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# Understanding the relevance of knowledge flows.
# How to realize the benefits of knowledge transfer processes

Doctoral thesis

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*“Twenty years from now you will be more disappointed*
*by the things you didn’t do than by the ones you did do.*
*So throw off the bowlines.*
*Sail away from the safe harbour.*
*Catch the trade winds in your sails.*
*Explore.*
*Dream.*
*Discover”.*

Mark Twain

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**Table of contents**

**Abstract**

Managing and exploiting knowledge flows is an imperative for all firms. Scholars, practitioners, and analysts agree on the importance of production, diffusion, and use of knowledge as the most relevant drivers of the world economy. Being knowledge tacit or explicit, organizations need to recognize it as a valuable resource and tap into the collective intelligence and skills of employees in order to create a greater organizational knowledge base and remain competitive in the global marketplace. Consistently, investigating knowledge, how this may be accumulated and then used as well as its consequences for individual and organizational performance is still a hot topic in several fields of research.

Starting from this premise, this dissertation proposes four studies on different yet interrelated knowledge-related topics. They are categorized into three research areas: cognition in knowledge-based processes, knowledge sharing and knowledge transfer, and knowledge utilization. Cognition in knowledge-based processes is addresses by Chapter 3, which links boundary spanning literature with top management teams' members interacting with both internal and external networks. The second research area (i.e., knowledge sharing and knowledge transfer) has led to the development of Chapter 4 and Chapter 5 which respectively investigate the organizational antecedents to employees' knowledge sharing behaviors and vicarious learning among companies engaging in licensing agreements. Knowledge utilization is examined in Chapter 6, whose purpose is to explore the effect of individual creativity and job design dimensions on employees' orientation toward using the already available knowledge.

**Keywords:** top management team, vicarious learning, knowledge transfer, knowledge utilization.

## Synthesis

Managing and exploiting knowledge flows is an imperative for all firms. Since Drucker's (1969) study, scholars, practitioners, and analysts agree on the importance of production, diffusion, and use of knowledge as a critical driver of the world economy. Consequently, the economic performance of individuals, organizations and countries is considered to be strongly determined by knowledge assets (Phelps, Heidl, and Wadhwa, 2012). Being knowledge tacit or explicit, organizations need to recognize it as a valuable resource and tap into the intelligence and skills of employees in order to create an effective organizational knowledge base and remain competitive in the global marketplace. Consistently, investigating knowledge, how this may be accumulated and then used as well as its consequences for individual and organizational performance is still a hot topic in several fields of research. Starting from this premise, this dissertation proposes four studies on different yet interrelated topics. They are categorized into three research areas: cognition in knowledge-based processes, knowledge sharing and knowledge transfer, and knowledge utilization.

As for the first research area, Chapter 3 grounds on social capital theory by relying on the importance of firms' external network to their innovativeness and performance. As economic actions are embedded within larger inter-organizational sets of linkages (Burt, 1992), external contacts play a critical role in the procurement of strategic assets and the identification of critical opportunities. This is particularly crucial when the focus is on top management team members, who are actively involved in the formulation and implementation of strategic decisions (Daily & Schwenk, 1996) while being linked to external entities to the organization. As a result, they are considered as boundary spanners

(Ancona & Caldwell, 1992). While existing literature has mostly explored the impact of top management team's external information networks on organizational outcomes (e.g., Beckman, Bird Schoonhoven, Rottner, and Kim, 2014; Knockaert, Ucbasaran, Wright, and Clarysse, 2011), little research has been done on both the other boundary-spanning activities TMT members engage in in external networks and the mechanisms by which they affect the strategic decision making process within the focal organization.

The second research area (i.e., knowledge sharing and knowledge transfer) inspired the studies included in Chapter 4 and Chapter 5. Scholars acknowledge that the success of knowledge management activities is strongly linked to intra-organizational knowledge sharing processes, that is to the extent to which employees share what they know with others inside the organization (Connelly, Ford, Turel, Gallupe, and Zweig, 2014; Wang, Noe, and Wang, 2014). This argument is consistent with the idea that individuals' knowledge will not have much impact on the organization unless it is made available to other individuals. Based on this, Chapter 4 suggests that knowledge management benefits from organizational settings that motivate individuals' sharing of intellectual capital (Cabrera, Collins, and Salgado, 2006). Accordingly, it integrates the literature on new organizational forms and on individuals' motivation with the purpose of explaining how such views may affect employees' intra-organizational knowledge sharing behaviors. Grounding on the literature on organizational learning, Chapter 5 offers a study on the incentives resulting from innovators engaging in strategic partnerships, such as licensing agreements, which, following recent research (e.g., Srivastava & Wang, 2015), allows the licensor to benefit from the vicarious learning opportunities spelled out by its downstream technology buyers. As a result, engaging in licensing–out is likely to reward the licensor by broadening its knowledge base and foster its innovation capability.

The third research area relates to knowledge utilization and is addressed by Chapter 6. Grounding on the assumption that sharing knowledge is not *per se* enough to provide the organizations with a critical source of competitive advantage, this Chapter contends that, in order for knowledge to lead to superior performance, it has to be applied, utilized to support commercial ends and innovative purposes (Haas & Hansen, 2007). Job design dimensions and individual creativity are investigated in order to understand to what extent they affect employees' knowledge utilization behaviors.

Consistently with this, my dissertation contributes to extant research in four main ways. It advances the literature on the outcomes resulting from top management team members building connections with external actors and the related cognitive processes they ground on to exploit the externally acquired knowledge. It deepens the understanding of the antecedents of knowledge exchange relationships built within the organizations and enriches the literature on the learning processes occurring among firms involved in formal partnerships (i.e. licensing agreements). Finally, it provides empirical evidence on individuals' orientation to apply available knowledge and information for superior performance, while emphasizing the importance of individual creativity and job design dimensions. As a result, it allows to strengthen the understanding of firms' absorptive capacity's main dimensions: both the potential absorptive capacity, which grounds on the acquisition and assimilation of new knowledge, and the realized absorptive capacity, which rather refers to the transformation and utilization of knowledge (Jansen, Van den Bosch, and Volberda, 2005; Zahra & George, 2002).

**Keywords:** top management team, vicarious learning, knowledge transfer, knowledge utilization.

# CHAPTER 1

## General introduction

Managing and exploiting knowledge flows is an imperative for all firms. Since Drucker's (1969) study, scholars, practitioners and analysts agree on the importance of production, diffusion, and use of knowledge as the most relevant drivers of the world economy. Research increasingly highlights that the economic performance of individuals, organizations and countries is strongly determined by knowledge assets (Phelps, Heidl, and Wadhwa, 2012). Being knowledge tacit or explicit, organizations need to recognize it as a valuable resource and develop a mechanism for tapping into the collective intelligence and skills of employees in order to create a greater organizational knowledge base and remain competitive in the global marketplace. Consistently, investigating knowledge, how this may be accumulated and then used as well as its consequences for individual and organizational performance is still a hot topic in several fields of research.

Knowledge flows may result from both social interactions developed inside the organization and relationships built outside of the firm's boundaries. As for the latter case, social capital theory suggests that a firm's external network represents a significant determinant of its performance. Given that economic actions are embedded within larger inter-organizational sets of linkages (Burt, 1992; Granovetter, 1985), external contacts play a relevant role in the procurement of strategic assets and the identification of critical opportunities. This is particularly crucial when the focus is on top management team members, who traditionally serve a critical function to the firm by being actively involved in the formulation and implementation of strategic decisions (Daily & Schwenk, 1996) and

linked to entities external to the organization. Given this, they can be considered as boundary spanners (Ancona & Caldwell, 1992).

However, scholars acknowledge that the success of knowledge management activities is also strongly linked to intra-organizational knowledge sharing processes, that is to the extent to which employees share what they know (e.g. their know-how, their abilities, their skills, etc.) with others inside the organization (Connelly, Ford, Turel, Gallupe, and Zweig, 2014; Jackson, Chuang, Harden, Jiang, and Joseph, 2006; Wang, Noe, and Wang, 2014). This argument is consistent with the idea that individuals' knowledge will not have much impact on the organization unless it is made available to other individuals. In this regard, the strategic relevance of knowledge sharing is well established in the literature, as it can contribute to knowledge application, innovation, and ultimately an organization's competitive advantage (Hwang, Singh, and Argote, 2015).

The importance of transmitting and exchanging knowledge is particularly relevant also when it occurs among firms. Consistently, researchers have increasingly devoted attention to the phenomenon of organizational learning and how organizations create, retain, and transfer knowledge (Argote, 1999; Huber, 1991; Szulanski, 2000). In this regard, recent works have focused on how firm create strategic partnerships, such as licensing agreements, in an attempt to both foster their own knowledge base and make sure that new and fresh knowledge is brought in from the outside (see, for instance, Srivastava & Wang, 2015).

Nevertheless, sharing knowledge is not *per se* enough to provide the organizations with a critical source of competitive advantage. In order for knowledge to lead to superior performance, not only it has to be shared, transmitted, exchanged with others - both individuals and firms - it also has to be applied, utilized to support commercial ends and

innovative purposes (Haas & Hansen, 2007). In line with this, scholars highlight that the ability to utilize existing knowledge is critical for an organization's success (e.g., Gonzales & Chakraborty, 2014; Vasuveda & Anand, 2011).

Despite the amount of contributions published so far on knowledge-based processes, the literature still shows a number of issues that need to be investigated more deeply. Based on this, my doctoral thesis aims at both theoretically and empirically contribute to:

- advance current literature on the outcomes resulting from top management team members building connections with external actors and the related cognitive processes they ground on to make use of the externally acquired knowledge;
- deepen the understanding of the antecedents of knowledge exchange relationships built within the organizations;
- enrich the literature on the learning processes occurring among firms involved in formal partnerships (i.e. licensing agreements);
- provide empirical evidence on individuals' orientation to apply available knowledge and information on the job.

# CHAPTER 2

## Outline of the thesis

My doctoral thesis develops around four studies. The first is a conceptual piece (see Chapter 3) which investigates top management team members' knowledge flows with external ties while taking a cognitive perspective. It grounds on social capital theory tenets which suggest that a firm's external network represents a significant determinant of its performance, as external contacts are critical in the procurement of strategic assets and the identification of key opportunities (Burt, 1992; Granovetter, 1985). This is especially relevant when the focus is on top management team (TMT) members, who at the same time are actively involved in the formulation and implementation of strategic decisions (Daily & Schwenk, 1996) and linked to entities external to the organization. Therefore, they can be considered as boundary spanners (Ancona & Caldwell, 1992), in that they are involved in managing their divisions and making strategic decisions internally, and at the same time have ties with entities external to the organization. While prior literature has mostly considered the impact of TMT external information networks on organizational outcomes (e.g., Beckman, Schoonhoven, Rottner, and Kim, 2014; Knockaert, Ucbasaran, Wright, and Clarysse, 2011), little research has been done on both the other boundary-spanning activities TMT members engage in in external networks and the mechanisms by which they affect the strategic decision making process within the focal organization. Accordingly, the first paper aims at addressing the following research question: "*How does TMT engagement in boundary spanning activities affect strategic decision-making effectiveness?*". Based on this, the paper provides a theoretical framework to understand how their engagement in several boundary spanning activities in these external networks influences strategic

decision making processes and effectiveness in the top management team of their focal organization. Classifying boundary spanning activities as informational and relational, we propose that TMT's members informational activities influence both rationality and political behavior in the decision making process, and that their relational activities moderate the relationship between the process characteristics and strategic decision making effectiveness.

The second paper (Chapter 4) starts from acknowledging that the impact of the recent financial crisis has forced many companies to reexamine and reshape their organizational forms. Such a phenomenon has mostly arisen around a new consideration of the importance of the company knowledge as the most strategic intangible asset. The switch of centrality from tangible to intangible assets has stimulated the seek for more flexible organizational forms, as more effective enablers for supporting knowledge sharing and new knowledge generation opportunities (Hassard, Morris, and McCann, 2012; Schreyögg & Sydow, 2010). Notwithstanding the importance of the organizational forms, knowledge still resides in the minds of individuals. Therefore, knowledge management works only if the organizational settings are able to motivate the individuals' sharing of their intellectual capital (Bock, Zmud, Kim, and Lee, 2005; Cabrera, Collins, and Salgado, 2006). Based on this, this paper integrates the literature on new organizational forms and on individuals' motivation with the purpose of explaining how such views may affect employees' intra-organizational knowledge sharing behaviors. More specifically, the purpose of this work is to investigate to what extent the dynamic relationship between intrinsic and extrinsic motivation (i.e. motivation crowding effect) influences an individual's knowledge sharing behaviors as well as whether extrinsic motivation (i.e. extrinsic rewards) affects the role played by integrative mechanisms on knowledge sharing behaviors. This translates in the

following research question that the second paper addresses: "*How do motivation crowding effect and new organizational forms jointly influence intra-organizational knowledge sharing processes?*". In order to test the hypotheses, a sample of 754 knowledge workers from 23 international manufacturing firms headquartered in Italy is empirically analyzed.

Grounding on the organizational learning literature (Levinthal & March, 1993; March, 1991), the third work included in Chapter 5 attempts to enrich the understanding of why should companies engage in licensing-out their technology. While the conventional wisdom mostly focuses on the financial and commercial benefits available to the licensor (e.g. Arora & Fosfuri, 2003; Fosfuri, 2006), this paper points to the learning opportunities the licensor (the originator) can seize through selling its knowledge to other firms (the recipients). Licensing-out allows the licensor to benefit from the vicarious learning opportunities spelled out by its downstream technology buyers (Srivastava & Wang, 2015); as a result, engaging in licensing–out is likely to reward the licensor by broadening its knowledge base and foster its innovation capability. In this sense, this study investigates the "double-loop" of vicarious learning in the context of licensing, from the originator to the recipient and from the recipient back to the originator. It therefore addresses the following research question: "*Can vicarious learning explain a firm's decision to license-out its technology?*". In order to do that, it analyzes a longitudinal database of 245 licensing agreements, registered to the Security Exchange Commission (SEC) between the mid-80s and 2014.

However, in order to be a source of competitive advantage, not only knowledge has to be shared, but it also has to be applied to support firm's innovative performance. As sharing, accumulating, and assimilating knowledge is no guarantee of a better performance (Zahra & George, 2002), organizations should be aware of how and whether the available

knowledge is effectively applied (Haas & Hansen, 2007). The fourth and last paper of my thesis (see Chapter 6) aims at exploring employees' knowledge utilization behaviors. Despite scholars acknowledge the importance of utilizing and applying knowledge to firms' innovation and competitiveness, so far empirical contributions addressing this topic are still limited (e.g., Haas & Hansen, 2005; Gardner, 2012; Ko & Dennis, 2011; Nag & Gioia, 2012). In particular, the way individual determinants influence the capacity to use available knowledge has not been fully investigated yet. Similarly, job design dimensions seem not to be taken into account when knowledge utilization processes come into play. That is, little is known about how micro-organization variables affect individuals' behaviors in terms of using the knowledge that is already there. Based on this, this works has the purpose to address the following research question: *"How do employees' work creativity together with job design dimensions affect knowledge utilization process?"*. In order to do that, it empirically explores survey data collected from 678 employees working in two Danish global consulting firms.

In an attempt to clarify the content and structure of each paper, here below I provide a schematic representation of the structure of the overall thesis (Table 2.1), including the following information:

- **Number of the paper** and its **related Chapter**;
- **Title** of each paper;
- **Type of paper**, that is whether it is a conceptual piece or an empirical study;
- **Level of analysis** the paper takes on;
- **Dataset**, indicating the data used for developing the empirical papers;
- **Keywords** of each paper;

- **Research area** the paper refers to. Based on their focus, the papers have been classified into three main areas: cognition in knowledge-based processes, knowledge sharing and knowledge transfer, knowledge utilization.

| #Paper/n. Chapter | Title | Type of paper | Level of analysis | Dataset | Keywords | Research area |
|---|---|---|---|---|---|---|
| Paper 1 *(Chapter 3)* | "Governing from the periphery: Impact of top management team boundary spanning on strategic decision making" | Conceptual | Team level | -------- | Top management team, social exchange, decision making/distributed decision making | Cognition in knowledge-based processes |
| Paper 2 *(Chapter 4)* | "A motivation crowding effect on knowledge sharing within organizational flexible structures" | Empirical | Individual level | Knowledge sharing dataset on international manufacturing firms – University of Florence | Knowledge sharing, motivation crowding-effect, integrative mechanisms, rewards | Knowledge sharing and knowledge transfer |
| Paper 3 *(Chapter 5)* | "When vicarious learning rewards the originating firm: Exploring the learning opportunities available to the licensor" | Empirical | Firm level | Longitudinal dataset on licensing agreements from 1986 to 2014, disclosed to the USA SEC and compiled by KTMine | Vicarious learning, licensing, incentives | Knowledge sharing and knowledge transfer |
| Paper 4 *(Chapter 6)* | "Realizing the benefits of knowledge sharing: An empirical investigation of knowledge utilization" | Empirical | Individual level | FOKS dataset – Copenaghen Business School | Knowledge utilization, creativity, feedback, autonomy | Knowledge utilization |

**Table 2.1 -** Outline of the thesis

# CHAPTER 3

## Governing from the periphery: Impact of top management team boundary spanning on strategic decision making

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### Introduction

Upper echelons theory (Hambrick & Mason, 1984) provides an excellent framework to study the dominant coalition in the organization and their impact on an organization's strategic decisions (Carpenter, Geletkanycz, and Sanders, 2004). While the CEO is indeed the focal actor within the dominant coalition and has a distinct impact on the organization (Chatterjee & Hambrick, 2007; Finkelstein, Hambrick, and Cannella, 2009; Quigley & Hambrick, 2015), the top management team serves a critical function since they are actively involved in the formulation and implementation of strategic decisions (Daily & Schwenk, 1996). Put simply, strategic decisions within organizations are "a shared activity, and the collective cognitions, capabilities, and interactions of the entire TMT enter into strategic behaviors" (Hambrick, 2007: 334). Therefore it becomes essential to understand the characteristics of the top management team and how they influence strategic decision-making processes and decision effectiveness.

Apart from being the decision-makers within their focal organization, top management team members are likely to serve as boundary spanning agents on other organizations. For instance, top management team members may serve as board members on other firms (Mizruchi, 1996), serve on alumni boards and other professional associations (Haunschild & Beckman, 1998). The external network of top management team members have been shown to influence a variety of organizational outcomes such as firm performance (Peng & Luo, 2000), strategic conformity to industry norms (Geletkanycz & Hambrick, 1997), and the adoption of organizational innovations (Davis, 1991) and strategic best practices (Haunschild, 1993; 1994; Westphal, Seidel, and Stewart, 2001). One important aspect regarding the external networks of top management team members is the information benefits that these networks provide which can subsequently influence the strategic decision making of the team member's focal organization. For instance, a top management team member's tie with a board member from another organization could lead to information exchange about the direction of the industry and therefore affect the strategic outlook of both their organizations (Alexiev, Jansen, van den Bosch, and Volberda, 2010).

Although the information obtained from top management team members' external networks likely influence the communication and information elaboration dynamics of the team during strategic decision making past research has only considered the effects of external networks at the organizational level and their impact on organizational outcomes (Beckman et al., 2014; Haunschild, 1993; 1994: Knockaert et al., 2011). Top management team members concurrently grapple with strategic decisions within their organizations while attempting to manage and sift through the information obtained from their memberships in multiple external networks. In other words, even as prior research in

strategy has underscored how the external networks of top management team members provide firms with valuable information and knowledge, little research has addressed the mechanisms in which these external networks and the information gained from them subsequently affect strategic decision making within the focal organization.

In this paper, we develop theory on the influence of top management team members' external network boundary spanning activities on strategic decision making processes and decision effectiveness. First, we review the extant research on top management teams and strategic decision making processes. We then develop propositions about the influence of informational activities of top managers in their external networks on the decision making process. Finally, we draw from research on relational pluralism in external networks of top managers (Gulati, Kilduff, Li, Shipilov, and Tsai, 2010) and theory on boundary spanning (Aldrich & Herker, 1977; Ancona & Caldwell, 1992) to explain the moderating effects of relational boundary spanning activities of top managers on the relationship between the strategic decision making process and its effectiveness.

## Theoretical background

### *Strategic decision making and top management teams*

Strategic decisions are defined as commitments of resources to action related to issues that are important to the organization (Mintzberg, Raisinghani, and Théorét, 1976). Eisenhardt and Zbaracki (1992) further specify that these decisions are non-routine and infrequent, and are made by the top leaders in the organization. Clearly, although the decisions themselves are different each time owing to contextual differences in the organization and its

environment (Shephard & Rudd, 2014), there are certain aspects of the decision-making process that stay relatively consistent, i.e., the individuals involved in decision making and the characteristics of the process itself (Elbanna & Child, 2007; Mintzberg et al., 1976; Papadakis, Thanos, and Barwise, 2010). In this section, we explicate how these two aspects of strategic making–individuals and process characteristics–potentially influence strategic decision making outcomes.

Furthermore, although strategic decision outcomes can be examined both at the decision level–effectiveness, success, quality, commitment, etc. (Elbanna & Child, 2007; Papadakis et al., 2010)–as well as at the organizational level–firm performance, innovation, etc. (Eisenhardt, 1989; Fredrickson, 1984; Goll & Rasheed, 1997; Hough & White, 2003)–we will restrict our focus to the decision level outcomes, particularly to strategic decision effectiveness (Dean & Sharfman, 1996). Maintaining our focus on the decision level, rather than relating strategic decisions to organizational level outcomes, enables us to maintain conceptual integrity in drawing insights from the micro organizational behavior literature, and applying them to the specific context of strategic decision making.

Broadly speaking, strategic decision making processes involve rationality, intuition and political behavior among the decision making authorities (Eisenhardt & Zbaracki, 1992). Elbanna and Child (2007) show that decision making effectiveness is positively influenced by rationality, negatively by political behavior and unaffected by intuition. However, apart from the external and internal contextual factors that influence these relationships (Elbanna & Child, 2007), the link between decision process characteristics and decision effectiveness depends on the individuals involved in strategic decisions, and the actions they engage in both during the decision making process as well as after the

decision has been made. Therefore, it becomes essential to examine these relationships from the perspective of the individuals involved in decision making, i.e., the top management team (TMT).

Although the CEO is often held responsible for the overall strategic direction of the organization, cognitive, social, and legal constraints make it impossible for a single individual to take charge of all aspects of the organization (Finkelstein, Hambrick, and Cannella, 2009). Top management team members share responsibility and often influence the CEO in the decision making process (Finkelstein et al., 2009). Based on the upper echelons theory (Hambrick and Mason, 1984), we define top management teams as the group of individuals who form the dominant coalition in the organization and engage in strategic decision making. Although the exact composition of the top team may vary, they are essentially the individuals identified by the CEO to make strategic decisions on behalf of the organization (Amason & Sapienza, 1997; Collins & Clark, 2003; Iaquinto & Fredrickson, 1997; West & Anderson, 1996; West & Schwenk, 1996). Top management teams may be comprised of the direct reports of the CEO (Boeker, 1997), all executives above the VP level (Hambrick, Cho, and Chen, 1996), or in general the top two tiers of the organization (Carpenter & Fredrickson, 2001) and could sometimes include board members as well (Carpenter & Westphal, 2001).

Research has examined the effects of several top management team characteristics on strategic decisions and firm outcomes (see Carpenter et al., 2004; Papadakis et al., 2010; and Shephard & Rudd, 2014 for reviews). Carpenter et al. (2004) stressed the need to explore top managers' characteristics beyond demographic diversity as teams involved in decision making are affected by more complex characteristics in the long term compared to

surface-level diversity (Harrison, Price, and Bell, 1998). As cognitive complexity is a critical aspect of decision making style (Henderson & Nutt, 1980), it becomes important to understand cognitive and meta-cognitive aspects of top management team members which would influence their interactions within and beyond the boundaries of the organization, thereby impacting strategic decision making.

How are the perspectives of top managers influenced? Geletkanycz & Hambrick (1997) demonstrated the importance of studying the external ties of top executives and the impact they have on the organization's strategic conformity with industrial norms. They explicate the process by which firms in an industry coalesce towards a common "recipe" owing to information flow across inter-organizational networks. While social networks are excellent conduits to examine the flow of information, relationships between top managers could represent several other exchanges and interactions which may have differential effects compared to exchange of information. Furthermore, as TMT members play the role of boundary spanners, the activities they engage in with their external ties will have important effects both during the decision making process as well as beyond on the effectiveness of these decisions.

In the subsequent sections, we first examine how external networks, defined broadly as the different types of relationships within a network (Beckman et al., 2014) and conceptualized as conduits for information flow, influence strategic decision making processes in top management teams. We then discuss the impact of top managers' relational pluralism in their external networks on the strategic decision making process. Finally, we draw from research on boundary-spanning of leaders and detail the effects of activities of top managers in the networks on strategic decision making outcomes.

***Strategic decision-making effectiveness: The rational and political perspectives***

Research into the strategic decision-making process highlights the importance of investigating the process-outcomes relationship by adopting a multidimensional approach. However, while prior contributions focus on one specific process dimension at once (see, for instance, Frederickson, 1984; Khatri & Ng, 2000), more recently scholars have attempted to provide a better understanding with regard to how different dimensions of the strategic decision-making process can influence its effectiveness. For example, according to Elbanna and Child (2007), strategic decision-making should be investigated as a rational and political process. Although within this research stream scholars tend to also include the intuition dimension, in this paper we only limit our analysis to the rationality and political aspects of the decision-making process. Three main reasons legitimize our choice. First, to date, empirical findings on the role that intuition directly plays on strategic decision-making are still few (e.g., Butler, 2002). That is, although scholars have suggested that managers frequently use intuition in decision-making (Agor, 1990), they have partially failed to empirically prove the link between intuitive processes and outcomes (Khatri & Ng, 2000). Second, existing evidence mostly shows that intuition does not significantly affect strategic decision making (see, for instance, Elbanna & Child, 2007). Thus, with respect to intuition, rationality and political behavior can be considered as more relevant antecedents for explaining strategic decision effectiveness. Third, despite intuition should not be conceived of as the opposite of rationality, it strongly recalls individuals' subconscious (Khatri & Ng, 2000), which, by definition is difficult to capture and, as such, to measure. As arguing about the relationship between subconscious processes and decision-making is

not the purpose of this paper, we decided to focus the attention only on the rational and political perspective underlying strategic decision making effectiveness.

The rationality perspective points to the procedural and analytic approach decision makers adopt when selecting the courses of action to be carried out. It represents the synoptic side of the process (e.g., Anderson, 1983; Nutt, 1984) in that actors collect information in order to develop a set of alternatives among which they will opt for the most satisficing one. As Frederickson and Mitchell (1984) state, it refers to the comprehensive dimension of strategy formulation. According to the authors, comprehensiveness is a measure of rationality, as it captures "the extent to which organizations attempt to be exhaustive or inclusive in making and integrating strategic decisions" (p. 399). Overall, a comprehensive decision-making process demands an accurate evaluation of a wide range of alternatives, to carefully ponder the costs and risks of various consequences as well as to thoroughly search for information to value the alternatives (Frederickson & Mitchell, 1984). Indeed, as boundedly rational actors, decision makers need to gather information and knowledge to be more efficient in making their decisions. This argument recalls one of the basic assumptions underlying the bounded rationality literature: being bounded rational entails the search for alternatives that decision makers implement in order to select the final decision to be executed (Simon, 1979). That is, a decision-making process requires the comparison between alternatives, in such a way that actors draw ideas from what others do in order to find support for their own plans (Nutt, 1984).

In contrast to the rational aspects are those underlying the political and incremental perspective of strategic decision-making process, which derives from the conceptualization of organizations as made of coalitions of individuals with competing interests, different

goals and preferences (Eisenhardt & Zbaracki, 1992; March, 1962). As a function of having dissimilar ambitions as well as different views on the future of the competitive environment (Allison, 1971), conflict among alternative decisions may arise. This is particularly frequent when people within the same group compete for scarce resources (Mumford & Pettigrew, 1975), which is generally the case of TMT members formulating strategic decisions. Starting from this, scholars have suggested that conflict among individuals is resolved by following the choices of the most powerful ones (March, 1962; Hinings, Hickson, Pennings, and Schneck, 1974; Salancik & Pfeffer, 1974; Stone, 2002). The political aspect of strategic decision-making, thus, "is concerned with the ways in which involved parties can affect the process and outcomes of strategic decision making either through the power they possess or through measures they take to exert influence" (Child, Elbanna, and Rodrigues, 2010: 105). As it entails the interplay of different interests, conflict, and power between individuals and groups, the strategic decision-making process can be defined as being naturally political (Wilson, 2003).

We propose that the both dimensions of the strategic decision-making process–rationality and political behavior–are influenced by TMT members' external networks.

***TMT external networks as conduits for information***

By virtue of their engagement in activities external to the organization such as participation in professional associations or membership in the boards of other organizations, TMT members can be simultaneously embedded in multiple networks, therefore acting as a repository of multiple relationships, and resulting in a highly influential source of critical knowledge (Beckman et al., 2014; Mizruchi, 1996). As current literature advocates

(Deutsch & Ross, 2003; Finkelstein & Hambrick, 1996), beyond their internal – and more traditional - function regarding policy setting, monitoring managers' actions, planning CEO succession (Hillman & Dalziel, 2003), externally executives play the role of facilitating access to relevant resources in the firm's environment (Pfeffer, 1972). In a similar vein, researchers have found that executives spend half of their time interacting with external entities (Mintzberg, 1973), which serve as conduits for information (Geletkanycz & Hambrick, 1997). Conceived of as a crucial component of markets, networks are thus seen as channels or pipes, which direct flows of information and resources within a social structure (Owen-Smith & Powell, 2004).

Through their external networks, board members can collect relevant insights likely to shape their actions and decisions within their organizations. As Eisenhardt (1989) points out, given that TMTs need real-time information to make high-quality and fast decisions, grounding on top managers' social network can help access timely and relevant information on both the external competitive environment and the organization (Collins & Clark, 2003).

In line with extant research (Beckman et al., 2014), TMT external networks can be characterized by a certain degree of heterogeneity, meaning that board members can form connections with others displaying different backgrounds and experiences. Recent works suggest that interacting with a wide range of external sources helps the firm foster its innovation capability (Chesbrough, 2003; Laursen & Salter, 2006). Similarly, absorptive capacity literature argues that accessing diverse knowledge facilitates innovation by enabling the individuals to make novel association and linkages (Cohen & Levinthal, 1990). This argument echoes social network theorists, which stress that being embedded in a diverse network can provide heterogeneous and fresh information (Granovetter, 1973)

and, similarly, that accessing non redundant knowledge is a critical determinant for firm's innovation and creativity advantages (Beckman & Haunschild, 2002; Shipilov & Li, 2008).

In this paper, we conceive diversity as a source of variety (Beckman et al., 2014; Harrison & Klein, 2007), related to the diverse network ties board members build. By displaying different connections, TMT members will bring a multiplicity of knowledge, information, and experience in such a way that higher variety will be positively associated with broader cognitive and behavioral repertoire of the team (Harrison & Klein, 2007). Indeed, grounding on the ecological and cognitive models of variation, selection, and retention (e.g., Campbell, 1960), when heterogeneous information are available, members are likely to be more open toward others' ideas and opinions, more receptive, thereby contributing to enhance organizational creativity, provide unique approaches to innovation, and foster decision-making quality and performance (Williams & O'Reilly, 1998). Hence, in theorizing about the influence of variety, scholars have pointed to the importance of providing as much heterogeneity as possible within a team, such that information overlap can be avoided and positive outcomes achieved (Harrison & Klein, 2007). That is, while perfect homogeneity leads team members to be highly similar in terms of knowledge, skills, and abilities they own, maximum variety is certainly a more interesting scenario.

When TMT members are exposed to greater information richness thanks to their external social ties (e.g., Austin, 2003; Finkelstein & Hambrick, 1996), they are expected to come up with better plans and more creative products (Harrison & Klein, 2007). Similarly, they are found to be more effective in their decision-making processes than team members who ground their choices on a highly homogeneous pool of resources (Jackson, May, and Whitney, 1995).

The basic assumption driving this idea is that diversity among top executives provides them with a greater "sociocognitive horsepower" (Carpenter, 2002: 280), thus stimulating discussion over strategy appropriateness, evaluation of strategic alternatives, and analysis of their feasibility. As they can rely on multiple points of view (Gibson & Vermeulen, 2003), heterogeneous TMT teams are expected to be more able in detecting strategic challenges, facing complex competitive environments (Carpenter, 2002), and responding with the most effective strategy. This is also consistent with the information processing perspective, according to which organizational units, such as TMT, are a critical means for interpreting, assimilating, and creating new knowledge (Hinsz, Tindale, and Vollrath, 1997), considered as the most strategic source of firms' competitive advantage (Grant, 1996).

***TMT external networks and strategic decision-making***

Consistently with extant research, external ties are critical to TMT strategy formulation and implementation (Geletkanycz & Hambrick, 1997; Kotter, 1982) in such a way that they influence not only the extent to which board directors acquire new knowledge, but also the way they interpret it (Geletkanycz & Hambrick, 1997).

Building on the bounded rationality perspective, in order to select a certain course of action, decision makers strongly rely on their counterparts' experience, interpretation, and understanding of the external context (Geletkanycz & Hambrick, 1997). More specifically, to economize on searching and selection activities, they ground on established external channels to collect information regarding plausible alternatives (Cyert & March, 1963). In this regard, authors acknowledge that decision makers tend to foster their

rationality or comprehensiveness (Frederickson, 1984) by using more information and relying on diverse perspectives (Eisenhardt & Zbaracki, 1992). Moreover, it has been shown that diverse information and knowledge are likely to reduce uncertainty and ambiguity (Geletkanycz & Hambrick, 1997), thereby fostering both speed and quality of the decision. In so doing, external referents provide models, which enrich the set of strategic options available to executives for selection. Given individuals' cognitive limitations, having the opportunity to access diverse information can help board members to make more rational decisions. In this regard, research on information seeking behavior shows that individuals engage in searching for and using information and knowledge in order to reduce uncertainty, that is in order to manage the difficulty in predicting the future, which is consistent with the incomplete set of information naturally available to human beings (Beckman, Hauschild, and Phillips, 2004). This argument suggests that external contacts may represent a critical source of information, likely to influence the rationality of the decision making process. Based on this, we expect the following:

*Proposition 1. Top management team members who access information from diverse external networks, compared to those with overlapping external networks, display higher levels of rationality in strategic decision-making.*

Current research also stresses that external ties may lead board members to foster their status and power within their organizations, thus increasing the influence they can exert on strategic decision-making processes (Geletkanycz & Hambrick, 1997). Thanks to their unique position at the top of the organizations, board members can affect the internal

information flow (Collins & Clark, 2003; Owen-Smith & Powell, 2004); but when they establish relationships with a heterogeneous external network, this influence may be stronger. In line with recent research (e.g, Child et al., 2010), executives tend to connect with counterparts in the external environment, to build web of relationships with other organizations, other players or institutions in order to reinforce their ability to carry out their preferred strategies. Moreover, when board members interact with diverse ties, the non-redundant information they access is likely to make them knowledgeable in a wide array of domains. Given their differentiated skills, they are perceived as able to question and challenge different aspects of the decisions, thus showing a high bargaining power when it comes to select the final alternative. Moreover, following a behavioral perspective, informal networks affect individual cognition and, consequently, decision making (Howard, 1994; Ridgeway, 2006). In fact, the most influential board members are considered to be those who occupy a central position within their informal network (Brass, 1992), by being connected to many different ties. Accordingly, we propose that:

*Proposition 2. Top management team members who access information from diverse external networks, compared to those with overlapping external networks, display higher levels of political behavior in strategic decision making.*

While top management team members who engage in information gathering activities from diverse external networks are able to utilize these perspectives to engage in more rational decision making, they could at the same time use such knowledge gained from external sources to exert influence over the decision making process, thereby leading

to higher political behavior in the top team. Elbanna and Child (2007) suggest that whereas rationality leads to better decision making effectiveness, political behavior is detrimental. This seems to suggest that the two propositions are contradictory in that the path through rationality predicts that information from external networks is positively related to decision making effectiveness and the path through political behavior predicts the opposite effect. However, in line with Elbanna and Child's (2007) results, these relationships operate within different boundary conditions pertaining to organizational factors, personal factors concerning the top managers, as well as external environmental characteristics. We propose that these mediated relationships between information gathering activities in top managers' external networks and decision making effectiveness are moderated by the other types of social exchange that top managers engage in in their external networks. To better understand these activities, we provide a review of research on social network theory which would elucidate the multi-dimensionality of the external networks of top managers.

***Relational pluralism in TMT external networks***

Social networks provide an excellent medium for understanding the flow of information between entities in an environment. However, the original conceptualization of social networks by Durkheim (1951) was much broader and included interrelationships between social entities in general. Harary (1956) later suggested that relationships between nodes in a network could take multiple forms. In organizations, and with individuals, this is indeed the case. For example, individuals could have multiple types of relationships, i.e. official, advice-seeking, friendship, conflict, etc., with other individuals. It is therefore evident that

theory on social networks can be applied more broadly to examine these multiple relationships between entities than merely to analyze information flow.

Gulati and colleagues (Gulati et al., 2010) introduce relational pluralism to reflect the multi-dimensional nature of social networks. More formally, they define relational pluralism as "the extent to which a focal entity (whether a person, a team, or an organization) derives its meaning and possibility of action from relations with other entities" (p. 1556). Research on organizational networks have examined several dimensions of relational pluralism, namely multiplexity, heterogeneity, and overlap (Gulati et al., 2010). Heterogeneity represents the extent to which an entity's connections are diverse and can be examined both at the individual and the collective level. Overlap concerns the extent to which the external connections of an individual or a group of individuals are clustered, and can again be examined both at the individual and the collective level. Beckman et al., (2014) analyze the effects of these different kinds of relational pluralism characteristics of boards of directors on organizational performance. For the rest of this paper, we focus on the third dimension of multiplexity.

Multiplexity at the collective or the organizational level represents the extent to which multiple individuals from the organization are connected to the same external entity. This builds redundancy in the system and provides stability to the relationships in case of turnover (Rogan, 2014). Multiplexity at an individual entity-level identifies the extent to which the same two entities have multiple types of relationships between each other. Scholars have begun examining relationship multiplexity at the organizational level (Beckman et al., 2014; Ranganathan & Rosenkopf, 2014; Rogan, 2014; Shipilov, Gulati, Kilduff, Li, and Tsai, 2014). However, more fundamentally research on multiplexity of

individual ties in social networks has been shown by several researchers in the past to lead to reinforcement of relationships and therefore to stronger ties (Granovetter, 1973). However, research examining the effects of multiplex ties of top management teams on decision making is hard to come by.

It is essential to examine relational pluralism among top managers for two important reasons. First, although organizational level relational pluralism has been conceptualized as multiple motives to be associated with the same entity, multiplexity between a pair of individuals may have a more nuanced meaning compared to that between organizations. Examining organizations as entities prevents us from examining the behavioral and agentic element of entities in social networks. On the other hand, when we examine individuals, multiplexity can also be conceptualized as the extent to which the same two individuals engage in different types of social exchange. For example, Crawford and LePine (2013) suggested that individuals in teams could have both task-based as well as relationship-based ties. Detert, Burris, Harrison, and Martin (2013) demonstrated that individuals who have pre-existing friendship ties are also more likely to engage in improvement-oriented communication with each other. In the context of top management teams, top managers may engage in multiple types of social exchange with their external connections, which may in turn have a more complex influence on these managers' actions in the top management team. A detailed examination of multiplexity among top managers therefore becomes imperative when assessing strategic decision making processes.

Second, top managers hold a unique position at the helm of an organization as they engage in strategic decision making in the top management team, head their respective divisions within the organization, and also engage in social exchange in their diverse

external networks. These actions of top managers are closely related to and are bound to influence each other. Beckman et al. (2014) contend that the external relationships of board members have the potential to influence actions of the focal organization. Owing to their unique position, top managers' external relationships are even more important than that of board members, as the former juggle between a higher number of roles associated to their home organizations (strategic decision making, implementation, external networking, etc.) and are often more actively involved in doing so than the board members. In other words, top managers play the classic role of boundary spanners (Ancona & Caldwell, 1992; Druskat & Wheeler, 2003). This is consistent with Aldrich and Herker's (1997) work, which identifies boundary roles as those performing two main roles, i.e., information processing and external representation, which both clearly recall the function of board members in TMTs. Therefore, the influence of their relational pluralism on the strategic decision making process and effectiveness would have important implications on organizational outcomes.

We now turn our attention to these other types of social exchange that top managers engage in with their ties in their networks external to the organization and examine the potential impact thereof on the strategic decision making effectiveness.

***Boundary spanning activities in TMT external networks***

Scholars have examined organizations as open systems with blur boundaries through which organizational constituents interact with the external environment (Aldrich & Herker, 1977; Katz & Kahn, 1978). These constituent individuals belong to the organization, but also have connections with individuals and other entities external to the organization. They are

embedded in multiple networks and interact constantly with members from the multiple networks they form a part of and respond to informational and social stimuli from these multiple networks (Caldwell & O'Reilly, 1982). Boundary spanning activities are those actions engaged in by the individuals acting on the periphery of the organizations "to establish linkages and manage interactions with parties in the external environment" (Marrone, 2010, p. 914). Several scholars have offered classifications of boundary spanning activities in teams and in organizations. See Table 3.1 for a summary of various classifications. Broadly, these activities can be divided into *informational* and *relational* activities.

The classifications by Yukl (1989) and Druskat and Wheeler (2003) pertain to leaders of teams as boundary spanners. As these teams operate within the realm of the larger organization, they also examine the internal activities of these leaders, which we classify as *other* activities. As discussed in the previous section, members of upper echelons play the role of boundary spanners in the broader context of organizations. The top management team members have a primary responsibility of managing their respective divisions within the organization and form an integral part of the decision making process in the top management team. At the same time, these individuals are also connected to the external environment, i.e., to individuals from their organizations associated to their own, to individuals from professional standards associations that their organizations are a part of, and, more importantly, to individuals with whom they may have had past associations within educational institutions or prior organizations.

In their role as boundary spanners, top managers engage in multiple types of social exchange activities, namely informational and relational. The first two propositions referred

particularly to the informational role of the top managers in these external networks. We now turn our attention towards the relational aspects of top managers. Whereas the informational role of the top managers influences the way in which strategic decisions are made in top management teams, we propose that the relational activities top managers engage in in their external networks influence the impact of their informational activities on decision making effectiveness. In other words, the relational activities determine whether strategic decision making processes are implemented and represented to the organization's external connections.

Relational activities of top managers could include building relationships with external parties such as top managers from customer organizations, regulatory bodies, government entities, social organizations, etc (Aldrich & Herker, 1977). Top managers of organizations are often responsible for making sales pitches to external parties, thereby representing the brand of the organization, engaging in persuading and negotiating activities, and advocating the organizations' strategy to the concerned external parties in order to achieve for their organizations favorable positions in the broader environment (Ingram & Roberts, 2000). Rosenkopf, Metiu, and George (2001) showed that when individuals build relationships through participation in committees in standards organizations, they help foster and enhance collaboration between their respective organizations. Similarly, Bartel (2001) showed that boundary spanning activities that involve the representation of one's organization to external entities enhanced organizational identification and therefore fostered inter-organizational collaboration and commitment. Therefore, when top managers engage in relational social exchange activities in their diverse external networks, there is a reinforcement of their commitment towards their

strategic decisions, whether they are synoptic or incremental, thereby resulting in better strategic decision effectiveness.

Informational activities that top managers engage in only capture the inputs into the decision making process. Relational activities, on the other hand, capture the efforts undertaken by top managers before and after the strategic decisions are made. The extent to which top managers engage in these activities in the external network represents their commitment to the organizational strategy and therefore positively influences strategic decision effectiveness. Therefore, although information seeking activities in the external network could lead to rationality during decision making, the strength of the other types of relational social exchange in the top managers' external networks determines whether rational decisions are effective or not. In the case of political behavior, although top managers engaging in political behavior may reduce the effectiveness of decision making, this effect is weakened by the extent to which the top managers display commitment by engaging in other types of social exchange in their external networks.

*Proposition 3. When top management team members engage in relational activities in their diverse external networks, the positive relationship between rationality and strategic decision-making effectiveness becomes more positive.*

*Proposition 4. When top management team members engage in relational activities in their diverse external networks, the negative relationship between political behavior and strategic decision-making effectiveness becomes less negative.*

The theoretical model summarizing the propositions is illustrated in Figure 3.1.

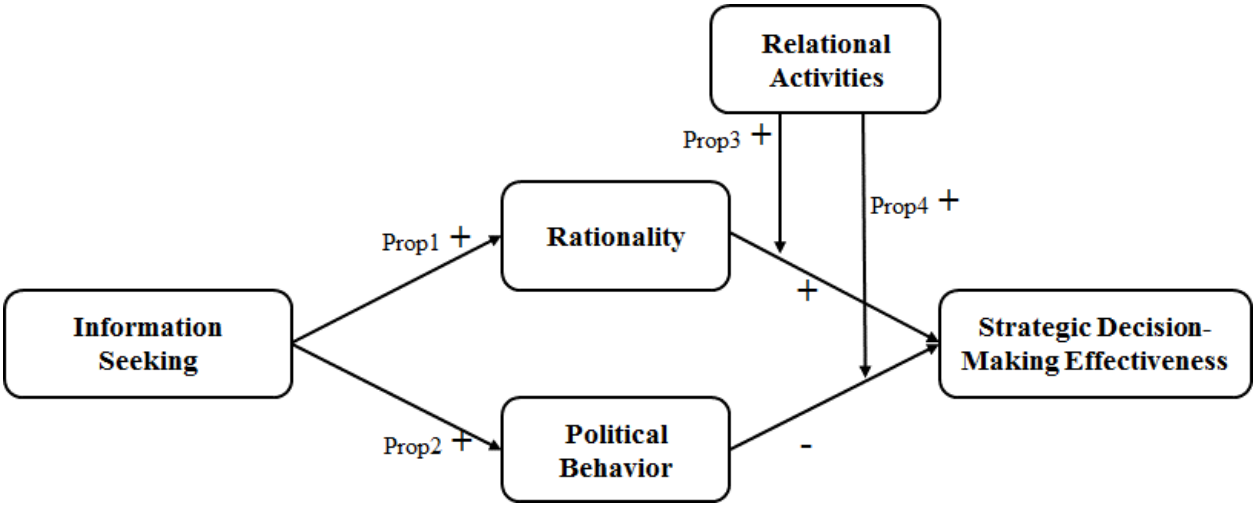


**Figure 3.1 -** Theoretical model of effects of TMT boundary spanning in external networks on strategic decision making process and effectiveness

| Authors | Year | Context | Boundary spanning activities classification | | |
|---|---|---|---|---|---|
| | | | **Informational** | **Relational** | **Other** |
| Aldrich, H. & Herker, D. | 1977 | Inter-organizational network | - Processing of information<br>- Decision to act and respond to information<br>- Transmission of information across boundary | - Maintaining or improving external political status of organization<br>- Negotiating<br>- Acquisition of resources and external support | |
| Jemison, D. B. | 1979 | Inter-organizational network | - Information acquisition and control | - Domain determination and interface | - Physical input control |
| Ancona, D. G., & Caldwell, D. F. | 1992 | Multiple teams within an organization | - Filtering of information (taking information from external sources and providing a small amount of it to the group) | - Mapping the external environment for opportunities and threats<br>- Assessing relationship with external parties<br>- Modifying external environment to suit organizational agenda<br>- Coordinating and negotiating | |
| Yukl, G. | 1989 | External leaders of teams in an organization | - Giving information<br>- Seeking information | - Influencing people<br>- Building relationships | - Making decisions |
| Druskat, V. U., & Wheeler, J. V. | 2003 | External leaders of teams in an organization | - Seeking information | - Relating to external parties - building social and political awareness<br>- Obtaining external support | - Relating to internal parties - building trust<br>- Influencing internal parties<br>- Empowering subordinates<br>- Making decisions<br>- Coaching<br>- Diagnosing internal issues<br>- Investigating problems systematically |
| Marrone, J. A. | 2010 | Multiple teams within an organization | - Access general or technical information from external parties | - Persuading<br>- Obtaining external support and resources | - Coordination |

**Table 3.1 -** Types of boundary spanning activities

**Discussion**

Starting from the importance of investigating the actions and interactions of the most dominant individuals in the organizations, this paper aims at offering a theoretical framework for enriching the understanding on how top management team members can affect strategic decision-making process. Based on Hambrick and Mason's (1984) upper echelons theory, we propose that executives can significantly affect the decisions made within their organization and, in turn, organizational outcomes, such as performance and innovation (Carpenter et al., 2004). Given this, examining top management team characteristics is essential in understanding the strategic decision making process in organizations

In adopting this perspective, we particularly focus on TMT members' external engagements, which have historically been related almost exclusively to their capacity to search for and collect information and relevant knowledge outside of the organizational boundaries. More specifically, we propose that the degree of heterogeneity of their external networks may have a crucial role in shaping two main dimensions of strategic decision effectiveness, namely rationality and political behavior. Additionally, our conceptual model expects both such dimensions to lead to strategic decision making effectiveness according to board members' relational activities. That is, building upon boundary spanning and relational pluralism literature, we suggest that executives' rational and political behavior shapes strategic decision effectiveness depending upon the extent to which they engage in persuading and negotiating activities. So, while the information seeking behavior describes the actions TMT members are likely to take *before* strategic decisions are made, relational activities

rather refer to those they engage *after* the strategy has been formulated and the decision made.

Our conceptual model contributes to extant research on managerial and organizational cognition in general, and particularly to decision making in top management teams in several ways. It extends the literature on upper echelons theory by examining the joint influence of *ex ante* and *ex post* activities board members engage in for increasing strategic decision effectiveness. Moreover, it theoretically speculates on the consequences that interacting with diverse external ties can produce for executives influencing strategic decision making. While scholars point to the relevance of building heterogeneous networks in order to access non-redundant knowledge, the way in which these networks influence TMT members' strategic-decision making has not been fully explored. By postulating a moderating effect of relational boundary spanning activities in the relationship between strategic decision-making processes and effectiveness, our paper sheds light on the importance of looking at board members as organizational actors, who are critical for linking their internal and external environments.

Consistent with the literature on top management teams (Deutsch & Ross, 2003; Finkelstein & Hambrick, 1996), we examine how top managers play different functions: on the one hand, monitoring their divisions' activities and functioning and providing advice to the CEO on organizational strategy, and on the other hand, and using their external connections to identify important cues regarding the firms' external environment–new opportunities available, potential new partners, etc. Our paper also contributes to TMT literature by proposing a linkage between these two functions, thereby deepening the understanding with regard to how board members exploit their opportunities to link external and internal organization environment.

With corporate governance increasingly coming into the focus for various reasons, both right and wrong, our conceptual model of how external boundary spanning activities of top managers influence decision making outcomes provides several key practical implications to organizations and CEOs. For example, organizations must think beyond merely intra-firm expertise and capabilities when choosing individuals into their top management teams. As these individuals play key roles in the external environment of the organizations as well, CEOs and organizations are better served in ensuring that the top team members complement each other in the nature of activities they engage in in their external networks. Moreover, developing boundary spanning capabilities such as relating and advocating will enable top management teams to exert better control over their immediate external environment and thereby balance between internal and external factors that lead to effective governance (Walsh & Seward, 1990).

## Conclusion

With past research on top managers and TMTs examining only informational activities of top managers, we advance theory about the other types of social exchange, namely relational activities, of top managers in their external networks and examine how they influence strategic decision making. Our conceptual framework provides insights into how relational activities in the periphery of the organization influences corporate governance, thereby opening up a stream of opportunities for future conceptual and empirical research with interesting practical implications for organizations.

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# CHAPTER 4

## A motivation crowding effect on knowledge sharing within organizational flexible structures

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### Introduction

The extensive changes occurred in the competitive environment over the last decades have led companies to reexamine their organization design. These changes have been brought particularly by the increasing relevance incorporated in the intangible assets, especially the knowledge-based resources, which have become the most strategic source to the firms' competitive advantage (Grant, 1996; Kogut & Zander, 1992). In order to be able to capitalize on these resources, the trend has moved away from the search for mass production efficiencies, hierarchical, and bureaucratic structures to get closer to new organizational forms, aimed at creating learning and knowledge exchange and generation opportunities (Daft & Lewin, 1993).

Consistent with these changes in organizational forms has been changes in the nature of jobs. Jobs have become increasingly knowledge-intensive. Given that knowledge primarily resides in the minds of individuals, successful knowledge management strategies are those that primarily account for individual behavior, and what motivates such behavior. In this regard, we argue that organizations should be

primarily concerned with how to manage employees' motivations affecting individuals' behaviours; more precisely, they should be aware of the dynamic relationship that links intrinsic and extrinsic motivation (Osterloh, Frey, and Frost, 2001), i.e. their crowding effect.

Moreover, although the phenomenon of new organizational forms has motivated several studies and indeed has become a central topic within the management literature, little work on how it actually relates to intra-organizational knowledge processes exists. In particular, even though the importance of organizational forms in facilitating employees' orientation to share knowledge with one another is quite acknowledged, our understanding about how the joint effect between structural-level factors and motivation-based factors affects employees' knowledge sharing behavior is still limited.

Building on prior literature highlighting the impact of the dynamics of motivation on new organizational forms (Osterloh, Frost, and Frey, 2002), we aim at extending this field of study and at filling the above mentioned research gap by placing emphasis on the management of motivation as a source of influence on the relationship between organizational forms and employees' knowledge sharing behaviours. Accordingly, our purpose is to address the following two research questions: 1) *"How does individual-level motivation - in the form of crowding effects - influence intra-organizational knowledge sharing behaviours?";* and 2) *"What is the impact of extrinsic rewards on employees' knowledge sharing (henceforth, KS) behaviours when organizational integrative mechanisms are in place?*".

By empirically examining survey data collected from a sample of 754 knowledge workers from 23 international manufacturing firms, the paper aims at

contributing to the literature on intra-organizational KS behaviours by building on new organizational forms and motivation crowding theory research.

## Theoretical background

### *Intra-organizational knowledge sharing processes*

Effectively managing knowledge may not be a sufficient condition to achieve a competitive advantage with respect to rivals. That is, beyond this, knowledge has to be shared with others. Hence, in order to avoid the loss of strategic intellectual capital, even after individuals leave the organization, knowledge has to be disseminated within the firm, across all organizational levels. Following prior work, KS processes strongly contribute to a successful knowledge management strategy.

KS can be seen as a social interaction culture in which employees exchange work-related experiences, skills, and know-how with colleagues (Lin, 2007), while providing them with task information and know-how which may help them do something better, solve problems more quickly and develop new ideas (Cummings, 2004; Reid, 2003). As Quinn, Anderson, and Finkelstein's (1996) claim, "as one shares knowledge with other units, not only do those units gain information [...]; they share it with others and feedback questions, amplifications, and modifications that add further value for the original sender, creating exponential total growth" (p. 8). Further, Burton and Obel (2013) see knowledge exchange as an iterative information flow in resource allocation systems. Thus, KS stimulates individuals to think critically, express their creativity, and generate new knowledge. In so doing, it ultimately leads to the enhancement of the firm's innovation capability (Lin, 2007).

KS represents a relational act based on a sender-receiver relationship, according to which a two-sided process takes place: communicating one's knowledge and receiving other's knowledge (Reid, 2003; Van den Hooff & Van Weenen, 2004). Moreover, sharing knowledge is seldom a voluntary act; rather, it often follows a request. Hence, the literature distinguishes between two dimensions of KS: one describes employees' willingness to communicate with others and voluntarily transfer their intellectual capital; the other identifies the process of asking colleagues for information and help, by consulting with them in order to learn from their knowledge (Lin, 2007). Given that the two KS sub-processes have a different nature, they can be influenced by different factors (Van den Hooff & De Ridder, 2004) and, as such, be analyzed separately. Following this, in this paper we conceive KS behaviours as resulting from others' request for knowledge, thereby including both the process of asking and getting help from colleagues (i.e. recipient perspective) and the one regarding the sending of knowledge when colleagues ask for it (i.e. the sender perspective).

***New organizational forms***

Over the past two decades, several changes occurred within the labor market and the competitive environment. There appeared to emerge a new way of thinking about generating innovations: firms' sustainable competitiveness increasingly relies on individuals' knowledge and competences, rather than on tangible or purely financial resources; employees' work mobility has amplified, due to the presence of more outside options; the most strategic innovations are those exploiting individuals' human capital (Foss, 2002).

As a response to this evolution in the model of innovating, most organizations have implemented new ways of governing the internal relations, by adopting organizational forms likely to foster the development and generation of knowledge assets (Cunha & Kamoche, 2001). Based on the literature, the notion of 'new organizational forms' identifies those firms adopting new ways of structuring their boundaries and their internal organization (Foss, 2002), taking on the forms of 'shamrock' organizations, network organizations, and virtual organizations (Drucker, 1988; Miles & Snow, 1986). Some have labelled them 'boundaryless organizations' (Bird, 1994) in order to underline their dynamic shapes and structures, which facilitate the adaptation to the environmental changes.

Inspired by Japanese organizations' practices (Aoki & Dore, 1994) and incorporated in practices such as autonomous work teams, outsourcing, etc. (Bowman & Singh, 1993), these organizational forms are often seen as the typical way of organizing in the knowledge economy (Miles, Snow, Mathews, Miles, and Coleman, 1997), which has made firms' boundaries more permeable and given rise to various forms of internal hybrids likely to smooth the lateral sharing and integration of knowledge and information (Osterloh et al., 2002). This is consistent with what Holmström and Roberts (1998, p. 90) stress in their paper: "information and knowledge are at the heart of organizational design".

***Crowding effects of motivation***

A great body of literature points to the argument that intrinsic and extrinsic motivation are not additive as standard economists assume (Milgrom & Roberts, 1995). Following this, human behaviour is more realistically influenced at the same time by both extrinsic

and intrinsic motivation (Frey & Oberholzer-Gee, 1997), whose systematic and dynamic relationship produces the so-called crowding effects (Festré & Giustiniano, 2011; Frey, 1997; Frey & Jegen, 2002). Thus, this theory looks at purely intrinsically and purely extrinsically motivated individuals as the two extremes of a continuum of possible combinations between these two types of motivation (Frey & Jegen, 2002) and posits that individuals can move along this spectrum, by getting closer either to the extrinsic motivation (crowding-out effect) or to the intrinsic motivation pole (crowding-in effect).

Individual behaviour studies have particularly benefitted from motivation crowding theory, whose effects have proved to be relevant in several fields of research, such as those related to the labour market, social policy, organization theory, entrepreneurship, psychology, and contract theory. However, when looking at organizational behaviour issues, it is clear that existing research has left the analysis of the individuals' motivation crowding effect on knowledge sharing processes almost unexplored. This is consistent with the limitation involved in the argument underlying the knowledge-based view, which tends to neglect incentive issues (Langlois & Foss, 1999), by assuming that no individuals' opportunistic behaviours as well as potentially conflicting interests exist (Conner & Prahalad, 1996). Hence, it implicitly looks at individuals as 'benevolent cooperators' (Dosi & Marengo, 2000) by underestimating the issue of (external) incentives (Osterloh et al., 2002), i.e. extrinsic motivation.

## Hypotheses development

### *Intrinsic motivation and employees' knowledge sharing behaviours*

Employees' intrinsic motivation has been found to strongly influence employees' behaviours in sharing knowledge and information with colleagues (Bock et al., 2005; Cabrera et al., 2006; Osterloh & Frey, 2000). Intrinsic motivation characterizes those individuals who perform an activity (e.g. task, action, etc.) for its inherent satisfaction and interest rather than for other consequences it may produce; that is, for the fun, the challenge or the positive experience the activity provides them. As Calder and Staw (1975: 599) underline, intrinsic motivation "is valued for its own sake and appears to be self sustained"; moreover, being it a natural tendency, it is a critical element in cognitive, social, and physical development, because "it is through acting on one's inherent interests that one grows in knowledge and skills" (Ryan & Deci, 2000: 56).

In line with Mudambi, Mudambi, and Navarra (2007), knowledge workers, which are usually highly intrinsically motivated, tend to value knowledge generation for its own sake, to foster both the search for knowledge from others and its subsequent integration, to be more curious and not to feel threatened by new and different views. Likewise, prior work shows that individuals who find their work intrinsically satisfying are more likely to raise mutual trust and social capital (Osterloh & Frey, 2000), thus being more open toward exchanging experiences and ideas with others and looking for learning opportunities. Thus, workers who are intrinsically motivated in their job may be more inclined toward sharing knowledge with their colleagues. According to this, we posit that:

*Hypothesis 1: Employees' intrinsic motivation is positively associated with knowledge sharing behaviours within the organization.*

***Organizational integrative mechanisms***

Classic organization theory literature states that the need for sharing knowledge and information between units or departments is contingent upon the interdependency between them (Argyres, 1995; Thompson, 1967). Moreover, it is known that the more complex the knowledge to be exchanged, the more difficult to integrate units and the more the need for complex integrative mechanisms (Galbraith, 1973).

Integrative mechanisms include all instruments that help establish communication channels between separated units (Mintzberg, 1979). Prior work emphasizes their role in facilitating knowledge dissemination and acquisition within the organization by focusing on the use of task forces (Gupta & Govindarajan, 2000) and multi-functional teams (Meeus, Oerlemans, and Hage, 2001). Building on lean structure characteristics, integrative mechanisms occurring via lateral "consultation rather than vertical commands" (Burns & Stalker, 1961: 121) are more appropriate for KS. Particularly, horizontal coordination, usually consisting of teams, networking, and integration roles, is found to be positively linked to communication and information needs, as it allows more flexibility in task execution and provides a rapid solution whenever a need for KS across units, departments or teams arises.

According to this premise, we argue that the implementation of integrative mechanisms that allow communication across all organizational level is likely to facilitate intra-organizational KS processes. Consequently, we hypothesize that:

*Hypothesis 2: The implementation of organizational integrative mechanisms is positively associated with employees' knowledge sharing behaviours within the organization.*

***Motivation crowding-out effect***

External incentives are likely to undermine individuals' intrinsic motivation in two ways: on one side, when individuals perceive an external factor, their self-determination is reduced because a shift in the locus of control from inside to outside the individual occurs (Rotter, 1966). As Reeson and Tisdell (2008: 274) state, in this case "it will no longer be clear whether the behavior is being performed as a 'good deed' or for a reward". Alternatively, external interventions may lead the individual to have the feeling that his/her involvement and competence are not really valued, decreasing his/her self-esteem, because he/she thinks the activity to be accomplished is not worthwhile (Lepper, Greene, and Nisbett, 1973). Overall, external interventions crowd-out intrinsic motivation if the individual affected perceives them to be controlling (Frey & Jegen, 2002; Reeson & Tisdell, 2008).

In support of this view, Kreps (1997) provides two kinds of rationale to crowding out, depending on the organizational context. He uses the results achieved by Holmström and Milgrom (1991) in multi-tasking setting when he states that "an obvious rationale, (…) is that the extrinsic incentives that are imposed – which almost necessarily will be relatively objective and formulaic – may be suboptimal, taking into account the full range of desired tasks." (1997: 361). In case of a single-task context, he instead poses that "(…) if 'intrinsic motivation' is the response of workers to fuzzy, but nonetheless extrinsic incentives, explicit extrinsic incentives that are imposed may fight

rather than complement pre-existing incentives." (1997: 362). The latter conclusion roots on the concept that that individuals are basically norms followers and that incentives might possibly disrupt such norms.

The explanation of such phenomena lies in the idea of 'perceived locus of causality' (PLOC, deCharms, 1968) or 'locus of control' (Rotter, 1966) existing between the perceived motivation and the individual actions. Following such a reasoning, where the locus of causality is *internal* we face pure internal motivation, i.e. the performance is attributed to the individual himself/herself, whereas we face extrinsic motivation where it is *external*, i.e. the performance is ascribed by individuals to the environment, in particular to the material (pay, bonus, etc.) or immaterial (prize, regard of others, etc.) rewards.

The motivation crowding-out effect is particularly relevant when organizations seek to enhance individuals' knowledge sharing orientations. Being knowledge a public good, it is likely that people may free ride on the efforts of others (Osterloh & Frey, 2000) by benefitting from the collective advantages of organizational knowledge exchange, without personally contributing to the joint effort. This represents a critical issue to our study because knowledge processes outcomes are usually hard to observe, to verify, and to measure, making opportunistic behaviours more likely to occur. This is the case, for instance, in which organizational members have no incentive to give up their individual competitive knowledge advantage as long as they are rewarded according to their profitability. Referred to as the social dilemma (Dawes, 1980; Tullock, 1974), this argument is also discussed as the tragedy of the commons in public choice (Hardin, 1968).

Based on this, we expect that when extrinsic rewards for KS behaviours are in place, the positive effect of intrinsic motivation be reduced. We thus posit that:

*Hypothesis 3: The positive association between employees' intrinsic motivation and their knowledge sharing behaviours is weakened when extrinsic rewards for KS are in place.*

***Interaction between extrinsic rewards and integrative mechanisms***

Highly integrated organizations, equipped with cross-level communication channels, often fail in their attempt to foster KS activities among employees, because of rewards systems which motivate them to adopt individualistic behaviours. In line with existing research, extrinsic incentives are thus likely to inhibit cooperative behaviours as they usually motivate individuals to do something because it leads to a separable outcome (Ryan & Deci, 2000).

In organizational contexts, extrinsic motivators usually consist of piece-rate pay (Lazear, 1988), pay for performance (Prendergast, 1999), and career progression (Morris & Empson, 1998). As prior studies highlight, extrinsically motivated employees are less likely to participate in knowledge exchange processes, especially when the knowledge to be exchanged is tacit in nature. This is due to the fact that it makes their effort (i.e. their performance) hard to measure, thus, hard to be compensated (Lam & Lambermont-Ford, 2010). Indeed, the use of extrinsic rewards tends to place the individual "in a transactional rather than a relational stance in respect of the organization" (Lam & Lambermont-Ford, 2010: 53).

Therefore, even when the organization is formally implementing cross-level integrative mechanisms aimed at linking all organizational units, departments, and work groups and increasing the KS activities, an extrinsic reward system is likely to play a negative role in influencing individuals' KS behaviours. Given this, we offer the following hypothesis:

*Hypothesis 4: The positive association between organizational integrative mechanisms and employees' knowledge sharing behaviours is weakened when extrinsic rewards for KS are in place.*

The above discussion is summarized in the research model illustrated in Figure 4.1. below.

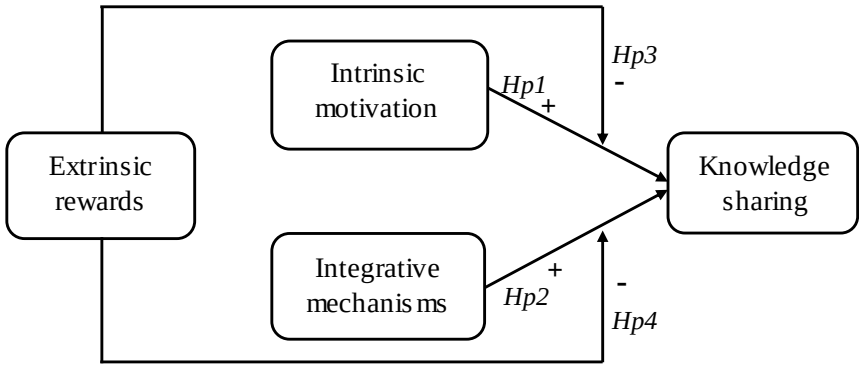


**Figure 4.1** - Research model

## Research method

### *Sample selection*

A draft questionnaire was pilot tested with 53 middle managers of three companies to ensure that its content and wording were free of misunderstandings. We then revised the questionnaire and retested it with 45 managers. For the purpose of this paper, we collected web-survey data from 23 manufacturing firms located in a critical economic area in Central Italy (Tuscany) and operating in international markets.

The need to specifically analyze manufacturing sectors emerged as part of a broader institutional research project, aimed to understand the distinctive features characterizing such industries, which play an important role in the region's competitiveness. Moreover, the need for leveraging intangible assets is particularly relevant for manufacturing companies, as they are increasingly experiencing a rapid change in their traditional manufacturing system, which has radically changed, from a single-site factory to a corporate international network.

A meeting with each of the twenty-three Human Resource Directors was carried out in order to explain the research purpose as well as the relevance of the phenomenon of interest. Together with them, we selected a sample of employees to be involved in the research. We particularly looked at those who are considered nodes of knowledge as they operate at the center of strategic information flows. Hence, the sample included employees that are directly involved in KS processes: in all cases they possess critical knowledge that may concern clients, and/or suppliers, and/or R&D, and/or markets and/or specific technical issues.

Out of the 1503 invitations sent out for participation in the survey, 754 questionnaires were filled in (50.1% response rate). The average response rate within

the companies involved in the study has been of 74.3% (27.6% the minimum; 100% the maximum).

***Measures***

According to Spector (1994), we used self-reported measures for operationalizing all variables in the questionnaire. All scales we adopted come from previous studies and all of them are multiple items- and seven-point Likert type scales.

*Dependent variable*. Van den Hooff and Van Weenen (2004) provided the items used to measure KS behaviour (four-item scale). As already stated, we conceive KS as the process of sharing knowledge by helping colleagues who specifically ask for information (Lin, 2007).

*Independent variables*. We adopted Wasko and Faraj (2000) four-item scale to measure employees' intrinsic motivation, that is the pleasure resulting from sharing knowledge with others. Extrinsic rewards were measured using four items derived from Hargadon (1998) and Davenport and Prusak (1998).

The measure of integrative mechanisms is derived from Galbraith (1973) and Gupta and Govindarajan (2000) and enriched with one item that we developed for the purpose of this research project. The measurement scale was anchored by 1 = "Seldom" and 7 = "Frequently".

*Control variables*. We controlled for a number of possible confounding effects that may impact on employees' KS behaviors. We thus include the following control variables in the empirical analysis: employees' age, their education level (years of education), whether the play a managerial role within the firm (dummy variable, 1=Yes, 0=Else), their level of autonomy in the job (the measure is provided by Hackman and

Oldham's Job Descriptive Index, 1974; 1 = "Strongly disagree", 7 = "Strongly agree") and the extent to which they make use of ICT facilities to share knowledge (two-item scale taken from Lee and Choi, 2003; 1 = "Strongly disagree", 7 = "Strongly agree").

All measurement scales and items are included in Table 4.1.

| *Construct* | *Items description* | *Scale* | *Source* |
|---|---|---|---|
| Knowledge sharing | To what extent do you agree with the following statements?<br>a) I share information I have with colleagues when they ask for it<br>b) I share my skills with colleagues when they ask for it<br>c) Colleagues in my company share knowledge with me when I ask them to<br>d) Colleagues in my company share their skills with me when I ask them to | 7-point Likert scale from 1=Strongly disagree, 7=Strongly agree | Van den Hooff and Van Weenen (2004) |
| Intrinsic motivation | To what extent do you agree with the following statements?<br>a) I enjoy sharing my knowledge with colleagues<br>b) I enjoy helping colleagues by sharing my knowledge<br>c) It feels good to help someone by sharing my knowledge<br>d) Sharing my knowledge with colleagues is pleasurable | 7-point Likert scale from 1=Strongly disagree, 7=Strongly agree | Wasko and Faraj (2000) |
| Extrinsic rewards | In this organization, sharing my knowledge with colleagues should be rewarded with:<br>a) A higher salary<br>b) A higher bonus<br>c) A promotion<br>d) An increased job security | 7-point Likert scale from 1=Strongly disagree, 7=Strongly agree | Hargadon (1998); Davenport and Prusak (1998) |
| Integrative mechanisms | In order to coordinate actions and decisions, to what extent your organizational unit uses the following mechanisms?<br>a) Integration roles (e.g. project manager, etc.)<br>b) Temporary work teams<br>c) Permanent work teams<br>d) Periodic meetings with bosses or co-workers (e.g.: once per week or per month) | 7-point Likert scale from 1=Seldom, 7=Frequently | Galbraith (1973); Gupta and Govindarajan (2000) |
| ICT use | Employees in this organization…<br>a) Make extensive use of electronic storage (such as online databases and data warehousing) to access knowledge<br>b) Use knowledge networks (such as groupware, intranet, virtual communities, etc.) to communicate with colleagues | 7-point Likert scale from 1=Strongly disagree, 7=Strongly agree | Lee and Choi (2003) |
| Autonomy in the job | To what extent do you agree with the following statements?<br>a) The job gives me considerable opportunity for independence and freedom in how I do the work<br>b) The job gives me the opportunity to use my personal initiative or judgment in carrying out the work | 7-point Likert scale from 1=Strongly disagree, 7=Strongly agree | Hackman and Oldham, JDI (1974) |
| Age | Continuous variable | - | - |
| Education | Years of education, continuous variable | - | - |
| Managerial role | Do you have a managerial or coordinating role? | 1=Yes; 0=No | - |

**Table 4.1** - Measurement scales and items

***Results***

Descriptive statistics and correlation matrix for all variables are reported in Table 4.2. In order to assess the internal reliability of our measurement scales, the Cronbach alpha coefficient was calculated and resulted in alpha coefficients which ranged from .64 to .96. Five of the six measures are above the Nunnally (1978) criterion according to which .70 is the minimum value to be considered acceptable. Even though one of the measures falls just below this criterion (i.e. the integrative mechanisms' measure displays an alpha coefficient of .64), we build on Peterson (1994) and Slater (1995) work suggesting that .60 is the 'criterion-in-use' (Ogbonna & Harris, 2000).

In Table 4.3 we provide the results of a hierarchical multiple regression analysis run using Stata on our dependent variable (i.e. employees' KS behaviours). All four models in Table 4.3 include the control variables related to individuals' opportunities to engage in KS activities. In Model 1 we included only the control variables. Model 2 includes all first-order associations between knowledge sharing and intrinsic motivation, extrinsic rewards, and integrative mechanisms, respectively. Model 3 adds the first interaction postulated in Hypothesis 3 and Model 4 adds the second interaction posited in Hypothesis 4.

Before generating the interaction terms, we centered the three variables (i.e. intrinsic motivation, extrinsic rewards, and integrative mechanisms); accordingly, we ran the analysis by including the other variables after centering them, with the only exception of the managerial role, being a dichotomous variable.

Furthermore, in order to detect the presence of multicollinearity among explanatory variables, for each model we calculated the variance inflaction factor (VIF). The VIF values are presented together with the regression results in Table 4.3.

As for control variables, we found that the extent to which employees make use of ICT facilities as well as their degree of autonomy in the job are positively associated with their KS behaviours. The results also show that older employees are less oriented toward engaging in KS activities when colleagues ask them for help and that whether they play a managerial role in the firm matters to their KS orientation. However, the negative and significant impact emerges only when the explanatory variables are included in the analysis (see Model 2-4, β=-.14, p<.05). Conversely, employees' level of education does not have a significant impact on their willingness to contribute to KS.

The findings provide evidence about the positive association between individuals' intrinsic motivation and KS participation (see Model 2, β= .44, $p < .001$; Model 3 and Model 4, β= .45, $p < .001$). Hypothesis 1 is thus strongly supported. We also found that adopting integrative mechanisms helps the employees strengthen their KS participation (see Model 2-4, β= .07, $p < .01$), thus supporting Hypothesis 2. Moreover, the analysis shows a significant and negative moderator effect of extrinsic rewards on the relationship between employees' intrinsic motivation and the dependent variable (see Model 3, β= -.06, $p < .05$; Model 4, β= -.04, $p < .10$), therefore supporting Hypothesis 3. Finally, we found evidence about the moderating role that extrinsic rewards play in the relationship between integrative mechanisms and employees' KS behaviours. In this regard, Model 4 reveals that the relationship postulated in Hypothesis 4 is strongly significant (β= -.04, $p < .001$).

In order to better interpret these results, Figure 4.2 and Figure 4.3 illustrate the interacting relationship between, respectively, extrinsic rewards and intrinsic motivation, and extrinsic rewards and integrative mechanisms.

As can be seen from Figure 4.2, extrinsic rewards are more effective for low intrinsically motivated employees, who tend to increase their knowledge sharing involvement in case their behaviour is rewarded with extrinsic incentives. Conversely, when employees are highly intrinsically motivated (dotted line), the implementation of reward systems for knowledge sharing behaviors leads them to decrease their participation in social interaction and information exchange.

As for the interaction between extrinsic rewards and integrative mechanisms, Figure 4.3 shows that the influence of reward systems is even stronger. Hence, when both variables take high values (i.e. high extrinsic rewards for knowledge sharing and high degree of organizational flexibility and horizontal coordination), employees are found to be less oriented toward sharing knowledge with others, than the case in which, beside high extrinsic rewards, the organization is rather mechanistic. In other words, those who perform best in terms of knowledge sharing orientation are those working within highly integrated organization and with low extrinsic rewards provided. When high integrated mechanisms are coupled with high extrinsic rewards, the potential value of helping individuals interact with each other is decreased.

Table 4.3 also illustrates the variation of the $R^2$ as the variables are added in the analysis. We found that it increases from .16 in Model 1 to .35 in Model 4, thus indicating that our model is able to explain the 35% of the variance of the phenomenon of interest (i.e. employees' KS behaviours). More importantly, even though the most relevant increase in the $R^2$ is determined by adding the main effect of the explanatory variables (see Model 2), the F-test is always highly significant, also when adding the first and second interaction (i.e. respectively, Model 3 and Model 4).

| | Mean | S.D. | Min | Max | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1. Knowledge sharing | 6.00 | .94 | 2 | 7 | *.84* | | | | | | | | |
| 2. Intrinsic motivation to KS | 6.39 | .84 | 1 | 7 | .47* | *.96* | | | | | | | |
| 3. Extrinsic motivation to KS | 3.87 | 1.67 | 1 | 7 | .10* | .03 | *.85* | | | | | | |
| 4. Integrative mechanisms | 4.35 | 1.42 | 1 | 7 | .22* | .20* | .07* | *.64* | | | | | |
| 5. ICT use | 4.65 | 1.67 | 1 | 7 | .19* | .14* | .12* | .34* | *.76* | | | | |
| 6. Autonomy in the job | 5.31 | 1.34 | 1 | 7 | .33* | .20* | .04 | .26* | .18* | *.90* | | | |
| 7. Age | 40 | 8.51 | 22 | 71 | -.04 | .03 | -.08* | -.01 | .06 | .13* | - | | |
| 8. Years of education | 16 | 2.88 | 6 | 10 | -.02 | .03 | -.06 | .21* | .02 | -.03 | -.17* | - | |
| 9. Managerial role | - | - | 0 | 1 | -.02 | .07* | -.21 | .25* | .04 | .19* | .27* | .14* | - |

*Correlation is significant at the .05 level.

*Alpha coefficient is shown in italics on the diagonal.*

**Table 4.2** - Descriptive statistics and correlation matrix for all variables (n = 754)

| | Knowledge sharing | | | |
|---|---|---|---|---|
| | **Model 1** | **Model 2** | **Model 3** | **Model 4** |
| Intercept | 6.07*** | 6.09*** | 6.09*** | 6.09*** |
| | *(127.44)* | *(144.49)* | *(146.19)* | *(147.84)* |
| ICT use | .09*** | .03† | .03† | .04* |
| | *(4.48)* | *(1.72)* | *(1.87)* | *(2.14)* |
| Autonomy in the job | .24*** | .18*** | .17*** | .17*** |
| | *(7.85)* | *(6.08)* | *(6.02)* | *(6.21)* |
| Age | -.01* | -.01* | -.01* | -.01* |
| | *(-2.27)* | *(-2.38)* | *(-2.32)* | *(-2.37)* |
| Level of education | -.00 | -.01 | -.01 | -.01 |
| | *(-.50)* | *(-1.29)* | *(-1.17)* | *(-1.19)* |
| Managerial role | -.11 | -.14* | -.14* | -.14* |
| | *(-1.63)* | *(-2.27)* | *(-2.29)* | *(-2.24)* |
| Intrinsic motivation to KS | | .44*** | .45*** | .45*** |
| | | *(10.00)* | *(10.80)* | *(10.91)* |
| Extrinsic motivation to KS | | .02 | .03 | .02 |
| | | *(1.38)* | *(1.56)* | *(1.44)* |
| Integrative mechanisms | | .07** | .07** | .07** |
| | | *(2.77)* | *(2.66)* | *(2.69)* |
| Extrinsic motivation to KS*Intrinsic motivation to KS | | | -.06* | -.04† |
| | | | *(-2.49)* | *(-1.72)* |
| Extrinsic motivation to KS*Integrative mechanisms | | | | -.04*** |
| | | | | *(-3.35)* |
| $R^2$ | .16 | .33 | .34 | .35 |
| F-test | 19.05*** | 41.60*** | 6.20** | 11.22*** |
| *Vif* | 1.10 | 1.17 | 1.16 | 1.15 |

*t* statistics in parentheses
† $p < .10$; * $p < .05$; ** $p < .01$; *** $p < .001$

**Table 4.3** – Regression results (n = 754)

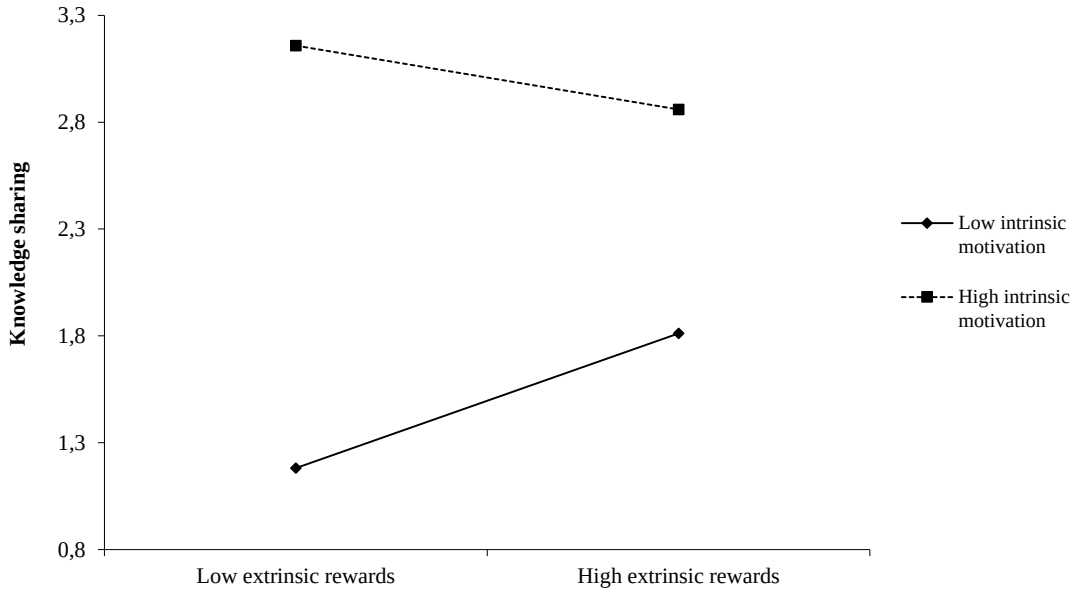


**Figure 4.2** - Interaction between extrinsic rewards and intrinsic motivation

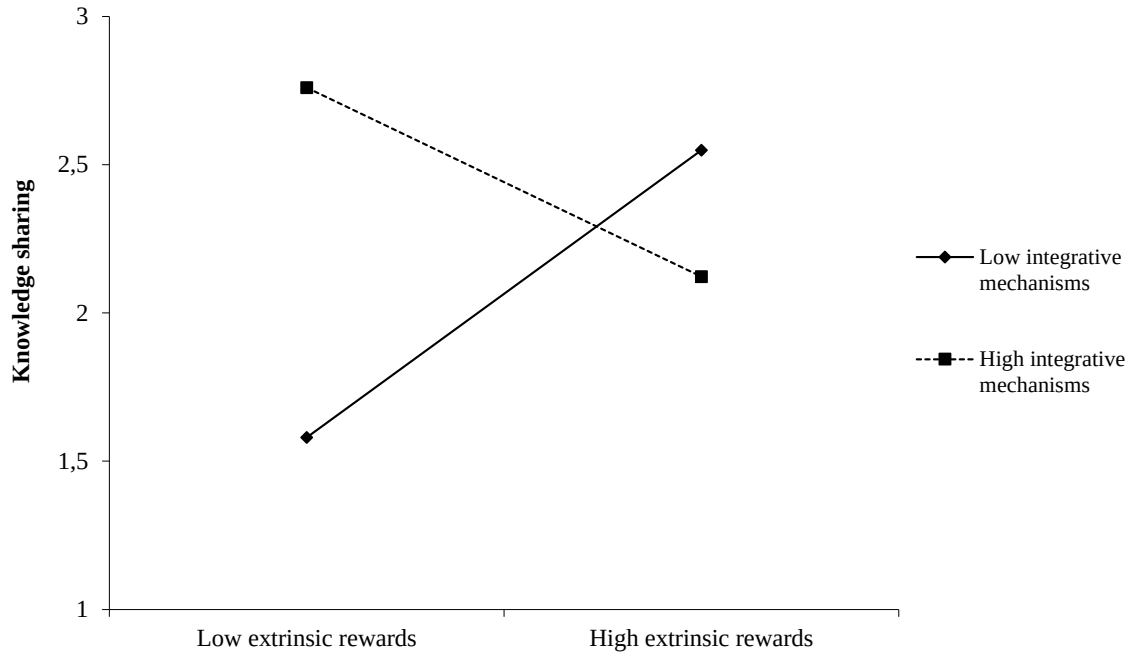


**Figure 4.3** - Interaction between extrinsic rewards and integrative mechanisms

## Discussion

### *Conclusion*

This paper aims at providing an explanation of KS behaviours' antecedents by putting together an organizational perspective (i.e. integrative mechanisms) with an individual one (i.e. motivation). By empirically examining a sample of 754 employees from 23 international manufacturing firms, we found evidence about the positive effect played by both individuals' intrinsic motivation and organizational integrative mechanisms on employees' participation in intra-organizational KS activities. The findings also show that when extrinsic rewards for adopting KS behaviours are in place, such positive effects are reduced.

Overall, the results demonstrate the power of extrinsic motivators as effective moderators likely to shape individuals' actions and to lower the impact of organizational mechanisms aimed at increasing social interaction, reciprocal communication, and, ultimately, KS activities.

Not surprisingly, we did not find empirical evidence about the direct effect of extrinsic rewards on our dependent variable (i.e. KS behaviours; see Table 4.3). This is quite consistent with the existing literature which does not show a consensus about whether and how extrinsic incentives affect employees' behaviours within their organizations. So, the circular loop *motivation* → *performance* → *incentive* → *motivation* is not affected only by the "psychological contract" that ties a single individual (A) to the organization, but also by the subjective evaluation referred to a significant benchmark (B). Such subjective evaluations call for the concept of perceived equity, by which any individual assesses not only the result of his/her effort (Outcomes A) out of his/her commitment (Input A), but instead focuses also on the same ratio

referred to the significant benchmark (Outcomes B/Input B) (Adams & Freedman, 1976). In case of a perceived iniquity (2), whichever is the perceived incentive, firms could encounter serious problems in addressing the behaviour of the individual (A) toward the expected performance.

***Contribution***

We believe that this paper provides interesting theoretical and practical contributions.

First, it sheds light on the importance of providing an appropriate motivation management strategy. Indeed, given that individuals' intrinsic motivation to share knowledge is likely to be reduced when external incentives are implemented, it is important for managers to understand how to avoid the crowding out effect of intrinsic motivation (Osterloh & Frey, 2000). Hence, as Simon (1991: 31-32) states, "in most organizations, employees contribute much more to goal achievement than the minimum that could be extracted from them by supervisory enforcement". This implies that much of the employees' contribution to the organizational objectives is due to their intrinsic motivation (Osterloh & Frey, 2000).

Second, simultaneously analyzing both intrinsic and extrinsic motivation has great advantage because individuals' behaviours are actually shaped by both of them at the same time. That is, it may be unrealistic to look at individuals as either purely intrinsically motivated or extrinsically motivated.

Third, investigating the way organizational integrative mechanisms affect KS behaviours is consistent with the literature supporting the organizational forms as a critical management tool which helps the organization align its strategy to the environment and the related changes in the competitive forces (Chandler, 1962;

Dijksterhuis, Van den Bosch, and Volberda, 1999). As intangible assets have become the most strategic source of firms' competitive advantage, organizations have struggled to find a way to capitalize on these assets, also by adopting the organizational form that is more likely to success (Lam, 2000).

Fourth, contributing to expand the literature on intra-organizational KS is always important because of its critical role in improving the firm's innovation capability and its competitiveness. However, individuals may decide not to spread their knowledge out, as it may cause a loss of distinctiveness (Gupta & Govindarajan, 2000). Accordingly, studying KS antecedents may allow managers to build a more comprehensive understanding about what really matters for it to occur.

***Limitations and directions for future research***

Despite the potential we think is included in the paper, we are aware of its limitations. Because of the sampling criterion, the results cannot be easily generalized; that is, given that data collection was limited to organizations operating in a highly specific area (i.e. Tuscany region), probably our findings could not be applicable to firms of different national cultures (Bock et al., 2005; Hofstede, 1991).

Moreover, cross-sectional data make it difficult to understand the direction of causality; thus, they preclude us from investigating possible endogenous effects in our model. Hence, one may derive alternative causal explanations regarding the relationships we hypothesized. For instance, the way employees engaged in KS in the past is likely to influence their willingness to do so in the future. Further research based on experimental or longitudinal data are needed to investigate the direction of causality.

Furthermore, the paper focuses only on the two main types of motivation, i.e. intrinsic and extrinsic motivation. Future research could then take into account other kinds of individual motivation (e.g. identified regulation, introjected regulation; Gagné, Forest, Gilbert, Aubé, Morin, and Malorni, 2010) in order to come up with a more detailed evidence regarding the influence of these individual enablers on employees' behaviors.

In addition, as suggested by Wang and Noe's (2010) review of KS research, an objective measure of KS should be developed, by collecting, for instance, third-party and archival data in order to enrich our understanding about the more common self-perceptual assessment of KS activities. Similarly, as the authors suggest, we agree that more qualitative research focused on specific KS issues could be useful.

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# CHAPTER 5

## When vicarious learning rewards the originating firm: Exploring the learning opportunities available to the licensor[1]

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### Introduction

The current increasing environmental uncertainty characterizing the competitive markets encourages firms - when faced with insufficient information from their own experience - to strongly rely on other firms' practices for interpreting their own challenges and situations (Baum, Li, and Usher, 2000; Levinthal & March, 1993). The literature defines this phenomenon a vicarious learning, which occurs when firms (the recipients) attempt to collect new external knowledge by observing other companies' (the originators) strategies, administrative practices, and actions (March, 1991). Through vicarious learning, firms are able to explore new external knowledge while choosing to imitate or avoid actions or strategies based on their perceived impact (Cyert & March, 1963). By both minimizing observers' risks of experimentation (Haunschild & Miner, 1997; Terlaak & Gong, 2008) and increasing the efficiency resulting from accessing external knowledge (Gavetti & Levinthal, 2000), vicarious learning is less costly and risky than other types of learning strategies (e.g. experiential search).

[1] Authors are grateful to KTMine for providing their License Agreements Database to support this research.

Existing research has shown the criticality of vicarious learning processes for market entry (Greve, 1998), investment banker choices (Haunschild & Miner, 1997), hotel chain location decisions (Baum & Haveman, 1997), nursing home acquisitions (Baum et al., 2000), and product introductions (Srinivasan, Haunschild, and Grewal, 2007). More recently, some authors (Yang, Phelps, and Steensma, 2010; Yang & Steensma, 2014) have uncovered the potential of what we can call "double loop of vicarious learning". It takes place when the innovator can learn vicariously by observing their imitators which have previously learned from it. According to the authors, the generation of possible recombinations between the originator's and the recipient's knowledge base leads to potential inventions (Ahuja & Katila, 2001; Fleming, 1999; Henderson & Cockburn, 1996; Sorenson, Rivkin, and Fleming, 2006) and produces a common ground of expertise that can reward the originator by observing its imitator at a later stage (Yang et al., 2010; Yang & Steensma, 2014). By holding this true, we posit that the understanding of the benefits innovators can get from building relationships with their imitators becomes more than critical and rewarding when facing the current uncertain and risky competitive scenario.

Inspired by these insights, our paper aims to reframe the analysis of licensing agreements in a vicarious learning fashion. We posit that licensing practices may be driven by the desire to exploit the vicarious learning opportunities available to both the originators (the licensors) and the recipients (the licensees). In this sense, we suggest that licensing-out may allow the licensor to benefit from the vicarious learning opportunities spelled out by its downstream technology buyers, in such a way that engaging in licensing–out may be considered a privileged strategy to build a fruitful relationship with imitators. This perspective suggests that, in the first round, the licensor

(the originator) can select its licensees (the recipients) that are more able to vicariously learn from it; in the second round, it can approach the licensee in the reversal situation by acquiring new knowledge – result of the recombination activity performed by the recipient as a consequence of the vicarious learning - to integrate it in its core processes and products. In this sense, we investigate the "double-loop" of vicarious learning in the context of licensing, from the originator to the recipient and from the recipient back to the originator. We therefore address the following research questions: "*Can vicarious learning explain a firm's decision to license-out its technology in the first stage? What kind of rewards (i.e. learning opportunities) can accrue to the licensor in the second stage?"*

Recent literature has emphasized the role of licensing as an inter-firm partnership that allows firms to tap into other organizations' research outcomes (Arora, Fosfuri, and Gambardella, 2001; Athreye & Cantwell, 2007) as well as to foster innovation and superior performance (e.g. Leone & Reichstein, 2012). However, while prior works have provided insightful evidence on the learning effect of licensing-in by focusing on the recombination activity performed by the licensee firm as a result of the integration of the externally sourced knowledge (e.g. Arora & Ceccagnoli, 2006; Johnson, 2002; Leone, Reichstein, Boccardelli, and Magnusson, 2015), so far extant literature has neglected the learning potential of the licensing from the licensor's perspective. A few articles (i.e. Pitketjly, 2001) have rather accentuated the dark side of the 'learning-by-licensing' by warning the licensors of losing the technological lead by giving away valuable learning opportunities to the licensee. As a consequence, attention has traditionally been given to the understanding of how the licensors could inhibit licensees' attempts to take advantage of their own "accidental" knowledge spillovers

(Hill, 1992). We advance the mainstream literature by building on the vicarious learning perspective in order to investigate and assess the role and strategic importance of the learning opportunities also available to the licensors. In this sense, we follow Srivastava and Wang (2015) whose study empirically demonstrates that licensing-out allows the licensor to improve its patenting performance, thus allowing it to reap the benefits from interacting with its licensing parties.

We explore the double loop of vicarious learning in the context of licensing agreements by analyzing a longitudinal database, compiled from 1986 to 2014, including information on 245 licensing agreements. We first identified all the cases where a licensor-licensee dyad exchanged their roles in a later stage. We therefore analyzed the circumstances under which the initial licensor licensed back a technology from its initial licensee in a second round, as a result of the vicarious learning opportunities exploited by the licensees in the first round. Findings show that a role inversion, of the originator/licensor and the recipient/licensee, mainly occurs when the initial licensee is in a technology class less familiar to the licensor, thus reinforcing the evidence of the explorative nature of the learning opportunities offered by licensing-out.

The contribution of the paper is threefold. First of all, grounding on the organizational learning literature, we attempt to enrich the understanding of the licensing phenomenon by focusing on the learning opportunities available to the licensing parties. In this sense, our arguments propose to shift the analysis of licensing-out from the traditional 'only seller' to the 'seller-and-buyer' perspective, also termed 'coupled process' of open innovation (Gassmann & Enkel, 2004), which points to the benefits generated by firms engaging simultaneously in 'giving' and 'taking', such as in licensing-out and licensing–in activies (Clarysse, Wright, and Mustar, 2009). Secondly,

this work informs the literature focused on the structure of incentives affecting the relationship between the licensor and the licensees. While so far scholars have extensively investigated the market-based incentives (i.e. 'revenue effect', Arora & Fosfuri, 2003; Fosfuri, 2006) from the licensor's perspective and the formal incentives from the licensee's perspective (i.e. inclusion of grant-back clause, Leone & Reichstein, 2012), our study aims at complementing prior research by claiming that the "double loop" of vicarious learning may provide a good incentive for both the licensor and the licensee to decide to engage in a licensing agreement. Thirdly, our research contributes to the research on vicarious learning in the context of formal partnerships, such as acquisitions (Baum et al., 2000), strategic alliances (Lubatkin, Florin, and Lane, 2001; Tsang, 1999) and, more broadly, internationalization processes (De Clercq, Sapienza, Yavuz, and Zhou, 2012), by providing empirical evidence in the case of licensing agreements. Furthermore, while to date scholars have investigated vicarious learning while analyzing longitudinal patent data collected within a single industry (e.g. Yang et al., 2010), we specifically look at data on licensing agreements among firms operating in a number of industries. This allows a broader generalization of the results and a closer understanding of the vicarious learning phenomenon within licensing deals.

The remainder of the paper is organized as follows. We develop the theoretical argument underlying the learning benefits available to the licensor. For this purpose, we firstly focus on licensing agreements as a critical means to learn from other companies and then shift the attention to the consequences of licensors' learning vicariously from their licensees. We follow with an outline of the data used for providing an exploratory analysis of the phenomenon. We then discuss the results and conclude with implications and directions for future research.

## Theoretical background

### *Licensing and learning*

Mounting literature has devoted attention to the benefits that both parties (i.e. licensor and licensee) can gain from engaging in licensing. From the recipient side, through licensing-in an innovator's technology, licensees can remain at the technological frontier, thus keeping competitors at bay (Leone & Reichstein, 2012) and leading to new combination of knowledge and increased innovation (Choi, 2002; Fleming & Sorenson, 2004; Rigby & Zook, 2002). Especially when struggling with the need to keep up with technological advances, licensees can get already developed and proven technology to face the environmental uncertainty (Atuahene-Gima, 1993), thereby increasing the likelihood of coming up with an innovation (Caves, Crookell, and Killing, 1983). Moreover, 'buying' external knowledge accelerates licensee's time to invention (Leone & Reichstein, 2012), leading to a more efficient internal R&D and a faster product development process (Markman, Gianiodis, Phan, and Balkin, 2005). From the innovator side, several reasons underlie the choice of selling its technology. Through licensing-out, firms can fully capitalize on their innovations (Arora & Fosfuri, 2003; Link & Scott, 2002; Walter, 2012), improve revenues and profits (Fosfuri, 2006), increase awareness of property rights issues, enhance social status as technology leaders in industries and regions and foster future patenting activities (Srivastava & Wang, 2015).

Besides traditional reasons for licensing-in and licensing-out, a critical, albeit less investigated, advantage that licensing is likely to provide to both the licensor and the licensee is the opportunity to learn. The literature has so far analyzed the learning

opportunities available to the licensee (e.g. Arora & Ceccagnoli, 2006; Johnson, 2002; Leone & Reichstein, 2012; Leone et al., 2015). In this regard, scholars have demonstrated that licensing-in technology allows the licensee to extend its technology search space (Laursen, Leone, and Torrisi, 2010), and ease the transfer of additional otherwise undisclosed knowledge, besides that wrapped in a patent document. These circumstances are conducive to the reinforcement and the improvement of the learning capacity and the innovation intensity of the licensees. According to the authors, the recombination of external sourced and internal knowledge triggers the innovation process and leads to the introduction of new patents in a shorter time period (Leone & Reichstein, 2012; Leone et al., 2015). Scant attention has instead been paid to the learning potential of the licensing from the licensor's perspective. The reasons for this is that licensing-out was primarily the prerogative of the big companies looking for additional source of revenues from their huge patenting stock. Therefore, the mainstream literature has generally zoomed into the market-based incentives (i.e. 'revenue effect', Arora & Fosfuri, 2003; Fosfuri, 2006; Link & Scott, 2002; Walter, 2012) explaining the reasons for licensing-out. A few articles (i.e. Pitketjly, 2001) have rather accentuated the dark side of the 'learning-by-licensing' by warning the licensors of losing the technological lead by giving away valuable learning opportunities to the licensee. As a consequence, attention has been traditionally given to the understanding of how licensors could inhibit licensees' attempts to take advantage of their own "accidental" knowledge spillovers (Hill, 1992).

In order to fill this gap, we advance previous literature by focusing on the learning opportunity available to the licensor. We draw from the organizational learning literature and borrow the vicarious learning construct to understand the phenomenon.

We argue that licensing-out may entail an incredible opportunity for the licensor to build fruitful relationships with the best licensees that can learn from it. In this sense, the vicarious learning opportunities exploited by the licensee may reward the licensor in the next round, in terms of new pieces of knowledge to build on for future innovations.

### *Vicarious learning in licensing agreements*

The way firms learn from other firms is a widely debated issue in the literature. In particular, recent attempts have been made to unveil the way firms observe others in order to imitate them and enhance their innovative performance (e.g., Terlaak & Gong, 2008). Scholars define this process as vicarious learning, and it occurs when firms attempt to learn by observing the behaviors and actions of other firms (Cyert and March, 1963; Huber, 1991; Levitt & March, 1988; March, 1991). It has been described as way to pursue a strategy of inter-organizational imitation (Hauschild & Miner, 1997) or, similarly, as a type of indirect learning (Bingham & Davis, 2012). By implying to learn from others' experience, it can be considered a form of heuristic search (Cyert & March, 1963); in so doing, it does not require the observer to invest great amount of resources (Huber, 1991), but the simple observation and evaluation of other companies. Such learning process involves at least two parties: on the one hand the originating firm (also called the innovator), that is the company which has introduced an innovation or, more generally, produced a new technology; on the other hand the recipient firm (the imitator), say the organization which attempts to imitate it and replicate the innovator's behavior by observation.

Current research offers several contributions exploring vicarious learning among firms. Existing studies investigate a variety of issues, such as the different modes of

inter-organizational imitation (Haunschild & Miner, 1997), the mechanisms through which such imitation may unfold (DiMaggio & Powell, 1983), as well as the contexts in which it is likely to take place (e.g., acquisitions, market entry, etc.; Beckman & Hauschild, 2002; McKendrick, 2001). Scholars have also attempted to analyze the consequences resulting from this type of inter-organizational learning process. The traditional wisdom, built on the Resource-Based View principles, has emphasized the importance of controlling valuable resources as critical determinants of firms' competitive advantage (Barney, 1991; Pfeffer & Salancik, 1978). Hence, several studies have tried to understand how imitators can reap the benefits of innovator's knowledge spillovers (e.g., Cohen & Levinthal, 1990; Henderson & Cockburn, 1996; Zahra & George, 2002) and, symmetrically, how innovators may prevent them from replicating their sources of competitive advantage (Kogut & Zander, 1992; Lippman & Rumelt, 1982).

Recent literature has instead suggested a new perspective on the phenomenon which is the consequence of the current blurring of boundaries between organizations. It explores how originating firms may benefit from the effects of the vicarious learning processes of recipient firms. Indeed, Yang et al. (2010) demonstrate that originating firms may learn from those organizations which have previously learned from them, thereby opening up a new avenue for conceptualizing the relationship between innovator and imitator. The authors propose that when an originating firm's knowledge spills over and is recombined and used by a recipient firm, a new pool of knowledge is created, which will be inherently based on the originating firm's knowledge base. Given the similarity between these two knowledge pools, the originating firm may find advantageous to learning vicariously from its recipients, thereby having the opportunity

to exploit its own knowledge spillovers. Following this, recent research has investigated the conditions under which this double-loop of vicarious learning is more likely to occur. In particular, Yang and Steensma (2014) acknowledge that the extent to which originating firms learn from their recipients is dependent upon the degree of market uncertainty as well as their risk taking behavior, such that the higher the environmental uncertainty and their risk aversion, the more likely innovators will rely on their imitators for guidance on future explorations. Conversely, a greater risk orientation within dynamic market would lead originating firms to rely less on what is known and rather emphasize the search for new knowledge domains. This argument is consistent with the idea that firms can strategically encourage external actors to copy their own technology in order to influence industry standards (Spencer, 2003). Similarly, it recalls the value incorporated in the 'selective revealing' strategies (e.g. Alexy, George, and Salter, 2013; Harhoff, Henkel, and von Hippel, 2003; Henkel, 2006), which are aimed at intendedly and purposefully disclosing internally developed knowledge. In this case, firm consciously make pieces of their own knowledge accessible to external actors, often for free and without contractual requirements. Such strategies are likely to foster firms' technological and market conditions, especially under adverse conditions, such as high partner uncertainty and high coordination costs (Chesbourgh, 2006; Alexy et al., 2013).

We follow this new stream of literature and provide a new theoretical framework for the analysis of licensing agreements in a vicarious learning fashion. We posit that licensing practices may be driven by the desire to exploit the vicarious learning opportunities available to both the originators (the licensors) and the recipients (the licensees). In this sense, we suggest that licensing-out may allow the licensor to benefit

from the vicarious learning opportunities spelled out by its downstream technology buyers and, therefore, engaging in licensing–out may be considered a privileged strategy to build a fruitful relationship with imitators. This perspective suggests that, in the first round, the licensor (the originator) can select its licensees (the recipients) that are more able to vicariously learn from it; in the second round, it can approach the licensee in the reversal situation by acquiring new knowledge – result of the recombination activity performed by the recipient as a consequence of the vicarious learning - to integrate it in its core processes and products. In this sense, we investigate the "double-loop" of vicarious learning in the context of licensing, from the originator to the recipient and from the recipient back to the originator. By learning from its recipient, the licensor is likely to recombine internal and external knowledge more effectively (Srivastava & Wang, 2015), build a more comprehensive understanding of the technology market, thus improving its learning skills (Clarysse et al., 2009) and innovative capability (Enkel, Gassmann, and Chesbrough, 2009; Gassmann & Enkel, 2004; Walter, 2012). In the same vein, licensing-out requires the licensor to map and grade its technology portfolio (Bianchi, Chiaroni, Chiesa, and Frattini, 2011), which fosters its capability through learning and likely leads to a higher propensity to patent (Srivastava & Wang, 2015).

Investigated under this new perspective, licensing-out provides the licensor with a valuable incentive to innovate, as it may result in significant rewards in terms of learning and competitiveness.

**Research context**

Consistently with the purpose of this paper, we test the argument that vicarious learning can explain the decision of originating firms to engage in licensing agreements on longitudinal data. Our database includes information on licensing agreements among firms from 1986 to 2014, disclosed to the USA Securities and Exchange Commission, and compiled by KTMine[2]. Data refer to firms working in different industries, such as medical, high-tech, electronics, etc. Hence, our study covers a wide spectrum of industries, including manufacturing and services (e.g. SIC 73) allowing a good representation of technology licensing trends. In so doing, our study answers to the call for more empirical studies based on comprehensive datasets of licensing agreements across many industries (Kim & Vonortas, 2006). Furthermore, given that our data extends for more than a decade, we complement existing literature, which mostly offers studies exploring licensing agreements that occurred in a limited period of time (e.g. Anand & Khanna, 2000, who examined a sample of licensing agreements over the period 1990-1993).

The original dataset contained information on the Agreement Date, Filing Company, Licensor and Licensee, Geographical Area, Exclusivity, and SIC Code of the agreement.

Given the explorative nature of this study, the analysis aimed at unveiling the information likely to show the vicarious learning underlying the relationship between licensor and licensee. In order to do that, we firstly identified all the cases in which a role inversions occurred among the licensor-licensee couples in our sample. Therefore, we coded all the cases in which a company licensed out technology to another firm, and

[2] http://www.ktmine.com/ip-data/license-agreements/

then in turn received a license back from its initial licensee in a following year. Based on this, for all the identified licensors, we also extracted all the other agreements they were involved in where no inversion occurred.

***Descriptive statistics: Does inversion occur?***

The resulting sample consists of 245 licensor-licensee-agreement entries of which 92 have an inversion in a different year than the initial licensing agreement and 153 which do not have an inversion over our reporting period. Of the inversions, 64 entries start with a one-way licensing agreement and follow on with a cross-license agreement between both companies, whereas the remaining 28 have a one-way license also for the reversal.

The number inversions and non-inversions in licensing agreements over time is shown in the Figure 5.1 here below. There is no definite pattern emerging; however, we can see that inversions are occurring in every period of our sample whereas non-reversing licensing deals are more concentrated in particular years namely 1999, 2002, 2007 and 2011.

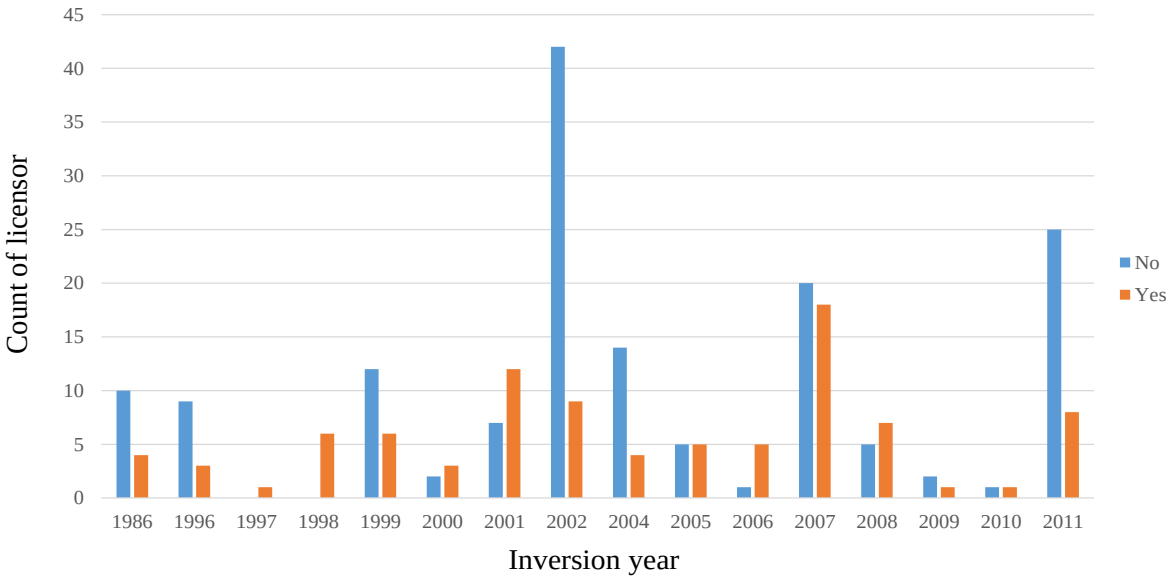


**Figure 5.1 -** Distribution of the inversion of licensing parties over time

Regarding the distribution of licensors' and licensees' industries, we have quite a wide variety of industrial sectors present in our sample. Below we offer a graphical representation of the distribution of the main SIC codes for the licensors and licensees (see Figure 5.2 and Figure 5.3). The most represented industry is the pharmaceutical sector, followed by biotechnologies and services. In the licensee category, we also have several research institutions.

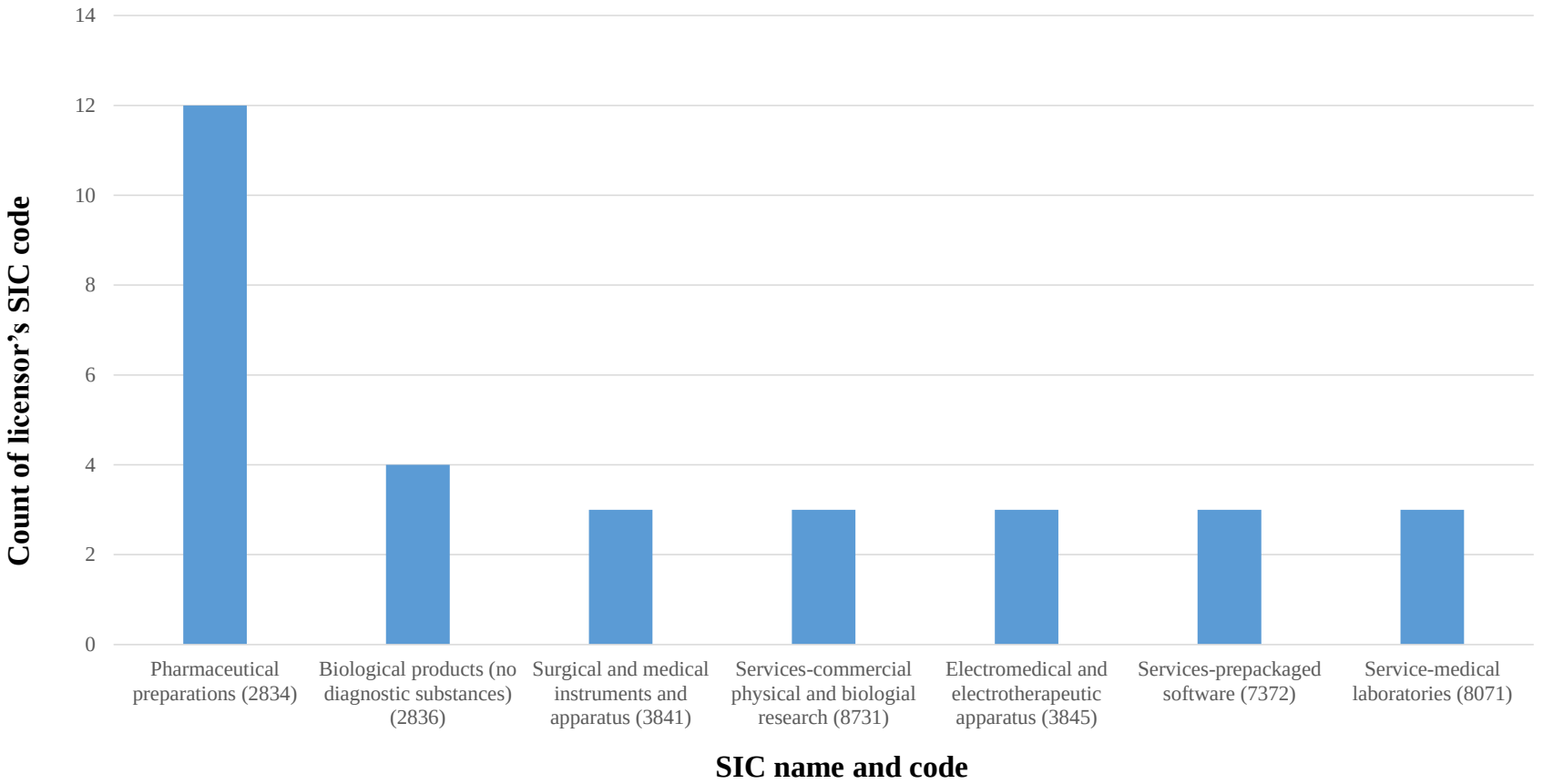


**Figure 5.2 -** Distribution of licensors' 4-Digit SIC codes

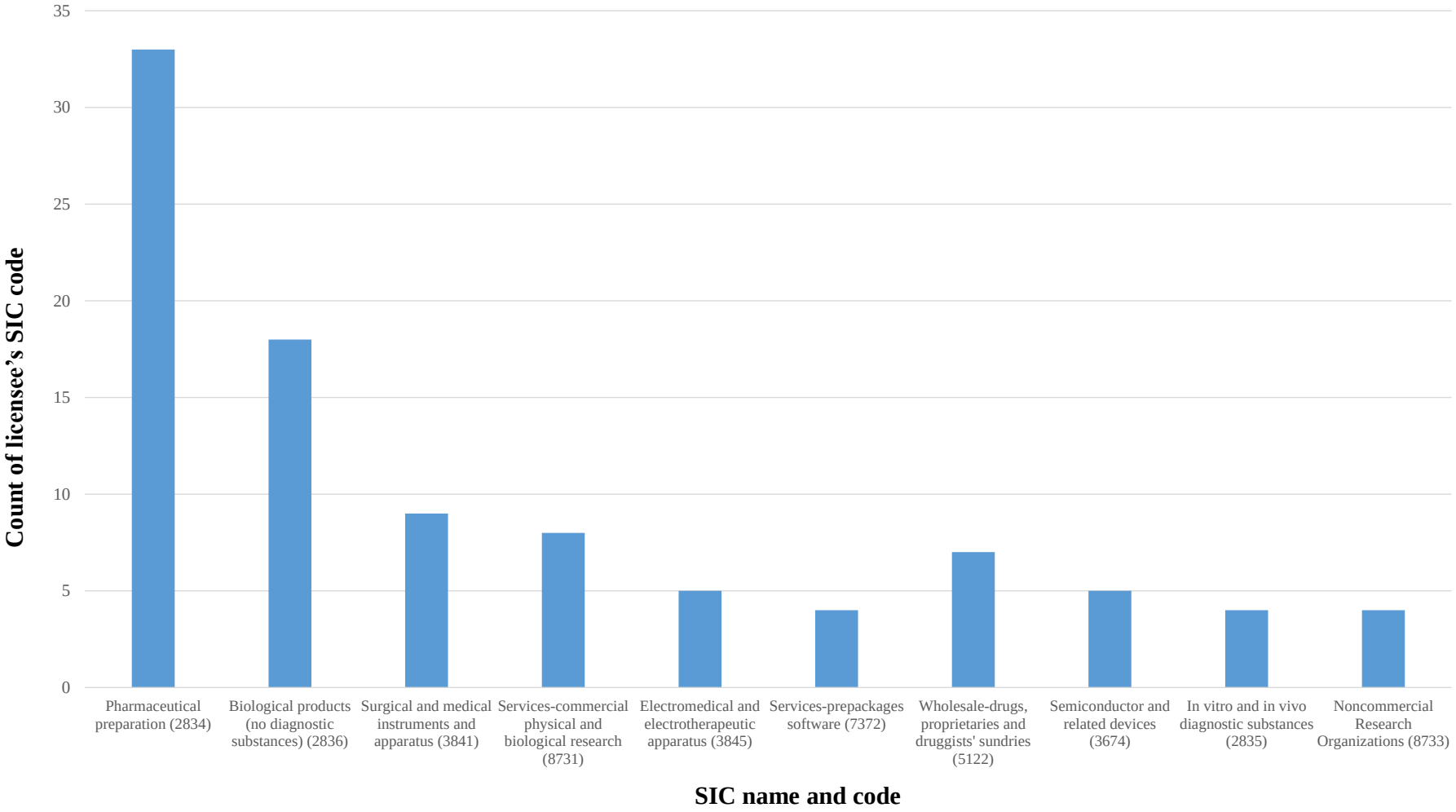


**Figure 5.3 -** Distribution of licensees' 4-Digit SIC codes

***Focus on the participants: Who engages in vicarious learning?***

In order to check whether vicarious learning could be driving the identified licensing agreements, we explored more in-depth the characteristics of the firms engaging in these agreements, both as licensors and as licensees. For the latter, we differentiated between those whose role was eventually inverted with their original licensor and those for which inversion did not occur.

The first variable which had a clear difference in this case was the average size of the licensee in inversion and non-inversion cases as shown by Table 5.1. This variable was measured at inversion year, i.e. at the year in which the licensor in the dyad first became a licensee of one of its previous licensees. On average companies that are part of inversion dyads are 2.5 times the size of the ones that don't end up licensing back technology to their original licensor. As the company size has often been an indicator of absorptive capacity, this is consistent with a vicarious learning scenario whereby the larger imitators can better absorb and process technology they receive from outside the firm, in this case in the original licensing agreement, and thus represents a greater learning opportunity for their licensor, who then will more likely take back a license to learn from them at a future date.

| | **Average employees (thousands)**[3] |
|---|---|
| **Licensees in Inversion Dyads** | 19,2 |
| **Licensees NOT in Inversion Dyads** | 7,7 |

**Table 5.1** – Average number of employees for licensees at inversion year

[3] Source: Compustat NA and Compustat Global.

Another interesting variable was compiled by taking the licensing stock (cumulative number of licenses the companies had participated in; see Figure 5.4) at inversion year for both licensors and licensees. Plotting this value against the time to inversion, i.e. the time it takes for the original licensor to capitalize on the learning opportunities available to it, we can see that the licensors in general have more experience than the licensees. Another interesting trend is that as the companies acquire more experience in licensing, it seems to take them longer to capitalize on the learning opportunities, indicating possibly that as companies become more experienced, and possibly less flexible, it becomes more complex for them to identify learning opportunities.

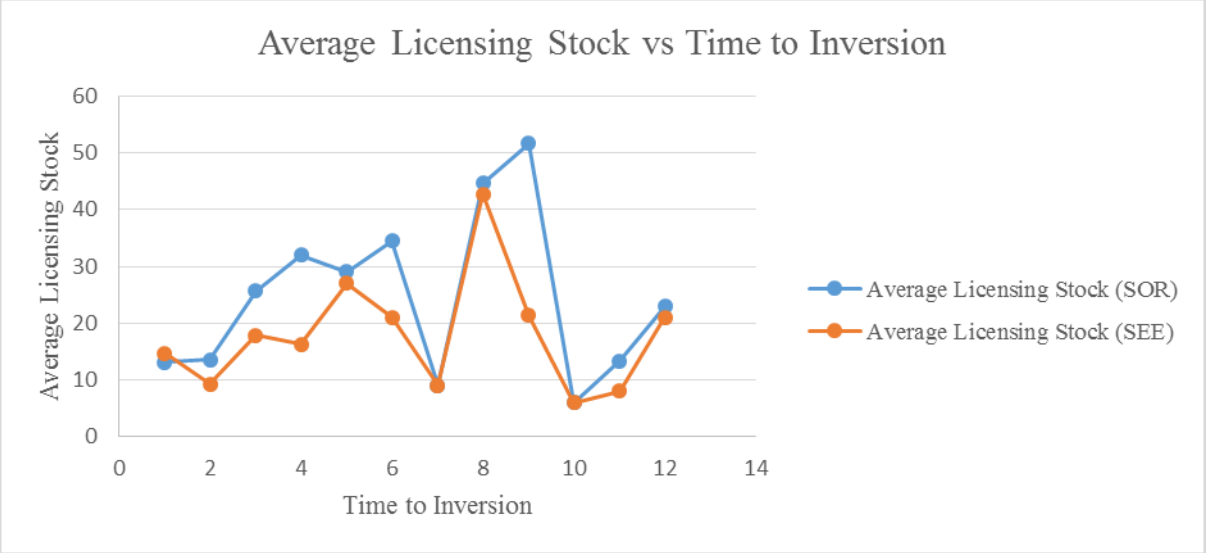


**Figure 5.4** – Average licensing stock versus time to inversion

***Focus on the opportunities: What type of learning is occurring?***

In order to identify which learning opportunities were possibly being exploited in these licensing deals, we started from the industrial classification of the licensor, the licensee and the agreement to see whether patterns emerged in the type of knowledge which was at the basis of a reversal. In order to do this, we compiled matrices showing the distribution of the SIC codes of both the licensor and licensee at the 2-digit and 4-digit level, differentiating between the dyads with and without inversion. These SIC codes indicate the technology area in which each company primarily operates and therefore the category with which they are most familiar and in which they are more knowledgeable.

As can be seen from Figure 5.5 and Figure 5.6 below, the distribution in both cases was almost identical both at the 4 and 2-digit level. This result is also summarized in Table 5.2. Therefore, no relationship was found between the inversion of a licensor-licensee dyad and the relative knowledge of the two companies.

| | **Inversion** | | **Non-inversion** | |
|---|---|---|---|---|
| | **Total** | **%** | **Total** | **%** |
| Same 4-Digit SIC Code for SOR & SEE | 14 | 22,6 | 17 | 19,8 |
| Different 4-Digit SIC Code for SOR & SEE | 48 | 77,4 | 69 | 80,2 |
| Same 2-Digit SIC Code for SOR & SEE | 25 | 40,3 | 34 | 39,5 |
| Different 2-Digit SIC Code for SOR & SEE | 23 | 37,1 | 35 | 40,7 |

**Table 5.2** – Comparison between licensor's and licensee's SIC code for couples with and without inversion

| | Licensee | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 20 | 26 | 28 | 29 | 35 | 36 | 38 | 47 | 48 | 50 | 51 | 59 | 67 | 73 | 80 | 87 | 80 | 99 |
| 20 | | | | | | | | | | | | | | | | | | |
| 26 | | | | | | | | | | | | | | | | | | |
| 28 | 1 | | 15 | | | 1 | 2 | | | | 1 | 1 | | | 2 | 4 | | |
| 32 | | | | | | | | | | | | 1 | | | | | | |
| 35 | | | | | | | | | | | 1 | | | | | | | |
| 36 | | | 1 | | | | | | | | | | 1 | | | | | |
| 38 | | | 4 | | | | 6 | | | | | | | | 1 | | | 1 |
| 47 | | 1 | | | | | | | | | | | | | | | | |
| 48 | | | | | | | | | | | | | | | | | | |
| 50 | | | 1 | | | | | | | | | | | | | | | |
| 51 | | | 1 | | | | | | | | | | | | | | | |
| 59 | | | | | | | | | | | | | | | | | | |
| 67 | | | | | | 1 | | | | | | | | 1 | | | | |
| 73 | | | | | 1 | | | | | | | | | | | | | |
| 80 | | | 2 | | | | | | | | | | | 1 | | | | |
| 87 | | | 4 | 1 | | | | | | | | | | | | 1 | | |
| 89 | | | | | | | | | 1 | | | | | | | | | |
| 99 | | | | | | | | | | | | | | | | | | |

**Figure 5.5 –** Number of inversions per licensor-licensee company 2-Digit SIC Code

| | Licensee | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 01 | 10 | 13 | 27 | 28 | 32 | 35 | 36 | 38 | 50 | 51 | 54 | 59 | 63 | 64 | 67 | 72 | 73 | 78 | 79 | 80 | 82 | 87 | 99 |
| 01 | | | | | | | | | | | | | | | | | | | | | | | | |
| 10 | | | | | | | | | | | | | | | | | | | | | | | | |
| 13 | | 1 | | | | | | | | | | | | | | | | | | | | | | |
| 27 | | | | | | | | | | | | | | | | | | | | | | | | |
| 28 | 1 | | | 1 | 30 | | 2 | | 4 | | 5 | | 1 | | | | | 1 | 1 | 1 | | 1 | 4 | |
| 32 | | | | | | | | | | 1 | | | | | | | | | | | | | | |
| 35 | | | | | | | | | | | | | | | | | | | | | | | | |
| 36 | | | | | | | 1 | 1 | | | | | | | | | | | | | | | | |
| 38 | 1 | | | | 1 | | 1 | | 2 | 2 | | | | | | | | | | | 1 | | 1 | 1 |
| 50 | | | | | | | | 1 | | 1 | | | | | | | | | | | | | | |
| 51 | | | | | | | | | | | | | | | | | | | | | | | | |
| 54 | | | | | | | | | | | | | | | | | | | | | | | | 1 |
| 59 | | | | | | | | | | | | | | | | | | | | | | | | |
| 63 | | | | | | | | | | | | | | | | | | | | | | | | |
| 64 | | | | | | | | | | | | | | | | | | | | | | | | |
| 67 | | | | | | | | 1 | | | | | | | | | | | | | | | | |
| 72 | | | | | | | | | | | | | 1 | | | | | | | | | | | |
| 73 | | | | | | | | 4 | | | | | | 2 | 1 | | | 1 | | | | | | |
| 78 | | | | | | | | | | | | | | | | | | | | | | | | |
| 79 | | | | | | | | | | | | | | | | | | | | | | | | |
| 80 | | | | | | | | | 1 | | | | | | | | | | | | | | 1 | |
| 82 | | | | | | | | | | | | | | | | | | | | | | | | |
| 87 | | | | | 2 | | 1 | 1 | | | | | 1 | | | | | | | | | | | |
| 99 | | | | | | | | | | | | | | | | | | | | | | | | |

**Figure 5.6** - Number of non-inversions per licensor-licensee company 2-Digit SIC Code

However, as shown in Table 5.3, when we look at the 4-digit SIC code of the licensing agreement compared to the SIC codes of the licensor and licensee, we find that in 40% of the cases where inversion occurs, the original license agreement is in neither the licensor nor the licensee's SIC category, against a mere 25% of the instances where inversion does not occur. Moreover, a lower percentage of the cases where inversion occurs have the license agreement in the same SIC code as both licensor and licensee, and the same goes for only the SIC code of the licensor. This implies that in the cases where there is an inversion, in a higher percentage of cases both the licensor and licensee are operating in an industry which is not their primary industry of expertise. Even more are the cases where the licensing is occurring outside the primary SIC code of the licensor, if compared to the cases with no inversion. This is consistent with a vicarious learning scenario, as the inversions occur predominantly when the licensors are initially licensing-out technology in a less familiar area, where they have more to gain from outside expertise, in this case coming from the licensee.

| | **License in Same SIC Code AS SOR & SEE** | **License in Same SIC as SOR only** | **License in Same SIC as SEE only** | **License in Diff SIC than SOR & SEE** | **Total** |
|---|---|---|---|---|---|
| No Inversion | 18 | 41 | 17 | 26 | 102 |
| NO INV % | 17,65 | 40,20 | 16,67 | 25,49 | 100,00 |
| Inversion | 8 | 15 | 9 | 22 | 54 |
| INV % | 14,81 | 27,78 | 16,67 | 40,74 | 100,00 |
| Total | | | | | 156 |

**Table 5.3** - SIC code of licensing agreement compared to licensor and licensee sic code for inversions and no inversions

**Discussion and conclusion**

Grounding on the organizational learning literature, we apply the vicarious learning principles to the licensing agreements. Firms learn vicariously when they observe other firms' strategies, administrative practices, and actions, with the aim of imitating the most successful ones or avoiding those which failed. Despite existing research shows vicarious learning as a frequent practice adopted by firms in a variety of formal partnerships (e.g. acquisitions, strategic alliances, etc.), studies on vicarious learning in licensing agreements are still limited. Starting from this, we aim at conceptualizing licensing agreements while grounding on the tenets of firms' vicarious learning. More specifically, we suggest that the decision to engage in licensing should take into account the incentive implicitly resulting from the vicarious learning opportunities available to both the licensor and the licensee. In order to do that, we ground on the literature analysing the incentives for technology licensing and, instead of focusing on the incentives available to the licensees (see Arora & Ceccagnoli, 2006; Leone et al., 2015), we shed light on those available to the licensor. We argue that innovators (i.e. licensors) may find it advantageous to license-out their technology given the opportunity to learn vicariously from their licensees. Grounding on existing research (e.g. Srivastava & Wang, 2015; Yang et al., 2010), we aim at demonstrating that vicarious learning underlies many licensing agreements, thus providing a valuable incentive for firms that are considering to license-out their own technology. This study offers an explorative analysis of the phenomenon based on an extensive panel data set from 1986 to 2014 including information on licensing agreements among firms, disclosed to the USA Securities and Exchange Commission. For the purpose of this study, we examined all cases where a licensor-licensee couple exchanged roles in a successive moment or

engaged in cross-licensing following the initial, one-way, licensing agreement. Results show that licensor and licensee tend to invert their roles when the initial licensee is in a technology class less familiar to the licensor. This finding supports our idea that vicarious learning is a crucial benefit resulting from licensing agreements.

By focusing on vicarious learning among licensing parties, this paper puts emphasis on the firms' internal realities affecting the relevance of the intellectual capital. As stressed also by practitioners (Harrison & Sullivan, 2000), the value of any company's intellectual capital, defined as "knowledge that can be converted into profit" (p. 34), is strongly dependent upon the "direction, resources, and constraints" which define "the firms' strengths and weaknesses as well as its capabilities for competing in the external world" (p. 36). Put another way, in order to extract profits from their innovations, firms should carefully appraise their internal environment, that is their resources and processes likely to support the strategy of managing their intellectual capital. Among such internal processes are the learning processes, which are considered as critical sources of a firm's sustainable competitiveness (March, 1991). Consistently, our argument poses attention on the importance of intellectual capital activities which impact on a future time dimension, instead of a current time one (Harrison & Sullivan, 2000). Unlike strategies aimed at generating a one-time value, often supported by favourable market conditions existing at the time of the strategy implementation (e.g. a particularly profitable technology sale), our focus accounts for the need to develop an intellectual capital strategy oriented toward the production of an ongoing value.

Three contributions are particularly worth emphasizing. First, this study adds to the licensing literature by offering a new theoretical lens to understand the underlying process of licensing-out and to fine-tune the tied relationship between this formal partnership and the learning processes unfolding within the licensing parties (Johnson &

Sohi, 2003; Link & Scott, 2002; Peng, Mu, and Di Benedetto, 2013; Pitkethly, 2001). More specifically, it attempts to foster the understanding of licensing as a new way through which licensors can increase their learning capabilities and innovation, thereby shifting the focus from the 'only seller' to the 'seller-and-buyer' perspective. As a result, this approach opens up new avenues for conceptualizing licensing agreements as a valuable strategy for simultaneously implementing an exploration-exploitation strategy, leading to increased ambidexterity and superior performance (He & Wong, 2004; Rothaermel & Alexandre, 2009; Stettner & Lavie, 2014). Consistently, it complements prior research on licensing which has mostly assumed the licensor to be a monopolist technology holder (Fosfuri, 2006), thus making the need to consider the interactions with its licensee almost irrelevant. More importantly, such a perspective on licensing has neglected the importance for any firm to constantly keep an eye on the external environment, thus preparing for embracing an open innovation approach to remain competitive in the market. Second, this work can inform the literature on the reasons that lead firms to license out their technology, by proposing that the vicarious learning resulting from interacting with the licensing party can be a valuable incentive to establish formal partnership. In particular, we provide new evidence regarding the incentives available to the licensor. So far, scholars have rather devoted attention to investigate the incentives available to the licensee (e.g. Laursen et al., 2010; Johnson, 2002; Hagedoorn, 1993). Differently, those focusing on the incentives available to the originating firms have emphasized two main types of incentives. On one side, the use of market-based incentives, such as the competition in the market (e.g. Arora & Fosfuri, 2003), whose main assumption is that the presence of multiple sources for a technology creates an incentive to license. When the number of potential licensors increases, licensors have weaker bargaining power *vis-à-vis* the one of the prospective licensees

(Fosfuri, 2006). Similarly, the literature highlights the role played by the licensor's market share as a determinant of its decision to license its technology. Assuming that market share is independent of other firm-specific variables, Fosfuri (2006) points out that firms with smaller market shares have stronger incentives to license as they suffer from a smaller profit dissipation effect. On the other side, researchers have devoted attention to formal incentives, such as the grant-back clause (e.g. Leone & Reichstein, 2012) which, by definition, require to be included in the licensing contract. However, both these incentive types have their limitations. Those related to market features do not account for the firm's internal processes and characteristics, such as the existing knowledge base, the capacity to assimilate new knowledge, the ability to exploit the different kind of benefits resulting from the decision to license-out. In turn, formal incentives assure the licensor to capture the value of licensees' future advances or improvements to the licensed technology developed during the term of the agreement; however, they may create a disincentive for the licensee to maximize the returns potentially resulting from engaging in licensing agreements (Leone & Reichstein, 2012). Consistently with this, our paper sheds light on firm-related and less formal incentives, such as those linked to the learning opportunities which accounts for the importance of considering the licensor's internal processes. Third, this paper extends recent research on vicarious learning among firms (e.g., Yang et al., 2010; Yang & Steensma, 2014) while focusing on the particular context of licensing agreements. I so doing, we extends current literature which mostly analyzes longitudinal patent data collected within a single industry (e.g. Yang et al., 2010). Differently, we collected and examined data on licensing agreements among firms operating in a number of industries, thus allowing broader generalization of the results and a closer understanding of the vicarious learning phenomenon within licensing deals. Consistently, while

grounding on the assumption that knowledge spillovers not only benefit the imitator but also the originating firms, we contribute to the licensing literature by proposing that licensing parties may learn from each other as a function of their involvement in a formal partnership (Srivastava & Wang, 2015).

***Managerial implications***

The paper offers managerial implications for both licensor and licensee. We suggest that both parties involved in licensing should be aware of the incentive related to the licensor's vicarious learning. From the licensor's point of view, this virtuous circle of learning may ultimately drive it to choose the "best imitators" as future partners, either by further licensing-out some internal technologies or by licensing-in formal technical knowledge from prior and/or current licensees. Put another way, embracing this perspective may help understand why some licensing agreements give rise to further licensing agreements whose parties invert their roles, i.e. the firm that once was the licensor becomes the technology buyer and, vice versa, the former licensee turns out to be the seller. From the licensees' side, conceptualizing vicarious learning as a critical incentive to licensing-out places the licensee in a favourable position. To the extent that the licensor is able to learn from the licensee, this may lead to increase the probability that the current licensor will buy the current licensee's technology in the future. Hence, unlike other types of incentives investigated in the literature (e.g. Leone & Reichstein, 2012) which provide a shift toward the licensor and away from the licensee, placing emphasis on the vicarious learning opportunities available to the licensor can also benefit the licensee. Consistently, conceptualizing licensing agreements though this lens allows to highlight the importance for both licensing parties to build favourable relationships with each other.

Additionally, theorizing licensing by considering both licensor and licensee learning partners echoes the core process archetypes proposed in the open innovation literature: the *outside-in*, the *inside-out*, and the *coupled process* (Gassmann & Enkel, 2004). While the *outside-in* process occurs when a company invests in cooperating with partners and integrates external knowledge in order to enrich its own knowledge base (e.g. by buying and/or licensing-in intellectual property, via suppliers and/or customers integration in product development), the *inside-out* process is typical of firms externalizing their knowledge such as by licensing-out intellectual property. When a firm simultaneously implements both the *outside-in* and the *inside-out* processes, then it can be said to pursue a *coupled process*. A coupled process identifies a firm's strategy which emphasizes the advantages of both 'give' and 'take', thus combining attempts to bring in external knowledge (i.e. *outside-in* process) with those of externalizing its own knowledge (i.e. *inside-out* process). Such a process requires a company to establish a strategic cooperation with specific partners, in order to reap the benefits of both importing technology from the market and jointly develop new technology with the other parties (Gassmann & Enkel, 2004). Given the complexity inherently characterizing the development of new technology, a *coupled process* implies a profound interaction between parties over a long period of time (Fritsch & Lukas, 2001; Pisano, 1990), which is likely to result in a mutual learning process (Hamel, 1991; Lane & Lubatkin, 1998) and an improvement in the competitive position. When applied to the licensing strategies, a *coupled process* is likely to result in licensors engaging in both licensing-out and licensing-in activities (Pitkethly, 2001; Srivastava & Wang, 2015) and suggests the innovators to constantly keep an eye on the opportunities potentially available in the external environment.

***Limitations and future research***

A potential direction for improving this paper might be to explore whether there is some relationship between the extent to which originating firms unintendedly disclose their knowledge leading to a potential vicarious learning process with their recipients and the extent to which they engage in subsequent 'selective revealing' behaviors. Thus, this paper may ground future research interested in understanding whether firms, which have benefitted from vicarious learning, may decide in the future to purposefully reveal their knowledge sources to externals to foster collaboration with partners and innovative performance.

In addition, this paper raises questions about the extent to which the double-loop of vicarious learning is likely to shape the position of the originating firm in the network of relationships with its recipients. Hence, it may also lead to unexpected and negative consequences for the originating firms, especially in case it is not able to integrate and assimilate the recipient's knowledge into its own knowledge base. For instance, this would be the case in which vicarious learning presents an opportunity to recipients to enhance their innovation capability while, at the same time, eroding innovators' competitive advantage.

Scholars acknowledge that repeated vicarious learning (i.e. when multiple organizations engage in vicarious learning over time) leads to isomorphism in the system, in such a way that most organizations will end up doing similar things and producing similar outcomes (Miner & Anderson, 1999). Despite research also stresses that there are some conditions under which this convergence is less likely (see Miner, Haunschild, and Schwab, 2003), future studies may want to address this issue and extend our work by investigating whether licensing agreements result in some within-industry similarity.

Moreover, based on recent research on organizational learning (Bingham & Davis, 2012), it may be that parties involved in licensing agreements engage in different types of learning over time. Scholars have suggested that direct and indirect learning may be used by firms in ordered ways (e.g. Schwab, 2007), concurrently (e.g. Baum & Dahlin, 2007) or partially concurrently (e.g. Chuang & Baum, 2003). Future research may explore whether and how licensing parties may show an orientation toward learning firstly through indirect learning and then through a direct one or whether there are other forms of organizational learning.

This study points to a further venue for better investigating the link between external and internal learning activities. In his work on external team learning activities and team performance, Bresman (2010) found that, in order to be successful and lead to positive outcomes, vicarious learning needs a sufficient amount of internal learning activities. That is, getting knowledge from observing others is not enough to make sure such knowledge will result in a superior performance. Organizations and their employees should appropriately engage in adjusting, experimenting, and reflecting on the external knowledge in order for it to be exploited and used for the firm's competitiveness. In this regard, existing research has highlighted the need for a deeper understanding of the mechanisms underlying the transfer of knowledge (e.g. Darr, Argote, and Epple, 1995). Accordingly, scholars have started devoting attention to the intra-organizational learning activities that help assimilate, absorb, and use external knowledge (e.g. Ancona & Bresman, 2005). One way to apply this idea to the study of vicarious learning in licensing may be to conduct a qualitative study in order to understand whether companies engage in particular internal learning processes and whether such processes differently affect their performance.

Finally, consistently with the bounded rationality and the limited attention of decision makers (Simon, 1991) as well as the frequent awareness characterizing vicarious learning processes, it may be important to understand how the licensors select the licensees they want to learn from. Organizational learning literature suggests that, in some cases, firms imitate other companies without deliberating much about the traits and characteristics these companies possess (Abrahamson & Rosenkopf, 1993; Haunschild & Miner, 1997); in other cases, they carefully select firms displaying certain features, likely to confirm their values and reputation (Greve, 1998; Rhee, Kim, and Han, 2006). Different theories have thus suggested different imitation modes (e.g., DiMaggio & Powell, 1983; Levitt & March, 1988). Future works may want to explore the criteria which drive the process through which licensors select their learning partners among their licensees.

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# CHAPTER 6

## Realizing the benefits of knowledge sharing: An empirical investigation of knowledge utilization[4]

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### Introduction

A fundamental challenge for any firm is to maximize the net returns from knowledge already possessed by the firm. This basic concern underlies much of the work over the last two to three decades in the "knowledge and organizations" space (e.g., Eisenhart & Santos, 2001; Grandori & Kogut, 2002), and is, of course, the main driving theme in knowledge management. The management challenges arise not only because of the familiar obstacles to the sharing of knowledge, such as lack of motivation, ability and opportunity among senders as well as recipients of knowledge (Reinholdt, Pedersen, and Foss, 2011). They also arise because recipients of new, presumably superior knowledge should also deploy such knowledge in their actual work practice. Merely holding knowledge about a technology, practice, process, opportunity, etc. does not lead *per se* to added value unless that knowledge is somehow manifested in practice (Nag,

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Corley, and Gioia, 2007). And yet, evidence suggests that decision makers actually make little use of the available information (Nelson, Roberts, Maederer, Wertheimer, and Johnson, 1987), whether this is caused by cognitive biases (e.g., neglect of non-salient base-rate information, retrievability heuristics, etc.) or because making use of new knowledge is a motivated effort, and individuals may not feel sufficiently motivated. This is problematic because firms focusing too much on acquiring new knowledge may bear the costs of acquisition while not benefitting from knowledge utilization (Zahra & George, 2002), thus suggesting that sharing, accumulating, and assimilating knowledge is no guarantee of a better performance. Organizations should rather be aware of how and whether the available knowledge is effectively applied (Haas & Hansen, 2007).

In spite of the obvious importance of knowledge utilization, so far empirical contributions addressing this issue are quite limited. Haas and Hansen (2005) focus on the relevance of using knowledge to firms' competitive advantage; Ko and Dennis (2011) explore the use of Knowledge Management Systems and its influence on individual- and group performance, while Nag and Gioia (2012) seek to understand how decision makers in organizations use what they know, and Gardner (2012) asks how teams can use their knowledge more effectively. However, so far the role of individual-level determinant in influencing employees' use of available knowledge has not been investigated. This is quite surprising, as scholars have widely emphasized individuals' orientation, perceptions, and motivation with respect to causing organizational-level outcomes, such as organizational performance, innovation, learning processes, etc. (Crossan, Lane, and White, 1999; Felin & Hesterly, 2007; Nag & Gioia, 2012). Hence, to date, those who have investigated knowledge utilization have mostly looked at quite aggregate phenomena, namely organizational capabilities and competencies (Prahalad

& Hamel, 1990; Teece, Pisano, and Shuen, 1997), while treating the way organizational members influence knowledge use in the first place (Alvesson, 2004).

In this study, we address knowledge utilization in the context of innovative and creative employee behaviors (Janssen, 2000; Basadur & Gelade, 2006). Employee creativity has been extensively explored as an outcome, resulting from personal characteristics (Barron & Harrington, 1981) and specific organizational contextual factors (Amabile, Goldfarb, and Brackfield, 1990; Shalley, 1991; Staw, 1990). However, so far only a few studies have linked employee creativity and knowledge sharing and utilization (e.g., Bharadwaj & Menon, 2000; Taggar, 2002), which is a chief focus in our study.

Additionally, we refine the analysis of the relationship between employee creativity and knowledge utilization by taking into account the moderating effect of job characteristics, specifically, job autonomy and supervisor feedback (cf. also Foss, Minbaeva, Pedersen, and Reinholdt, 2009; Foss, Pedersen, Stea, and Reinholt, 2016). This builds from the argument that the value of knowledge need to be analyzed in relation to a specific context or situation, as possessing knowledge does not necessarily mean that the actor is able to make the best or, in fact, any use of it (Tyre & Von Hippel, 1997). Similarly, Orlikowski (2002) argues that individual competencies and capabilities are constituted on a daily basis following the situated practices of the organizational actors.

To confront our theoretical argument with empirical data, we analyze survey data on 678 employees in two global consulting firms. We find evidence for our main effect argument, namely that the impact of knowledge sharing on work creativity is positively associated with knowledge utilization, that is, those employees that can benefit more from knowledge sharing in terms of being more creative in the job

situation are also those employees who will utilize knowledge to a larger extent. Additionally, we find that job design components significantly moderate the relationship between employees' creativity and knowledge utilization. Our results particularly show that knowledge utilization behaviors are high when employees' creativity, job autonomy, and feedback are all high. Also, our results suggest that giving feedback may lead less creative and low autonomous workers to perform better than highly creative and more independent employees, in terms of utilizing and applying the available knowledge.

In sum, our study contributes to the broad knowledge management field in the following ways. First, by investigating knowledge utilization it stresses the importance of actually using knowledge rather than oinnly sharing, assimilating and accumulating it. Second, our study contributes to enrichen research on micro-foundations of knowledge processes as it provides a link between individual and collective level of analysis (Felin & Hesterly, 2007). That is, it adopts an individual-level perspective and relates it to a potential higher-level outcome (i.e. innovation). Third, by postulating a relationship between idea development (i.e. work creativity) and idea implementation behaviors (i.e. knowledge utilization), it adds evidence for key points in the innovative work behavior literature (Janssen, 2000). Fourth, by conceptualizing work creativity as resulting from sharing knowledge with others, it offers empirical evidence with regard to how the social side of work creativity can affect innovative processes.

## Theoretical background

### *Knowledge utilization*

Research in the organizations and knowledge space, including knowledge management, is based on the assumption of beneficial consequences of knowledge sharing (factoring in the costs of sharing knowledge) (Kogut & Grandori, 2002). To account for the benefits and costs, most empirical research focuses either on the quality and quantity of the knowledge possessed (Hargadon & Fanelli, 2002) or on some distinctive characteristics of knowledge, such as tacitness, stickiness, and complexity (Simonin, 1999; Szulanski, 1996). However, the fundamental assumption of the beneficial consequences of knowledge sharing is somewhat at variance with existing evidence indicating that decision makers make little use of the available information (see Nelson et al., 1987). In fact, the distinction between the availability and the use of available knowledge is well recognized in the literature (Gordon, 1956). Similarly, research stresses that firms that are much focused on acquiring new knowledge may demonstrate a higher ability to renew their knowledge stocks, but are often also likely to bear the costs of acquisition while not benefitting from knowledge utilization (Zahra & George, 2002). Overall, these insights suggest that sharing, accumulating, and assimilating knowledge is no guarantee of a better performance; rather, organizations should be aware of how and whether the shared knowledge is effectively applied (Haas & Hansen, 2007). This idea is clearly summarized in Nag and Gioia's (2012) study, reporting an answer they received from one of their respondents:

*It is one thing to know something, but that doesn't make you successful. 'Applying' what you know is what makes you successful; the application of knowledge is what actually makes the difference.*

In order to fill the gap concerning knowledge utilization in the research literature, we adopt the pragmatist view that knowledge is an active and emergent property, rather than simply something that resides in repositories; it is an asset in action, which is rooted in the situated, localized, and meaningful daily action of the organizational members (Dewey, 1922; Nag & Gioia, 2012; Nag, Corley, and Gioia, 2007; Ryle, 1949). This means that knowledge is exercised in practice, that is, in the methods and the ways of doing things, which demonstrate and incorporate its value (Brown & Duguid, 2001; Carlile, 2002). Hence, holding knowledge about a technology or a process does not lead *per se* to added value unless that knowledge is used (Nag et al., 2007).

Focusing on the practice-side of knowledge thus allows us to highlight its utilization instead of its content (Nag et al., 2007; Orlikowski, 2002). This helps contribute to the call highlighted by Cook and Brown (1999: 38), who contend that there is a need to understand how "organizations can dynamically afford, within the situated practices of organizational daily work, the productive inquiry essential to ongoing innovation" (p. 398). Based on this, looking at employees' knowledge utilization becomes important for innovation to occur: to innovate requires individuals to accumulate and then use their knowledge, by thus proposing novel knowledge recombination likely to result in innovations (Murray & O'Mahony, 2007). As prior research suggests, innovation concerns the implementation of new ideas (West and Anderson 1996). Especially in service organizations, such as consulting firms, a

significant amount of critical knowledge "is embedded in the actual practice of innovation" (Dougherty, 2004: 36) and it is the most vital resource to these firms' competitive advantage (Sarvary, 1999). Teece (1998: 55) supports this argument by pointing out that "it has long been recognized that economic prosperity rests upon knowledge and its useful application." Similarly, Levin and Cross (2004) assert that in order to support their innovative activities, firms should make full use of their knowledge.

Despite the need to shift the focus more clearly on the practice-side of knowledge processes, so far the empirical contributions addressing this topic are still limited. Extant literature is rather dominated by studies on knowledge sharing antecedents (Černe et al., 2014; Reinholt, Pedersen, and Foss, 2011), knowledge acquisition (Yli-Renko, Autio, and Sapienza, 2001), and knowledge assimilation (Szulanski, 1996), leaving the dimension of knowledge utilization almost unexplored. To date, only few scholars have devoted attention to this issue. For instance, Haas and Hansen (2005) focus on the relevance of using knowledge for increasing firms' competitive advantage; Haas (2006) investigates knowledge utilization while looking at the role played by locals and cosmopolitans in providing different types of knowledge to the firm; Ko and Dennis (2011) rather explore the use of Knowledge Management Systems and its influence on individual- and group performance. Other researches have then attempted to understand how decision makers in organizations use what they know (Nag & Gioia, 2012), what matters to teams to use their knowledge more effectively (Gardner, 2012), how employees make use of 'boundary objects' (Carlile, 2002) as well as what knowledge is used for the internal recombination process (Nerkar & Paruchuri, 2005).

Regardless of these studies, our understanding of the link between individual-level determinants and knowledge utilization behaviors remains incomplete. Hence, those focusing on knowledge utilization mostly look at organizational capabilities and competencies, as well as at the processes by which firms reconfigure their resources (Prahalad & Hamel, 1990; Teece et al., 1997), thereby underestimating the way organizational members influence knowledge utilization in the first place (Alvesson, 2004). In an attempt to fill this gap, we adopt the perspective of those contending that individual-level knowledge is an essential precursor to collective knowledge (Crossan et al., 1999; Kim, 1993). Following this, we build on Haas and Hansen (2005) and refer to knowledge utilization as the process of obtaining and using knowledge from others within the organization, thereby conceptualizing it as a dimension of the innovation process. Hence, prior research has defined innovation as a process of knowledge recombination which necessarily calls for assimilating and then using knowledge (Murray and O'Mahony, 2007).

***Work creativity as a social process***

All innovations result from creative ideas, in such a way that companies are increasingly emphasizing the need to foster their creativity and innovation (Zhou & Shalley, 2007). Hence, successful implementation of new programs, new products, new processes or services follows a person or a team developing good and new ideas beyond their initial state (Amabile, Conti, Coon, Lazenby, and Herron, 1996; Schepers & Van den Berg, 2007: 408). Actually, creative contributions can be valuable also for the individuals, in that the ability to come up with unique and new ideas can help them stand out from the crowd (Perry-Smith & Shalley, 2003).

Following the literature (Amabile, 1996; Ford, 1996; Perry-Smith & Shalley, 2003; Shalley, 1991), individuals can be creative in various work situations, for instance, in the generation of new ways of performing their tasks, in coming up with innovative ideas, discovering novel procedures, or in the reconfiguration of existing approaches. As prior research emphasizes (e.g., Amabile, 1996; Amabile, 1983; Anderson, De Dreu, and Nijstad, 2004; Shalley & Gilson, 2004; Woodman, Sawyer, and Griffin, 1993), social factors are particularly critical for creativity and innovation, as creativity at work is strongly related to the social environment of employees (Paulus & Dzindolet, 2008). In order to capture the social side of creativity, we conceptualize work creativity as related to the knowledge sharing they experience within their work environment and define it as the tendency of employees to consequently produce novel ideas and solutions likely to improve their job quality.

Knowledge sharing is the process of exchanging opinions, work-related experiences, and know-how with colleagues (Lin, 2007; Wang & Noe, 2010) which in turn may give to innovative and creative behaviors at work as the recipient's existing knowledge is combined with new, incoming knowledge from colleagues (e.g., Perry-Smith, 2006; Perry-Smith & Shalley, 2003). The literature stresses that the more individuals are exposed to several ideas, the higher their creativity (Schepers & Van den Berg, 2007) and, similarly, that free social interaction, characterized by few barriers, is positively related to the generation of innovative ideas (Feurer, Chaharbaghi, and Wargin, 1996). That is, communication and interactions with diverse others is likely to enhance creativity (e.g., Amabile, 1996; Ford, 1996; Woodman et al., 1993).

As prior contributions highlight, creativity differs from innovation. The former is about developing ideas, that is about the production of novel and useful ideas in any domain (e.g., Amabile et al., 1996; Stein, 1974; Woodman et al., 1993); the latter rather

regards the implementation of ideas (Shalley & Gilson, 2004). Based on this, creativity is a necessary starting point, but not a sufficient condition, for innovation. However, as Amabile et al. (1996) state, it is the seed of all innovation (p. 1155). In line with prior research (Schepers & Van den Berg, 2007), we consider creativity at work to be an individual-level construct. Especially in knowledge-intensive organizations, the focus of self-perception measure of creativity is consistent with the difficulty of identifying a general work environment creativity, as the different departments composing those organizations tend usually to build their own environment, likely to strongly differ from each other.

***Job design***

Job design is defined as the set of opportunities and constraints implied by the assigned tasks and responsibilities affecting how individuals accomplish and experience their work (Hackman & Oldham, 1974). Prior studies have demonstrated the relevance of job design in shaping employees behaviors, including knowledge-related behaviors (Foss, Minbaeva, Pedersen, and Reinholt, 2009). We here consider the role played by two core dimensions of job design, namely autonomy in the job and feedback on employees' knowledge utilization behavior. The importance of looking at these two job characteristics is consistent with the fact that they have been found to show robust correlates of attitudinal outcomes (Mowday, Stone, and Porter, 1979), thus being likely to strongly influence individuals' behaviors.

*Job autonomy***.** Autonomy identifies "the degree to which the job provides substantial freedom, independence, and discretion to the individual in scheduling the work and in determining the procedures to be used in carrying it out" (Oldham & Hackman, 2010: 464). It can be considered a management practice as conceived by

Amabile's (1988) componential model of creativity and innovation in organizations. We focus on job autonomy because of its importance to several outcomes, such as employees' performance, turnover intention, job satisfaction, role conflict and so on (see, for example, Humphrey, Nahrgang, and Morgeson, 2007) and because, among the job characteristics, it may be considered the most prominent and important (Fried & Ferris, 1987; Karasek & Theorell, 1990). It has to be distinguished from freedom as the latter rather refers to individuals' opportunities to make judgments at work and to choose which tasks to accomplish (cf. Cohen-Meitar, Carmeli, and Waldman, 2009).

*Feedback.* Job-based feedback is described as the extent to which "carrying out the work activities required by the job provides the individual with direct and clear information about the effectiveness of his or her performance" (Oldham & Hackman, 2010: 464). Being it called also 'performance information' or 'knowledge of performance' (Kluger & DeNisi, 1996), it gives employees the opportunity to get direct knowledge regarding the results and outcomes of his/her work. Tsui and Ashford (1994) suggested that "feedback is simply information about 'the self'" and that this information can stimulate a variety of responses. It is considered as a social dimension of the work.

It is particularly critical to employees' behaviors as it may reduce the uncertainty associated with the changing nature of work (Zhou, 1998); moreover, with regard to individuals' creative behaviors, it may help performers to set creative standards, by suggesting "new paths to consider for pushing work forward and stimulate new ideas for improving processes" (De Stobbeleir, Ashford, and Buyens, 2011: 812). We do not specifically look at feedback-seeking behaviors from employees (e.g. Ashford & Cummings, 1983; De Stobbeleir et al., 2011); rather, our aim is to understand whether receiving, more than asking for, feedback can affect employees' knowledge utilization.

In this regard, we follow prior research (Kluger & DeNisi, 1996) and define feedback as actions taken by (an) external agent(s) to provide information regarding some aspect(s) of one's task performance.

## Hypotheses development

In order to develop our argument, we build the following hypotheses. Overall, we expect more creative employees (i.e. those who perceive knowledge sharing to be more valuable to their job) to be more oriented toward using knowledge. We also posit that in both cases they are given autonomy and get feedback regarding their performance, this relationship is strengthen. We finally postulate a three-way interaction among work creativity, job autonomy, and feedback.

### *Work creativity and knowledge utilization*

Companies increasingly emphasize the need for creativity and innovation for maintaining their competitiveness (Zhou & Shalley, 2007). Moreover, the literature widely recognizes the role of individuals' creativity for innovation to occur (Paulus & Dzindolet, 2008; Simonton, 2004; Sternberg, 2006). Based on prior research showing that creativity is a precondition for innovation (Bassett-Jones, 2005), we expect employees who are more creative in their job to be more oriented toward using the available knowledge.

*Hp1: The impact of knowledge sharing on work creativity is positively associated with knowledge utilization.*

***Work creativity, job autonomy, and knowledge utilization***

Several studies (Bailyn, 1985; Paolillo & Brown, 1978) show that creativity is fostered when individuals have a high autonomy in the daily conduct of the work and feel a sense of ownership and control over their task and ideas (Schepers & Van den Berg, 2007). Similarly, others have found that employees tend to produce more creative work when they perceive they can choose how to accomplish the task they are given (Amabile & Gitomer, 1984).

Following this, this study postulates that when individuals are given more autonomy in their job, the relationship between their work creativity and their knowledge utilization behaviour is strengthened.

> *Hp2: Job autonomy positively moderates the relationship between work creativity and knowledge utilization.*

***Work creativity, feedback, and knowledge utilization***

Consistent with existing literature, assimilation of accurate feedback is crucial to employees' learning and development (Cannon & Whiterspoon, 2005). Managers are increasingly worried about how to make their feedback 'actionable' in order for it to lead to relevant outcomes, such as employees' increased performance and effectiveness.

In this study, we hypothesize that feedback on the job is likely to positively moderate the relationship between employees' work creativity and knowledge utilization. The importance of looking at the influence of feedback as a moderator is consistent with Ilgen et al.'s (1979) claim that "to relate feedback directly to behavior is very confusing. Results are contradictory and seldom straight-forward" (p. 368).

The importance of feedback for knowledge utilization behaviors is consistent with the argument that talented people or knowledge workers' performance strongly depends on others' assessments of their work. Hence, as Cannon and Whiterspoon (2005) stress, "without feedback about their performance, they have a hard time figuring out how to improve" (p. 121). Based on this, we expect that:

*Hp3: Feedback on the job positively moderates the relationship between work creativity and knowledge utilization.*

***Work creativity, autonomy, feedback, and knowledge utilization***

We further argue that none of the factors we investigate can guarantee high levels of knowledge utilization when taken in isolation, meaning low values of any of the dimensions will lead to low levels of knowledge utilization. Consistently with extant literature (Orlikowski, 2002; Tyre & Von Hippel, 1997), the value of knowledge resources should be investigated in relation to a specific context, given that possessing knowledge does not necessarily mean that the actor is able to make the best use of it.

We start from the argument that more autonomous employees are more likely to facilitate the positive outcomes of individuals' creativity (Zhou, 1998), given their freedom in choosing the method and procedure to get the work done. However, as more autonomous employees traditionally look for self-competence, it can be expected that when they receive feedback on their performance, this will lead them to perform better. This is due to the fact that social information coming from the work environment strengthens their competence and self-determination, thus increasing their intrinsic motivation to give their best in their job, i.e. to contribute to the innovation process through knowledge utilization behaviors. Similarly, the literature stresses that feedback

has no effect in a vacuum: to be powerful, it should be addressed to a context (e.g. task, activity, etc.) the employee is interested in accomplishing. This is more likely the case in which he/she is given a certain autonomy, which provides him/her with the intrinsic motivation to perform better in the job. In other words, "feedback by itself may not have the power to initiate further action" (Hattie & Timperley, 2007: 82).

Our argument is also consistent with the Motivating Potential Score (MPS) model which posits a multiplicative combination of feedback and autonomy of individuals' behaviors (Dood & Gangster, 1996), that is, that job characteristics interact with each other in determining the overall impact of the job on workers' behaviors.

In light of the above, we argue that when employees are simultaneously high in work creativity, job autonomy, and feedback received from supervisors, they can be expected to be better in using the already available knowledge, thus contributing to innovation. This suggests the following hypothesis:

> *Hp4: There is a three-way interaction between employees' work creativity, job autonomy, and feedback, which implies that the level of knowledge utilization is highest when all three dimensions are high.*

The hypothesized relationships are represented in the research model, illustrated in Figure 6.1.

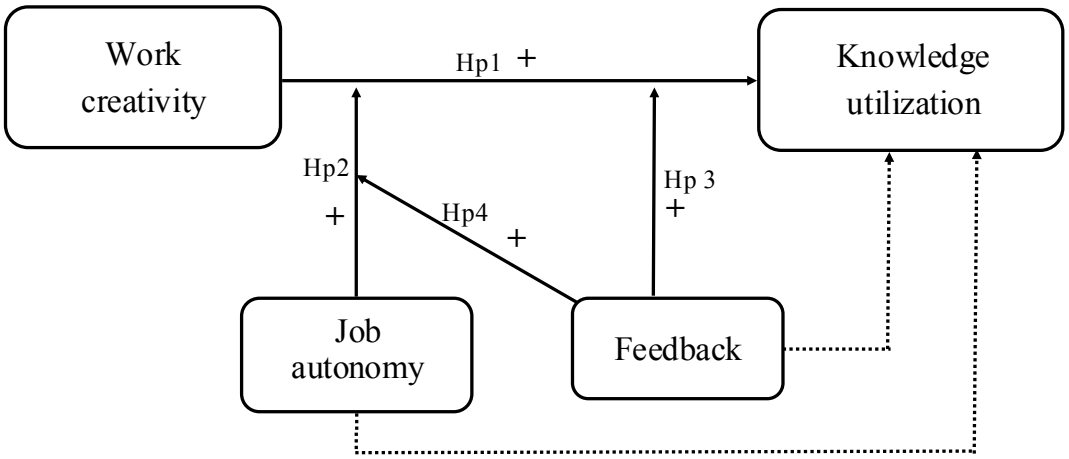


**Figure 6.1** - Research model

## Research method

### *Sample selection and data collection*

The hypotheses are tested using the FOKS dataset available at SMG Department (Copenhagen Business School) which includes survey data about two Danish consulting firms collected within the period 2007-2008. Preliminary interviews with companies representatives together with the analysis of existing documentation confirmed that both firms can be considered as knowledge intensive organizations. This is consistent with the literature stressing that these firms' main characteristic is the capacity to solve complex problems by tapping into creative and innovative solutions (Alvesson, 1993). The two firms are highly comparable as both of them are global consulting firms operating worldwide; given the nature of their business, both rely strongly on knowledge assets to sustain their competitive advantage in the market; both firms have a multidivisional organizational structure; finally, both are Danish and thus may be assumed as having similar cultures.

Several reasons make this setting relevant for this study. First, knowledge management processes are significantly critical to these firms, as their main activity is about selling knowledge and expertise. As Cross and Cummings (2004) highlight, in knowledge-intensive organizations the performance is closely dependent upon the availability of information necessary to solve challenging problems. In particular, such organizations must be able to use the already available knowledge in a creative way; moreover, they are usually composed of multidisciplinary teams, whose members come from different parts of the organization (Schepers & Van den Berg, 2007). This makes both knowledge utilization capacity and work creativity highly critical to these firms. Second, they have to quickly respond to clients' demands with customized and high-quality analyses by applying new and updated knowledge. Knowledge utilization is, therefore, a critical activity within these companies. Third, the data allow to capture individual-level heterogeneity over and above aggregate levels of analysis as they refer to employees coming from and working in different geographical, cultural, and institutional environments. Fourth, the companies are project-based organizations, whose teams are formed according to the customers' requests and only exist until the project has been completed and the related output delivered to the customers (Reinholt et al., 2011). Accordingly, this helps employees to access various types of knowledge very often, thus making this setting even more suitable for examining both individuals' network position and knowledge utilization processes.

Data were collected by administering a web-based questionnaire, developed following an intensive literature review. Beforehand, we followed prior research (Hunt, Sparkman, and Wilcox, 1982) and tested it with a group of practitioners and academicians in order to be sure that its content could be easily understood.

The survey aimed at involving all employees who might account for most of the heterogeneity of the firm (Mäkelä, Höglund, Sumelius, and Ahlvik, 2012). Based on this, we selected all workers potentially possessing critical knowledge and, consistently with the social side of work creativity, those who are involved in knowledge sharing processes with other organizational members. Given that this study investigates individual behaviors, this selection criterion offers a great advantage compared to surveys designed to target one or few respondents in many different organizations (Felin & Hesterly, 2007). Prior to send the invitation to participate in the survey, all selected employees were invited by their superior to fill in the questionnaire. In order to reduce the risk of social desirability bias, we guarantee that any of the respondents could be identified by the survey software; moreover, we ensure that all responses were returned to the research group. The companies only received the results of the survey in an aggregate form.

Among the total of 2,499 questionnaires sent out, six hundred seventy-eight questionnaires were usable for this study, which corresponds to a response rate of 27.13 percent.

***Measures***

Most variables used in this study are operationalized through self-perceptions (Spector, 1994) and are measured with a Likert scales. Following extant literature, the use of self-assessment measures is consistent with the purpose of this study. Hence, as for the job characteristics investigated in this paper (i.e., autonomy and feedback), it should be noted that, in line with prior research (see Hackman & Lawler, 1971), it is not their objective state which shapes employees' behaviors; rather, it is how they are

experienced by individuals within their work environment. As Hackman and Lawler (1971: 264-265) suggest:

> regardless of the amount of feedback […] or autonomy […] a worker really has in his work, it is how much *he perceives that he has* which will affect his reactions to the job. Objective job characteristics are important because they do affect the perceptions and experiences of employees. But there are often substantial differences between objective job characteristics and how they are perceived by employees, and it is dangerous to assume that simply because the objective characteristics of a job have been measured (or changed) that the way that job is experienced by employees has been dealt with as well.

*Dependent variable*. Employees' knowledge utilization is measured with a six-item scale developed by the FOKS research group. This measure aims at evaluating two different but interrelated aspect of utilizing knowledge. On one side, it captures the extent to which employees use the knowledge they share with their colleagues inside the firm; specifically, we looked at knowledge shared with those working on other projects, in other domestic departments, as well as in foreign departments. On the other hand, the scale takes into account the extent to which such colleagues use the knowledge they collected from others. Hence, we asked respondents to evaluate the extent to which they have received (3-item scale) and used (3-item scale) knowledge collected from colleagues. The scale ranged from 1, "No or very little extent", and 7, "Very large extent".

*Independent variables*. Work creativity was measured with a three-item scale assessing the way employees believe sharing knowledge with others leads to generate

new ideas, more creative solutions as well as to increase job quality (1, "Negatively," to 7, "Positively"). In order to measure job autonomy, we asked respondents to indicate the extent to which they are given freedom and independence in carrying out their job (two-item scale, where 1, "No or very little extent", 7, "Very large extent"). Feedback was measured on a scale anchored by 1, "Not at all or very little" and 7, "Very much". Participants were require to provide their opinion regarding the extent to which they have the opportunity to receive feedback on their job performance and how much the get it from their supervisor (four-item scale).

*Control variables.* The analysis included the following control variables: employees' gender (dummy variable, 1=Female, 0=Male), age (six dummy variables), education (six dummy variables), project management responsibility (dummy variable, 1=Yes, 0=No) and tenure (years spent within the firm). In line with the componential model of creativity and innovation in organizations (Amabile, 1988; Schepers & Van den Berg, 2007), we also control for the resources the organization provides to support innovative work and thus include the following variables in the analysis: time availability for sharing knowledge and interacting with others (one item), trust climate (one item) and ICT availability for sharing knowledge with others (one item), which were measured with a 7-point Likert scale. We also controlled for autonomous motivation (4-item scale), by asking participants to indicate the extent to which they share knowledge with other because they enjoy it. Consistently with the argument that the position individuals occupy within the firm's network is likely to lead to a host of meaningful outcomes (see Nerkar & Paruchuri, 2005), we controlled for network centrality, by measuring the number of persons the respondent usually shares knowledge with inside the firm. In this regard, the literature stresses that more central employees have easier access to information and are thus a key source for firms'

competitive advantage (Allen & Katz, 1985); similarly, in professional service industries, knowledge stars are found to be critical to the bulk of the organization's business as well as to its core knowledge assets (Oldroyd & Morris, 2012). Furthermore, controlling for the degree of centrality within the firm's network, allows us to capture the social network perspective of job design, which is consistent with the purpose of our research and is recently attracting a lot of attention from scholars (Grant, 2007; Grant & Parker, 2009; Humphrey et al., 2007; Kilduff & Brass, 2010). Hence, it has been found that important features of job design, such as autonomy or feedback, may be subject to relatively invisible social network constraints, being jobs inevitably embedded in networks of relationships that affect employees' interactions with others. Finally, we controlled for the firm the respondent belongs to (dummy variable). All items are provided in Table 6.1.

| *Construct* | *Items description* | *Scale* |
|---|---|---|
| Knowledge utilization | To what extent have you:<br>a) … received knowledge from colleagues on other projects?<br>b) … used knowledge from colleagues on other projects?<br>c) … received knowledge from colleagues in other domestic departments?<br>d) … used knowledge from colleagues in other domestic departments?<br>e) … received knowledge from colleagues in foreign departments?<br>f) … used knowledge from colleagues in foreign departments? | 7-point Likert scale from 1=No or very little extent, 7=Very large extent |
| Work creativity | How does knowledge sharing influence the following aspects of your performance?<br>a) The quality of my work<br>b) My ability to generate new ideas<br>c) My ability to generate more creative solutions | 7-point Likert scale from 1=Negatively, 7=Positively |
| Job autonomy | To what extent is your job characterized by the following?<br>a) The freedom to carry out my job the way I want to<br>b) The opportunity for independent initiative | 7-point Likert scale from 1=No or very little extent, 7=Very large extent |
| Feedback | The following questions are related to the characteristics of your current job.<br>a) To what extent do you have the opportunity to get feedback on your job performance?<br>b) How much feedback do you receive from the head of your department on your job performance?<br>c) To what extent do you find out how well you are doing on the job while you are working?<br>d) How much feedback do you receive from your project manager on your job performance? | 7-point Likert scale from 1=Not at all or very little, 7=Very much |
| Gender | Dummy variable | 1=Female; 0=Male |
| Age | Six dummy variables were created | Age1= 18-24<br>Age2= 25-34<br>Age3= 35-44<br>Age4= 45-54<br>Age5= 55-64<br>Age6= >=65 |
| Education | Six dummy variables were created | High school; Middle training; Bachelor; Master; Ph.D.; Other education |
| Project management | Does your job include Project Management? | 1=Yes; 0=No |
| Tenure | Years spent within the firm | |
| Time availability | To what extent do you agree with the following:<br>a) There is time to share knowledge (originally, reverse coded item) | 7-point Likert scale from 1=Strongly disagree, 7=Strongly agree |
| Trust climate | To what extent do you agree with the following:<br>a) There is trust between employees (originally, reverse coded item) | 7-point Likert scale from 1=Strongly disagree, 7=Strongly agree |
| ICT availability | To what extent do you agree with the following:<br>a) The necessary IT systems to support knowledge sharing are in place | 7-point Likert scale from 1=Strongly disagree, 7=Strongly agree |
| Autonomous motivation | I share knowledge because:<br>a)… I enjoy it<br>b)… I think it is an important part of my job<br>c)… I find it personally satisfying<br>d)… I like it | 7-point Likert scale from 1=Strongly disagree, 7=Strongly agree |
| Network centrality | How many persons within the firm group do you share knowledge with on a regular basis? | From "0" to "25 or above" |
| Firm | Dummy variable | 1=Firm Alpha; 0=Firm Beta |

**Table 6.1** - Measurement scales and items

**Results**

Descriptive statistics, correlation coefficients of all variables together with Chronbach indexes are presented in Table 6.2. All correlations are well below the 0.8 that would indicate high collinearity among the variables (Kennedy, 1985). In order to further check the presence of multicollinearity, we calculated the Variance Inflation Factor (VIF) for each variable (Mansfield & Helms, 1982) and found that the largest VIF was less than 2, thereby indicating that multicollinearity is not a problem in our data (Belsley, Kuh, and Welsh, 1980). VIF values are presented together with the regression results in Table 6.3.

We empirically tested the hypothesized relationships with a multiple regression analysis run using Stata12, whose results are shown in Table 6.3. Prior to build the interaction, we standardized the independent variables of interest (Neter, Wasserman, and Kutner, 1990). As Table 6.3 illustrates, Model 1 includes the control variables; Model 2 adds the main effect of the explanatory variables (i.e. work creativity, job autonomy, and feedback); Model 3 includes the three two-way interactions and, finally, Model 4 enters the three-way interaction term. As for the age and the education level, age 2 (i.e. 25-34 years old) and Master's degree are the baseline.

In order to better investigate and illustrate the results, we plotted the three-way interaction, whose output is provided in Figure 6.2. The Figure shows the following. First, high creative employees particularly benefit from being autonomous in their job as well as from receiving feedback from their supervisor, as this leads them to strongly increase their orientation toward using knowledge (see Line 1). Particularly, the influence of work creativity is so powerful that even with low job autonomy and low feedback, the increase in the performance is still high (see Line 4). Hence, the growth

rate of Line 1 and Line 4 is more or less the same, running them in parallel with each other.

In case employees are highly autonomous but tend to receive few feedback from their bosses, work creativity matters but still less than in the other cases. The increase in their knowledge utilization behavior is, in fact, lower (see Line 3). Moreover, the analysis shows that highly creative employees perform at their best when they experience high job autonomy and high feedback (see Line 1); conversely, their performance is lowest in case of high feedback and low autonomy (see Line 2).

Low creative individuals display a different behavioral pattern: they tend to show very low levels of knowledge utilization when provided with low feedback and low autonomy in their job; in turn, they are found the be very good performers when receiving a lot of feedback regarding their job, but left with a low degree of autonomy in their job. The fascinating result is that they are those that perform best among all other cases we analyzed, in terms of knowledge utilization behavior.

In other words, the best performance results from low levels of both work creativity and job autonomy and high levels of feedback (see Line 2). Conversely, the worst performers are those that, even if displaying high degree of work creativity, are strongly influenced by getting a lot of feedback while experiencing low degrees of autonomy in their job (see Line 2).

| | Mean | S.D. | Min | Max | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1. Knowledge utilization | 3.59 | 1.22 | 1 | 7 | *.82* | | | | | | | | | | | | | | | | | | | | | | | | |
| 2. Work creativity | 5.80 | 1.02 | 1 | 7 | .24*** | *.84* | | | | | | | | | | | | | | | | | | | | | | | |
| 3. Job autonomy | 5.54 | 1.16 | 1 | 7 | .28*** | .18*** | *.71* | | | | | | | | | | | | | | | | | | | | | | |
| 4. Feedback | 4.10 | 1.22 | 1 | 7 | .15*** | .12** | .25*** | *.80* | | | | | | | | | | | | | | | | | | | | | |
| 5. Gender | .30 | .46 | 0 | 1 | .02 | .15*** | -.01 | .08* | - | | | | | | | | | | | | | | | | | | | | |
| 6. Age1 | .02 | .15 | 0 | 1 | -.05 | .14 | -.09* | .08* | .47 | - | | | | | | | | | | | | | | | | | | | |
| 7. Age2 | .34 | .47 | 0 | 1 | .09 | -.09* | -.15*** | -.05 | .10* | -.12** | - | | | | | | | | | | | | | | | | | | |
| 8. Age3 | .28 | .45 | 0 | 1 | .01 | .22 | .18 | .25 | .40 | -.10** | -.48*** | - | | | | | | | | | | | | | | | | | |
| 9. Age4 | .20 | .40 | 0 | 1 | .11 | .08* | .12** | .10 | -.08* | -.08* | -.36*** | -.30*** | 1 | | | | | | | | | | | | | | | | |
| 10. Age5 | .13 | .34 | 0 | 1 | -.04 | -.03 | .48 | -.01 | -.11** | -.06 | -.28*** | -.23*** | -.17*** | - | | | | | | | | | | | | | | | |
| 11. Age6 | .02 | .13 | 0 | 1 | .31 | .11 | .36 | -.05 | -.10* | -.02 | -.12** | -.10* | -.07 | -.06 | - | | | | | | | | | | | | | | |
| 12. High school | .06 | .24 | 0 | 1 | -.06 | -.03 | -.12** | -.03 | .46 | .00 | -.07 | -.04 | .25 | .11** | .00 | - | | | | | | | | | | | | | |
| 13. Middle training | .09 | .29 | 0 | 1 | -.10** | -.13*** | -.09* | -.02 | .07* | -.02 | -.15*** | .13*** | .29 | -.00 | -.01 | -.07 | - | | | | | | | | | | | | |
| 14. Bachelor | .26 | .44 | 0 | 1 | -.02 | -.02 | -.05 | .22 | -.07 | -.01 | -.03 | -.01 | .09* | -.02 | -.05 | -.14*** | -.18*** | - | | | | | | | | | | | |
| 15. Master | .48 | .50 | 0 | 1 | .10* | .12** | .10* | .11 | .17 | .34 | .23*** | -.08* | -.15*** | -.09* | .41 | -.24*** | -.31*** | -.59*** | - | | | | | | | | | | |
| 16. Ph.D. | .04 | .20 | 0 | 1 | .25 | -.01 | .34 | -.06 | -.08* | -.03 | -.10** | .31 | .21 | .39 | .10 | -.05 | -.06 | -.12** | -.21*** | - | | | | | | | | | |
| 17. Other education | .07 | .25 | 0 | 1 | -.02 | -.00 | .48 | .11 | -.01 | -.04 | -.09* | .22 | .27 | .08* | -.04 | -.06 | -.08* | -.15*** | -.25*** | -.05 | - | | | | | | | | |
| 18. Project management | .66 | .47 | 0 | 1 | .13*** | .10** | .28*** | .14 | -.13*** | -.10* | -.15*** | .33 | .12** | .28 | .28 | -.18*** | -.14*** | .00 | .13*** | .08* | -.02 | - | | | | | | | |
| 19. Tenure | 7.29 | 8.53 | 0 | 44 | .13*** | .07 | .16*** | .20 | -.06 | -.11** | -.40*** | -.06 | .18*** | .42*** | .18*** | .42 | .08* | -.01 | -.11** | .14 | .08* | .14*** | - | | | | | | |
| 20. Time availability | 3.49 | 1.56 | 1 | 7 | .15*** | .10** | .11** | .15*** | -.03 | .18 | -.11** | -.02 | .37 | .46 | .08* | .24 | .22 | -.04 | -.05 | .29 | .48 | -.00 | .41 | - | | | | | |
| 21. Trust climate | 5.34 | 1.35 | 1 | 7 | .13*** | .51 | .16*** | .21*** | .41 | -.03 | .11** | .13 | -.08* | -.07 | -.00 | -.06 | -.03 | -.11** | .13** | -.01 | .26 | .28 | -.01 | .12** | - | | | | |
| 22. ICT availability | 4.22 | 1.59 | 1 | 7 | .07* | .24 | .00 | .08* | .19 | -.09* | -.03 | -.03 | .29 | .46 | .34 | .32 | -.01 | -.01 | -.04 | .12 | .48 | -.04 | .13*** | .14*** | .40 | - | | | |
| 23. Autonomous motivation | 5.88 | .78 | 2 | 7 | .17*** | .34*** | .17*** | .18*** | .13*** | -.00 | -.04 | .52 | .01 | -.04 | -.03 | .00 | -.06 | -.06 | .49 | .14 | .01 | .14*** | -.08* | .49 | .09* | .00 | *.71* | | |
| 24. Network centrality | 11.04 | 7.37 | 0 | 25 | .32*** | .19*** | .22*** | .16*** | -.00 | -.04 | -.11** | .25 | .08* | .38 | -.02 | -.05 | -.05 | -.02 | .47 | .25 | -.03 | .16*** | .20*** | .39 | .09* | -.04 | .20*** | - | |
| 25. Firm | .23 | .42 | 0 | 1 | .25*** | .10** | .15*** | -.09* | .28 | -.08* | -.14*** | -.05 | .09* | .15*** | .13*** | .00 | .29 | .52 | -.13*** | .34 | .33 | -.07 | .28*** | .14*** | -.00 | .34 | -.05 | .09* | - |

** p < 0.05, ** p < 0.01, *** p < 0.001. Cronbach's coefficients Alpha are shown in italics on the diagonal.*

**Table 6.2** - Descriptive statistics and correlation matrix for all variables (n=678)

| | Knowledge utilization | | | |
|---|---|---|---|---|
| | **Model 1** | **Model 2** | **Model 3** | **Model 4** |
| Intercept | 3.54*** | 3.70*** | 3.70*** | 3.70*** |
| | (34.88) | (34.15) | (34.34) | (34.46) |
| Gender | -.02 | -.03 | -.04 | -.05 |
| | (-.17) | (-.32) | (-.40) | (-.50) |
| | *1.10* | *1.13* | *1.14* | *1.14* |
| Age1 | -.17 | -.20 | -.17 | -.13 |
| | (-.68) | (-.88) | (-.72) | (-.54) |
| | *1.06* | *1.08* | *1.09* | *1.10* |
| Age3 | -.12 | -.21 | **-.23*** | -.22 |
| | (-1.08) | (-1.84) | (-1.99) | (-1.93) |
| | *1.50* | *1.46* | *1.47* | *1.47* |
| Age4 | -.21 | **-.41**** | **-.45***** | **-.45***** |
| | (-1.65) | (-3.11) | (-3.38) | (-3.39) |
| | *1.63* | *1.64* | *1.65* | *1.65* |
| Age5 | **-.42**** | **-.70***** | **-.69***** | **-.67***** |
| | (-2.76) | (-4.66) | (-4.63) | (-4.51) |
| | *1.80* | *1.76* | *1.77* | *1.77* |
| Age6 | -.14 | -.37 | -.38 | -.41 |
| | (-.42) | (-1.20) | (-1.16) | (-1.28) |
| | *1.17* | *1.20* | *1.20* | *1.20* |
| High school | -.15 | -.08 | -.06 | -.04 |
| | (-.79) | (-.49) | (-.32) | (-.23) |
| | *1.15* | *1.17* | *1.20* | *1.20* |
| Middle training | -.28 | -.28 | -.25 | -.23 |
| | (-1.84) | (-1.73) | (-1.58) | (-1.46) |
| | *1.19* | *1.24* | *1.25* | *1.25* |
| Bachelor | -.13 | -.07 | -.09 | -.09 |
| | (-1.41) | (-.77) | (-.87) | (-.89) |
| | *1.18* | *1.22* | *1.24* | *1.24* |
| Ph.D. | -.07 | .07 | .07 | .09 |
| | (-.39) | (.37) | (.33) | (.42) |
| | *1.07* | *1.09* | *1.09* | *1.09* |
| Other education | -.30 | -.22 | -.23 | -.24 |
| | (-1.71) | (-1.21) | (-1.29) | (-1.38) |
| | *1.13* | *1.12* | *1.12* | *1.12* |
| Project management | **.22*** | .12 | .14 | .13 |
| | (2.34) | (1.22) | (1.36) | (1.34) |
| | *1.22* | *1.26* | *1.27* | *1.27* |
| Tenure | .00 | .01* | .01** | .01* |
| | (.96) | (2.58) | (2.60) | (2.52) |
| | *1.62* | *1.67* | *1.67* | *1.68* |
| Time availability | **.09**** | **.06*** | **.06*** | **.06*** |
| | (3.28) | (2.07) | (1.97) | (2.01) |
| | *1.09* | *1.11* | *1.12* | *1.12* |
| Trust climate | .05 | .02 | .02 | .01 |
| | (1.72) | (.64) | (.56) | (.43) |
| | *1.07* | *1.13* | *1.14* | *1.15* |
| ICT availability | .05 | .04 | .04 | .04 |
| | (1.82) | (1.61) | (1.57) | (1.38) |
| | *1.06* | *1.07* | *1.08* | *1.09* |
| Autonomous motivation | **.17**** | .08 | .09 | .08 |
| | (3.05) | (1.35) | (1.42) | (1.40) |
| | *1.13* | *1.24* | *1.26* | *1.26* |
| Network centrality | **.04***** | **.03***** | **.03***** | **.03***** |
| | (6.98) | (5.74) | (5.89) | (5.94) |
| | *1.16* | *1.18* | *1.19* | *1.19* |
| Firm | **.60***** | **.61***** | **.62***** | **.61***** |
| | (5.96) | (5.51) | (5.55) | (5.48) |
| | *1.17* | *1.23* | *1.23* | *1.23* |
| Work creativity | | **.14**** | **.15**** | **.13**** |
| | | (2.95) | (3.30) | (2.80) |

| | | | | |
|---|---|---|---|---|
| | | *1.25* | *1.26* | *1.31* |
| Job autonomy | | **.14**$^{***}$ | **.12**$^{**}$ | **.12**$^{**}$ |
| | | (3.64) | (3.13) | (2.96) |
| | | *1.32* | *1.40* | *1.40* |
| Feedback | | .05 | .06 | .05 |
| | | (1.40) | (1.70) | (1.38) |
| | | *1.22* | *1.24* | *1.26* |
| Work creativity*Job autonomy | | | .06 | **.09**$^{*}$ |
| | | | (1.67) | (2.23) |
| | | | *1.19* | *1.36* |
| Work creativity*Feedback | | | **-.08**$^{*}$ | **-.09**$^{**}$ |
| | | | (-2.55) | (-2.61) |
| | | | *1.19* | *1.19* |
| Feedback*Job autonomy | | | -.03 | -.03 |
| | | | (-1.18) | (-1.36) |
| | | | *1.16* | *1.17* |
| Work creativity*Job autonomy*Feedback | | | | **.05**$^{**}$ |
| | | | | (2.50) |
| | | | | *1.35* |
| $R^2$ | .21 | .25 | .26 | .27 |
| F-test | 10.00*** | 10.14*** | 2.97* | 6.23** |
| Mean Vif | 1.24 | 1.26 | 1.26 | 1.28 |

*t* statistics in parentheses. *Vif values in italics.*
$^{*}$ $p < 0.05$, $^{**}$ $p < 0.01$, $^{***}$ $p < 0.001$

**Table 6.3** - Regression results (n=678)

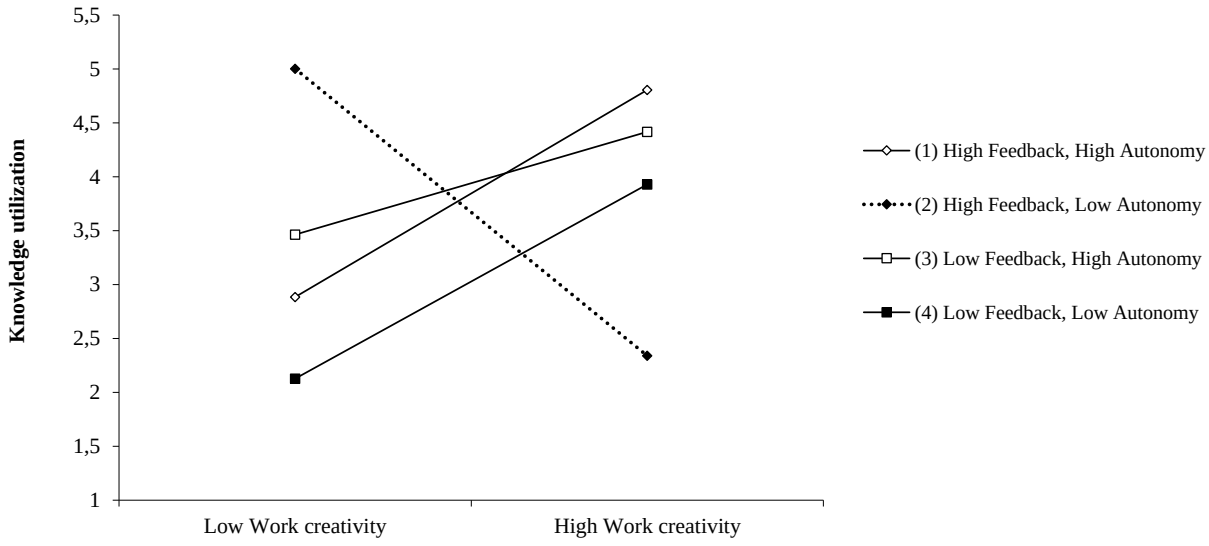


**Figure 6.2** - Plot of the three-way interaction among work creativity, job autonomy, and feedback on knowledge utilization

## Concluding discussion

This study starts from the understanding that holding knowledge about a technology is not guarantee *per se* that it will lead to added value. This is because accumulating and assimilating knowledge may not mean better and superior performance, unless that knowledge is manifested in practice (Nag et al., 2007). In order to enrich existing literature on this topic, we conceive knowledge utilization as part of the innovation process (Basadur & Gelade, 2006) and investigate the link between employees' creativity, resulting from sharing knowledge with others, and their participation to the innovation process, by looking at their orientation toward using the knowledge they already possess. Moreover, following prior contributions showing that knowledge value is not absolute, rather it should be examined in relation to a specific situation or context, we analyze this relationship by taking into account the moderating effect of job characteristics. We thus expect that the relationship between employees' creativity and their knowledge utilization behavior is influenced by job autonomy and feedback from supervisor. Based on this, we aim at addressing the following research question: *"how do employees' work creativity together with job design dimensions affect knowledge utilization process?"* and, in order to do so, we analyze web survey data from 678 employees in two global consulting firms.

Our results show that job design components significantly moderate the relationship between employees' creativity and knowledge utilization and, in particular, that knowledge utilization is high when employees' creativity, job autonomy, and feedback are all high. Surprisingly, we found that giving feedback leads less creative and low autonomous workers to perform better than any others, that is also than highly

creative and more independent employees, in terms of utilizing the available knowledge.

***Contribution to the literature***

This study may contribute to provide a better understanding regarding individuals' knowledge utilization behaviors, by also shedding light on how innovation may be fostered: to innovate requires individuals to accumulate and then use their knowledge, by thus proposing novel knowledge recombinations likely to result in innovations (Murray & O'Mahony, 2007). Teece (1998) underlines this argument by claiming that "it has long been recognized that economic prosperity rests upon knowledge and its useful application" (p. 55). Especially in service organizations, such as consulting firms, a significant amount of critical knowledge "is embedded in the actual practice of innovation" (Dougherty, 2004: 36) and it is the most vital resource to these firms' competitive advantage (Sarvary, 1999).

Moreover, taking this perspective also makes the link between individual and collective level of analysis (Felin & Hesterly, 2007) stronger as organizational performances and outcomes are mainly the results of what the organizational members know as well as how they behave within the firm. In particular, by focusing on individual-level antecedents linked to knowledge utilization processes, this study may be viewed as a first step toward building a microfoundation-based research, as it looks at using knowledge as a component of the innovation process. In doing so, it sets the stage for future research which are interested in empirically investigating the role played by individuals in affecting organizational performance. Based on the argument that an organization's knowledge is built upon that of individuals, we agree that enhancing

knowledge-based processes, such as knowledge utilization, first calls for understanding where such knowledge is created, i.e. where the locus of knowledge resides (Felin & Hesterly, 2007). That is, we support the view that the need to provide more microfoundations-based research must involve individuals (Foss & Lindenberg, 2013) and, accordingly, focus our analysis on the micro-micro link (Coleman, 1990). As recent contributions highlight, this is the fundamental starting point for understanding "what goes on both between and across the levels of analysis" (Devinney, 2013: 82).

Moreover, by postulating a relationship between idea development (i.e. work creativity) and idea implementation behaviors (i.e. knowledge utilization), this paper may provide a link with the innovative work behavior literature (Janssen, 2000), which distinguishes among three different dimensions, namely idea generation, idea promotion, and idea realization, thus delineating three clearly different behavioral tasks. Among these, idea generation recalls work creativity behaviors, while idea realization recall knowledge utilization processes.

Finally, this paper conceptualizes work creativity while emphasizing its social side and relates it to knowledge utilization. In doing so, it provides new empirical evidence with regard to how being socially embedded within the organization can influence innovative processes.

### *Implications*

Less creative employees may be supported by giving them information regarding their performance: instead of investing time and resources in those who are already oriented toward creativity, managers should also pay attention to those who are intrinsically less prone to generate new ideas. Moreover, as we found no significant main effect of

feedback on knowledge utilization, we can conclude that "feedback by itself may not have the power to initiate further action" (Hattie & Timperley, 2007: 82). Based on this, managers better examine its effect in relation to a context, such as a social context. Job dimensions should be considered in their joint and simultaneous effect, rather than look at them in isolation.

***Future research***

Given that this study is a cross-sectional one, generalizing its findings may be difficult. Cross-sectional data make it hard also to understand the direction of causality, so further research based on experimental or longitudinal data is needed. In particular, this study may hide a reverse causality issue which should then be carefully addressed in order to understand whether is the work creativity leading employees to use knowledge or, conversely, the other way around.

Our data do not allow us to provide any argument with regard to the content of the feedback delivered to the employees and their related influence on our dependent variable. Hence, extant research distinguishes between constructive and destructive feedback (Baron, 1988; London, 1995) and defines the former as a constructive feedback, which is specific, considerate, and as such attributes poor performance to external causes (e.g., situational factors) and good performance to internal ones (e.g., employee's effort and ability); the latter rather usually includes general comments about performance, an inconsiderate tone and sometimes threats.

We also acknowledge the shortcomings resulting from using perceptual measures for operationalizing our variables. Given this, a combination between these and more objective indicators may help develop more elaborate measures. An

additional limitation may result from observing individuals' behaviors in the companies without focusing on the project team-level. Hence, given that teams are particularly critical to the competitiveness of consulting firms, understanding the behaviors that characterize them may make this empirical setting even more valuable for this study.

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# CHAPTER 7

## Overall conclusions and implications

Based on the papers described in the previous chapters, my thesis is, first, an attempt to extend current research on the outcomes resulting from top management teams' members establishing relationships with external contacts. Second, it aims at expanding the literature on individual-level knowledge exchange behaviors, by exploring more in detail the interactions existing between individual- and organizational-level variables which, so far, have attracted only limited attention in the literature. Third, its purpose is also to provide empirical evidence on how learning benefits may represent a critical reward available to the innovators which engage in formal partnerships, such as licensing agreements. Lastly, my dissertation seeks to advance existing research on what matters for stimulating people to use the already available knowledge, thus fostering the exploitation capability of the firm.

Overall, the papers of my thesis offer several managerial implications. Deepening the understanding of knowledge sharing and knowledge utilization behaviors may contribute to strengthen firms' absorptive capacity's main dimensions: both the *potential* absorptive capacity, which grounds on the acquisition and assimilation of new knowledge, and the *realized* absorptive capacity, which rather refers to the transformation and utilization of knowledge (Jansen, Van den Bosch, and Volberda, 2005; Zahra & George, 2002).

Investigating individuals' interactions with external networks, my thesis suggests practitioners to think beyond merely intra-firm expertise and capabilities when choosing members of their top management team. As these individuals play key roles both in the firm's internal and external environment, CEOs and organizations should

ensure that the top team members complement each other in the nature of activities they engage in within their external networks. Moreover, developing boundary spanning capabilities such as relating and advocating will enable top management teams to exert better control over their immediate external environment and thereby balance between internal and external factors that lead to effective governance (Walsh & Seward, 1990). The consequences of establishing fruitful relationships with external actors can indeed affect board members' strategy formulation and implementation and, subsequently, the effectiveness of the decision-making process.

In addition, given their inherent complexity, employees' knowledge sharing behaviors may be very hard to modify. Providing evidence on the effects that individual- and organizational variables may have on such behaviors can inform managers on how they should deal with them in order to foster the contribution that intra-organizational interpersonal relationships may give to firms' performance and competitiveness. Similarly, our analysis of knowledge sharing behaviors suggests the importance of distinguishing between voluntary knowledge sharing behaviors and those occurring only upon request (i.e., knowledge donating and knowledge collecting). Being aware of the existence of these two processes opens up new and relevant insights as to how to improve employees' engagement in contributing to their firm's performance by providing their know-how and skills to others.

By focusing on vicarious learning among licensing parties, my dissertation puts emphasis on the firms' internal realities affecting the relevance of the intellectual capital. Hence, the value of any company's intellectual capital, defined as "knowledge that can be converted into profit" (Harrison & Sullivan, 2000: 34), is strongly dependent upon the "direction, resources, and constraints" which define "the firms' strengths and

weaknesses as well as its capabilities for competing in the external world" (p. 36). Therefore, in order to extract profits from their innovations, firms should carefully appraise their internal environment, that is their resources and processes likely to support the strategy of managing their intellectual capital. Among such internal processes are the learning processes, which are considered as critical sources of a firm's sustainable competitiveness (March, 1991). Consistently, the argument of this thesis poses attention on the importance of both firms' internal intellectual capital activities which impact on a future time dimension, instead of a current time one (Harrison & Sullivan, 2000); and on their ability to collect fresh and relevant knowledge from the external environment, by interacting with other companies.

Concluding, this dissertation contributes to provide a deeper understanding regarding individuals' knowledge utilization behaviors, by shedding light on how innovation may be fostered: to innovate requires individuals to accumulate and then use their knowledge, by thus proposing novel knowledge recombinations likely to result in innovations (Murray & O'Mahony, 2007). Teece (1998) underlines this argument by claiming that "it has long been recognized that economic prosperity rests upon knowledge and its useful application" (p. 55). Especially in service organizations, such as consulting firms, a significant amount of critical knowledge "is embedded in the actual practice of innovation" (Dougherty, 2004: 36) and it is the most vital resource to these firms' competitive advantage (Sarvary, 1999). Moreover, taking this perspective allows to make the link between individual and collective level of analysis (Felin & Hesterly, 2007) stronger as organizational performances and outcomes are mainly the results of what the organizational members know as well as how they behave within the firm.

# CHAPTER 8

## Future research

In addition to the above-described papers, two further research projects, currently in their infancy, have been developed during the PhD program and are being considered for submission to conferences and journals. Here below I provide a brief summary of each of them.

### Boundary spanners' motivation in building external knowledge networks

Prior studies extensively demonstrate that firms build and sustain their innovation capacity by tapping both into internal and external knowledge sources (Freeman, 1991; Rosenberg, 1990) in such a way that it is likely to be some degree of interaction across them. Moreover, it is known that these knowledge sources may provide access to knowledge that is different in terms of nature (e.g., tacit or explicit, simple or complex, etc.) and relevance (e.g., degree of usefulness for the organization). Building connections across them may thus be particularly beneficial. This is consistent with the organizational learning literature, which argues that firms should balance between exploring new knowledge and exploiting the already available one (March, 1991).

Following this, I assume that employees may display four different patterns of interacting with others, which correspond to different extents to which they build internal and external networks for sourcing knowledge (Figure 8.1).

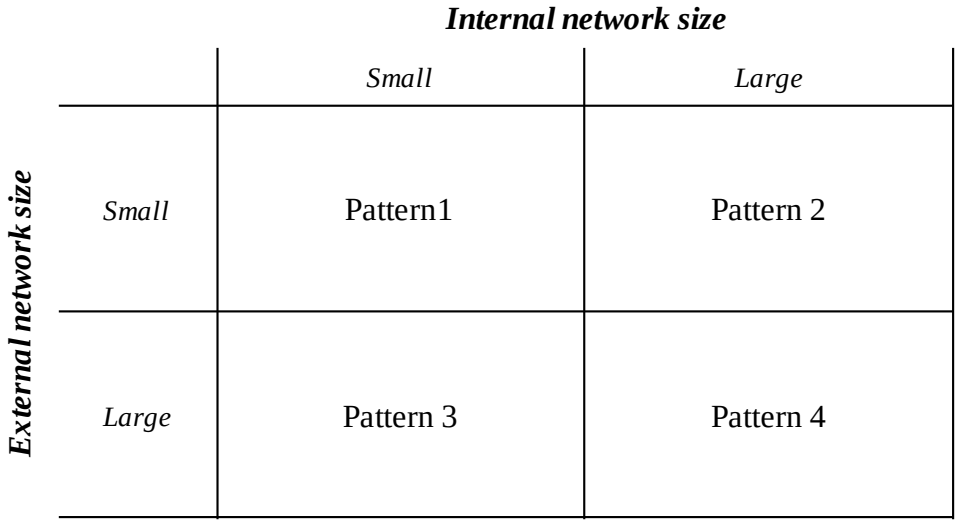


**Figure 8.1** - Matrix of different interaction patterns between internal and external network size

So far, most research on knowledge exchange processes has focused on exploring knowledge and information exchange either inside firms (Hansen & Løvås, 2004; Gupta & Govindarajan, 2000) or between firms (McEvily & Zaheer, 1999), while limiting the simultaneous investigation of both dimensions. In an attempt to fill this gap, I believe that the extent to which employees engage in exchanging knowledge with internal and external networks firstly depend on motivational factors. That is, it is important to understand whether the extent to which employees use these knowledge sources can be explained by individuals' motivational factors.

Overall, this study aims at providing more theoretical and empirical research on how individual-level antecedents affect individuals' knowledge sourcing both inside and outside the firm. For this purpose, it builds on the relevance of individuals' perceptions and motivations, which are likely to strongly shape employees' behavior.

This means that a given 'piece of knowledge' may be valued in different ways by different employees, because of personal tendencies, preferences, and so on. Moreover, this work may contribute to the literature on individual-level knowledge exchange behaviors because, rather than analyzing whether individuals choose one network instead of the other for sharing and acquiring knowledge, it examines the motivational factors underlying the decision to use a certain *combination* of them. In so doing, this idea wants to draw a more realistic view of how and why individuals effectively behave in a certain way in their daily work life.

**Investigating the relationship between structural holes and creativity**

Even though it is often desirable, fostering individual creativity within organizations is far from easy. Scholars have devoted great attention to understand the factors in work contexts that are likely to constrain or improve individuals' creative contributions. While initial studies on creativity are rooted in the historical tradition of psychology and consistently focus on the importance of individual traits (see Barron & Harrington, 1981), more recent ones have explored facets of organizations and jobs, such as rewards, job goals, job complexity, the evaluative context, teaching and training, and so on (e.g., Shalley & Perry-Smith, 2001).

In doing so, scholars have given much less attention to the role played by more social factors on creativity. Hence, despite the conceptualization of creativity as a social process is not new (see Amabile, 1983; Woodman et al., 1993), still a lot needs to be done in order to fill this gap. For instance, researchers have proposed that communication and interactions with diverse others enhance creativity (e.g., Amabile,

1996) while others have examined the role of several social network parameters (e.g., weak and strong ties, network centrality, etc.) on creativity (Perry-Smith, 2006). However, if creativity has truly a social nature (Perry-Smith, 2006), then focusing more explicitly on the social context and the interactions employees experience should enrich our understanding of what it takes to be creative. As Simonton stressed, "A successful 'social psychology of creativity' demands that the creative individual be placed within a network of interpersonal relationships" (1984: 1273). The importance of exploring the influence of network features on creativity become even clearer when knowledge accessibility is considered. As prior research points outs (e.g., Cramton, 2001), knowledge is unevenly distributed across individuals, groups, and organizations, thus making the availability of fresh information difficult.

Building on this, this paper takes on the view that the structure of the network where people find themselves can influence their creativity. Even though this relationship has been extensively investigated in the literature, so far, research has mostly focused on the diversity of information potentially accessible from alters in a network. Hence, the relationship between network structure and access to novel information has been mainly examined by looking at alters' knowledge. Thus, extant research almost overlooks the extent to which the diversity of knowledge possessed by the ego can determine access to new knowledge, which is a critical antecedent to individuals' creativity. For instance, Aral and Van Alstyne (2011) speculate on the contingencies that make access to novel information more likely, given a certain degree of heterogeneity of alters' knowledge. Similarly, Rogan and Mors (2014) focus on the heterogeneity of contacts providing knowledge in the network and relate it to the ambidextrous behavior of senior managers. Based on this, the way ego's own

knowledge affects his/her access to new information potentially coming from his/her alters in a network remains unexplored.

In order to fill this gap, I depart from Aral and Van Alstyne (2011) paper and try to integrate their view in explaining the relationship between structural position and creativity. While they take on the view that alters' knowledge is relevant for ego to access novel information, I extend (or complement) their contribution and focus on the relevance of ego's knowledge. Moreover, while they are interested in understanding what makes diverse versus cohesive networks more beneficial for creativity, I focus only on the former and examine what matters for actors occupying a structural hole to increase their creativity. I particularly posit that egos in diverse networks (i.e., brokers) can benefit from their position advantage depending on the knowledge they possess in relation to their alters. So, contrary to Aral and Van Alstyne (2011), I hold constant alters' knowledge in order to study the influence that different types of ego's knowledge can have on his/her creativity. For this purpose, I ground on Postrel's (2002) distinction between specialized knowledge and trans-specialist understanding and apply it to the study of the relationship between structural position within a diverse network and individual-level creativity. According to this premise, this study aims at addressing the following research question: *"To what extent does broker's specialized knowledge vs trans-specialist understanding benefit his/her own creativity?"*.

Moreover, in order to answer to the call for more empirical results showing the influence of brokers' network structure (see Phelps et al., 2012), I propose that the relationship between his/her knowledge and his/her creativity should be investigated through a contingency perspective. I thus expect such relationship to change depending upon ego's metaknowledge, i.e., the extent to which he/she knows what others know.

Based on extant literature, metaknowledge allows individuals to gather useful information in a timely manner, thus helping them come up with new alternatives and solutions, i.e., potentially fostering their creativity (Lewis & Herndon, 2011).

The argument developed in this paper posits a new challenge in both organizational behaviour and network literature: even when individuals are positioned within a structural hole (e.g., brokers), their advantage depends on the knowledge they have in relation to those of the alters they interact with. Their ability to be creative will thus be contingent upon this assessment. In other words, the position within the network determines the capacity to foster creativity, but it is not enough as the knowledge individuals possess is critical to understand how and whether they can come up with creative outcomes. Moreover, as they interact in a network with other actors, the extent to which they are aware of what such other actors know and what their expertise is can affect their ability to generate creative ideas.

Based on this, I seek to offer at least three contributions to the literature. First, I aim at shedding light on the contingencies that make brokers' advantageous position beneficial for his/her creativity, thus enriching structural holes arguments within network theory. Second, extant research on individual-level creativity has mostly investigated the intra-psychic processes likely to lead people to be more creative, while devoting little attention to organizational members as actors embedded in a network. Third, this study enriches the understanding of how brokers can foster their absorptive capacity. Hence, based on Cohen and Levinthal's (1990) study, in order to be successful, new knowledge acquisition requires prior knowledge, thus posing the question of the extent to which should such prior knowledge overlap with new knowledge.

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## List of tables



## List of figures