determinant. Specifically, I provide theoretical arguments for distinct influences of offshoring different types of services – knowledge-intensive services (KIS) and labor-intensive services (LIS). I argue that the offshoring of KIS can enhance a firm's ability to introduce new products and services as it provides access to skilled labor at low costs (Quinn, 2000) and to a wide range of offshore knowledge sources (Li *et al.*, 2008). However, offshoring KIS it may also decrease firms' ability to transform new knowledge into innovations (Teece, 1987). Offshoring LIS can enhance the introduction of new products and services as it allows the firms to focus on knowledge-generating activities and it provides cost-savings that can be relocated to innovation-related activities. In this way, the study contributes to establishing offshoring as an important antecedent of innovation as it addresses previously incongruent findings and contradictory argumentation (Doh, 2005; Li, Liu, Li, & Wu, 2008; Ramamurti, 2004; Youngdahl *et al.*, 2008).

Furthermore, this study provides a managerial contingency perspective arguing that the way TMTs oversee the offshoring process will condition the consequences of offshoring KIS and LIS. By proposing TMT reflexivity as an important moderator, we support existing assertions regarding the role of TMTs in international sourcing (Fey and Furu, 2008). Table 18 provides a summary of the propositions put forward in Study 1.

Table 16. Propositions of Study 1

Proposition
There is an inverted U-shaped relationship between offshoring KIS and the level of firm innovation.
There is a positive relationship between offshoring LIS and the level of firm innovation.
The degree of integration with offshore operations moderates the relationship between offshoring KIS and the level of innovation in such a way that it enhances the positive effect of low levels of offshoring and reduces the negative effect of high levels of offshoring on firm innovation.
The degree of integration with offshore operations moderates the relationship between offshoring LIS and the level of innovation in such a way that offshoring LIS is associated with higher levels of innovation in firms that use lower degrees of integration.
TMT reflexivity moderates the relationship between offshoring KIS and the level of innovation in such a way that it enhances the positive effect of low levels of offshoring and reduces the negative effect of high levels of offshoring on firm innovation.
TMT reflexivity moderates the relationship between the offshoring of LIS and the level of innovation in such a way that offshoring is associated with higher levels of innovation in firms whose TMTs are more reflexive.

6.2.2 Study 2

Study 2 extends the contributions of Study 1 as it provides an empirical test of offshoring as an antecedent of innovation. This study seeks to explain how and under what conditions offshoring enhances firms' innovative performance. I specifically propose that the offshoring of those business functions that are the primary providers of knowledge (i.e. production, R&D, and engineering) has an inverted U-shaped influence on the introduction of new products and services. Thus, this study advances offshoring as an antecedent of innovativeness as it not only integrates and reconciles the opposing perspectives in extant literatures, but also finds empirical evidence to support this nonlinear conceptualization.

In addition, Study 2 contributes to establishing the link between upper echelon and innovation literatures by highlighting and clarifying the role of TMT in international sourcing (Fey and Furu, 2008). I argue that TMT attributes influence the extent to which firms may capitalize on the opportunities of offshoring. In this way, the study highlights the interconnectedness of upper echelon and innovation literatures by emphasizing the importance of the *interplay* between TMT strategic choices and TMT attributes in determining a firm's ability

to introduce new products and services. The study answers a call for a better understanding of how senior executives influence the effectiveness of sourcing across national borders (Foss and Pedersen, 2004) as it complements the existing view that TMTs are crucial to organizational outcomes (e.g. Cannella, Park, and Lee, 2008; Simons, Pelled and Smith, 1999).

Table 19 provides a summary of the relationships proposed in Study 2 and the results of the empirical tests.

Table 17. Hypotheses and results of Study 2

Hypothesis	Result
The extent of offshoring primary functions has an inverted U-shaped relationship with firm innovativeness.	Supported
TMT informational diversity moderates the inverted U-shaped relationship between the extent of offshoring primary functions and firm innovativeness in such a way that the inverted U-shaped relationship will be steeper in firms with high TMT informational diversity than in firms with low TMT informational diversity.	Supported
TMT shared vision moderates the inverted U-shaped relationship between the extent of offshoring primary functions and firm innovativeness in such a way that the inverted U-shaped relationship will be flatter in firms with high TMT shared vision than in firms with low TMT shared vision.	Partly supported

6.2.3. Study 3

Whereas the previous three studies addressed the question of how to enhance product/service innovation, Study 3 advanced theory on the antecedents of *management* innovation. The extant findings in the literature regarding the positive role of management innovation for firm performance (e.g. Mol and Birkinshaw, 2009), raise the question of how to stimulate changes in management practices, processes, and structures. This study proposes and finds empirical evidence that TMT reflexivity and TMT minority dissent are important determinants of management innovation. These findings contribute to theory on the leadership antecedents of management innovation as they complement existing studies regarding the role of TMTs in stimulating management innovation (e.g. Vaccaro et al., 2012). As such, the findings of Study 4 make an important step towards establishing the upper echelons as an important locus for introducing management innovation.

In addition, this study finds evidence that the effectiveness of TMT reflexivity and minority dissent for enhancing management innovation depends on the organizations' level of absorptive capacity. This finding is quite interesting as it highlights that the successful introduction of management innovation depends on the interaction between TMT learning processes and organizational learning capacity. This finding also contributes to the absorptive capacity literature as while existing research has started to uncover the contingency role of absorptive capacity in the case of technological innovation (e.g. Rothaermel and Alexandre, 2009; Stock, Greis, and Fischer, 2001), it considerably lacks behind in the case of management innovation. Thus, this not only advances the understanding of the contextual complexities of introducing new management practices, but also it contributes to the research on absorptive capacity by showing that the contingency role of absorptive capacity extends to the introduction of new managerial practices.

Table 20 provides a summary of the hypothesis tested in Study 3.

Table 18. Hypotheses and results of Study 3

Hypothesis	Result
There is a positive relationship between TMT reflexivity and management innovation.	Supported
There is a positive relationship between TMT minority dissent and management innovation.	Supported
Absorptive capacity moderates the relationship between TMT reflexivity and management innovation in such a way that the relationship is stronger for firms with higher rather than lower levels of absorptive capacity.	Supported
Absorptive capacity moderates the relationship between TMT minority dissent and management innovation in such a way that the relationship is stronger for firms with higher rather than levels of absorptive capacity.	Supported

6.2.3. Study 4

This study advances the understanding of the antecedents of innovation by proposing TMT shared leadership as a determinant of organizational ambidexterity. The finding that TMT shared leadership is associated with higher levels of ambidexterity extends the literature on the leadership solutions for ambidexterity (c.f. Raisch & Birkinshaw, 2008) by showing that in addition to the previous findings of TMT characteristics (Beckman, 2006; Carmeli & Halevi,

2009; Jansen et al., 2008; Lubatkin et al., 2006; Tushman & O'Reilly, 1996), TMT processes are also important for balancing exploration and exploitation.

In addition, this study answers a call for more research on the boundary conditions concerning the determinants of organizational ambidexterity (Raisch & Birkinshaw, 2008). Building on the idea that organizational structure has important implications for the effectiveness of leadership (e.g. Jung, Wu & Chow, 2008), it provides a rich understanding of the role of TMT shared leadership as an enabler of organizational ambidexterity by considering its effectiveness under different organizational structures. Specifically, the empirical results indicate that TMT shared leadership behavior is particularly effective in stimulating ambidexterity in organization with specific formal and informal structures. This advances current understanding of how firms can simultaneously engage in exploration and exploitation as previous studies have considered leadership solutions (e.g. Beckman, 2006; Lubatkin et al., 2006) and organizational structure (e.g. Tushman & O'Reilly, 1998; Jansen, Tempelaar, Van Den Bosch, & Volberda, 2009) independently of one another. The contingency view adopted in Study 4 acknowledges the importance of both leadership and structure for pursuing ambidexterity and the empirical findings provide evidence that leadership behavior and organizational structure *jointly* determine the ability of firms to achieve ambidexterity.

Table 21, provides a summary of the relationship proposed in Study 4 and the results of the empirical tests.

Table 19. Hypotheses and results of Study 4

Hypothesis	Result
There is a positive relationship between the TMT shared leadership and organizational ambidexterity.	Supported
Centralization of decision-making moderates the relationship between TMT shared leadership and organizational ambidexterity in such a way that the positive effect of TMT shared leadership is stronger in organizations with higher levels of centralization.	Supported
Connectedness moderates the relationship between the TMT shared leadership and organizational ambidexterity in such a way that the effect of TMT shared leadership is stronger in organizations with higher levels of connectedness.	Supported

6.3. Overarching theoretical contributions

The aim of this dissertation was to advance the understanding of how firms can stimulate innovation by proposing managerial and organizational determinants and considering their interrelations. Specifically, this dissertation aims to contribute to a more advanced understanding of how firms can enhance their innovativeness whether that is in terms of introducing (a) new products or services or (b) new management practices, processes, and structures. Thus, the main contributions of this dissertation are to the literature on the determinants of innovation.

6.3.1. Proposing organizational determinants of innovation

Contribute to organizational change literature by advancing the understanding of how firms innovate. Specifically, in this thesis, I propose several internal contextual factors (Armenakis and Bedeian, 1999) that affect firms' ability to innovate. Following previous conceptualizations (c.f. Crossan and Apaydin, 2010), I recognize that the internal contextual factors of change can be both organizational and managerial.

This dissertation highlights the importance of organizational antecedents of innovation. Extant research has proposed structural factors such as centralization (Damanpour, 1991), connectedness (Atuahene-Gima, 2003; Sheremata, 2000), formalization (West, Smith, Feng, and Lawthom, 1998), specialization (e.g. Damanpour, 1991), complexity (Kinberly, 1981), or modularity (Ethiraj, Levinthal, and Roy, 2008). Studies 1 and 2 contribute to this dialog by providing insights about a complementary question of organizational design – i.e. where to perform certain business functions. Specifically, this thesis shows that whether certain functions are performed at the home or at foreign locations affects firms' ability to use existing and new knowledge to introduce new products and services. Considering the geographical aspect of the organizational structure is not only a theoretical, but also a timely managerial contribution as the business environment is characterized by mounting pressures to optimize the value chain by disentangling business functions and geographically sourcing processes from those international locations that provide specific comparative advantages.

Studies 1 and 2 contribute to the understanding of how the geographical aspect of the organizational structure affects organizational change by proposing offshoring as an important antecedent of innovation in products and services and finding supporting empirical evidence. While research has previously proposed a link between the geographical disaggregation of business functions and innovation (e.g. Doh, 2005; Ramamurti, 2004; Youngdahl et al., 2008), the theoretical arguments were contradictory and empirical findings were inconclusive regarding the direction of the effect of offshoring on innovation. This thesis provides a more nuanced understanding of the role of offshoring as an antecedent of innovation as it reconciles the positive (Li *et al.*, 2008; Venkatraman, 2004) and negative (Teece, 1987) arguments. By proposing a nonlinear (i.e. inverted U-shaped) effect, I show that the previous opposing assertions are valid, but their applicability depends on the level of offshoring.

That is, studies 1 and 2 contribute to the understanding of how firms can enhance innovativeness by showing that, at low levels, offshoring is an important mechanism to access valuable tangible or intangible resources that either augment or complement firms' existing resource stock, thus, aiding firms in developing their combinative capabilities (Sirmon, Hitt, and Ireland, 2007). By sourcing certain functions from the foreign locations that offer specific advantages in terms of expertise or labor costs, offshoring can enhance firms' ability to recombine existing and newly acquired knowledge in order to develop new products and services (Teece, Pisano, and Shuen, 1997). Importantly, this thesis also raises some warning signs regarding the potential negative effect of high levels of offshoring on innovation. In other words, we find evidence that while at low levels offshoring can enhance innovation, over-offshoring poses the risk of reduced innovative outcomes. Therefore, this thesis indicates that organizational structure matters as the geographical disaggregation of business functions provides important opportunities to enhance innovation, but it also has the potential of reducing the ability of firms to introduce new products and services.

6.3.2. Proposing managerial determinants of innovation

Ignited by Hambrick and Mason's (1984) argument that TMT's demographic characteristics affect strategic decision making and organizational outcomes, upper echelon research has shown that TMTs are crucial to organizational outcomes (e.g. Cannella, Park, and Lee, 2008; Simons, Pelled and Smith, 1999). The idea that "TMT members are the strategists who set the direction of firms" (Pegels, Song, and Yang, 2000: 911) and the considerable evidence indicating the influence of TMTs on organizational outcomes point out the importance of advancing the knowledge regarding how TMTs' actions influence firm-level innovation.

This thesis makes important advancements in this direction as they uncover a positive relationship between TMT processes and innovation. Study 3 shows that *TMT reflexivity* and *TMT minority dissent* are associated with higher levels of management innovation. The finding that TMT reflexivity and minority dissent are associated with more introduction of new managerial practices, processes, and structures contributes new evidence to the very limited, albeit growing, research on the managerial antecedent of management innovation (i.e. Vaccaro et al., 2010). This is a particularly important contribution as it shows that TMTs play an important role in stimulating not only product/service innovation but also management innovation. In so doing, this thesis reinforces claims about the role of "human agency" in the introduction of management innovations (Birkinshaw et al., 2008).

In addition, Study 4 finds evidence that *TMT shared leadership* enhances firms' ability to simultaneously engage in higher levels of exploration and exploitation. As it can enhance behavioral integration (Carmeli, Schaubroeck, & Tishler, 2011) and facilitate the selection of complex strategic options (Finkelstein and Hambrick, 1996; Perry, Pearce, & Sims, 1999), TMT shared leadership reduces the tension between exploratory and exploitative innovation and, thus, enhances the likelihood that firms become ambidextrous.

By putting forward theoretical arguments and finding supporting empirical evidence of the role of shared leadership, reflexivity, and minority dissent within the TMT as determinants of both product/service and management innovation, this thesis provides insights into how TMT behaviors oriented at team functioning affect innovation. Research so far has been somewhat biased toward TMT behaviors aimed towards organizational members at lower hierarchical levels. For instance, previous studies argue that TMTs can influence innovation by providing support for experimentation (Damanpour, 1991; King et al., 1992; Nystrom 1990; West and Anderson, 1992), creating a learning environment that tolerates failed idea (Madjar et al., 2002; Shalley and Perry-Smith, 2001), or implementing risk-taking norms (King et al., 1992; West and Anderson, 1992). In this thesis, I find that TMT processes associated with team functioning are also important for innovation. While undoubtedly, these processes eventually have consequences for organizational members outside of the TMT, they primarily reflect TMT functioning. In other words, this thesis complements the view that leaders affect innovation outcomes by influencing the behavior of those at lower hierarchical levels, by proposing that the processes *within* the TMT can also affect innovation outcomes.

6.3.3. Considering the interrelations between organizational and managerial factors

A primary motivation of this thesis was to uncover how the interrelation between organizational and managerial factors affects innovation. To this end, the studies of this thesis build towards a framework that considers not only determinants of innovation, but also the interaction between managerial and organizational factors. As all studies found empirical evidence supporting this contingency perspective, this thesis highlights the highly contextual nature of the antecedents of innovation.

First, in order to provide a nuanced understanding of how organizational structure affects innovation, studies 1 and 2 argued that the effectiveness of offshoring depends on TMT characteristics. Drawing on upper echelon research suggesting that TMTs' attributes and actions alter the effectiveness of firm actions (e.g. Finkelstein and Hambrick, 1996; Vissa and Chacar, 2009), I proposed that TMT processes (Study 1) and attributes (Study 2) affect how firms perceive and use the opportunities that arise from offshoring. Thus, in these two studies, I show that considering only structural determinants of innovation provides an incomplete picture as the relationship between offshoring and innovation takes different shapes depending on the TMTs' characteristics. Considering managerial contingencies advances innovation literature as it enables a more detailed understanding of offshoring's influence. More generally, it acknowledges that where certain organizational structures create a potential – as in the case of offshoring –, the extent to which that potential materializes in new products and services depends on the characteristics of the senior executive team.

Second, in order to advance a more advanced understanding of TMT antecedents of innovation, it is important to uncover under what conditions the actions of TMTs are likely to lead to more innovation. Carpenter (2002: 276) argues that “there is ample behavioral and social

psychological research to suggest that any link between TMT demographic characteristics and substantive outcomes will likely be affected by a top team's situation". In other words, the effectiveness of TMT actions depends on contextual factors. Other research has acknowledged and answered the call for a contingency perspective of the effectiveness of TMT actions (e.g. Jung, Wu & Chow, 2008).

This thesis picks up this inquiry by arguing that the organizational structure is an important contingency for the effect of TMT processes on firm innovativeness. Both Study 3 and Study 4 show that the influence of TMT processes on innovation is contingent on organizational factors. Study 3 shows that the influence of TMT learning processes on management innovation is enhanced when firms have higher absorptive capacity, as there are important complementarities between TMT learning processes the organization's learning capacity. In addition, Study 4 finds that the effectiveness of TMT shared leadership in enhancing ambidexterity depends on organizational coordination mechanisms, i.e. centralization of decision-making and connectedness. These structural factors affect the type of information that TMTs consider in decision-making and how organizational members react to TMT actions.

Overall, this thesis advances a contingency theory of organizational innovation as it shows that the effectiveness of the determinants of innovation depends upon other contextual factors. Together, the findings of this thesis highlight the need to consider not only managerial or organizational determinants of innovation, but also the context in which these factors operate.

6.4. Managerial implications

This thesis has several important managerial implications. Overall, it informs managers that there are both managerial and organizational levers of innovation. In this sense, this thesis shifts managerial attention from R&D spending as the main determinant of innovation and informs about potential organizational and managerial factors that can be used to stimulate innovativeness. Furthermore, this thesis informs managers that the applicability of the determinants of innovation is highly contextual and they should be wary of cure-all solutions for innovation.

Of direct interest to managers is the proposition and finding of studies 1 and 2 that offshoring affects firms' ability to innovate. This thesis informs managers that they should consider the consequences for their firms' ability to introduce new products and services when deciding to move jobs to foreign locations and when determining the extent of this action. This finding is particularly relevant as most firms engage in offshoring in order to realize cost savings (Lewin and Peeters, 2006). As such, firms may not be aware of the potential that offshoring has to enhance or harm their innovativeness. That is, the thesis raises awareness of missed opportunities and potential dangers of offshoring that go beyond the primary logic of realizing cost savings. Offshoring firms are well advised to monitor their performance also in terms of innovativeness even when they offshore for other reasons. Furthermore, Study 2 finds that the effect of offshoring on innovation depends on TMT characteristics. This finding suggests that firms engaged in offshoring should develop well-thought-out offshoring strategies as the consequences

of offshoring in terms of innovativeness depend on the level of offshoring and other contextual factors, such as the characteristics of the TMT. In the context in which offshoring decisions take place as random experiments diffused from the bottom-up (Lewin and Peeters, 2006: 226), this finding suggests that offshoring decisions should be taken with the TMT’s involvement as there are firm-level factors that affect the consequences of offshoring.

Table 20. Main managerial implications

Main managerial implications
1. Informing managerial about organizational and managerial factors that can stimulate innovativeness in addition to the traditional focus on R&D spending.
2. Offshoring can act as a mechanism to enhance innovativeness, but it must be used with care due to the potential danger of over-offshoring that can lead to a decrease of innovation.
3. Firms with TMTs that engage in learning processes (i.e. reflexivity and minority dissent) to a greater extent tend to introduce more managerial innovations.
4. The use of TMT shared leadership is associated with higher levels of organizational ambidexterity
5. The effects of both organizational and managerial determinants of innovation are highly contextual, so firms should carefully consider the characteristics of their own organizations when attempting to stimulate innovation.

In addition, through the findings of studies 3 and 4, this thesis suggests that TMTs should consider their internal processes as these are related to firms’ innovativeness. Study 3 proposes that firms whose TMTs engage in more reflexivity and exhibit more minority dissent have higher levels of management innovation. Study 4 finds evidence that firms whose TMTs engage in more shared leadership are more proficient at simultaneously introducing both exploratory and exploitative innovation. That is, firms whose top executives more equally participate in leadership tasks such as making major strategic and operational decisions and motivating not only downward but also lateral are better able to handle the tensions between exploration and exploitation. Together, these findings suggest that firms are well advised to invest in management training programs that address the function of the TMT as opposed to classical executive programs which are focused on how TMTs handle organizational members at lower hierarchical levels (i.e. focus on internal functioning of the TMT in addition or instead of how to,

for instance, motivate lower level employees). This suggestion can be particularly useful for managers as it provides a “manageable” solution for stimulating innovation in addition to outward-looking ones.

Of particular importance, this thesis advises that managers should carefully consider the measures they implement to enhance their innovativeness, as the effectiveness of both organizational and managerial determinants depends on contextual factors. As studies 1 and 2 indicate, the effectiveness of organizational determinants (e.g. offshoring) depends on the characteristics of the TMT. On the other hand, studies 3 and 4 show that the effectiveness of managerial determinants of innovation is contingent on organizational factors. These findings inform managers to consider the context in which they implement measures to stimulate innovativeness and to be wary of any solution presented as universally effective.

6.5. Limitations and suggestions for future research

While this dissertation makes several important contributions, there are a number of ways in which it could be improved and advanced both from a methodological and theoretical perspective. Below, I discuss the thesis’ overall limitations and future research opportunities as previous chapters have already discussed in great detail the limitations of the individual studies.

As this thesis aimed to analyze determinants of firm innovation it would have been preferred to investigate the effect of changes of the proposed determinants over time. In an effort to capture a temporal dimension, Studies 2 and 4 use data that is collected at different points in time – the dependent variables are measured about one year after the independent variables. The temporal separation of measurement decreases the risk of common method bias because it reduces biases in the respondents’ retrieval process, lessens the respondents’ ability to use previous answer to fill in gaps in what is recalled, and it makes previous answers less salient (Podsakoff *et al.*, 2003). While longitudinal designs are preferred, the nature of the concepts measured in this dissertation required collecting original data from top level executives. Top executives are well known for their reluctance to participate in surveys and, consequently, attempting to collect data repeatedly over a longer period of time from TMT members is problematic due to respondent attrition (Cycyota and Harrison, 2006). Thus, although I took great care to obtain temporally separated data, a longitudinal research design would provide additional confidence in the causal link between offshoring and innovativeness.

In addition, the analyses of this thesis take place at a single level of analysis – i.e. the firm. In a recent literature review, Crossan and Apaydin (2010) show that only about eight percent of studies on innovation have a multilevel design. Multilevel research can make important contributions to the understanding of the antecedents of innovation by allowing to analyze how higher level variables affect the influence of firm-level determinants or to provide a closer look and analyze the cross-level effects of firm and lower level determinants. Future studies using multilevel design could probe, for instance, whether the effect of offshoring on innovation depends on the industry from which a firm is part or whether the offshore location

affects the relationship. Another interesting avenue for future research would be to consider how organizational-level factors affect the relationship between individual or group-level variables and innovation.

Another important avenue of future research is to analyze the mechanisms between the proposed antecedents and innovation. For instance, Study 4 proposes that TMT shared leadership enhances ambidexterity as it may create shared perceptions and paradoxical cognitions within the TMTs and it may promote collaborative behaviors at lower hierarchical levels. While these mechanisms are supported by extant theory, it would be interesting to use mediation analysis (Baron and Kenny, 1986) to test whether these are in fact the intervening mechanisms and also which one of them is more important. Similar extension could be employed for the other studies in this dissertation.

6.6. Conclusion

This thesis aimed to advance the understanding of how firms can enhance their innovativeness. It does so by proposing organizational and managerial determinants and analyzing important interrelations. Overall, this thesis provides support for the existence of both organizational and managerial levers of innovation and that their effectiveness is highly contextual.

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ENGLISH SUMMARY

Innovation is the engine of sustained organizational performance and is central to organizations' competitive advantage. In an environment characterized by continuously increasing rates of change, firms need to innovate in order to stay competitive. Motivated by the importance of innovation, my research analyzes how firms can stimulate two types of innovation outcomes: (i) product and service innovation and (ii) management innovation. Product and service innovation refers to the introduction of products and services that are new to the firm. Innovation in products and services is largely believed to stem from a firm's knowledge resources. However, a particular knowledge stock is not sufficient to guarantee a certain level of innovation. What makes the difference between innovative and non-innovative firms is how firms use their knowledge. As such, my research aims to uncover what managerial and organizational factors inhibit or enable firms to use their knowledge to transform it into new products and services. Management innovation refers to the introduction of new management practices, processes and structures. In other words, management innovation refers to changes in the management activities of an organization such as changes in organizational structure, administrative processes and human resources. Current research shows the importance of management innovation for firm performance, but there is a lack of understanding of how firms can stimulate management innovation.

Several insights from my research about how firms can enhance their innovativeness:

- Offshoring (i.e., the relocation of business processes to foreign locations) can be used to stimulate the introduction of new products or services. However, there is the danger of over-offshoring: while low levels of offshoring enhance innovation, high levels of offshoring can reduce firms' ability to introduce new products and services.
- Top management team (TMT) shared leadership enhances firms' ability to engage in both radical and incremental innovation. That is, by sharing the task of leadership between all the members of the TMT, firms can pursue both new products as well as improve their current product portfolio.
- Processes that provide a systematic way in which TMT question managerial best practices such as reflexivity and minority dissent enhance firms' management innovation. This effect is particularly strong in firms that have a high learning capacity (i.e. absorptive capacity).

NEDERLANDSE SAMENVATTING (DUTCH SUMMARY)

Innovatie is de motor van duurzame organisatorische prestaties en staat centraal in het behalen van concurrentievoordeel. In een omgeving die wordt gekenmerkt door toenemende verandering moeten bedrijven voortdurend innoveren om concurrerend te blijven. Gemotiveerd door het belang van innovatie richt mijn onderzoek zich op het behalen van twee typen innovatie uitkomsten: (i) product- en service innovatie en (ii) management innovatie. Product- en service innovatie heeft betrekking op de introductie van producten en diensten die nieuw zijn voor de onderneming. Innovatie in producten en diensten wordt algemeen verondersteld voort te komen uit de kennisbronnen van een bedrijf. Echter, het hebben van kennis is niet voldoende om een bepaald niveau van innovatie te waarborgen. Het verschil tussen innovatieve en niet innovatieve bedrijven komt namelijk tevens voort uit de toepassing van kennis. Mijn onderzoek richt zich op de vraag welke bestuurlijke en organisatorische factoren ondernemingen remmen of in staat stellen of hun kennis te transformeren in nieuwe producten en diensten. Management innovatie verwijst naar de introductie van nieuwe management praktijken, processen en structuren. Met andere woorden, management innovatie heeft betrekking op wijzigingen in de management activiteiten van een organisatie, zoals veranderingen in de organisatiestructuur, administratieve processen en human resources. Recent onderzoek toont het belang van management innovatie voor bedrijfsprestaties aan, maar er is een gebrek aan inzicht in hoe bedrijven management innovatie kunnen stimuleren.

Mijn onderzoek geeft verschillende inzichten in de manier waarop bedrijven hun innovativiteit kunnen versterken:

- Offshoring (de verplaatsing van bedrijfsprocessen naar buitenlandse locaties) kan worden gebruikt om de introductie van nieuwe producten van diensten te stimuleren. Echter, er is een gevaar van over-offshoring: terwijl een lage mate van offshoring innovatie kan versterken, kan een hoge mate van offshoring bedrijven beperken in hun mogelijkheden om nieuwe producten en diensten te introduceren.
- Gedeeld leiderschap binnen een Top Management Team (TMT) verbetert het vermogen om zowel radicale als incrementele innovaties te ontwikkelen. Door het delen van de leiderschapstaak tussen alle leden van het TMT zijn bedrijven beter in staat nieuwe producten te ontwikkelen en hun huidige product portfolio te verbeteren.
- Management innovatie wordt gedreven door processen die het TMT in staat stellen op systematische wijze hun *best practices* kritisch te beoordelen, zoals reflexiviteit en het horen van afwijkende meningen van minderheden. Dit effect is in het bijzonder sterk in bedrijven met een hoog leervermogen (absorptiecapaciteit) hebben.

ABOUT THE AUTHOR

Oli Radu Mihalache started his PhD in the Department of Strategic Management and Entrepreneurship at the Rotterdam School of Management, Erasmus University in September 2009 after graduating cum laude from the master degree in business research (MPhil) from the same university. Prior to studying in the Netherlands, Oli obtained a Bachelor of Commerce (with high distinction) from University of Toronto and worked for several financial institutions in Canada. His current research interests revolve around how firms can enhance innovation. His research from this dissertation has been published or is forthcoming in *Strategic Management Journal* and as a book chapter. In addition, Oli regularly presents his research at international conferences such as Academy of Management, Strategic Management Society, and Academy of International Business.

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STIMULATING FIRM INNOVATIVENESS

PROBING THE INTERRELATIONS BETWEEN MANAGERIAL AND ORGANIZATIONAL DETERMINANTS

Innovation is the engine of sustained organizational performance and is central to organizations' competitive advantage. This thesis aims to further the understanding of how firms can stimulate two types of innovation outcomes: i) product and service innovation, and ii) management innovation. To this end, this thesis analyzes how managerial and organizational factors and their interrelations inhibit or enable these two types of innovation. Research findings indicate that offshoring is an important mechanism that can stimulate the introduction of new products and services; however, over-offshoring poses the risk of reducing firms' innovativeness. Furthermore, this research suggests that when members of the top management team (TMT) share the task of leadership firms can achieve higher levels of both exploratory and exploitative innovation. Also, findings indicate that TMT learning processes (i.e., processes that systematically challenge the status-quo) can stimulate firms' management innovation.

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