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***Antecedents and consequences of inter-organizational knowledge transfer:
emerging themes and openings for further research***

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BI NORWEGIAN BUSINESS SCHOOL

**ANTECEDENTS AND CONSEQUENCES OF INTER-ORGANIZATIONAL
KNOWLEDGE TRANSFER: EMERGING THEMES AND OPENINGS FOR FURTHER
RESEARCH**

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INTRODUCTION

The role of knowledge as a strategically important organizational resource that leads to gaining and sustaining a competitive advantage has been widely recognized in the strategic management literature. A modern firm has been defined as a social community specializing in the speed and efficiency of knowledge creation and transfer that promotes innovation and motivated behaviour (Kogut and Zander, 1992). By integrating two streams of research – organizational learning and the resource-based view of the firm – the knowledge-based perspective gave knowledge a central role in determining organizational performance differentials (Sorensen, 2003). A strong research focus was given on analyzing the antecedents of organizational learning, learning processes and learning outcomes at both intra- and inter-organizational levels (Argote et al., 2003). Inter-organizational learning has often been associated with knowledge transfers from entities outside organizational boundaries and largely understood as the process through which one organization learns from the experience and knowledge of another for gaining or sustaining a competitive advantage (Easterby-Smith et al., 2008). Joint ventures, mergers and acquisitions, licensing agreements and other modes of market entry are viewed as platforms for learning providing firms access to skills and competencies of their partners that can be used for the development of firm-specific knowledge-based capabilities (Kogut, 1988). Following a resource-based view tradition, researchers examine the extent to which the acquired knowledge contributes to product, market and financial performance of individual firms and inter-organizational settings. Empirical findings suggest that inter-organizational knowledge transfer contributes to higher sales growth, improved profitability and market share (Lyles and Salk, 1996; Zahra et al., 2000; Lane et al., 2001; Sorensen, 2003), increased employee productivity (Steensma et al., 2005), new product development (Tsai, 2001; Yli-Renko et al., 2001; McEvily and Chakravathy, 2002), higher product quality and customer satisfaction (Tsang et al., 2004) and improved organizational efficiency (Yli-Renko et al., 2001).

Despite the growing evidence that knowledge can serve as a basis for competitive advantage, many researchers agree that inter-organizational knowledge transfer embodies a multifaceted nature of boundaries, cultures and processes that make the creation and transfer of knowledge far from easy (Kogut and Zander, 1992; Grant, 1996; Szulanski, 1996; Daugeliene and Krisciunas, 2004; Easterby-Smith et al., 2008). The current body of research documents a variety of knowledge-specific, organizational and inter-organizational level antecedents that inhibit the efficiency and effectiveness of knowledge transfer. In this paper, antecedent [of knowledge transfer] is meant to be a determining factor (a predictor) of the ease (or difficulty), amount, speed and quality of inter-firm

knowledge transfer (Simonin, 1999; van Wijk et al., 2008; Jansen et al., 2005; Lane et al., 2001)¹. The author argues that organizational knowledge is characterized by high levels of tacitness, specificity and complexity that generate causal ambiguity and, consequently, make knowledge difficult to transfer (Grant, 1996; Szulanski, 1996). Organizations also vary in their abilities to absorb new external knowledge – i.e. understand, assimilate and apply knowledge to commercial ends (Cohen and Levinthal, 1990). Moreover, low motivational dispositions of the donor and recipient firms to transfer and acquire knowledge inhibit knowledge flows between organizations (Gupta and Govindarajan, 2000; Steensma et al., 2005). Empirical findings suggest that in equity modes of market entry organizations acquire the partner firm's knowledge faster than firms collaborating in contractual alliances (Lyles and Salk, 1996; Zahra et al., 2000). Researchers also note that the effectiveness of inter-organizational knowledge transfer increases when unintended risks of knowledge transfer are reduced and inter-firm relationships are built on the basis of high partner commitment and mutual trust (Yli-Renko et al., 2001; Tsang et al., 2004; Becerra et al., 2008).

Studying the inter-organizational knowledge transfer phenomenon is particularly appealing due to a multifaceted nature of boundaries that transcend various levels of analysis and call researchers to examine causal links between knowledge transfer and organizational performance. However, although research on inter-organizational knowledge transfer is burgeoning, yet our understanding of its antecedents and consequences remains unclear (van Wijk et al., 2008). As a first step to filling this gap, the author builds an integrative framework of the antecedents and consequences of transfer in which different types of antecedents, inter-organizational learning outcomes and firm performance results are analyzed. The structure of this paper is as follows. In the first part, methodological considerations for developing this study are highlighted. The underlying construct of inter-organizational knowledge transfer is described in the second part of the paper. In the third part, conceptual differences of *inter-* and *intra-*organizational knowledge transfer are presented that delineate the scope of this study. Stemming from explanations of the domain construct in prior research, a set of antecedents and consequences of inter-organizational knowledge transfer are analyzed in the fourth part of the paper. As for conclusion, a number of gaps and openings for further research are briefly discussed.

METHODOLOGY OF THE PAPER

¹ In knowledge transfer research the term 'antecedent' is often used in conceptual models of cause-effect relationships and refers to the cause (or a set of causes) that condition the effect (Simonin, 1999; Lane et al., 2001; van Wijk et al., 2008). In this paper, knowledge-related, organizational and network-level antecedents are conceptualized as the key determinants of knowledge transfer between firms. 'Consequences' of knowledge transfer are conceptualized as organizational learning outcomes and performance results (*see p. 12-15*).

This study provides a comprehensive review of research papers and empirical findings on antecedents and performance implications of knowledge transfer between firms. More specifically, it consolidates research in an integrative framework of cause-effect relationships between knowledge-related, organizational and network level antecedents of transfer, learning outcomes and firm performance results. When assuming that transfer of knowledge does not by itself influence financial, product/market and strategic performance of firms, this paper gives special attention to a mediating role of knowledge acquisition (the extent, type and nature of the ‘new knowledge learned’) in relationship between antecedents and consequences of transfer. Stemming from definition of the domain construct and clarification of the scope of *inter-organizational* knowledge transfer, the proposed analytical framework is built alongside three dimensions – (1) the antecedents of transfer (‘inputs’), (2) knowledge acquisition (‘outputs’) and (3) firm performance results (‘outcomes’) (see, Figure 1). By aggregating and consolidating the current body of research this study reveals its limitations and provides directions for future research. It does not contain empirical research but rather seeks to define the domain construct of inter-organizational knowledge transfer, explain the key concepts and relationships between them. Lack of empirical testing of the conceptual model might be seen as a major shortage of this paper, which requires further empirical research to examine cause-effect relationships between a range of antecedents, learning outcomes and performance effects of knowledge transfer between firms forming various types of alliances.

DEFINITION OF THE DOMAIN CONSTRUCT

Inter-organizational knowledge transfer has been defined in various but related ways. Prior research has labelled it as the *movement* or *flows of knowledge* across organizational boundaries (van Wijk *et al.*, 2008; Easterby-Smith *et al.*, 2008; Gupta and Govindarajan, 2000), as *knowledge sharing* (Appleyard, 1996; Hansen, 1999; Postrel, 2002) and the *diffusion of knowledge* within a network of inter-organizational relationships (Powell *et al.*, 1996; Spencer, 2003a). Knowledge transfer has also been considered as the “*learning race*” between alliance partners that reflect a competitive nature of inter-firm relationships (Hamel, 1991). For other researchers, transferring knowledge between firms forming an alliance implies “*grafting*” new knowledge on the partner (Huber, 1991; Lane *et al.*, 2001). Last but not the least, the terms “*access*” and “*acquisition*” of new knowledge carry two distinct meanings of inter-organizational knowledge transfer (Powell *et al.*, 1996; Simonin, 1999; Mowery *et al.*, 1996; Lyles and Salk, 1996; Zahra *et al.*, 2000).

Different theoretical approaches have been used to explain the inter-organizational knowledge transfer phenomenon. One way to look at it is purely *strategic* that involves calculating the risks and benefits of transferring knowledge beyond organizational boundaries (Hamel, 1991; Appleyard,

1996; Postrel, 2002). Inter-firm knowledge transfer is seen as competitive collaboration between alliance partners that is driven by firms' incentives to reduce partner dependency, increase bargaining power, and gain competitive advantage over alliance partners outside the collaboration (Hamel, 1991). Researchers raise concerns of unintended "leakage of knowledge" to partner firms that may result in negative externalities, such as involuntary expropriation of knowledge, and the risk of creating a new competitor (Hamel, 1991; Becerra et al., 2008). Bearing these risks of knowledge transfer, firms are less transparent and less willing to share knowledge with their alliance partners that may pose conflicts and subsequently impair transfer of knowledge between partners (Kogut, 1988; Lyles and Salk, 1996). As put by Postrel (2002, p. 1), since the economy depends on its efficiency upon drastic separation of knowledge across organizational boundaries, it is most common to observe the "islands of shared knowledge in a sea of mutual ignorance".

Following a *social constructivist view* of organizational learning (Brown and Duguid, 1991), knowledge transfer is seen as being contingent upon the locus of knowledge creation and transfer (Powell et al., 1996). Transfer of knowledge between firms is primarily associated with access of new knowledge in networks of inter-firm relationships that represent evolving "communities of practice" (Lave and Wenger, 1991; Powell et al., 1996; Hansen, 1999). Following this view, new knowledge is rarely appropriated entirely by a single firm but rather diffuses among firms through formal and informal knowledge-diffusion networks (Spencer, 2003a). Contrary to the transaction-cost economic view, sharing of knowledge with partners in the firm's global innovative system is seen as the most appropriate strategy for gaining and sustaining a competitive advantage (Spencer, 2003b).

A *process* perspective of inter-organizational knowledge transfer gives focus on a multifaceted nature of barriers inhibiting the knowledge flows between alliance partners (Argote et al., 2003). Knowledge transfer is conceptualized as the continuous flow of knowledge between firms that is contingent upon characteristics of the donor and recipient firms (Mowery et al., 1996; Gupta and Govindarajan, 2000; Lane et al., 2001), the nature of knowledge (Kogut, 1988; Simonin, 1999, 2004; Chakravarthy et al., 2003) and the inter-organizational dynamics (Inkpen and Dinur, 1995; Van den Bosch et al., 1999; Kostova, 1999; Yli-Renko et al., 2001; Tsang et al., 2004).

Other studies move beyond conceptualizing the transfer of knowledge as a process of inter-firm learning, but rather explaining how it contributes to better *performance* of firms forming an alliance (Mowery et al., 1996; Zahra et al., 2000; Lane et al., 2001; Tsai, 2001; Katila and Ahuja, 2002; McEvily and Chakravarthy, 2002; Steensma et al., 2005). Knowledge transfer is often associated

with acquisition of knowledge, defined as the extent to which the partner firm's knowledge is integrated and commercially applied (Mowery et al., 1996; Zahra et al., 2000; Lane et al., 2001). Researchers emphasize that gaining access to the partner firm's knowledge does not necessarily lead to integration and exploitation of that knowledge (Appleyard, 1996; Mowery et al., 1996; Powell et al., 1996). Moreover, knowledge acquisition is not a discrete outcome but rather an ongoing activity that mediates a relationship between a set of antecedents and performance outcomes (Lyles and Salk, 1996). Following this view, a clear distinction is made between "learning performance" – the speed, extent, type and nature of the 'new knowledge learned' – and "organizational performance" associated with goal achievement, profitability, market share, and innovativeness (Lyles and Salk, 1996; Zahra et al., 2000; Lane et al., 2001).

To *summarize*, transfer of knowledge beyond organizational boundaries has been conceptualized as the strategic decision-making, as the process, the context, and the outcome of inter-organizational learning. Researchers raise questions as to *why* and under what circumstances firms share knowledge, *how* knowledge is transferred between firms and what are the barriers for such transfer, *where* or in what context the inter-firm knowledge transfer occurs, and what are the *outcomes* of transfer.

Building on prior research and for the purpose of this paper, a domain construct of inter-organizational knowledge transfer is defined as *acquisition of the partner firm's knowledge in the alliance that is contingent upon knowledge-specific and organizational antecedents of transfer and is aimed at enhancing the firm's financial, market and strategic performance.*

SCOPE OF STUDY

This paper analyzes the antecedents and consequences of transferring knowledge between firms forming an alliance. Since the antecedents and consequences of transfer are contingent upon the *inter-* and *intra-*organizational context (van Wijk et al., 2008) it is worth of describing *how* transfer of knowledge between firms differs from that between units (or individuals) within a single firm.

A vast body of research on inter-firm knowledge transfer is based on transaction cost economics, strategy and organizational theory that emphasize competitive gains from transferring knowledge across organizational boundaries. Success of transfer is largely understood as a result of firms' abilities to balance between transferring knowledge to their partners and preventing the spillover of knowledge to external constituents (Hamel, 1991; Zander and Kogut, 1995; Appleyard, 1996;

Postrel, 2002). In contrast, a dominant logic of integration rather than differentiation informs the intra-firm knowledge transfer research. The focus is given on psychological foundations of knowledge transfer at the individual and group level of analysis that involve issues, such as transactive memory, cognitive and normative legitimacy of knowledge, social identity, in-group favoritism, and others (*see* Argote et al., 2000 for a review).

Other researchers emphasize that the nature of boundaries inform about differences between inter- and intra-organizational knowledge transfer processes (Easterby-Smith et al., 2008). When transferring knowledge between firms, organizational and industrial cluster boundaries represent specific problems of ‘leakage’, the dynamics of learning races, and idiosyncratic patterns of knowledge transfer within networks of inter-firm relationships (*ibid.*). All *this* indicates that differently from business units within a single firm, firms are more cautious in transferring knowledge to their alliance partners, especially when they have similar competitive positions or operate in distinct industrial clusters, the so called, “networks of learning” (Powell et al., 1996). As put by Easterby-Smith et al (2008), the boundary of the business unit seems to be more permeable than an organizational boundary, defined by the organization’s discretion to initiate, maintain or end the actions of its members (Pfeffer and Salancik, 2003).

Transfer of knowledge beyond organizational boundaries is distinctly different from knowledge transfer within the firm, as neither the knowledge embedded in individual relationships and organizational routines are well understood, nor the “social fabric” (Kogut and Zander, 1992) required to support the new learning is known for other firms. Due to tacit nature of knowledge, it can lose value when transferred unless the organization is itself replicated (Kogut, 1988). In contrast, when transferring knowledge within a firm one could expect sharing of a common stock of knowledge among members or groups of an organization (Kogut and Zander, 1992). According to Arrow (1974), organizations are able to economize in communication through a common code that is developed over time and reflect normative and cognitive institutional environments (Kostova, 1999; Szulanski, 2000). With a set of commonly shared norms and values among organizational members, higher level of integration of knowledge is expected (Grant, 1996). To add, while replication of knowledge is often desirable within the context of intra-firm knowledge transfer, it is seen as a threat to the firm’s competitive position in the context of inter-firm knowledge transfer (Kogut and Zander, 1992).

Differently from intra-firm knowledge transfer models, both “access” and “acquisition” dimensions are included in conceptual frameworks of inter-firm knowledge transfer. Access of knowledge is

primarily associated with the firm's search behavior (Katila and Ahuja, 2002), its exposure to diverse knowledge base (Zahra et al., 2000), network positioning (Powell et al., 1996), motivational dispositions of partners (Gupta and Govindarajan, 2000) and calculations of rents (Postrel, 2002). Researchers emphasize that for inter-organizational knowledge transfer to yield an advantage new external knowledge must be integrated into organizational routines that guide the firm's future strategic actions (Teece et al., 1997). A large body of research focuses on knowledge acquisition dynamics – integration (Grant, 1996), combination (Kogut and Zander, 1992) and exploitation of knowledge within the firm forming an alliance (Mowery et al., 1996; Lyles and Salk, 1996; Lane et al., 2001; Steensma et al., 2005). Knowledge acquisition is viewed as a management function that is aimed to convert organizational learning into new knowledge with better performance implications (Postrel, 2002).

BUILDING AN INTEGRATIVE FRAMEWORK OF THE ANTECEDENTS AND CONSEQUENCES OF INTER-ORGANIZATIONAL KNOWLEDGE TRANSFER

Stemming from definition of the domain construct and scope of this study, a range of antecedents and consequences of inter-organizational knowledge transfer may be analyzed in more depth. In prior research, the attributes of underlying knowledge, organizational characteristics and inter-organizational dynamics have been considered as key factors that influence the extent to which firms acquire and utilize knowledge of their alliance partners (Easterby-Smith et al., 2008). A widespread agreement occurred in the literature that knowledge acquisition mediates the relationship between antecedents of transfer and organizational performance (Lyles and Salk, 1996; Zahra et al., 2000; Lane et al., 2001; Steensma et al., 2005; van Wijk et al., 2008). Building on these insights, the author maps prior research in an integrative framework of the antecedents and consequences of inter-organizational knowledge transfer (see, *Figure 1*). The framework is built alongside three dimensions– the antecedents of transfer ('inputs'), knowledge acquisition ('outputs') and firm performance results ('outcomes').

/insert Figure 1 here/

Antecedents of inter-organizational knowledge transfer

Knowledge attributes. A growing body of literature considers *tacitness*, *complexity*, *specificity* and *institutional embeddedness* of knowledge as key antecedents of knowledge transfer between firms forming an alliance (Kogut and Zander, 1992; Simonin, 1999; McEvily and Chakravathy, 2002; Kostova, 1999). Knowledge properties do not only affect the extent and rate at which knowledge is accumulated and retained, but also how easily it diffuses across firm boundaries (Argote et al., 2003). Transfer of tacit knowledge, defined as knowledge that is difficult to codify and articulate (Kogut and Zander, 1992; Nonaka, 1994), is facilitated through socialization (Grant, 1996; Tsoukas, 2003; Jansen et al., 2005) and informal learning processes (Alonderiene et al., 2006). High level of knowledge complexity, defined as the degree to which distinct and multiple types of competences are combined for the development of a particular organizational capability (Zander and Kogut, 1995), is also regarded as the impeding factor of inter-organizational knowledge transfer (Simonin, 1999, 2004). Firm-specific assets deployed for a particular transaction often lead to high level of interdependency among transaction parties, which is a source of inherent uncertainty as to what the underlying knowledge components are and how they interact (Reed and de Fillippi, 1990; Simonin, 1999). Building on institutional theory, researchers argue that organizational knowledge is embedded in cognitive and normative institutional environments (Kostova, 1999; Szulanski et al., 2004). Managerial approaches and organizational routines may vary from one country to another, and what works in one country may not be readily translated to another one (Szulanski, 2000). Researchers also suggest that cognitive and normative legitimacy of knowledge being transferred from the source to the recipient decrease with the increasing institutional distance between the parties (Kostova and Zaheer, 1999). As a result, firms may not be willing to obtain new practices from their partners and abandon the old ones (Szulanski, 2000). Overall, empirical findings show that high level of tacitness, complexity, specificity and institutional embeddedness of the underlying knowledge generate high level of causal ambiguity, which acts as an imitation barrier for rivals but also hinders transfer of knowledge between alliance partners. This, in turn, negatively affects long-term profitability of firms forming an alliance (McEvily and Chakravathy, 2002).

Researchers also point to the *source* of knowledge, knowledge *uniqueness* and *publicity* as important antecedents of inter-organizational knowledge transfer. For example, Menon and Pfeffer (2003) maintain that firms prefer to obtain knowledge from external sources rather than internally because external knowledge appears to be scarce and unique. Most recently, Pérez-Nordtvedt *et al* (2008) suggested that the attractiveness of external knowledge, in terms of its value, rareness,

inimitability, and non-substitutability, is a key factor that contributes to the effectiveness of transfer of knowledge beyond organizational boundaries. Uzzi and Lancaster (2003) emphasize that private (as opposed to public) knowledge about idiosyncratic aspects of the firm is not equally available to all parties and, therefore, is transferred more effectively between firms that are linked via socially embedded ties.

Organizational attributes. Inter-organizational knowledge transfer is seen as a dyadic or network-type exchange of knowledge between the donor and recipient of knowledge, for which characteristics of the donor and recipient firm matters. Organizational attributes may be classified into three categories: *absorptive capacity*, *motivation to teach and learn*, and *intra-organizational transfer capability* (Easterby-Smith *et al.*, 2008).

Originally introduced by Cohen and Levinthal (1990), *absorptive capacity* has emerged as one of the prominent themes in knowledge transfer literature. Researchers argue that new external knowledge does not automatically lead firms to better competitive positions – firms need to recognize the value of new knowledge, assimilate and use it for commercial ends (Lyles and Salk, 1996). Absorptive capacity of the recipient firm is determined by the amount of its prior related knowledge, trust and cultural compatibility among partners, adaptability of the recipient firm as well as the amount and quality of trainings provided by the donor (Lane *et al.*, 2001). Zahra *et al* (2001) suggest that international market entry modes influence the breath, depth and speed of inter-organizational learning, which, in turn, has an impact on organizational performance. The authors argue that new ventures, which expand through high-control market entry modes, such as start-ups or acquisitions, are more exposed to multiple and varied sources of information, gain deeper understanding of new concepts and skills and acquire more tacit knowledge from international activities. By being close to local customers, these ventures are fast in recognizing the value, assimilating and using new knowledge in their market operations (Zahra *et al.*, 2001). As such, high level of absorptive capacity on behalf of the donor and recipient firms is treated as one of the key facilitating factors for inter-organizational knowledge transfer (Lyles and Salk, 1996; Mowery *et al.*, 1996; Lane *et al.*, 2001).

Firms must not only be able but also willing to share and absorb knowledge from their partners. As Steensma *et al* (2005) put, inter-firm knowledge transfer depends on the willingness of the “teacher” (the donor) to provide resources and motivation of the “student” (the recipient) to learn from these resources. The more willing the donor firm is, the greater the opportunity is for the recipient firm to internalize knowledge (*ibid*). In contrast, Gupta and Govindarajan (2000) found

that high motivation of the donor firm to share its knowledge with the recipient did not have any impact on the magnitude of knowledge outflows. Motivational disposition to share knowledge may depend on the firm's age, locus of control and organizational commitment of the partner. It may also depend on the intensity, stability and spread of the knowledge culture herein, especially when knowledge is highly tacit (Girdauskiene and Savaneviciene, 2007). Studies of inter-organizational knowledge transfer in transition economy contexts confirm that motivation of the recipient firm to acquire new knowledge may be far more important than motivation of the donor firm to share it (Lyles and Salk, 1996; Lane et al., 2001; Steensma et al., 2005).

Organizational structures and learning mechanisms employed therein influence the development of intra-organizational knowledge transfer capabilities. Sorensen (2003) found that high level of vertical integration inhibits the firm's abilities to acquire new knowledge from alliance partners. With increasingly interdependent organizational routines, the link between actions and outcomes is obscured and the selection of effective routines becomes problematic (ibid). Dyer et al (2001) suggest creating strategic alliance functions within firms so that gains from inter-organizational knowledge transfer are appropriated. Appointment of senior managers to strategic alliance management positions may result in better institutionalization – i.e. articulation, documentation, codification and diffusion – of the alliance-management knowledge throughout the firm, and in this way facilitate acquisition of knowledge from the alliance partner (Dyer et al., 2001).

Inter-organizational dynamics. Properties of inter-organizational relationships may also facilitate (or inhibit) the flows of knowledge between firms and help to explain their performance differentials. Following Easterby-Smith *et al* (2008), four groups of factors are distinguished: *power relations, trust and risk, social ties* and *structures* of inter-organizational relationships.

In situations of unidirectional knowledge transfer firms often experience power asymmetries with the donor of knowledge being in a more superior position. When assuming that learning shifts partner-dependency relation (Hamel, 1991), the pace of knowledge acquisition by the recipient becomes a key factor determining its bargaining power relative to the donor. When the recipient firm finds that there is little further that it can learn from the donor, the basis for cooperation may disappear. The role of power relations is mostly evident in transition economy contexts. Steensma *et al* (2005) found that the influence of foreign parent decision becomes more critical for knowledge acquisition in early stages of economic transition when the recipient firms lack prior learning experience and when their absorptive capacity is weak. Only after new knowledge is gained and the

recipient's motivation to acquire that knowledge increases, one would expect local firms to replace foreign parents as advocates for learning (ibid).

A donor firm often perceives risks of unintended transfer of knowledge that may lead to the erosion of its competitive advantage (Hamel, 1991; Becerra et al., 2008). It may also face risk of unilaterally losing core proprietary knowledge and capabilities to its partner (Appleyard, 1996; Kale et al., 2000). On the other hand, the recipient firm may be endangered by low credibility of the source, which is associated with the acquired knowledge that is not useful (Easterby-Smith et al., 2008). Source credibility is contingent upon partner commitment and mutual trust that decrease probability of opportunistic behaviours, alleviate cultural differences, minimize conflicts between partners, and consequently facilitate knowledge transfer between them (Uzzi, 1997; Yli-Renko et al., 2001; Tsang et al., 2004; Girdauskiene and Savaneviciene, 2007; Becerra et al., 2008). As organizational knowledge is socially constructed (Kogut, 1988; Nonaka, 1994; Grant, 1996), centrally connected firms in networks of inter-firm relationships are more successful in leveraging useful knowledge from network members (Powell et al, 1996; Tsai, 2001; Spencer, 2003a). However, high level of trust and reciprocity make firms unwilling to acquire new knowledge from the network but rather rely excessively on prior knowledge and existing inter-organizational routines (Yli-Renko et al., 2001).

Ownership and management structures are also important antecedents of inter-organizational knowledge transfer. Lyles and Salk (1996) argue that shared ownership joint ventures have higher levels of knowledge acquisition as compared to other ownership structures since the spread of knowledge and interaction among firms is more frequent in the former. Researchers also note that in equity modes of inter-firm collaboration knowledge articulation and codification mechanisms facilitate knowledge acquisition and, subsequently, the creation of new and high-quality products (Zahra et al., 2000). In contrast, formal mechanisms of knowledge integration do not play a crucial role for knowledge acquisition in contractual alliances (ibid). In these ownership structures, best described as parent-parent "learning races" (Hamel, 1991), trust and commitment are considered as critical factors that facilitate knowledge sharing among partners. Hagedoorn and Duysters (2002) further emphasize that in mergers and acquisitions strategic and organizational fit between partners are crucial for acquiring new technological skills and achieving superior technological performance.

Consequences of inter-organizational knowledge transfer: learning performance and organizational performance

As discussed in previous sections of this article, consequences of inter-organizational knowledge transfer refer to “learning performance” and “organizational performance” (Lane et al., 2001). Scholars have increasingly demonstrated that knowledge transfer between firms is a two-stage process of learning that involves acquisition of new external knowledge and exploitation of that knowledge. While some of the acquired knowledge may be acted on immediately, it is more likely that it will have to be adapted to firm strategic environment and disseminated throughout the firm before it can be commercially utilized (Cohen and Levinthal, 1990). This is particularly true in various types of international alliances as differences in global business environments mean that knowledge transferred by the foreign source must be integrated into the local firm’s social, cultural and competitive context (Lane *et al.*, 2001; Kostova, 1999; Szulanski et al., 2004). Related to this, *knowledge acquisition*, also labelled as “learning performance” (Lane et al., 2001), is understood as the extent, type and nature of the ‘new knowledge learned’. *Knowledge exploitation* is primarily associated with changes in organizational performance, in particular, financial, product/market, and strategic performance of firms forming an alliance. Most importantly, researchers emphasize that knowledge acquisition mediates the relationship between a range of antecedents and performance outcomes of inter-organizational knowledge transfer (Lyles and Salk, 1996; Zahra et al., 2000; Lane et al., 2001; Steensma et al., 2005; van Wijk et al., 2008).

One of the first attempts to link the outcomes of inter-organizational learning and firm performance results was the study done by Lyles and Salk (1996) and later developed by Lane, Salk and Lyles (2001). The authors build a two-stage model of inter-organizational learning, in which they analyze the impact of absorptive capacity on acquisition of knowledge and examine links between outcomes of learning and organizational performance. Lane *et al* (2001) argue that three components of absorptive capacity have two distinct sets of effects. Scholars emphasize that one set of factors, which is related to understanding and assimilating new external knowledge, affects learning but not performance. Another set of factors, associated with application of knowledge, affects performance but not learning. The firm’s abilities to understand and assimilate its partner firm’s knowledge are treated as interdependent yet distinct from its abilities to apply that knowledge to commercial ends. More specifically, “learning performance” is defined in terms of the extent and type of the ‘new knowledge learned’ from the partner and classified into five categories – technological expertise, marketing expertise, product development expertise, managerial techniques, and manufacturing processes (Lane *et al*, 2001). Outcomes of inter-organizational learning are also ranked alongside tacitness dimension. Whereas managerial skills represent a highly tacit and socially embedded knowledge, manufacturing process knowledge is more explicit and easy to absorb. Most importantly, scholars maintain that acquisition of new knowledge does not by itself influence

organizational performance. An appropriate business strategy and training competence should be developed as the firm's ability to adapt new knowledge to its strategic environment influences its ability to effectively apply that knowledge. After the appropriate strategic context is established, one could expect that the newly acquired knowledge from the alliance partner results in higher business volumes, higher profits, increased market share and the achievement of strategic goals (Lane et al., 2001).

Other researchers define "learning performance" in terms of the breath, depth and speed of the 'new knowledge learned' (Zahra *et al.*, 2000). Empirical findings show that internationally diverse new ventures, which expand through equity modes of market entry, are exposed to multiple sources of information and gain a deeper understanding of new concepts and skills. These ventures are also fast in recognizing value of the partner firm's knowledge, assimilating and using it in their market operations (Zahra *et al.*, 2000). Market entry mode moderates the relationship between inter-organizational learning outcomes and firm performance results. Zahra *et al.* (2000) found that licensing agreements provide fewer opportunities for learning but are good predictors of profitability and sales growth. In contrast, knowledge transfer in acquisitions has no positive relationship with higher returns on assets but is strongly associated with sales growth. All *this* indicates that market expansion goals can be achieved through acquisitions in a short term, however greater time and higher financial and managerial resources are required to integrate knowledge of both partners in a newly merged firm (Bresman et al., 1999; Ranft and Lord, 2002).

Prior research implicitly assumes that firms achieve better performance only if and insofar as inter-firm knowledge transfer is effective. The effectiveness of transfer is associated with gaining access to rare, inimitable and non-substitutable knowledge assets from the alliance partner, and utilizing these assets for commercial ends (Tsai, 2001; Pérez-Nordtvedt et al., 2008). As the locus of innovations lie in a network an inter-organizational relationships, a centrally connected firm has better abilities to access the most relevant knowledge from the network (Powell et al., 1996; Spencer, 2003a). On the other hand, firms that have more experience in managing network ties are better positioned to exploit that knowledge internally and, therefore, enjoy higher rates of new product development (Powell et al., 1996; Tsai, 2001). These and other research findings witness that whereas the amount and value of different types of knowledge are linked to knowledge acquisition outcomes, innovativeness, technological distinctiveness and cost efficiency are defined as knowledge exploitation outcomes (Powell et al., 1996; Yli-Renko et al., 2001).

The nature of underlying knowledge also has differential effects on knowledge acquisition and knowledge exploitation outcomes. Organizational knowledge that is most tacit, complex and institutionally embedded (e.g. managerial and marketing knowledge) inhibits the speed and efficiency of transfer but contributes to higher business volumes, higher profits and increased employee productivity of alliance partners (Tsang et al, 2004; Steensma et al, 2005). These knowledge attributes create imitation barriers for large product improvements by rivals and lead firms to enjoy sustainable performance advantages (Kogut and Zander, 1992; McEvily and Chakravarthy, 2002).

Researchers also note that too much learning from alliance partners may be detrimental to firm performance (van Wijk et al., 2008). A balance between exploitation of previous (internal) knowledge and exploration of new (external) knowledge informs about the quality rather than the amount of the newly acquired knowledge (Katila and Ahuja, 2002). Scholars argue that it is detrimental for firms to exclusively rely on continuous revision of its existing knowledge base since excessive exploitation of prior knowledge and organizational routines reduce firm adaptation to environmental changes (ibid). On the other hand, excessive exploration makes integration of new knowledge very costly or merely impossible (March, 1991; Puranam et al., 2006). Hence, firm abilities to balance between exploitation and exploration objectives manifest the quality of knowledge acquisition and act as a key factor of inter-organizational knowledge transfer success.

IN LIEU OF CONCLUSION: SHORTCOMINGS AND OPENINGS FOR FURTHER RESEARCH

Given a limited scope of this paper and its ultimate goal to conceptualize cause-effect relationships between various types of antecedents of knowledge transfer, learning and performance the paper does not provide managerial implications but rather reveals some of the critical gaps and openings for further research. A number of research implications are summarized below.

1. Inter-organizational knowledge transfer research seems to be over-simplistic in revealing a mediating role of knowledge acquisition in relationship between a range of antecedents and performance outcomes of knowledge transfer. Many researchers almost implicitly assume that acquiring relevant knowledge from the alliance partner leads to better performance of the recipient firm (Mowery et al., 1996; Lyles and Salk, 1996; Zahra et al., 2000; Lane et al., 2001). However, only few scholars have explicitly defined, classified and measured the ‘new knowledge learned’ (Easterby-Smith et al., 2008). Moreover, causal links between the extent,

type and nature of the newly acquired knowledge and product, financial and strategic performance of firms have not been disclosed in the literature, which opens a promising avenue for future research.

2. Furthermore, prior research is rather limited in capturing the dynamics of inter-firm knowledge transfer through feedback loops. One could assume the transfer of knowledge between firms is a path-dependent process where the antecedents of transfer (e.g. the firm's absorptive capacity) are contingent upon learning outcomes and firm performance results (Todorova and Durisin, 2007). Drawing on evolutionary economics (Nelson and Winter, 1982) and system dynamics theory (Forester, 1958), researchers may better reveal causal links and feedback relationships between knowledge-specific, organizational and inter-organizational antecedents, learning outcomes and firm performance results (van Wijk *et al.*, 2008). Following this way, inter-organizational knowledge transfer may be considered as a dynamic feed-back loop structure where linkages between antecedents and consequences of transfer unfold in a constantly changing system of inter-organizational learning.
3. We know relatively less about inter-organizational knowledge transfer and performance in the context of environment volatility (Sorensen, 2003). Following March (1991), contribution of learning to knowledge depends on the amount of turbulence in the environment – i.e. firms tend to acquire less knowledge from their partners with the increasing technological uncertainty and market instability. Although firms adjust to environmental turbulence by exploiting on their experiences and revisiting existing knowledge, exogenous environmental change makes adaptation process difficult (March, 1991). Having a widespread agreement about knowledge-specific, organizational and inter-organizational antecedents of knowledge transfer, more research should be done on analyzing moderating effect of environmental turbulence on relationship between antecedents and consequences of transfer. Not less important are managerial implications of such kind of research as knowledge and learning become even more critical assets for organizations to cope with tremendous environmental changes in today's global economic recession.
4. To the author's knowledge, there are only a few studies done in transition economy contexts where patterns of inter-firm knowledge transfer are distinctively different from those in mature business environments (Lyles and Salk, 1996; Lane *et al.*, 2001; Tsang *et al.*, 2004; Steensma *et al.*, 2005). Responding to this as a limitation of prior research, the author calls future studies on inter-organizational knowledge transfer to go beyond the scope of mature business

environments. In transition economy context, poor absorptive capacities and high motivational dispositions to learn from foreign partners may be of limited explanatory value. As transition economies are themselves rapidly evolving, local firms may be more able but less willing to absorb knowledge from their foreign partners. Moreover, as the amount of knowledge increases in transition economy firms over time, the role of knowledge sharing rather than ‘teaching’ or ‘learning’ may become more critical in various forms of cross-border collaboration. Existing models and theoretical frameworks of inter-organizational knowledge transfer do not fully reflect this reality and, therefore, call for more research in this field.

5. When it comes to modelling the inter-firm knowledge transfer process, current body of research is rather limited in explaining how attributes of knowledge (i.e. tacitness, social complexity and embeddedness) affect firms’ abilities to recognize value, assimilate, transform and exploit knowledge from their alliance partners. Researchers almost implicitly assume that path dependency logics and knowledge relevance determine the degree of absorptive capacity (Cohen and Levinthal, 1990; Lane and Lubatkin, 1998; Zahra and George, 2002; Todorova and Durisin, 2007). The role of knowledge ambiguity has been largely underestimated. When assuming that organizational knowledge generates “inherent uncertainty” as to what causal connections between actions and outcomes are (Lippman and Rumelt, 1982), acquisition of “relevant” knowledge from alliance partners might be problematic. Prior experience might not be sufficient to ensure knowledge acquisition either. In contrast, one could assume that the intrinsic nature of knowledge rather than the amount and relatedness of experience between partners better explain knowledge acquisition dynamics in various forms of alliances. In order to make valuable conclusions, more empirical testing is needed.
6. Many unresolved methodological difficulties call for more research in this field. Problems are primarily associated with latent and lagged effects of learning that make measurement of learning processes problematic. Since organizations store knowledge in routines, structures and cultural systems, and accumulate such knowledge over time it becomes difficult to measure the antecedents and outcomes of knowledge transfer in retrospect at a given point of time. Moreover, since it is difficult to codify knowledge and as a resource it creates value only when it is deployed in transferring inputs into outputs (Grant, 1996b), measuring market/product and financial performance outcomes becomes complicated. Evaluating success of knowledge transfer through measuring changes in learning and organizational performance also poses difficulties of controlling for factors that are not related to the transfer process itself (Easterby-Smith et al., 2008). Furthermore, few studies address actual learning processes and the

timeliness of knowledge usage. Related to this, the author calls future studies to move beyond survey measures and use more direct observations, longitudinal data and multiple case study methods so that the dynamics and complexity of the knowledge transfer phenomenon is better revealed (Pérez-Nordtvedt et al., 2008). As many researchers excessively rely on self-reported organizational learning and performance measures, reliability and comparability of these measures and data collection methods becomes questionable (Geringer and Hebert, 1991). In order to overcome these methodological limitations a combination of subjective and objective performance measures might be a solution. Testing “learning performance” and “organizational performance” as outcomes of knowledge transfer at different stages of alliance development might also contribute to higher methodological quality (van Wijk *et al.*, 2008).

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Figure 1: Integrative framework of the antecedents and consequences of inter-organizational knowledge transfer

