The effect of organizational separation on individuals' knowledge sharing in MNCs

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Abstract:

The ability of an organization to apply knowledge globally has been conceptualized as critical for the existence of multinational corporations (MNCs). We argue for an organizational separation effect on knowledge sharing that challenges the view of the MNC as a latent social community. Using a unique data-set of more than 4.000 individual responses from an MNC, Telenor, we test how three types of drivers for individuals' knowledge sharing –individuals' motivation, and individuals' perceptions of organizational values and organizational work practices- work differently within, as opposed to across, business units. Our analysis suggests that while intrinsic motivation, innovative values and job autonomy are relatively important drivers of knowledge sharing within the business units, extrinsic motivation, result-oriented values and participation in corporate employee development are relatively more important for knowledge sharing across business units.

Key words:

Knowledge sharing, internal boundaries, business units, motivation, organizational work practices, organizational values.

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INTRODUCTION

The ability to share knowledge within the MNC is critical for a host of organizational process and performance outcomes. An influential view is that of the knowledge-based theory of the firm. Kogut and Zander (1993, 1996) have proposed that "(the firm) should be understood as a social community specializing in the speed and efficiency in the creation and transfer of knowledge" (1996, p. 503). That is, organizations including multinational corporations (MNCs), can develop particular capabilities that enable them to share knowledge in a way that is superior to that of the market. Employees of organizations have a sense of social belonging that distinguishes members from non-members (Nahapiet & Ghoshal, 1998).

In this paper, we qualify this assumption of the MNC as a latent cohesive community that eases knowledge sharing across the whole MNC. We contend that this view tends to "over-socialize" the MNC and to underestimate the formal separation derived from structuring the MNC into distinct organizational units. Such formal separation creates internal boundaries (Carlile, 2004) and has, at least, two consequences for individuals' knowledge sharing. First, individuals belonging to the same organizational unit share a formal proximity that connects them on a regular basis. Further, they will usually share a common organizational unit goal. By contrast, their interaction with colleagues in other organizational units (even within the MNC) will be less frequent and organizational goals may not overlap. Second, because of this, the drivers that stimulate knowledge sharing by individuals within

their own organizational unit may be relatively distinct from those that stimulate knowledge sharing across organizational units in the MNC.

The notion that organizational separateness may have a profound effect on the relative efficacy of knowledge sharing mechanisms is not entirely new. In fact, both the organizational behavior (OB) literature on knowledge sharing behavior (Caimo & Lomi, 2015; Carlile, 2004; Cummings & Teng, 2003) and the international business (IB) literature on knowledge sharing in MNCs (Ambos & Ambos, 2009; Gupta & Govindarajan, 2000; Hansen & Løvås, 2004) have pointed to organizational separation as a hindering factor for knowledge sharing. However, while the former has focused on the interaction between the individual and features of the organization (e.g. organizational roles, information systems, expectations), the latter has focused more on the role of geographical separation (e.g. cultural, institutional and language distance). In reality most MNCs are both separated organizationally (multi-unit) and geographically (multi-national) and one should not disregard either of these aspects of the MNC. Therefore, both strands of literature – OB and IB – are needed for an understanding of knowledge sharing within and across subunits in the MNC. In this paper, we contribute to this by adding an OB perspective (in particular, the theory of planned behavior) to the current IB understanding of knowledge sharing in MNCs. In so doing, we are responding to the call from Roth and Kostova (2003) to study intra-organizational heterogeneity and complexity in MNCs.

We propose that organizational separateness influences the relative efficacy of knowledge sharing mechanisms and argue that the organizational separation in MNCs has an effect that is distinct from (and additional to) the various types of "distance" that are held to be key to variations in knowledge sharing in the IB literature (Håkanson & Ambos, 2010; Welch & Welch, 2008).

Knowledge sharing is an intentional behavior[1] influenced by the attitude the individual has toward it, by social norms and by a sense of empowerment (Ajzen, 1991; Gagné, 2009). These three elements vary depending on the context in which knowledge is shared. The theoretical logic that underpins our study is that the syntactic, semantic and political boundaries that exist because of formal organizational separation (Carlile, 2004) affect the extent of control and psychological safety perceived by the individual when sharing knowledge across units. Therefore, our reasoning is that the (organizational) mechanisms required for promoting knowledge sharing by individuals across organizational units differ in their relative impact to those that operate within the organizational unit.

Although it is individuals rather than organizations who share knowledge, the use of data at the organizational level has been a common feature of most studies on knowledge sharing in the MNC. This study avoids such "methodological collectivism" by drawing on a data set of 4,067 employees distributed across the 14 business units of the multinational mobile telecom operator, Telenor. Telenor is evolving from being a prototypical multi-domestic MNC characterized by business units that have developed from having a pronounced degree of autonomy to respond to local market conditions to being more integrated across business units (Elter, Gooderham & Ulset, 2014).

In this study, we focus on the organizational separation that arises as a consequence of the formation of separate business units[2]. Our motivation for operationalizing the concept of organizational unit as "business unit" is due to its consistency with the theoretical characteristics of the concept within the IB literature as well as with the terminology

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[1] Our definition of knowledge is consistent with Davenport and Prusak (1998, p. 5) where "Knowledge is a fluid mix of framed experience, values, contextual information, and expert insight". We concur with Gagné's (2009) definition of knowledge sharing as an intended behavior that depends on the individuals' willingness.

[2] We acknowledge the existence of other types of organizational separation beyond business units (for instance, task or functional boundaries) that also affect knowledge differentiation and knowledge complexity. These will not be discussed further here, but we do control for them in our statistical analysis. Our empirical setting is a MNC –Telenor- whose business units do not span across countries, which allows us to control for the IB distance factors when analyzing the organizational separation effect. However, it should be noted that in other MNCs it may be the case that business units span across countries.

employed by Telenor. Thus, business units refer to organizationally separated units that have a defined profit-loss responsibility and whose members share the same strategic mission and address the same operational issues, thereby generating major interdependencies within them (Govindarajan & Fisher, 1990; Gupta & Govindarajan, 1984). Additionally, as organizational contexts, business units provide a social setting that creates a shared sense of membership that enhances within-unit ties (Caimo & Lomi, 2015).

In order to ensure that our focus is on those parts of Telenor where knowledge sharing is a regular feature, our data-set comprises those employees who share knowledge with colleagues in other business units as well as their own. Our approach is to compare the knowledge sharing behavior of these same individuals across these two settings. This is a matched sample by design where we ask the same individuals about their knowledge sharing within and between business units, respectively. This makes our data particularly suitable for testing for differences between the two knowledge sharing settings, within and between business units.

We examined how these individuals' perceptions of their motivation for knowledge sharing, the organizational work practices they are exposed to, and the organizational values they perceive impact on their knowledge sharing behavior within and across business units. Our results indicate that in the context of within business unit knowledge sharing, intrinsic motivation, job autonomy and the perception of an innovative organizational culture are of relatively greater significance than for knowledge sharing across business units. For sharing knowledge across business units, we show that for the same individuals, extrinsic motivation and result-oriented organizational values supplemented by corporate employee development are relatively more important. This is because these factors contribute to reducing the sense of knowledge sharing across business units as inherently risky by establishing a "psychologically safe environment" (Gibson & Gibbs, 2006).

In the following, we develop a theoretical backdrop for why organizational separation into business units constitutes a boundary that challenges the social community assumption regarding MNCs. Further, because of this organizational boundary, we hypothesize that those factors that promote knowledge sharing by individuals within and across business units are relatively dissimilar. After describing our methodology, we test our hypotheses and present our main findings. Finally, we discuss the theoretical and managerial implications of the paper.

DIFFERENCES BETWEEN INTER-UNIT AND INTRA-UNIT CONTEXTS

While external firm boundaries are an obvious source of knowledge stickiness, it is less evident that organizational separation within the firm creates similar problems for knowledge sharing (Grandori, 2001). Indeed, proponents of the Knowledge Based View (KBV) of the firm like Kogut and Zander (1993) highlight that the firm (as a social community) is a more efficient mechanism of knowledge sharing than the external market. More specifically, they argue that the MNC possesses "higher order organizing principles that are diffused across borders" (Kogut & Zander, 1993, p. 638), which smooth the internal sharing of knowledge in the MNC.

However, it has also been observed that within MNCs there are internal boundaries between legally and organizationally distinct units like business units which may result in knowledge differentiation (Carlile, 2004; Grandori, 2001), variation in organizational values (Leonardi, 2011) and degrees of internal stickiness (Szulanski, 1996). For example, Marschan´s (1996) study of the MNC, KONE Elevators, identified internal barriers between business units that caused a sense of remoteness and disconnectedness across the MNC.

The creation of business units is a structural solution that MNCs adopt in order to manage complexity derived from geographic dispersion, product or project diversity and to

confine major interdependencies within them (Govindarajan, 1988). Each business unit typically operates independently, follows its own budget, evaluation system, and obtains significant discretion in designing its own business strategy (Govindarajan & Fisher, 1990). However, by segmenting themselves into multiple business units MNCs also breed internal differentiation and "sub-cultures" (Egelhoff, 1988; Sackmann, 1992) that affect their members' identification and interpretation of events (Caimo & Lomi, 2015). Such organizational separation is not trivial as it promotes many types of boundaries between the business units. Egelhoff (1991:357) applies information-processing theory on the MNC and concludes that research seems "strongly to support the assumption that formal organizational structure has a major influence on the location of knowledge and decision making". Along the same line, a number of authors have highlighted that the MNC rarely is characterized by having one mono-culture, but rather a number of sub-cultures that stem from organizational separation into distinct sub-units (Sackman, 1992; Welch & Welch, 2006).

Based on an organizational behavior perspective Carlile (2004) has identified three generic types of boundaries inside the firm that follow from this organizational separation: syntactic, semantic and political/pragmatic boundaries. Syntactic boundaries between units refer to the lack of a "common lexicon" that can be used for transferring specific knowledge. Semantic boundaries and interpretive discrepancies follow when there is a lack of shared meanings across units even if such units share the same language or communication code. These semantic discrepancies are due to context-specific aspects that lead individuals to interpret information in different ways. When one adds political boundaries to this in the sense of conflicting interests, knowledge sharing across business units is impeded (Carlile, 2004). In the following, we will discuss these boundaries further in the context of intra-versus inter-business unit knowledge sharing in the MNC.

A salient difference between the intra-business unit and the inter-business unit context is that in the first individuals commonly share the same language and share a common memory bank of critical past events. Further, within the business unit there are more interdependencies and the knowledge relatedness is higher, which has been established as a factor that increases knowledge flows (Hansen & Løvås, 2004; Tortoriello, Reagans & McEvely, 2016). In addition, the existence of formal ties increases the likelihood of a higher frequency of communication between individuals (Caimo & Lomi, 2015) which augments their awareness of the opportunities and means for knowledge sharing (Monteiro et al., 2008). Therefore, both relatedness in knowledge and frequency of communication contribute to developing a common base of knowledge – technological, operational behavioral - also known as "architectural knowledge" (Tallman and Chacar, 2011). This is less so when individuals communicate across business units. Consequently, the internal boundaries highlighted by Carlile (2004) that relate to the lack of a common code of communication (syntactic) and of shared meaning (semantics) will be more prominent for individuals' knowledge sharing between business units than within the business unit.

In addition, political frictions between corporate units are a further source of internal boundaries (Carlile, 2004). Business units compete for gaining attention and resources from headquarters and as such, their influence and power varies (Bouquet & Birkinshaw, 2008). The IB literature has recognized the significance of political frictions within the MNC at the organizational level. One aspect is that of subsidiaries or business unit's self-interest as their particular interests may not be aligned with the headquarters of the MNC as a whole (Gooderham, 2012; Nohria & Ghoshal, 1994). Another issue is headquarters' attention to the business unit in relation to its competences, its structural position in the MNC, and its initiative taking (Bouquet & Birkinshaw, 2008; Dellestrand & Kappen, 2012; Nohria & Ghoshal, 1997). Such political boundaries have implications for knowledge sharing at the

individual level. First, given the prevalence of political friction between business units, individual employees who share knowledge with colleagues in other business units confront the uncertainty of whether their efforts will be subject to some form of misappropriation. Second, both Monteiro et al. (2008) and Caimo and Lomi (2015) point to the role of reciprocity or moral obligation of the knowledge receiver to uphold the implicit contract to provide knowledge to the sender if and when needed in the future. Our theoretical logic assumes that this norm applies more strongly under the formal mandate of the business unit.

Taken together, syntactic, semantic and political boundaries generate an "organizational separation" effect that forms our baseline hypothesis. Integral to our proposition is that this organizational separation effect is independent of (and complementary to) those "distance" factors that have previously been highlighted in the literature on knowledge sharing across the MNC such as geographical, institutional, cultural and language distance (e.g. Ambos & Ambos, 2009; Mäkelä, Andersson & Seppälä, 2012; Welch & Welch, 2008). Accordingly, we hypothesize:

H1: Individuals who engage in knowledge sharing with colleagues in other business units share knowledge to a significantly greater degree with colleagues in their own business units.

FACTORS AFFECTING INDIVIDUALS' KNOWLEDGE SHARING

The literature on knowledge sharing in the MNC is extensive and spans a number of promoting factors (e.g. Gupta & Govindarajan, 2000; Michailova & Mustaffa, 2012). However, in a comprehensive review of this literature, Michailova and Mustaffa (2012, p. 391) conclude that it is deficient in studies at the individual level: "the field is in need of more studies which investigate how knowledge flows among *individuals* (our emphasis) can affect subsidiary-level and MNC-level knowledge flows. For instance, a fine-grained assessment of

organizational members is likely to trigger new and more nuanced insights about knowledge flows in subsidiaries and in MNCs." In this study, we aim to address this gap by focusing on the mechanisms that promote individual level knowledge sharing in the MNC.

We concur with Foss, Husted and Michailova's (2010) view that there is not only a lack of studies that draw on samples collected at the individual level but also a paucity of studies that are based on theoretically driven assumptions about individual behavior. Our review of the literature that has examined factors affecting *knowledge sharing at the individual level* spans empirical studies, theoretical contributions and literature overviews. In this review -see Appendix 1- we have taken into account both studies conducted in the MNC context as well as non-MNC studies on individual drivers of knowledge sharing. On a conceptual level, these studies have identified three broad categories of factors. The first factor relates to individual attitudes (i.e. individual motivation) (Cabrera & Cabrera, 2005, Cabrera et al., 2006; Foss et al., 2009; Gagné, 2009; Mibaeva et al., 2012, Wang & Noe, 2010). The second factor focuses on individual perceptions of social norms (i.e. organizational values) (Cabrera & Cabrera, 2005, Cabrera et al., 2006, Gagné, 2005, Gooderham et al., 2011, Mäkelä & Brewster, 2009, Minbaeva et al., 2012, Wang & Noe, 2010) and the third factor refers to the individual's perception of various organizational work practices (Cabrera & Cabrera, 2005, Cabrera et al., 2006, Foss et al., 2009, Gagné, 2005, Gooderham et al., 2011, Minbaeva et al., 2012, Wang & Noe, 2010, Wang et al., 2011). Together these studies constitute the theoretical underpinnings of an explanation of individual knowledge sharing behavior. The empirical studies highlight factors such as individuals' self-efficacy, their openness to experience and their perceptions of support from colleagues and superiors (Cabrera et al., 2006; Gagné, 2009; Wang et al., 2011). In addition, several studies point to the superiority of individuals' intrinsic motivation over extrinsic motivation for fostering knowledge sharing (Foss et al, 2009; Gagné, 2009; Gooderham et al., 2011; Minbaeva et al., 2012). However, a general

characteristic of the studies featured in Appendix 1 is that they pay little attention to variation in the organizational context, while mainly focusing on the within-unit knowledge sharing. One exception to this is Mäkelä and Brewster's (2009) study. Nonetheless, to the extent they specify organizational boundaries they take a nodal approach and focus on knowledge sharing within a single business unit. Thus, for example, they did not explain why inter-unit meetings fail to influence the creation of trust and shared understanding among participants. In the light of these findings, the question of how internal boundaries affect the effectiveness of knowledge sharing drivers at the individual level remains unclear.

A fundamental assumption of this literature is that sharing knowledge between individuals requires deliberate behaviors on the part of the involved parties (Gupta & Govindarajan, 2000; McDermott, 1999; Felin & Hesterly, 2007; Foss & Pedersen, 2004). McDermott (1999) emphasizes that sharing knowledge involves an individual making a conscious effort to guide another individual through his or her thinking. Therefore, a behavioral perspective is very suitable in explaining the drivers of knowledge sharing at the individual level (Gagné, 2009).

Individual behavior is context-specific and socially embedded, meaning that while an individual may behave in a certain way in one context, that same behavior may not be repeated in another context. It depends on how individuals perceive themselves and the conditions of the context (Felin & Hesterly, 2007; Foss et al., 2010). Ajzen (1991, 2002) has developed a framework - the Theory of Planed Behavior (TPB) - for understanding the contextual aspects of deliberate human behavior. According to TPB, intended behavior is guided by three kinds of perceptions: "beliefs about the likely consequences of the behavior (*behavioral beliefs*), beliefs about the normative expectations of others (*normative beliefs*), and beliefs about the presence of factors that may facilitate or impede performance of the

behavior (*control beliefs*)" (Ajzen, 2002, p. 107). Each of these three beliefs is context specific.

In the following, we will apply TPB in order to understand what facilitates the knowledge sharing behavior of each individual employee within and across the business unit. In fact, the three types of beliefs in Ajzen's theory of planned behavior resonate very well with the three individual levels factors of knowledge sharing we derive from our literature review in Appendix 1. Behavioral beliefs are at the core of individual motivation, normative beliefs are associated with organizational values and control beliefs derive from organizational work practices. In the following, we scrutinize how these three factors vary in their significance for promoting knowledge sharing in the two different contexts of within and between business units.

Individual's motivation towards knowledge sharing

Previous research featured in Appendix 1 highlights individuals' motivation towards knowledge sharing as a key antecedent of behavior because it affects their beliefs about the outcomes of their behavior (Ajzen, 1991; Cabrera, Collins & Salgado, 2006; Foss et al, 2009; Gagné, 2009; Minbaeva & Pedersen, 2010; Osterloh & Frey, 2000). There are two generic types of motivation for the sharing of knowledge. First, extrinsic motivation is associated with an expectancy of a tangible compensation. This type of motivation implies that a goal (reward) affects the behavior of the individual resulting in satisfaction that is discrete to the activity or process. Second, and in contrast, intrinsic motivation for knowledge sharing implies engaging in the behavior because it is in accordance with the individual's values and interests and leads to personal satisfaction. Thus, the expected outcome for intrinsic motivation is related to the process of engaging in the behavior rather than to an external reward (Foss et al. 2009; Gagné, 2009; Osterloh & Frey, 2000).

Individuals tend to favor those behaviors that have desirable outcomes or that do not incur undesirable costs (Ajzen, 1991). When sharing knowledge within an individual's own business unit syntactic and semantic boundaries are lower and motivation can act as an efficient tool for reducing differences. Within the context of one's own business unit, individuals can directly interact with other people (supervisors or other colleagues) who provide them with feedback about the outcomes of their behavior. If they do not know the recipient themselves, they can be readily linked via other colleagues in the business unit. They can then assess the outcomes of their behavior and observe who is using the shared knowledge, in what ways and to what ends. This opportunity to monitor and evaluate outcomes reduces the likelihood of circumspection in knowledge sharing. Further, in the case of within business unit knowledge sharing, it is more straightforward to assess the trustworthiness of colleagues and therefore there is a greater likelihood that a norm of reciprocity will develop (Caimo & Lomi, 2015; Nahapiet & Ghoshal, 1998). Thus, in this context intrinsic motivation is likely to be a relatively important driver of knowledge sharing.

However, the organizational separation into distinct business units creates diverse contexts. This affects individuals' expectancy of the outcomes of knowledge sharing across them. The lack of a common lexicon and shared meanings between business units means that individuals incur added costs even when intrinsic motivation is high. Additionally, latent or actual competition between units creates political friction that reduces individual intrinsic motivation for knowledge sharing. A further factor in relation to intrinsic motivation is that individuals who share knowledge with individuals in other business units will unlikely find it problematic to experience any immediate or direct sense of the usefulness of their behavior. Finally, organizational separateness negates trust-based relationships from developing. However, extrinsic motivation could be relatively more important for sharing knowledge across business units, as the individual may perceive sufficient tangible rewards –in the form

of their supervisor's appreciation and recognition or the possibility of rewards and promotion - as valuable compensation for the effort and uncertainty involved.

Therefore, we hypothesize:

H2a: Relative to the inter-business unit context, intrinsic motivation is a more important driver of knowledge sharing by individuals in the intra-business unit context.

H2b: Relative to the intra-business unit context, extrinsic motivation is a more important driver of knowledge sharing in the inter-business unit context.

Individuals' perceptions of organizational values

Organizational values constitute a form of informal control that directs individuals to what the organization considers to be "right" behavior (De Long & Fahey, 2000; Dose, 1997; Somers, 2001). By establishing what acceptable and preferred behavior in the organization is and what is not, organizational values affect the conditions of individual behavior. Therefore, the individual's perception of organizational values affects behavior (Ajzen, 1991; De Long & Fahey, 2000; Golden, 1992). In the case of MNCs, perceptions of organizational values may vary across business units and even across departments within each business unit (Quinn & Rohrbaugh, 1983).

For the knowledge-based view of the firm (KBV), organizational values are of critical significance for MNCs as they provide a normative framework with which members identify (Kogut & Zander, 1996). As Kogut and Zander (1996, p. 507) state: "identity improves coordination, communication and learning". Through the mechanisms of fostering trust among individuals or promoting the willingness to learn and the intended search for new ideas (Wang & Noe, 2010) certain organizational values promote knowledge sharing (Mueller, 2014). We focus on two types of organizational values that previous research indicates are

positively related to knowledge sharing: innovativeness values and result-orientation values (Beugelsdijk, Koen & Noorderhaven, 2006; Mueller, 2014; Wang & Noe, 2010). These two organizational values respectively capture two significant but distinct organizational qualities, creativeness and effectiveness.

Organizations characterized by innovativeness values encourage experimentation and learning by trial and error. These values - related to risk and initiative taking- have been shown to lead to the development of relationship skills (Beugelsdijk et al., 2006) and to superior information sharing (Wang & Noe, 2010). In contrast, result-orientation values are less process-oriented and place considerably more emphasis on achievement, performance and actual outcomes. With a result-orientation culture, employees might have some leeway regarding the process to obtain a desired outcome that has been shown to influence positively a broader search for effective solutions (Morris, Zhong & Makhija, 2015; Mueller, 2014).

While we accept the potential these organizational values have for promoting individuals' knowledge sharing by shaping the normative framework with which they identify, we are skeptical to any monolithic notion of the MNC as a social community. Boundaries between business units will likely result in a plurality of social communities rather than in one overarching social community. In turn, this could interfere with the processes of attribution and individuals' identification with the MNC; therefore affecting the frequency of exchanges between individuals (Monteiro et al., 2008). The outcome is one of a plurality of "communities of practice" where individuals share common "architectural knowledge" (Tallman & Chacar, 2011, p. 279) or "epistemic communities" whereby individuals differ in their frames of references and cognitive systems (Håkanson, 2010). Our argument adds to these views, positing that syntactic, semantic and political boundaries within the MNC create sub-contexts of diverse "social communities" that co-exist. Thus, there is greater likelihood of shared organizational values within than between business units. This

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affects communication and understanding between individuals from different business units (Leonardi, 2011).

Given that the immediate context for individuals to experience organizational values is their own immediate unit (department and business unit), organizational values that promote processes of knowledge sharing will typically have more cohesive power within than across business units. Thus, the effect of innovativeness values with its process orientation is of greater significance for knowledge sharing within than across business units. The result-oriented values on the other hand are more tangible and provide the individual with both a clear signal as to priorities and the latitude to engage in sharing knowledge beyond the business unit. To the extent which individuals who undertake knowledge sharing with colleagues in other business units, we argue this will be primarily driven by values that emphasize tangible outcomes rather than indeterminate processes with uncertain outcomes. Accordingly, we hypothesize:

> **H3a: Relative to the inter-business unit context, innovative values are a more important driver of knowledge sharing by individuals in the intra-business unit context.**
>
> **H3b: Relative to the intra-business unit context, result-orientation values are a more important driver of knowledge sharing in the inter-business unit context.**

Individuals´ perceptions of work practices

The third set of factors we have identified that conditions the knowledge sharing behavior of individuals is related to the notion individuals have of whether they have the resources and opportunities to succeed in their intended behavior. According to Ajzen (1991, p. 196), "*the more resources and opportunities the individuals believe they possess, and the fewer the*

obstacles or impediments they anticipate, the greater should be their perceived behavioral control." Thus, one important aspect to knowledge sharing is the degree to which the individual perceives that he or she has the latitude or autonomy to initiate knowledge sharing and to see it through. This perceived behavioral control enhances a sense of self-efficacy (Ajzen, 2002).

We argue that the extent to which the organization empowers its employees through work practices will affect their perception of behavioral control and self-efficacy. Such empowerment will be of crucial importance for knowledge sharing across business units in order to overcome the interpersonal risks and impediments of internal boundaries. Job autonomy has been shown to affect individuals' knowledge sharing by increasing their sense of responsibility for their organization and to increase their willingness to engage in creativity (Cabrera et al. 2006; Foss et al. 2009; Gooderham et al., 2011).

Another source of perceived behavioral control contained in the literature on knowledge sharing in virtual teams is that of psychological safety. Knowledge sharing is inherently risky in the sense that it has an uncertain outcome. The likelihood that individuals will engage in it increases when the organizational context is experienced as psychologically safe for the risk taking (Gibson & Gibbs, 2006). Organizational work practices can enhance both a sense of job autonomy and psychological safety. However, whereas job autonomy is inherent to the job itself, a sense of psychological safety is more a product of active and intended corporate employee development that creates arenas for exploring the expectations of the organization and for creating a common sense of purpose (Gooderham, 2007). Examples of such mechanisms include job rotation, seminars, workshops, and management and specialized training (Foss, 2007; Gagne, 2009; Grandori, 2001). These mechanisms have been shown to positively affect knowledge sharing by creating the appropriate conditions for it (Cabrera & Cabrera, 2005; Cabrera et al., 2006). Not only do they leverage social networks,

but they also generate an enhanced sense of mutual goodwill that promotes a collaborative context for knowledge sharing (Gooderham et al., 2011; Mäkelä & Brewster, 2009).

Thus, the degree of job autonomy is therefore salient for positive assessments. However, in the case of knowledge sharing across business units, because the outcome of knowledge sharing is not readily observable, job autonomy is less of a driver of knowledge sharing. Given that the risk involved in knowledge sharing is substantially greater when sharing knowledge with individuals that are separated organizationally and socially, participation in corporate employee development as a means of establishing a sense of psychological safety is significantly more important. Within their own business units, because knowledge owners have direct links to potential recipients there is inherently less risk involved as such links provide psychological safety to the individual. Therefore participating in corporate employee development is significantly less critical for knowledge sharing.

Thus, we hypothesize:

H4a: Relative to the inter-business unit context, individuals' perception of job autonomy is a more important driver of knowledge sharing in the intra-business unit context.

H4b: Relative to the intra-business unit context, participation in corporate employee development is a more important driver of knowledge sharing in the inter-business unit context.

Figure 1 depicts our theoretical model and hypotheses.

Figure 1 about here

It should be noted that hypotheses 2a-4b are not formulated as traditional causal hypotheses, but rather as hypotheses on the comparative effect of knowledge promoting

factors for knowledge sharing by individuals in two fundamentally different contexts: within and between business units.

METHODS

<u>Sample and data collection</u>

We test our hypotheses in the context of the MNC, Telenor. In 2014 –when we conducted our study, Telenor was the seventh largest mobile telephony operator in the world with 186 million mobile subscriptions and an annual revenue of NOK 106.5 billion. It comprised 14 majority owned and Telenor controlled business units in Scandinavia, Central and Eastern Europe, and Asia. With the exception of its home market, Norway, where it had four distinct business units (Telenor Norway, Digital, Broadcast and ASA), there was one business unit per national market (Denmark, Sweden, Hungary, Serbia, Montenegro, Malaysia, Thailand, India, Bangladesh, Pakistan). However, whether the business unit had a product or market focus they were all primarily stand-alone profit units.

Capital-intensive mobile network operators have dominated the industry. Typically, these have expanded into new markets by replicating and adapting their business models and outsourcing some value chain activities to partners. Over the last decade, the telecom industry has experienced significant competitive changes linked to its customers, operators, device vendors and service suppliers. As a consequence, Telenor has shifted from being a multi-domestic MNC with pronounced business unit autonomy towards an organization with designated integrated global functions in marketing, technology and purchasing (Elter, Gooderham & Ulset, 2014). This development implies a stronger focus on the sharing of knowledge across business units in order to exploit knowledge globally irrespective of where it was created in the first place. The knowledge sharing that is promoted among Telenor employees is what can be characterized as knowledge on how to carry out tasks and involves

both tacit and codified elements, as there is contextual information but also experience and expert insights (Davenport & Prusak, 1998). Examples include the sharing of knowledge on new features such as digital services, development of customer relations and the optimization of infrastructure deployment. This is not always path-breaking knowledge, but knowledge on new tasks or on performing the existing tasks more efficiently. For example, Telenor utilizes global teams of local chief experience offices (CXOs) that evaluate and prioritize among competing knowledge proposals and then set up project teams that develop the approved best practices for cross-unit replication. Other initiatives include global category teams that regularly have virtual meetings and inter-business unit exchanges of selected employees (Elter et al., 2014). Telenor also applies a range of practices that are held to promote knowledge sharing across the whole organization such as job rotation, education programs and empowerment of employees (Gooderham, 2007).

Our study includes 14 different business units distributed across ten countries in Scandinavia, Central & Eastern Europe and Asia[3]. We negotiated access to respondents and data through the company's central HR unit. A pilot design of the survey instrument was developed and pretested among 74 employees in Bangladesh and Norway. In order to minimize the problems related to equivalence of meaning when translating the survey, we combined several methods involving back-translation and several pre-tests (Chidlow, Plakoyiannaki & Welch, 2014). Thereafter, we carried out a full-scale pilot among 1081 employees in Telenor Pakistan as this was considered to be a typically well-established business unit in the Telenor group. Based on the feedback from the pilot respondents, we adjusted the questionnaire. We also iteratively reviewed the questionnaire with 14 senior managers in R&D and HR before arriving at a final version.

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[3] We have concentrated on investigating those BUs that, at the moment of data collection, represented the core business (mobile and fixed communications) and other significant businesses measured in turnover (e.g. Digital). Also, we focus on BUs where the company has full operational control –even though in two cases the company does not own 100% of the shares. We excluded the company's operations in Bulgaria and Myanmar, as these were too recent to have been integrated into the company's knowledge flows.

Using the company's internal e-mail system, in March 2014 the survey was sent to all employees in the selected business units. This spanned 25,340 employees. The survey package included a front-page letter from Telenor Research introducing the study and explaining how we would de-identify the responses and protect the confidentiality of the respondents. After three weeks, 15,793 respondents had returned the questionnaire, which amounts to a total response rate of 63 percent. We achieved a response rate of above 50 percent in all but three business units.

In addition, for each of these respondents we were able to link the survey data on knowledge sharing with data from a second survey, Telenor's annual engagement survey (i.e. an employee satisfaction survey) that had been conducted among all employees in January 2014. While the March 2014 survey focused more on knowledge sharing behavior, the Telenor engagement survey focused on the employees' perception of the work environment. An obvious strength of combining two data sources that were collected separately at different points in time is that common method bias becomes less likely. Reverse causality is also less likely because the data for almost half of our included variables were collected before (January 2014) the dependent variable data (March 2014).

One of the key questions in the survey was "Do you collaborate with people from other BUs than your own?" In all 4,067 respondents answered in the affirmative to this question, while the rest answered no. In order to achieve a sample of respondents who share knowledge both across and within business units, we excluded all those who reported that they do not engage in knowledge sharing across business units. This allows us to compare the knowledge sharing behavior across the two contexts, within and between business units, of the same individuals (a matched sample by design). The strength of this method is that the individuals are kept constant when determining the drivers of knowledge sharing while the context is changed. As such, this is a conservative approach to testing our hypotheses as we

deliberately disregard all those employees who are not engaged in knowledge sharing across business units, and only include those employees engaged in knowledge sharing both within and across business units (25.8 percent of respondents). However, we also conducted a number of robustness checks on the full sample of employees.

Table 1 summarizes the number of responses and response rate and also the number of employees included in the analysis for each business unit.

*** Table 1 about here***

Measures

For the majority of the items for the hypothesized relationships, we used existing multi-item scales from prior empirical studies, only some of our control variables are single item measures. When a new scale was developed, it was based on the adaptation of existing measures from the literature. The constructs were measured using multiple items requiring an indication of intensity on a Likert-type scale for each item. For the multi-item constructs all items – including their exact wordings, factor loadings and reliability scores – are presented in Appendix 2. The single item constructs are not listed in Appendix 2, but the exact measures are detailed below.

The multi-item constructs were tested for construct reliability and discriminant validity in a confirmatory factor analysis (measurement model). It appears from Appendix 2 that the (standardized) factor loadings for all items are strong (all greater than 0.52). Second, the construct reliability for all constructs is well above the recommended threshold of 0.70 (Anderson & Gerbing, 1988) (all greater than or equal to 0.84). Several measures of *discriminant validity* are obtained from the data. By constructing 99.9 percent confidence intervals around the correlations and causal paths, we can confirm that none of them is close to 1. In addition, concerning the variance extracted, the overall model is clearly robust, as all

constructs are above the recommended threshold of 0.50 for AVE values (all greater or equal to 0.57). In sum, the measures provide strong reliability and validity for all of our constructs.

Our two dependent variables are the level of individual's *knowledge sharing within the business unit* and *across the business unit*, respectively. The motivation for these measures stems from Gupta and Govindarajan (2000) who similarly measure the different types of knowledge shared among units. Six items measure each of our two dependent variables. Based on a 7-point scale that ranged from "never" to "very often" respondents indicated how often they shared knowledge with colleagues in their own business unit/other business units for knowledge about "new service development", "technology and telecom infrastructure", and "new ways to serve the customers", among others. The advantage of self-reported measures is that employees are likely best suited to report their knowledge sharing behaviors because their understanding of own behaviors may be subtler than that of anyone else. In this regard, we follow a number of other studies applying self-reported measures of knowledge sharing behavior (e.g. Monteiro et al., 2008; Raab et al., 2014; Reinholdt et al., 2011).

The independent variables fall into the three groups of factors that are viewed as promoting knowledge sharing: the individual's motivation and perceived organizational work practices and organizational values.

Individuals' motivation. We apply the insights and scales from self-determination theory on motivation that make a clear distinction between intrinsic and extrinsic motivation (Ryan & Deci, 2000; Foss et al., 2009). Using a 7-point scale ranging from "strongly disagree" to "strongly agree" respondents were asked why they share knowledge with others. We applied four items to capture intrinsic motivation, and four items for extrinsic motivation.

Organizational work practices include two types of mechanisms analyzed in the literature: job autonomy and corporate employee development. For measuring job autonomy, we followed Foss et al. (2009). This involves five items that capture job autonomy

characteristics that respondents rank on a 7-point scale ranging from "not at all" to "very well".

In terms of corporate employee development, we followed Cabrera and Cabrera (2005) that highlight this as a key practice promoting knowledge sharing. Respondents were asked to indicate whether they have participated in general management/specialized training/seminars and whether they have been involved in job rotation. These items were measured by ticking boxes "yes" and "no", and because of the binary nature of the items, we could not include this construct in the confirmatory factor analysis. However, a weaker test of the construct is conducted by calculating the Cronbach alpha value. This is 0.74, which is highly satisfactory.

The *Organizational values* measure is based on the Organizational Culture Profile (OCP) developed by O'Reilly, Chatman and Caldwell (1991) that includes different dimensions of organizational values. For our study, we apply the OCP measures of innovative values and result-oriented values as these are related to knowledge sharing. While the other potential dimensions of the OCP are typically highly correlated with either the innovative or the result-oriented values, these two values are markedly less correlated with each other. As suggested by O'Reilly et al. (1991), using a 7-point scale, ranging from "most uncharacteristic" to "most characteristic", the innovative and result-oriented values are measured by 6 and 4 items, respectively.

Control variables. We added a number of control variables to test out confounding explanations for the variation in individual's knowledge sharing behavior. The control variables can be divided into four groups: i) Personal characteristics; ii) Distances between sender and receiver; iii) Organizational level factors and iv) Structural characteristics.

The personal characteristics included three "satisfaction" variables taken from the Telenor Engagement Survey on the perceived satisfaction of the focal employee. *Satisfaction*

with work was measured by the question: "Overall, I am extremely satisfied with my company as a place to work", *Satisfaction with career*" by the question: "I am satisfied with the career opportunities available at my company" and *Workload* by asking: "My workload is reasonable". All three questions are measured on a 7-point scale ranging from highly disagree to highly agree. By adding these three questions, we are controlling for whether there is any social desirability bias in our data. We also included tenure, *gender* and *nationality*. These three items were collected in the survey by asking respondents in open questions to write in their tenure (years working in current department), gender and nationality. We also calculated the variable *foreign country nationals* as a dummy if the focal employee' was a foreign national in the host country (e.g. non Danes working in the Danish subsidiary). The personal characteristics are added because individuals might have different propensity to share knowledge with others based on these characteristics e.g. tenure might affect the employee's confidence in knowledge sharing as well as their network in Telenor.

The measures of distance are those commonly used in studies within the IB-literature as affecting knowledge sharing across national boundaries (e.g. Ambos & Ambos, 2009). Thus, we include controls for four types of distances: geographic, institutional, cultural, and language. Each respondent was asked to indicate "Which BUs (others than your own) do you most often work with?" and they could list up to three different business units within Telenor with whom they were engaged in knowledge sharing. As both the work address of the respondents and the main address of the BUs are known to us, we were able to calculate the distances between the focal respondents and the other BUs they work with. *Geographic distance* was measured as air miles between respondents and the other BUs. To measure *institutional distance* we adopted the widely used Worldwide Governance Indicators, which are based on World Bank Data (Kaufmann, Kraay & Mastruzzi, 2010). We used data for 2014 for each country with respect to six variables: voice and accountability, political stability,

government effectiveness, regulatory quality, the rule of law, and control of corruption. The distance in each relationship (pair of countries) across the six variables was calculated as the bilateral Euclidian distance. *Cultural distance* in each knowledge relationship was measured based on Hofstede's four cultural dimensions of power distance, masculinity, individualism and uncertainty avoidance and the difference for each pair of countries across the four variables was used to calculate the bilateral Euclidian distance. The *language distance* variable is taken from Dow and Karunaratna (2006), who operationalize it as a five-point measure that captures distance between the official languages of any two countries.

The organizational level factors are those other factors that the literature has highlighted as important drivers of knowledge sharing in MNCs. They include related competences, formal proximity and informal links as put forward by Hansen and Løvås (2004), reciprocity norms (Monteiro et al., 2008) and communities of practice (Tallman and Chakar, 2011). These are all factors anchored at the organizational level (e.g. subsidiary, team, department). Thus, while the hypotheses and mechanisms studied in this paper are located at the individual level, we nevertheless control for the confounding effects of these organizational level factors in our models as we add controls for related competences, formal proximity, reciprocity, and community of practice across units. We derive our measure of *related competences* from, as mentioned above, the responses to which other business units with whom they work. A simple measure of related competences is calculated as the number of relationships going into a particular business unit divided by the total number of potential relationships (also a measure of degree centrality). We source the data for the other four organizational level factors from the Telenor engagement survey. These are all single-item measures on a 7-point Likert-scale. *Informal links* were measured by the question: "There is a good cooperation between my department and other departments within my company", and *formal proximity* in this way: "I have received clear communication on what is expected of

me". *Reciprocity* is captured by asking: "When I need help from someone outside of my own department I am treated as a valued customer" and *community of practice* by the question: "I am able to collaborate effectively across Telenor Group".

The structural characteristics include function and business unit. The variable function (i.e. dummy variables for sales, technology, R&D, supply chain and administration) is added as the factors promoting knowledge sharing might work differently when sharing knowledge for example on technology as opposed to for example sales. In the same vein, we added dummies for the 14 business units (listed in Table 2). Most of the business units are located in different countries (except for Norway which contains four of the business units) and by adding the dummies for business units we are controlling for all variation in knowledge sharing attached to the business unit such as the nature of the business unit, its location and management.

Common method bias is an obvious limitation of survey-based measures (Chang, Witteloostuijn & Eden, 2010). However, common method bias is less of an issue for our study because our hypotheses are formulated with a focus on comparing the perceptual values of the same individuals (a matched sample design). As we do not expect the bias to vary between the contexts of within versus across business units, the comparative values should be less biased. In addition, we have included a number of perceptual satisfaction measures to control out an eventual social desirability bias. Also the fact that the included variables stem from two different sources collected at different points in time, the knowledge sharing survey and the Telenor engagement survey, also makes common method bias less of an issue in these data.

To further address this issue, we performed a number of statistical analyses to assess the severity of common method bias. The Harman's one-factor test on the variables indicated that common method bias was not a major issue. That is, multiple factors were detected and the variance did not merely stem from the first factors (Podsakoff & Organ, 1986). In

addition, we ran a confirmatory factor analysis where all items loaded on the same factor (a Single Factor Model). The assumption is that the existence of a single factor that is the common denominator across all items reflects the presence of a common method bias (Podsakoff et. al, 2003; Chang et. al, 2010). However, the goodness-of-fit of the single-factor model (GFI = 0.31, NNFI = 0.38 and RMSEA = 0.17), including all normally distributed items in the model shows that the single-factor model offers a poor representation of the data which indicates that a common variance factor does not explain a sizeable portion of the variation in our data. In addition, we include variables in our models that are measured from two different sources and at different point in time making common method bias across these variables less likely. Finally, the questionnaire consisted of different scales (some of which were reversed). This, in combination with the fact that our results are based on comparative values and complex estimations that involve multiple independent variables, makes it highly unlikely that the results of such models emerge solely because of common method bias (Siemsen et al., 2010).

RESULTS

Our first, baseline, hypothesis proposes that individuals in MNCs who share knowledge with colleagues in other business units are nevertheless significantly more inclined to share knowledge with members of their own business unit. The upper section of Table 2 lists the mean values for the level of knowledge sharing within and across business units. In order to test Hypothesis 1 we conducted a t-test of the difference in the means for knowledge sharing within business units (mean=4.50) and across business units (mean=3.64) for the same individuals. The T-test between the two variables is highly significant (t-value=40.38, $p < 0.0001$) indicating that the same individuals do indeed perceive their level of knowledge

sharing across business units to be significantly lower than their level of knowledge sharing within their own respective business units.

Since four of the business units are located in Norway, we can isolate the "untainted" effect of organizational separation from any confounding effects related to distance and foreignness by conducting the same test for the sub-sample of business units located in Norway where the distance and foreignness factors are absent. Thus in the lower section of Table 2 we employ the same t-test on the four Norwegian business units in order to observe a pure measure of the organizational separation. The pattern is unchanged: the mean value for knowledge sharing is greater for within than across business units (4.26 vs. 3.36) and standard deviation is lower (1.39 vs. 1.61). The t-test indicates that the level of knowledge sharing is significantly higher within than across business units (t-value=23.79, $p < 0.0001$)[4]. Therefore, we can conclude in line with Hypothesis 1 that the organizational separation into different business units in itself constitutes a barrier for knowledge sharing that is distinct from the acknowledged barriers that derive from various forms of distance.

*** Table 2 about here***

The presentation of the results for the subsequent hypotheses involves tests of the hypotheses in regression and MANOVA-analyses. Several checks were done to verify that the assumptions of the regression model were met, including examining residual plots and normal probability plots of the residuals and tests all variables for normality (e.g. the Anderson-Darling test).

We conducted a number of MANOVA-analyses in order to test whether our independent variables explained our two dependent variables to the same extent. More precisely, we conducted the Wilk's Lambda test of whether our independent variables had the same explanatory power on our two dependent variables. The results are shown in Table 3

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[4] We also conducted the same analysis where we further disaggregated the data into Oslo versus the rest of Norway and obtained very similar results.

with the Wilk's Lambda-values in the last column. The Wilk's Lambda values for the hypothesized variables are all significant indicating that our independent variables do vary in their explanatory power as we expected.

*** Table 3 about here***

The explanatory power of our two models is relatively substantial. Without the control variables, the models explain 24 percent of the knowledge sharing within business units and 22 percent of the knowledge sharing between business units. Adding the control variables increases explanatory power to 31 percent and 29 percent respectively. While clearly of some importance, the control variables do not play a pronounced role in explaining knowledge sharing by individuals either within or between their business units. Thus, even when for example taking into account the various measures of distance that the IB literature has regarded as significant explanatories of knowledge sharing in MNCs, the promoting factors we have identified clearly constitute a substantial contribution to our understanding of the knowledge sharing behavior of individuals within MNCs.

In order to investigate whether the promoting factors differ in importance for knowledge sharing in the contexts of inter- and intra-business unit, the next step was to conduct OLS regression analyses. We conducted two OLS regression analyses with knowledge sharing within and across business units, respectively, as our dependent variables and our promoting factors plus control variables for individual characteristics, distances, organization and structural characteristics as independent variables. We present the obtained regression coefficients in the first two columns of Table 3. With the exception of result orientation in the intra-business unit context, all six promoting factors have a significant impact on knowledge sharing both within and across business units. However, we formulated hypotheses 2-4 comparatively in order to capture differences in the relative importance of the promoting factors in the intra- and inter business unit contexts, respectively. In order to gauge

these differences we use the results of the MANOVA analysis whose results are contained in the third column of Table 3.

Hypothesis 2a proposes that relative to the inter-business unit context, intrinsic motivation is a more important driver of knowledge sharing by individuals in the intra-business unit context. The obtained coefficients for intrinsic motivation are 0.34 (within) and 0.18 (across) and as Wilk's Lambda is significant (90.6***), this difference is in line with Hypothesis 2a. Hypothesis 2b submits that relative to the within-business unit context, extrinsic motivation is a more important driver of knowledge sharing in the inter-business unit context. Again, looking at the regression coefficients (within: 0.07 and across: 0.22) and Wilk's Lambda (82.2***) we find that the results listed in Table 3 support our hypothesis.

Hypothesis 3a argues that relative to the inter-business unit context, innovative values are a more important driver of knowledge sharing by individuals in the intra-business unit context, whereas hypothesis 3b contends that relative to the within-business unit context, result-orientation values are a more important driver of knowledge sharing in the inter-business unit context. The Wilk's Lambda analysis provides support for both hypotheses (49.1*** and 5.6**). However, in the case of hypothesis 3b, we note that because result-orientation for knowledge sharing within BUs does not achieve statistical significance, the difference is not just relative, but also absolute.

The contention of Hypothesis 4a is that relative to the inter-business unit context, individuals' perception of job autonomy is a more important driver of knowledge sharing in the intra-business unit context. This receives support (Wilk's Lambda: 6.7**). Hypothesis 4b suggests that relative to the within-business unit context, participation in corporate employee development is a more important driver of knowledge sharing in the inter-business unit context. Our Wilk's Lambda analysis provides support for this (37.5***).

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Overall, our analysis provides substantial support for our notion that knowledge sharing is subject to an autonomous effect of organizational separation. Not only are those individuals who share knowledge with colleagues in other business units more likely to do so with colleagues in their own business units, but the relative importance of those factors that promote their knowledge sharing behavior vary according to context. More specifically our analysis suggests that while intrinsic motivation, innovative values and job autonomy are relatively important drivers of knowledge sharing within the business units, extrinsic motivation, result-oriented values and participation in corporate employee development are relatively more important for knowledge sharing across business units.

Our analysis indicated that while the control variables contribute explanatory power, their overall impact on individual-level knowledge sharing behavior in Telenor is relatively minor. We note that two of the distance variables (geographic and cultural distance) have significant Wilk's Lambda values. This is because, as expected, these distances are significantly negative in the case of knowledge sharing between business units, while insignificant in the case of within business unit knowledge sharing. Both institutional and language distance are insignificant, which might be due to correlation with the other distance variables (multicollinearity). It is noteworthy that for the organizational level factors reciprocity is significant for knowledge sharing within business units, while formal proximity and reciprocity positively affect knowledge sharing between business units. These results reinforce the point that across business units, knowledge sharing is driven by more formalized mechanisms than knowledge sharing within units. Regarding the role of reciprocity, our results confirm previous insights explaining subsidiaries isolation (Monteiro et al., 2008) or advice relations between individuals (Caimo & Lomi, 2015), as reciprocating feelings is a significant driver for sharing knowledge not only under the context of a formal mandate but, more interestingly, across business units where there are lower hierarchical ties. In addition,

gender is significant and here the coefficient is negative indicating that females share less knowledge than their male counterparts and that this is even more so within business units than across business units. Finally, both the satisfaction with work and career variables, respectively, are significant both in the case of within and across business unit knowledge sharing.

DISCUSSION AND CONCLUSIONS

We started our study by calling attention to the role that formal separation in organizational units has for challenging any assumption of a coherent MNC social community or shared identity. We found strong evidence of the "effect of organizational separation" on individuals' knowledge sharing that follows from the internal boundaries between separated business units. This effect received further support when our analysis was confined to business units located in the same national context, where there were no confounding effects of geographical, institutional, cultural and language distance. The effect of organizational separation does not substitute for the known effects of distance, but it does supplement it and therefore adds to the explanation of knowledge sharing within MNCs. By stressing the intra-organizational complexity and heterogeneity inherent to the MNC (Roth and Kostova, 2003, p.888), we contribute to the understanding of knowledge sharing by individuals both in terms of the IB and the OB literature streams. First, by analyzing the individual level knowledge sharing behavior within MNCs we bridge some classic gaps in the IB literature (Foss and Pedersen, 2004). Most IB literature views knowledge sharing at the aggregate level of headquarters and/or subsidiaries and tends to assume homogeneity of individuals' behavior. In this regard, our study adds to previous criticisms of the knowledge-based view of the MNC (Foss and Pedersen, 2004; Håkanson, 2010; Monteiro et al., 2008) by theoretically framing the way in which individuals behave under the heterogeneous conditions created because of

organizational separateness. Second, our study extends previous research from the OB literature on individuals' knowledge sharing as previous studies have largely ignored how variation in the organizational context affects the individuals' behavior (as shown in Appendix 1). By conducting our research in the MNC context and empirically comparing individuals' behavior under conditions of heterogeneity and contextual variability within the firm, we are able to underscore the role that internal boundaries have on individuals' perceptions and theorize on the mechanisms that intervene on differences in knowledge sharing.

As a key contribution we find that, organizational separation has a distinct impact not just on knowledge sharing per se, but also on the effectiveness of knowledge sharing drivers. In this sense, we are sensitive to the calls to establish the micro-foundations that link organizational design and individuals' behavior (Felin & Hesterly, 2007; Foss and Pedersen, 2004; Foss et al., 2010). By employing the theory of planned behavior (Ajzen, 1991, 2002), our theoretical model views knowledge sharing by individuals as deriving from their motivation, perceptions of organizational values and organizational work practices. We formulated a series of hypotheses that test for relative differences in the salient drivers of knowledge sharing for intra- and inter business unit contexts. Our analysis indicated support for our hypotheses. When we observe individuals who share knowledge across business units not only do we observe that they are more likely to share knowledge with members of their own business unit, but those factors that promote knowledge sharing in the two contexts differ in comparative terms. Our study contributes to the understanding of knowledge sharing in MNCs by simultaneously addressing knowledge sharing drivers that are very different in nature -formal versus informal (Foss et al., 2010). In this sense, the uniqueness of our dataset allows us to unpack the context through which the knowledge sharing drivers are more effective. In particular, we identify "locus of control" and "psychological safety" as the key

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differences between the within and across business unit contexts, and the key areas where the mechanisms for promoting knowledge sharing can make a difference.

Concerning the distinction between intrinsic and extrinsic motivation, previous empirical studies have shown clear positive effects of individuals' intrinsic motivation on their level of knowledge sharing (Foss et al., 2009; Gooderham et al. 2011; Cabrera et al., 2006). However, the findings for extrinsic motivation are much more mixed. While some studies have found a positive relationship between externally rewarded motivation and knowledge sharing (Cabrera et al., 2006; Wang & Noe, 2010; Wang et al., 2011), others have shown that extrinsic motivation can either have a negative effect on knowledge sharing behavior (Gooderham et al, 2011; Foss et al., 2009; Osterloh & Frey, 2000), or promote more strategizing behavior by individuals (Foss et al, 2009; Gagné, 2009).

However, as our study differentiates individuals' behavior under the two knowledge sharing contexts, we find individuals' extrinsic motivation strongly relevant for sharing knowledge across units. Our results are in line with recent research on the importance of outcome-based incentives for individual's searching knowledge beyond their project team boundaries (Morris, et al., 2015). We account for the importance of extrinsic motivation for individuals engaging in knowledge sharing between business units as a means of compensating for the outcome uncertainty that organizational separateness creates. Hence, our study provides empirical support for Grandori's (2001, 39) observation concerning the underestimated possibilities of "high-powered" incentives for motivating individuals to engage in the sharing and internal exchange of knowledge in large firms.

Similarly, a more fine-grained examination of the results for the organizational work practices also shows different patterns for job autonomy and corporate employee development depending on the context in which knowledge is shared. We observe that job autonomy is relatively more important for knowledge sharing within business units where individuals

perceive higher controllability over the way in which the knowledge they share is used (Ajzen, 1991, 2002). Across business units, however, internal boundaries may negatively affect such perceptions. Corporate employee development – formal programs for training, workshop participation and job rotation - can alleviate the reluctance to engage in knowledge sharing across units because it develops a greater sense of corporate overview and citizenship and thereby a greater sense of psychological security when sharing knowledge.

Our results indicate that the notion of "locus of control" is of key importance for knowledge sharing. We argue that when contextual conditions allow for the locus of control residing in the individual – i.e. within the business unit - the informal drivers of intrinsic motivation, job autonomy and innovativeness values are more suitable for knowledge sharing, since individuals can exercise control and follow-up under conditions of transparency. It appears that knowledge sharing within the business unit can take place without the need for overt interventions by the organization, while knowledge sharing across units requires more active intervention. When it comes to sharing knowledge across business units the locus of control needs to lie with the organization. In order to overcome the internal boundaries that create uncertainty for the employee, the organization needs to provide clear signals on goals, incentives and potential outcomes of the knowledge sharing process as well as increasing the controllability of the process. Not only must the organization initiate corporate employee development but it also has to communicate organizational values that emphasize the desirability of seeking performance improvements wherever there may be a potential for so doing. Employees also need to perceive tangible benefits that stem from the organization.

Consequently, organizational values have a different effectiveness depending on their nature. We observe that innovativeness values are more relevant for intra-unit knowledge sharing and that result-oriented values are of importance for knowledge sharing between business units but not within. While Ajzen (1991) emphasizes the role of the subjective norm

as a function of the perceived likelihood that important referent individuals or groups approve or disapprove of the behavior, our results shed some light on the subtleties behind these two types of values. One of the differences between innovativeness and result-oriented values is the relevance of broader acquiescence for the latter. We suggest that in the case of individuals' perception of newness and innovative values the key referent group is largely limited to the business unit, so these values exert less influence beyond the boundaries of the business unit to which individuals belong as this context might be perceived as less safe. However, for individuals that perceive result-oriented values as relevant, they focus more on how to enhance performance outcomes, which in turn contributes to expanding their knowledge sharing.

As such, the results of our study are in line with the conclusions from the literature on knowledge sharing in virtual teams (e.g. Gibson & Gibbs, 2007) that highlight the importance of a "psychological safe environment" for knowledge sharing. In addition, our findings invite an extension of Ajzen's (2002) reflection on the concept of "locus" of control. While Ajzen (2002, 676) affirms that the "perceived control over an outcome or event is independent of the internal or external locus of the factors responsible for it", our study shows that in large firms where internal boundaries create different contexts, it is highly relevant to understand where the perceived controllability resides. Our findings suggest that it is either in the close community or in the mechanisms proactively pursued by the organization.

One of the strengths of our study is the uniqueness of its research design and the big sample of respondents. In this sense, we have been able to obtain responses from a wide range of employees and focus on the ones that share knowledge in the two contexts. Such research design allows for a better understanding of knowledge sharing patterns for the whole organization and not only for knowledge-intensive tasks (Cabrera and Cabrera, 2005). However, there are some limitations to our study that must be noted. First, because we are

relying on cross-sectional data we cannot derive causality but only association; therefore our results should be interpreted with some caution. Even though we could link our data with data from a previous survey in order to measure some control variables, such a limitation persists. Second, focusing on one MNC allows our research design to control for a variety of contextual factors that could affect internal knowledge sharing. However, it limits the generalizability of our conclusions. Finally, as we explained in the methods section, we rely on perceptual measures of our variables operationalized through self-reports. Even though we combined two sources of information and we have applied several tests in order to control for different biases, perceptual measures for assessing behaviors have limitations linked to cognitive biases as errors in recalling information or individuals' prior beliefs (Denrell, Arvidson & Zander, 2004). While our approach to knowledge sharing has been nodal, future studies could advance in dealing with these biases by approaching the issue from a dyadic viewpoint including responses from receivers as well as senders of knowledge.

Managerial implications

One important managerial implication of our study is the need to direct managers' attention to the significance of the internal boundaries that arise when business units are formed. Arguably, in regard to their role as catalyzers of knowledge sharing, the literature has instructed managers in MNCs to pay careful attention to various types of distance such as cultural, linguistic and institutional distance (Raab, Ambos & Tallman, 2014; Tippmann, Scott & Mangematin, 2014). Our research goes beyond these recommendations and has normative content as it provides managers with a better understanding of why individuals also behave differently according to the organizational context. The proximity that exists within the business unit creates the conditions for employees to have a sense of control over the outcomes of their behavior. In this context, managers should avoid interventions that introduce an external sense of pressure as this might have a negative effect on the intrinsic

motivation for knowledge sharing. Further, managers should take steps to ensure the maintenance of psychological safety by supporting individuals' job autonomy and by promoting innovative values as such interventions support the locus of control residing with the individual. On the other hand, according to our analysis, there is particular scope for managerial discretion when it comes to fostering individuals' knowledge sharing across internal boundaries. We observe that reduction in the individual's sense of control introduced by organizational boundaries can be compensated for by the deployment of extrinsic rewards, by ensuring that there is a perception of result-oriented organizational values and by initiating corporate employee development programs. By moving the locus of control from the individual to the organization, such interventions enhance the psychological security for sharing knowledge.

Finally, in terms of future research we view our study as an initial attempt to locate knowledge sharing at the individual level. Our analysis of how individual motivation and perceptions of organizational work practices and organizational values influence individual knowledge sharing behavior constitutes a major contribution to the micro-foundational understanding of knowledge processes in firms. However, our design does not enable us to link individual behavior to organizational level outcomes of knowledge sharing such as innovation, product development, or process development. Future research should aim to address this limitation through multilevel approaches that links individual behavior to the organizational level by including organizational level outcomes of knowledge sharing.

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Figure 1. Theoretical model

Intrinsic motivation

H2a (>)

Extrinsic motivation

H2b (>)

Innovative organizational values

H3a (>)

Result-orientation organizational values

H3b (>)

Job autonomy

H4a (>)

Corporate Employee development

H4b (>)

Knowledge sharing within BU
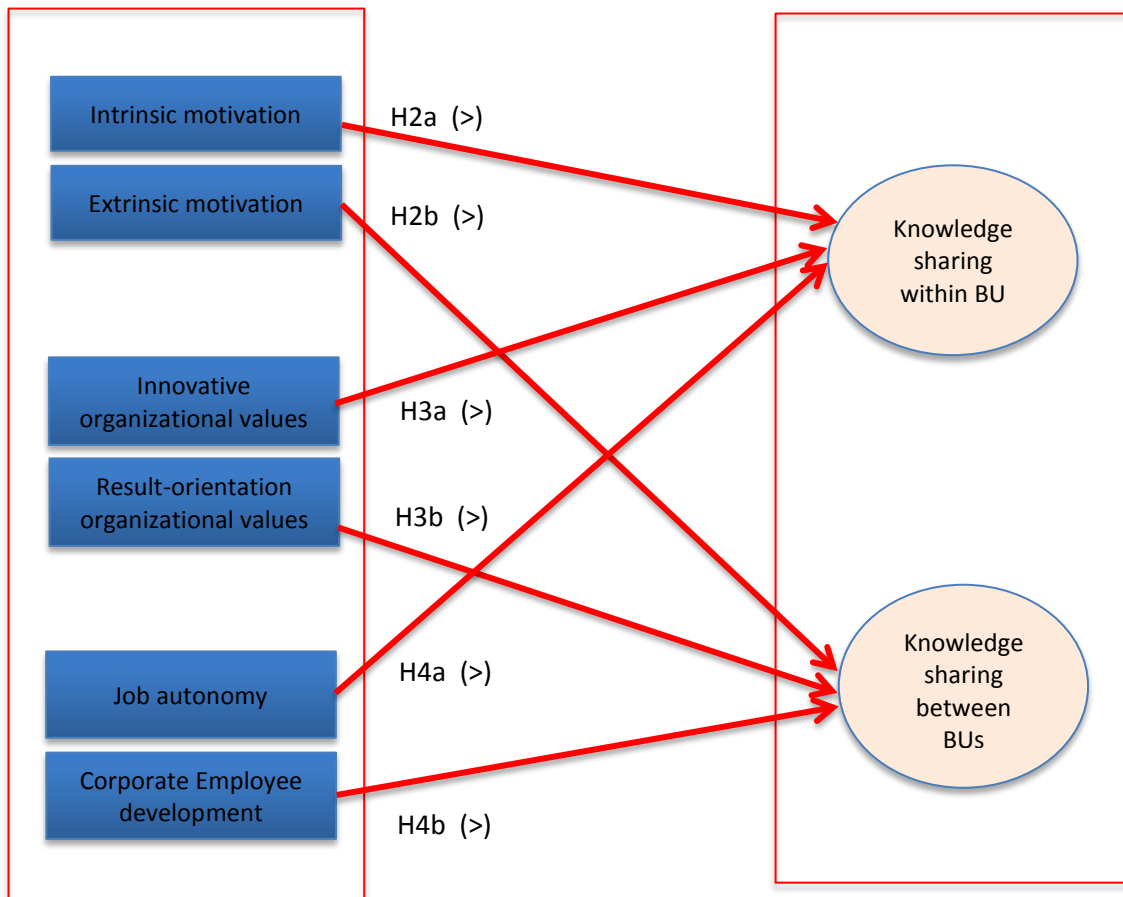
Knowledge sharing between BUs

Table 1: Business unit response rates

Business unit	Invited employees	Response count	Response rate	Employees engaged in knowledge sharing across BUs	Share of respondents sharing knowledge across BUs
Digi / Malaysia	2194	1735	**79 %**	480	**27.5%**
Dtac / Thailand	4592	3398	**74 %**	405	**11.9%**
Serbia	1335	959	**72 %**	183	**19.1%**
Norway*	4228	2755	**66 %**	800	**18.9%**
Uninor / India	1328	868	**65 %**	150	**29.0%**
Montenegro	320	196	**61 %**	72	**36.7%**
Hungary	1003	593	**59 %**	179	**30.2%**
Pakistan	2011	1081	**56 %**	266	**24.6%**
Grameenphone / Bangladesh	3004	1653	**55 %**	291	**17.6%**
Sweden	1614	868	**54 %**	369	**42.5%**
Telenor ASA / central unit*	552	281	**51 %**	249	**88.6%**
Denmark	1944	932	**48 %**	396	**42.5%**
Digital / central unit*	414	179	**43 %**	101	**56.4%**
Broadcast / central unit*	801	294	**37 %**	126	**42.9%**
Sum	**25340**	**15793**	**63 %**	**4067**	**25.8%**

* These four business units are all located in close vicinity in Oslo (Fornebu), Norway

Table 2: The level of knowledge sharing within and across business units

	Within business units	Across business units
	All respondents engaged in knowledge across business units (N=4,067)	
Level of knowledge sharing (7 point scale)	4.50	3.64
- Standard deviation	1.39	1.69
T-test of mean differences	**40.38 (p < 0.0001)**	
	Only individuals from the four Norwegian business units (N=1,276)	
Level of knowledge sharing (7 point scale)	4.26	3.36
- Standard deviation	1.39	1.61
T-test of mean differences	**23.79 (p < 0.0001)**	

Table 3. The results of the regression and MANOVA-analyses (N=4,067)

	Regression analysis		MANOVA
	Knowledge sharing within BUs	Knowledge sharing between BUs	Wilk's Lambda
Individual motivation			
- Intrinsic motivation	**0.34*** (0.03)	0.18*** (0.03)	90.6***
- Extrinsic motivation	0.07*** (0.01)	**0.22*** (0.02)	82.2***
Organizational work practices			
- Job autonomy	**0.11*** (0.03)	0.08* (0.04)	6.7**
- Corporate employee development	0.13*** (0.02)	**0.43*** (0.03)	37.5***
Organizational values			
- Innovative values	**0.30*** (0.03)	0.21*** (0.04)	49.1***
- Result-orientation	0.06 (0.03)	**0.14*** (0.04)	5.6**
Controls			
Personal characteristics			
- Tenure	-0.01 (0,02)	-0.01 (0.02)	0.1
- Gender	-0.32*** (0.05)	-0.21*** (0.06)	19.9***
- Workload	0.03 (0.03)	0.06 (0.03)	1.9
- Satisfaction with work	0.09* (0.04)	0.14** (0.04)	5.9**
- Satisfaction with career	0.07* (0.03)	0.08** (0.03)	3.0*
- Foreign country nationals	0.14 (0.18)	0.27 (0.22)	0.7
- Nationality (37 dummies)	Yes	Yes	0.9
Organizational level factors			
- Related competences	0.01 (0.01)	0.01 (0.02)	1.8
- Informal links	-0.03 (0.03)	0.05 (0.03)	4.1*
- Reciprocity	0.06* (0.03)	0.06* (0.04)	2.0
- Formal proximity	0.01 (0.03)	0.08* (0.04)	4.0*
- Collaborate	0.05 (0.03)	-0.01 (0.04)	2.1
Distance			
- Geographic distance	-0.01 (0.01)	-0.08* (0.04)	4.3*
- Cultural distance	0.06 (0.04)	-0.09* (0.04)	3.1*
- Institutional distance	-0.04 (0.03)	0.02 (0.04)	0.9
- Language distance (5 dummies)	Yes	Yes	1.1
Structural characteristics			
- Function (4 dummies)	Yes	Yes	6.5***
- Business unit (13 dummies)	Yes	Yes	6.8***
Intercept	0.86 (0.70)	1.60 (0.86)	
F-value	19.1***	18.3***	
R-square	0.31 (without controls: 0.24)	0.29 (without controls: 0.22)	

*, ** and *** indicates significance at 5%, 1% and 0.1 % level, respectively

Appendix 1. Studies at the individual level of factors affecting knowledge sharing (*)

	Individual motivation	Organizational work practices	Organizational values	Type of empirical study and context	Main results and contribution
Cabrera & Cabrera (2005) (**)	- Intrinsic - Extrinsic (Knowledge-sharing based rewards)	- Work design - Staffing - Training and development - Performance appraisal - Compensation and rewards - Information Technology	- Knowledge sharing norms - Trust and cooperation - Communication, egalitarianism, fairness, perceived support.	- Conceptual paper that analyses knowledge sharing between individuals within the organization. - Does not take into account the inter-unit or intra-unit context. - No mention of internal boundaries.	- Identification of people management practices that affect the individuals' attitudes towards knowledge sharing. - Explanation of the theoretical mechanisms for these relationships.
Cabrera, Collins & Salgado (2006)	- Intrinsic - Extrinsic	- Job autonomy - Perceived support from colleagues - Knowledge management systems	- Value-based commitment to the organization	One large MNC in information technology - Study done in one unit (Spanish subsidiary) -Intra-unit knowledge sharing	- Individuals' self-efficacy, openness to experience and perceptions of organizational support are positive related to their knowledge sharing. - No significant support was found for a direct relationship of intrinsic and extrinsic rewards, and job autonomy.
Foss, Minbaeva, Pedersen & Reinholdt (2009)	- Intrinsic - Introjected - Extrinsic	- Job design variables - Autonomy - Task identity - Feedback		- The Danish unit of a German MNC - Within department, no reference to internal boundaries.	- Job design affects knowledge sharing through a differentiated effect on individuals intrinsic and extrinsic motivation. - Intrinsic motivation is positively related to individuals sending and receiving of knowledge - Extrinsic motivation is negatively related to individuals' sending of knowledge.
Gagné (2009) (**)	- Autonomous (intrinsic and identified regulation)	- Job design - Performance appraisal and compensation systems - Managerial styles - Training	- Sharing norms	- Conceptual paper that analyses knowledge sharing between individuals within the organization. - Does not take into account the inter-unit or intra-unit context. - No mention to internal boundaries	- Development of a theoretical model based on the Theory of Planned Behavior and Self-Determination Theory. - Identification of staffing, job design, performance and compensation systems, managerial styles, and training as the HRM practices for motivating knowledge sharing.

Gooderham, Minbaeva & Pedersen (2011)		- Autonomy (hierarchical gov. mechanism) - Intrinsic (social gov. mechanism) - Extrinsic (market gov. mechanism)	- Social capital	- Two MNCs -No reference to internal boundaries, no comparison with other contexts.	- Social capital is positively related to individuals' knowledge sharing. - While social knowledge governance mechanisms are positively related to the building of social capital, the application of hierarchical and market-based mechanisms has a negative impact on it.	(*) This table does not include the "personality trait" factors that a small number of studies point to. Those factors of a
Mäkelä & Brewster (2009)			- Relational social capital (interpersonal trust) - Shared cognitive capital	- 35 Large MNCs - 413 interpersonal inter-unit relationships in four different interaction contexts: inter-unit meetings, project groups, cross-border teams and expatriate/repatriate interactions.	- The four interaction contexts are associated with differing levels of affective and cognitive social capital. - Out of the four contexts, only the relationship between the individuals' knowledge sharing and the contexts of cross-border team and expatriate/repatriate are fully mediated by the two types of social capital.	
Minbaeva, Mälelä & Rabiosi (2012)	- Intrinsic - Extrinsic	- Social Interaction for knowledge sharing	- Perception of organizational commitment to knowledge sharing	- Three Danish MNCs - Across departments within the same MNC -No reference to organizational boundaries, no comparison with other contexts.	- Intrinsic motivation and engagement in social interaction significantly mediate the relationship between perceived organizational commitments and knowledge sharing. - This effect is higher than that of extrinsic motivation on knowledge sharing.	
Wang & Noe (2010) (**)	- Intrinsic - Extrinsic	- Management support - Rewards and incentives	- Trust and cooperation - Individual competition - Innovation culture - Learning culture - Norm reciprocity	- Review paper that identifies previous areas of research and areas where emphasis should be done.	- Identification of potential research areas related to the theoretical foundations for individuals' knowledge sharing as well as to the individual and organizational factors that affect individuals' behavior.	
Wang, Noe & Wang (2011)		- Knowledge sharing evaluation (accountability) - Knowledge sharing rewards system (incentive)		- One large software development company in China. - No references to internal boundaries	- The influence of accountability practices on individuals knowledge sharing varies depending on the personality traits of the individual	

purely psychological nature lie beyond the parameters of our study.
(**) Theoretical studies or Review articles.

Appendix 2: Constructs, items, factor loadings and construct validity

Construct	Factor loading	Construct reliability	AVE	Cronbach Alpha
Dependent variables				
Knowledge sharing within the business unit				
How often do you share the following types of knowledge with colleagues within your business unit?		0.93	0.70	0.94
1. Knowledge about customer groups and markets.	0.83			
2. Knowledge about new service development.	0.86			
3. Knowledge about new ways to serve the customers.	0.86			
4. Knowledge about technology and telecom infrastructure.	0.80			
5. Knowledge and experience in developing corporate strategy.	0.84			
6. Knowledge about solutions and best practices from third-party companies.	0.83			
Knowledge sharing across business units				
How often do you share the following types of knowledge with colleagues who work in other business units?		0.98	0.88	0.98
1. Knowledge about customer groups and markets.	0.93			
2. Knowledge about new service development.	0.95			
3. Knowledge about new ways to serve the customers.	0.95			
4. Knowledge about technology and telecom infrastructure.	0.92			
5. Knowledge and experience in developing corporate strategy.	0.94			
6. Knowledge about solutions and best practices from third-party companies.	0.93			
Motivation variables				
Intrinsic motivation				
Why do you share knowledge with others?		0.85	0.60	0.84
1. I think it is an important part of my job.	0.75			
2. I find it personally satisfying.	0.67			
3. I like sharing knowledge.	0.84			
4. I feel that I have knowledge that can be useful for others.	0.81			
Extrinsic motivation				
Why do you share knowledge with others?		0.90	0.69	0.90
1. I want my supervisor(s) to appreciate me.	0.79			
2. I want my colleague(s) to appreciate me.	0.70			
3. I might get a reward.	0.90			
4. It may help me get promoted.	0.91			
Organizational work practices				
Job autonomy				
How well do the following statements describe your current job?		0.84	0.58	0.86
1. The freedom to carry out my job the way I want to	0.80			
2. A high level of variety in the job	0.75			
3. The opportunity for independent initiative	0.88			
4. The opportunity to complete work that I started.	0.77			
5. I can conduct the tasks independent of others.	0.56			
Corporate employee development				
Do the following statements describe your situation? (yes/no)		n.a.	n.a.	0.74
1. I participate in job rotation within my BU/across different BUs	n.a.			
2. I participate in general management/specialized training	n.a.			
3. I participate in seminars and workshops in my own BU/different BUs	n.a.			
Organizational values				
Innovative values				
To what degree do you think the following value statements are **characteristic** of the department in which you work?		0.88	0.57	0.88
1. Risk taking.	0.52			
2. Being willing to experiment.	0.69			
3. Being innovative.	0.84			
4. Fast moving.	0.75			
5. Being quick to take advantage of opportunities.	0.80			
6. Taking initiative.	0.86			
Result-oriented values				
To what degree do you think the following value statements are **characteristic** of the department in which you work?		0.86	0.60	0.86
1. Being results-oriented.	0.76			
2. Having high expectations for performance.	0.70			
3. Achievement-oriented.	0.82			
4. Action oriented	0.80			