

# SYNERGIES IN STRATEGIC ALLIANCES: MOTIVATION AND OUTCOMES OF COMPLEMENTARY AND SYNERGISTIC KNOWLEDGE NETWORKS

## 3.1 Knowledge creation and transfer in inter-organizational networks (Competitive Paper)

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This paper aims at contributing to the research concerning alliance dynamics by combining elements from research considering motives for alliance formation and alliance outcomes. This paper draws on the resource-based view of the firm, suggesting that firms' competitive advantages derive from their preferential access to idiosyncratic resources, especially tacit knowledge-related (based) resources. However, by integrating the resource-based view into the network perspective, the main arguments focus on the relationship between conditions for alliance formation and outcomes and the impact of learning on the dynamic evolution of alliances. The paper breaks with the traditional assumption of complementarity of resources (or resource-bases) as a necessity for successful collaboration, and proposes a different and more dynamic approach to alliance formation in the pursuit of what seems to be the ultimate goal of strategic alliances: Synergy. Ultimately, this paper identifies two different types of knowledge networks: Complementary Knowledge Networks and Synergistic Knowledge Networks, which, depending on the initial motivation and conditions, will lead to different outcomes in terms of learning and knowledge creation for the partners.

Keywords: Synergy, Resource-Based View, Strategic Alliance, Knowledge Creation

Research on strategic collaboration between firms has received increasing attention in the literature during the last decade, reflecting the increasing frequency and importance of strategic alliances in business practice. Two main streams, in terms of focus, in this literature can be identified; one stream is mainly concerned with examining the underlying conditions favoring alliance formation (motivation for alliance formation or intent) (Harrigan, 1985; Teece, 1986; Contractor & Lorange, 1988; Hennart, 1988; Kogut, 1988; Oliver, 1990; Williamson, 1991), the other stream is occupied with investigating alliance outcomes and the impact of alliances on the partner firms (Kogut, 1989; Blodgett, 1992; Dussage & Garette, 1995; Doz, 1996; Mitchell & Singh, 1996; Park & Russo, 1996; Nakamura, Shaver & Yeung, 1996). Lately, some researchers have begun to explore issues related to alliance dynamics (Singh & Mitchell, 1996; Gulati, 1998; Koza & Lewin, 1998). This paper aims at contributing to the research concerning alliance dynamics by combining elements from the two streams. The main arguments focus on the relationship between conditions for alliance formation and outcomes and the impact of learning on the dynamic evolution of alliances.

This paper draws on the resource-based view of the firm, suggesting that firms' competitive advantages derive from their preferential access to idiosyncratic resources, especially tacit knowledge-related (based) resources (Penrose, 1959; Wernerfelt, 1984; Conner, 1991). Approaching alliance formation from a resource-based perspective has, traditionally, meant a focus on existing competencies (or lack thereof) that may propel firms to enter into new alliances rather than the conditions that determine the opportunity set firms may perceive (Gulati, 1999). This internal, static focus implicitly considers firms as atomistic actors engaging in strategic actions in an asocial context, thereby encapsulating the external context within measures of competitiveness in product or supplier markets. Building on the assumptions identified early by Barnard (1938), Simon (1957), and others, recognizing that firms on their own cannot create all the resources and capabilities necessary to prosper and grow, collaboration can be regarded a

viable way of combining resources in order to exploit new business opportunities. However, the fact that the opportunity set a firm may perceive for strategic actions can be influenced in important ways by the social structural context in which it is placed must also be taken into consideration. Hence, combining the resource-based view of the firm with the network perspective, taking into account the embeddedness of firms in the social and structural context, collaboration in this paper is approached from a dynamic, synergistic perspective. This shifts the unit of analysis from the firm and its resources to the collaboration of firms, focusing on intra-firm capabilities combined with inter-firm dependencies embedded in a social context.

The importance of synergies of knowledge is apparent in relation to strategic integration; however, most traditional literature is preoccupied with knowledge compatibility (possession of skills and resources that match those of another firm) and knowledge complementarity (skills and resources that the other partner needs but does not have) (Geringer, 1988). Most Western firms focus on explicit knowledge that can be created through analytical skills and concrete forms of oral and visual presentations and incorporated in the parent firm (Nonaka & Takeuchi, 1995; Inkpen & Dinur, 1998). Because of this focus on sharing of explicit knowledge, most firms approach collaboration from a complementary view and seek to identify visible, matching knowledge related capabilities that can be transferred and incorporated in the parent firm. As argued by Harrigan, strategic alliances are more likely to succeed when partners possess complementary assets and thus a firm will seek knowledge it considers lacking but vital for the fulfillment of its strategic objectives (Harrigan, 1985). One traditional view is that in seeking and applying this relevant knowledge, a firm will furthermore need to possess a knowledge base in the same or similar area, since only such similarity will allow for an understanding of the intricacies of the new knowledge as well as of its applicability to the firm's unique circumstances (Cohen & Levinthal, 1990). Another dominant interpretation holds that a firm will seek knowledge complementary to its own,

especially when that enables and/or facilitates the absorption of other knowledge. This interpretation has its roots in strategic alliance literature, identifying the possession of complementary knowledge as conducive to international strategic alliance formation (Beamish, 1988; Geringer, 1988; Parkhe, 1993). Hence, according to Balakrishnan and Koza (Balakrishnan & Koza, 1993), a joint venture can be defined as “a special mechanism for pooling complementary assets”.

This paper breaks with the traditional assumption of complementarity of resources (or resource-bases) as a necessity for successful collaboration (Beamish, 1988; Harrigan, 1985; Geringer, 1988; Parkhe, 1993). In fact, this paper proposes a different and more dynamic approach to alliance formation in the pursuit of what seems to be the ultimate goal of strategic alliances: Synergy. Distinguishing between different types of alliances in terms of their contribution to the partners is both conceptually and managerially important (Hennart et al., 1999), since the type of network in which an organization is embedded defines the opportunities potentially available and its access to these. Hence, this paper aims at identifying two different types of alliances, which, depending on the initial motivation and conditions, will lead to different outcomes in terms of learning and knowledge creation for the partners.

### **Motivation for Alliance Formation (Management Intent)**

The literature on motivation for alliance formation is rich and fragmented.

One main theoretical explanation for why firms collaborate is offered by the transaction cost perspective. According to Williamson, intermediate asset specificity and low uncertainty are conditions that may lead to a preference for hybrid forms of governance structure over both arm's length transactions and internalization (Williamson, 1991). Hence, the network perspective has been advanced - from a traditional Williamson-like transaction cost standpoint – as an intermediate form between market and hierarchy, in order to explain the existence and economic justification of these networks, suggesting the

existence of a continuum of organizational forms ranging from market through network to vertically integrated firms (Williamson, 1985; Powell & DiMaggio, 1991).

**Figure 1A: Strategic Integration Continuum**

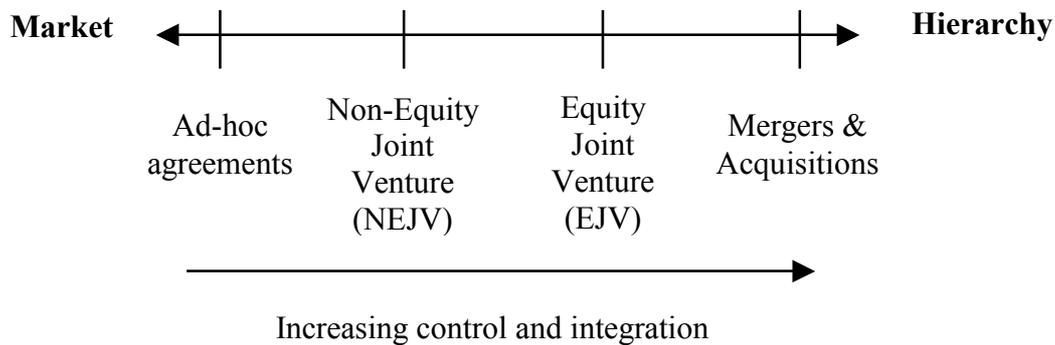


Figure 1A indicates some of the different organizational forms in the strategic integration continuum. The figure also suggests a positive correlation between level of integration and degree of control. Hence, the higher the level of integration (moving from left to right in the continuum) the higher the degree of control. The distinction between a non-equity joint venture (NEJV) and an equity joint venture (EJV) is made in order to emphasize the difference in level of integration and degree of control, which may have an impact on the motivation for forming such alliances. A non-equity joint venture (NEJV) is an agreement between partners to cooperate in some way without creating a new, joined entity. In contrast, an equity joint venture (EJV) involves the establishment of a newly incorporated entity in which each of the partners has an equity position. Partners involved in an EJV normally expect representation on the board of directors and a proportional share of dividends as compensation (Contractor and Lorange, 1988). A second interpretation of a network defines it as a distinct, highly differentiated, heterogeneous organizational form (Powell, 1990). This view emphasizes the cooperative elements of alliances and

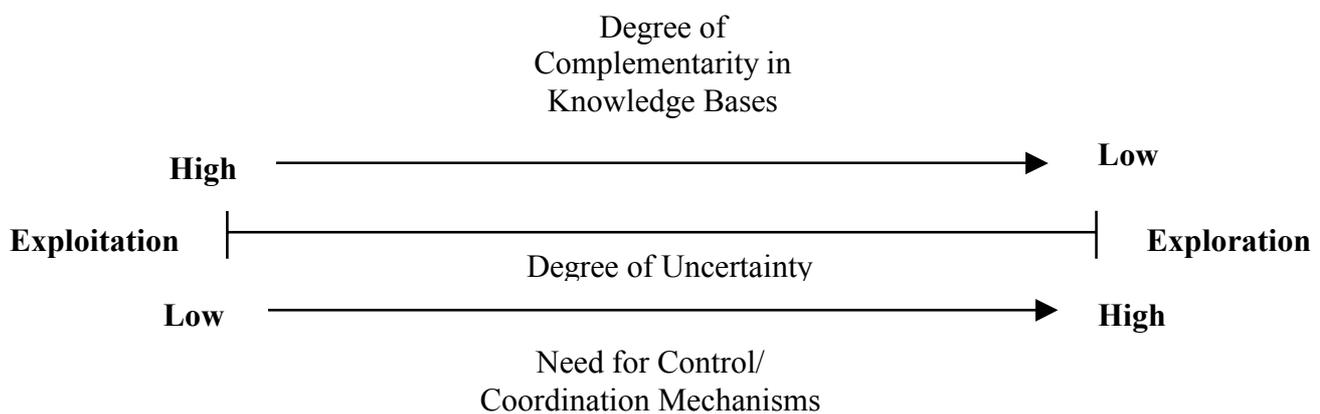
suggests that networks evolve into multiple webs of technical, financial and social interactions (Kogut *et al.*, 1992; Gulati, 1995). Others argue that alliance formation may allow firms to reduce the level of uncertainty that stems from some transactions (Kogut, 1988; Hennart, 1988).

The literature has produced an impressive list of reasons for why organizations enter into an alliance, including categorizations such as “learning alliances”, where the objective is to learn and acquire from each other products, skills, and knowledge (Lei & Slocum, 1992) and “business alliances”, intending to maximize the utilization of complementary assets (Harrigan, 1985). In terms of strategic choice of the firm, this is consistent with the widely accepted dichotomy in terms of the choice between exploiting existing resources and capabilities or exploring new opportunities (March, 1991; Koza & Lewin, 1998). Exploitation is concerned with increasing the productivity and efficiency of employed capital and assets through standardization, systematic cost reductions, and improvement of existing technologies, skills, and capabilities (Koza & Lewin, 1998). Exploration, on the other hand, is associated with discovering new opportunities for wealth creation and above average returns via innovation, invention, building new capabilities, and investment in the firm’s absorptive capacity (Cohen & Levinthal, 1990). Although conceptually a clear distinction, in practice this dichotomy reflects a continuum of choices between these two extremes, as firms are likely to seek both exploiting and exploring benefits from their involvement in collaborative ventures.

Figure 1B shows the dichotomy between exploitation and exploration and how it relates to degree of complementarity in knowledge bases and need for control/coordination in order to reduce the level of uncertainty. As indicated in figure 1B, the higher the degree of complementarity in knowledge bases the more likely is the outcome to be exploitation rather than exploration. As the collaboration moves toward exploration on the continuum, the degree of uncertainty increases as does the need for control/coordination mechanisms.

This paper builds on this dichotomy but aims at developing a different dichotomy of motivational intent for alliance formation based on perception of complementarity (symmetry vs. asymmetry) in knowledge bases and the *networking* of these. Hence, I argue that the difference in perceived intentions behind the alliance formation is likely to have an impact on the performance of the alliance partners in terms of creation of new knowledge-related capabilities vs. transfer of existing knowledge-related capabilities in what I define as Complementary vs. Synergistic Knowledge Networks.

**Figure 1B: Strategic Choice Continuum**



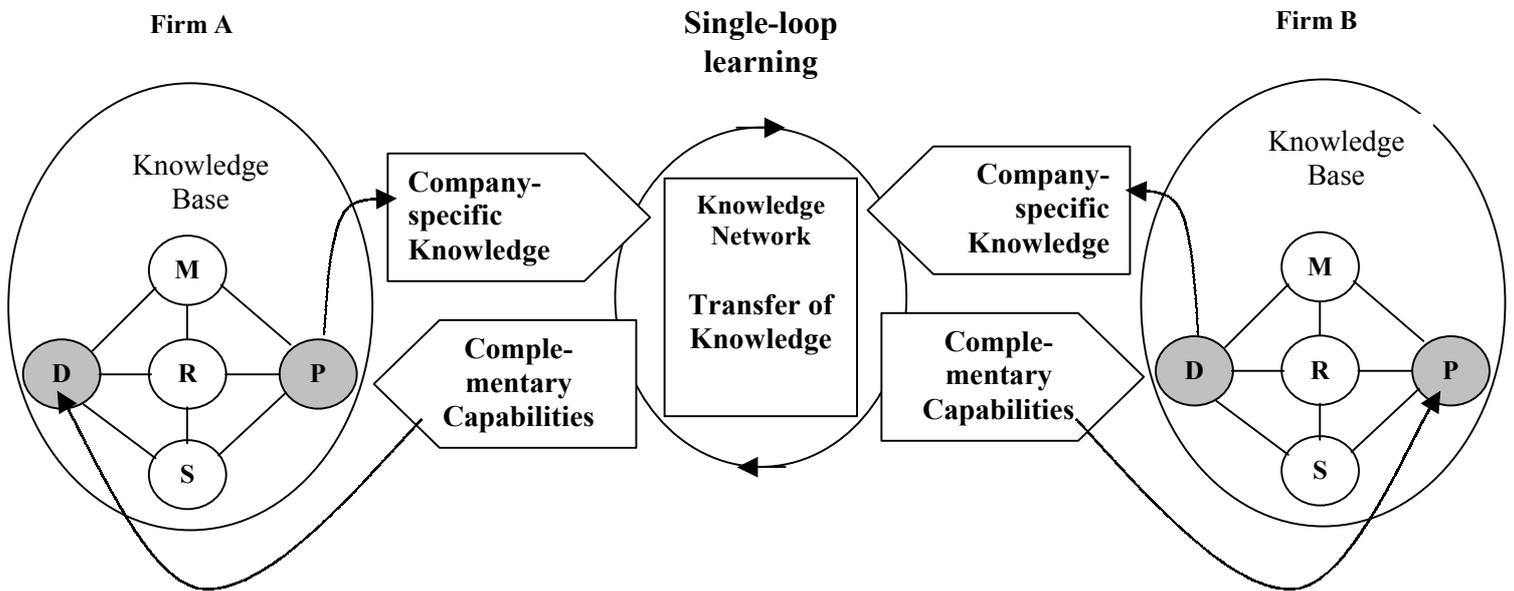
### **Complementary Knowledge Networks**

As mentioned earlier, traditional alliance literature is preoccupied with knowledge compatibility and knowledge complementarity. The focus tends to be on transfer of existing, explicit knowledge rather than creation of new, tacit knowledge. Explicit knowledge is understood as knowledge that is transmittable in formal, systematic language and may include explicit facts, axiomatic propositions, and symbols (Kogut & Zander, 1992). Tacit knowledge, on the other hand, can be regarded as knowledge that is nonverbalizable, intuitive, and unarticulated (Polanyi, 1962) - knowledge that has not yet been abstracted from practice (Spender, 1996). This distinction between tacit and explicit knowledge should not be

regarded as a dichotomy but rather as ‘a continuum ranging from explicit knowledge embodied in specific products and processes to tacit knowledge acquired through experience and use and embodied in individual cognition and organizational routines’ (Inkpen & Dinur, 1998). Because of this preoccupation with transfer of knowledge, most collaboration seems to be approached from a complementary point of view. Hence, alliances motivated by complementarity in knowledge bases tend to facilitate transfer of predominantly explicit (formal) knowledge (most likely in the form of carefully drafted agreements) in relation to a specific project and the level of exchange tends to be predominantly at the executive or senior management level (top-down). Furthermore, these alliances are likely to involve relatively few (and highly compatible) parts of the knowledge bases (or stages in the value chains) and little or no reflections are made. The objective is (implicitly or explicitly) to produce economies of scale for those activities carried out in collaboration (Dussauge et al., 2000). The focus is on solving problems in the present without examining the appropriateness of current learning behaviors. This is consistent with Argyris’ (1976) concept of single-loop learning, where the norms and mental models remain the same and changes are made within the existing systems. In other words, the change is in the action (facilitates transfer of knowledge) only and not in the governing variables (facilitates creation of knowledge).

This type of integration is furthermore characterized by the fact that success of the parent companies is of main concern to the members of the alliance. Since both organizations are introducing only selected complementary, company-specific knowledge to the relationship, the main result will be transfer of complementary knowledge related capabilities (economics of knowledge) between firm A and Firm B in the network. The alliance is used as a channel for transferring selected, complementary knowledge related capabilities. This is illustrated in the following figure 2A.

**Figure 2A: Complementary Knowledge Network\***



Every firm can be seen as a composite of interrelated, value-creating capabilities (Porter, 1980) containing company specific knowledge (i.e. knowledge base), here made up of Marketing (M), Product (P), Service (S), Distribution (D), and Research & Development (R). In this example, firm A possesses a product-specific capability (P), which is entered into the relationship. The perceived incentive (motivation) for firm A for entering into the relationship is to gain distribution capabilities from firm B. Firm B, on the other hand, possesses a distribution-specific capability but lacks the product. Thus, firm B's incentive (motivation) for collaborating with firm A in the knowledge network is to gain complementary, product-specific knowledge related capabilities.

Examples of this kind of knowledge network is abundant in the literature on vertical alliances, where firms are looking for similarities and complementarities among upstream and downstream partners with the explicit goal of creating competitive advantage. The traditional distinction between vertical and horizontal alliances focuses on stages in the value-creating process (value-chain) and suggests that

horizontal alliances predominantly involve firms within the same industry (Porter & Fuller, 1986). That is horizontal alliances are defined as collaboration involving two or more companies within the same industry aimed at creating economies of scope and synergies across multiple businesses as opposed to vertical alliances, involving two or more companies relying on complementarities in upstream or downstream partners to build competitive advantage. Porter and Fuller (1986) furthermore categorize alliances in terms of the similarity and location of the respective contributions of each partner to the alliance, however, only coalitions between competitors (horizontal alliances) are considered. It seems, however, that a type of vertical alliance also exist among competitors (or potential competitors) within an industry, depending on the objectives that firms assign to the alliance and the perceived motivation for engaging in it. Notable examples of such networks, where the two allies create a form of customer-supplier relationship, include the 1971 agreement between Chrysler and Mitsubishi, as well as the agreements linking General Motors to Isuzu in the 1970s and 1980s, where one partner (Mitsubishi and Isuzu) provided market access to products developed by the other partner (Chrysler and GM).

These examples have one thing in common; combining complementary skills and resources, contributed by each partner, in order to extent and exploit core competencies, suggesting that access to complementary, knowledge related capabilities is the motivation for collaborating in these types of alliances. Sakakiba (1997) makes a distinction between cost-sharing and skill-sharing motivation for collaborating and finds that cost sharing tends to involve partners with homogeneous capabilities, while skill sharing tends to involve partners with heterogeneous capabilities. Hence, rather than categorizing alliances in terms of contribution to value activities according to the vertical-horizontal dichotomy, I suggest that alliances be differentiated based on strategic intent (objectives) and perceived motivation in terms of knowledge related capabilities and learning. This is consistent with the complementary

knowledge network depicted in figure 1A and suggests a positive relation between homogeneous, knowledge related capabilities and complementary knowledge networks, expressed in proposition 1:

**Proposition 1: Knowledge networks motivated by perceived enhanced complementary capabilities are likely to involve firms with homogeneous, knowledge related capabilities (symmetrical knowledge bases) rather than firms with heterogeneous, knowledge related capabilities (asymmetrical knowledge bases).**

As mentioned earlier, most Western firms tend to focus on explicit knowledge that can be created through analytical skills and concrete forms of oral and visual presentations and incorporated in (transferred to) the parent firm. Since the motivation for forming homogeneous alliances is to create economies of knowledge in order to enhance competitive advantage, organizations engaging in this type of integration are likely to focus on transfer of explicit knowledge rather than tacit knowledge, hence one would expect the following relationship:

**Proposition 2: Knowledge networks motivated by perceived enhanced complementary capabilities are likely to facilitate transfer of explicit knowledge rather than tacit knowledge.**

Because homogeneous alliances are concerned with integrating adjacent activities in the value chain, the exchange of knowledge tends to be specific in nature and limited to a particular project or department. The similarity and compatibility of knowledge bases reduces the uncertainty involved in this type of alliance and the explicit and formal character of the knowledge exchanged dictate that planning and control mechanisms are employed through carefully drafted agreements. In order to effectively manage this process and ensure relevant transfer of knowledge, senior managers need to facilitate the exchange:

**Proposition 3: Knowledge networks motivated by perceived enhanced complementary capabilities are likely to involve mostly exchange of knowledge at the executive or senior management level rather than broad exchange of knowledge at all levels of both organizations.**

Combining these statements and adding the fact that these alliances are responding to problems in the present, one can argue that these firms are displaying relatively short-term strategic focus. Furthermore, as argued by Simonin (1999), knowledge ambiguity in skills and resource deployment that are sources of competitive advantage creates barriers to learning from a partner. Companies participating in these types of collaborative arrangements are concerned with immediate changes in action (single-loop learning) rather than actual renewal and learning (double-loop learning), which leads to transfer of existing knowledge rather than creation of new knowledge:

**Proposition 4: Knowledge networks motivated by perceived enhanced complementary capabilities are likely to facilitate transfer of existing knowledge rather than creation of new knowledge (single-loop learning rather than double-loop learning).**

### **Synergistic Knowledge Networks**

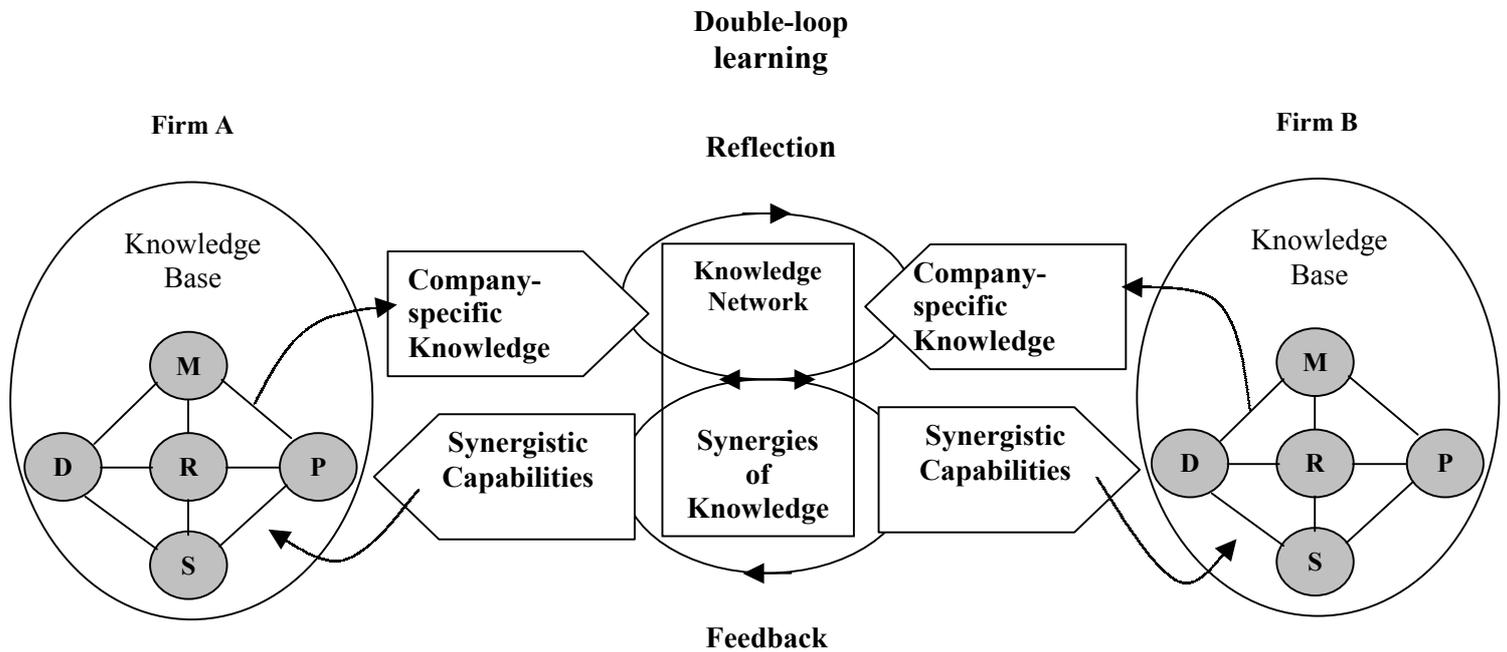
Approaching collaboration from a dynamic, synergistic perspective, on the other hand, shifts the unit of analysis from the firm and its resources to the collaboration of firms, focusing on intra-firm capabilities combined with inter-firm dependencies through the concept of cooptation (cooperation combined with competition). This simultaneous focus on internal, firm specific competencies and external, collaborative synergies plays an important role in creating new knowledge-related capabilities and thereby enhancing competitive performance. According to this perspective knowledge is viewed as a complex, dynamic and subjective set of assets, which is inherently indeterminate and continually reconfiguring. Hence, new

knowledge can be created *among* the participants in a strategic aggregate arrangement as a synergy (and not simply the sum) of the knowledge-related capabilities brought into the collaboration by each member.

Synergistic knowledge, thus, is difficult to define, since this reflects a complex, dynamic (or spiral) exchange of both tacit and explicit knowledge, both formally and informally, between organizations engaged in the alliance. The emphasis is not simply on compatibility and complementarity, rather the rules of exchange of knowledge are loosely drafted in order to facilitate “free” flow of related and non-related (in terms of a particular project) knowledge. Exchange takes place at all levels of the organizations as relevant employees of both organizations team up to share knowledge in an attempt to enhance efficiency and creativity and create new ways of dealing with the project at hand, simultaneously keeping options open for new innovations and process enhancements. Hence, these types of alliances are likely to involve relatively large parts of the knowledge bases (or value chains), and the process of reflection and feedback is emphasized.

The focus is on challenging the norms and the systems themselves, thereby facilitating synergies. This is consistent with Argyris’ (1976) concept of double-loop learning, where changes are both in the action (facilitating knowledge transfer) and the governing variables (facilitating knowledge creation). Double-loop learning recognizes the inherent gap that exists between stored knowledge and the knowledge required to act effectively. Figure 2B shows a Synergistic Knowledge Network:

**Figure 2B: Synergistic Knowledge Network\***



\* Knowledge network, in this paper, refers to the collaborative relationship existing at the interface of two firms collaborating in a dyadic alliance. The term network is used on purpose to indicate the myriad of interconnections existing at the knowledge-related capability level.

These alliances are managed like an independent business, thereby giving its personnel strong incentives to work for the success of the network, as opposed to the parents (Badaracco, 1991). In terms of control and integration, this implies that these alliances are more likely to be found to the right on the strategic integration continuum (see figure 1A above), for instance organized as equity joint ventures. Since the knowledge base of each firm in the network relationship is made up of a composite of company specific, knowledge-related capabilities, a perceived synergistic incentive to integrate involves, theoretically, virtually *all* aspects of the value chain and the knowledge bases. Firm A enters into the network with the explicit objective of sharing a wide range of knowledge specific capabilities in order to create synergy within the knowledge network. Firm B also engages in the strategic network with the intent of sharing a variety of company specific, knowledge related capabilities, however the knowledge bases of the two

partnering firms are asymmetrical allowing for new knowledge to be created as a result of the synergistic interaction. In other words, the partners in this type of alliance contribute *different* knowledge related capabilities to the same stage or stages in the value-creating process, as opposed to scale alliances, where partners contribute similar resources in order to merely produce economies of scale (see Dussauge *et al.* (2000) for definition of scale alliances).

Examples of synergistic knowledge creation are scarcer in the literature, reflecting the paradox between the perceived synergies resulting from alliances and the actual lack of enhanced knowledge related capabilities. However, certain prominent horizontal joint ventures might qualify; the PRV alliance between Peugeot, Renault and Volvo set up in 1971 to develop the V6 engine is an example of joint R&D efforts that through the sharing of knowledge lead not only to the development of the V6 engine, but also spun off several additional product and process enhancements throughout the organizations of the partners involved. The Star-Alliance between several major international airlines also involves more than simply marketing and customer service elements as the partners have embarked on a journey to integrate increasing parts of their knowledge bases and value-adding activities in an attempt to create new, enhanced products and services and, at the same time, becoming more cost-efficient. A contributing factor to the increased popularity of forming alliances is that these types of alliances also serve as a way of avoiding, or at least postponing, mergers and acquisitions in industries undergoing strong concentration processes (Dussauge & Garrette, 1995). Synergistic Knowledge Networks, however, do not merely exist in horizontal relationships, since vertical alliances also present the possibility of combining asymmetrical knowledge bases in the pursuit of synergistic effects in terms of new knowledge creation. Often, though, firms engaged in vertical alliances cease to acknowledge the potential to share knowledge related capabilities above and beyond the initial specific project, partially due, one might speculate, to a difference in power relations stemming from the perceived customer/supplier relationship. Again, the

strategic intent and perceived objectives of the alliance prior to its formation impacts the outcome in terms of knowledge creation. Creating synergies of knowledge does not dictate that the knowledge bases be similar or matching, suggesting that complementarity of knowledge bases is a poor criteria for selecting an alliance partner if creating synergy is the goal. Hence, shifting the focus from inter-firm pooling and transfer of complementary knowledge *through* strategic alliances to development and distribution of synergies of knowledge *within* strategic alliances (knowledge networks), a more dynamic and flexible understanding of the relationship between the motivation and outcome in complex strategic integrations can be achieved. Thus, consistent with the arguments presented above, the following propositions about Synergistic Knowledge Networks can be made:

**Proposition 5: Knowledge networks motivated by perceived enhanced synergistic capabilities are likely to involve firms with heterogeneous, knowledge related capabilities (asymmetrical knowledge bases) rather than firms with homogeneous, knowledge related capabilities (symmetrical knowledge bases).**

**Proposition 6: Knowledge networks motivated by perceived enhanced synergistic capabilities are likely to facilitate transfer of tacit knowledge rather than explicit knowledge.**

**Proposition 7: Knowledge networks motivated by perceived enhanced synergistic capabilities are likely to involve broad exchange of knowledge at all levels of both organizations rather than mostly exchange of knowledge at the executive or senior management level.**

**Proposition 8: Knowledge networks motivated by perceived enhanced synergistic capabilities are likely to facilitate creation of new knowledge rather than transfer of existing knowledge (double-loop learning rather than single-loop learning).**

Both these types of knowledge networks are, however, associated with a high degree of uncertainty and risk. For instance, decisions as to which capabilities should be shared, how to share knowledge, alignment of goals and strategies etc. all contribute to the lack of control in these networks. Hence, coordinating these collaborative relationships becomes the dominant challenge for managers of strategic alliances. Determining the motivation for engaging in different types of knowledge networks can be modeled as a function of the expected returns from the alliance, the perception of complementarity in knowledge bases, managerial cognition of the environment, and strategic intent. As mentioned by March (1991) the returns to exploitation of existing resources and capabilities are proximal in time and more certain compared to the returns associated with exploration. Borys and Jemison (1989) furthermore acknowledge the impact of tacitness on the instability of cooperation by stating that technology transfer agreements whose purpose is the exchange of tacit knowledge and expertise (learning) tend to break down more often than those involving the exchange of formalizable technology. Tacitness, then, as a source of destabilization or conflict in an alliance is a manifestation of the difficulty and frustration in learning. Hence, in alliances characterized by high level of similarity and compatibility of knowledge-related capabilities contributed by both partners, uncertainty is likely to be reduced compared to alliances, characterized by dissimilarity and sharing of asymmetric knowledge. Thus, consistent with figure 2B above, one would expect a negative relationship between uncertainty and similarity in knowledge bases, suggesting the following relationship:

**Proposition 9: The degree of uncertainty is higher in alliances where the degree of complementarity in knowledge bases is low (Synergistic Knowledge Networks) compared to alliances where the degree of complementarity in knowledge bases is high (Complementary Knowledge Networks).**

Hence, consistent with the transaction cost perspective, one would expect:

**Proposition 10: The need for control (governance or coordination) mechanisms is higher in Synergistic Knowledge Networks than in Complementary Knowledge Networks.**

And, in terms of duration:

**Proposition 11: Cooperation among partners in Complementary Knowledge Networks is likely to continue longer than cooperation among partners in Synergistic Knowledge Networks.**

Table 1 summarizes the variables of the theoretical construct and illustrates how these 11 propositions are related to 7 testable hypotheses aimed at identifying the proposed two types of knowledge networks:

**Table 1: Summary of variables, propositions and hypotheses**

<b>Variables (Construct)</b>	<b>Proposition Number</b>	<b>Hypothesis Number</b>	<b>Expected value of variables for Complementary Knowledge Networks</b>	<b>Expected value of variables for Synergistic Knowledge Networks</b>
Knowledge base of partners	P1 + P2	H1	Homogenous/symmetrical	Heterogeneous/asymmetrical
Characteristics of transferred knowledge	P2 + P6	H2	Explicit	Tacit
Organizational level at which knowledge transfer takes place	P3 + P7	H3	Executive/senior	All levels
Characteristics of network learning	P4 + P8	H4	Single-loop learning	Double-loop learning
Degree of uncertainty	P9	H5	Low	High
Perceived need for control	P10	H6	Low	High
Expected longevity of alliance	P11	H7	Long	Short

**Trust**

Although trust has been given much attention in alliance literature as an explanatory factor, little research has been devoted to defining and operationalizing trust. Trust is more or less seen as a magic ingredient, poorly understood much like the concept of luck, and usually attributed ex post; successful alliances seem to involve trust; unsuccessful alliances do not (Koza & Lewin, 1998). Trust among partners in alliances is obviously important, as it is in all relationships, however, in the extant literature, trust is treated as a residual term for the complex social-psychological processes necessary for social action to occur (Koza

& Lewin, 1998). Since trust is a social phenomenon, both national culture and institutional arrangements have an impact on trust and the perception of trust. Hence, applying a single definition of trust is unlikely to capture the complexity of this concept, which might be the reason why useful measures of trust are lacking in the literature. Recognizing the problems of trust as a useful concept in terms of research, some authors have attempted to develop non-trust explanations for non-opportunistic behavior in strategic alliances, arguing that trust is nothing more than an emergent and epiphenomenal property of successful alliances (Madhok & Tallman, 1998).

Although seemingly important, the question of the specific effects of trust on alliance performance has yet to be fully researched and understood in order for it to be used as an explanatory and measurable variable. Therefore, for the purposes of this paper, trust will be disregarded as an explanatory factor in determining the dynamics of motivation and outcomes of different types of strategic alliances.

### **Conclusion and Future Research Direction**

As hybrid organizational forms become increasingly prevalent in the business environment the need to understand the dynamics of these emerging organizational forms increase, as managers and researchers struggle to find patterns and indications of how to effectively manage these complex collaborative arrangements. This paper focused on the relationship between conditions for alliance formation and outcomes and the impact of learning on the dynamic evolution of alliances. This paper breaks with the traditional assumption of complementarity of knowledge bases as a necessity for successful collaboration and proposes a different and more dynamic approach to alliance formation in the pursuit of what seems to be the magic objective in relation to collaboration: Synergy. Building on existing dichotomies of types of alliances, this paper proposes two different types of alliances, which, depending on the initial motivation and conditions, will lead to different outcomes in terms of learning and knowledge creation (synergy) for the partners. Complementary Knowledge Networks are motivated by intent to share pre-determined,

project-specific knowledge across well-defined boundaries. This type of alliance involves only certain parts of the knowledge base of each partner and is driven by complementarity in knowledge related capabilities. Marketing and licensing agreements are examples of this kind of collaboration, which, as proposed in this paper, is likely to lead to *transfer* of existing, predominantly explicit, knowledge related capabilities rather than *creation* of new, tacit knowledge related capabilities or synergies of knowledge. Synergistic Knowledge Networks, on the other hand, are motivated by a perception of developing synergies of knowledge through the interaction of most – or all parts of the knowledge bases of the firms involved. These types of alliances are more likely to lead to double-loop learning and spin off new innovations or process improvements as more levels of the firms get involved and the project boundaries are relaxed. The central proposition of this paper is that Synergistic Knowledge Networks are more likely to lead to creation of new knowledge related capabilities and eventually, through synergies of knowledge, better performance than Complementary Knowledge Networks. If this proposition is substantiated, then why are all strategic alliances not modeled as Synergistic Knowledge Networks? The answer is, of course, that the processes of forming – and managing strategic alliances are extremely complex and poorly understood by researcher and managers alike. Organizations are made up of people and due to bounded rationality and opportunism, issues like trust and uncertainty lead to a need for governance and coordination. Synergistic Knowledge Networks involve a deeper integration of knowledge bases, which increases the stakes and the potential for opportunistic behavior. Hence, Synergistic Knowledge Networks lead to more uncertainty and thus a need for more governance and coordination, which, paradoxically, tend to obstruct the very purpose of the alliance; to create new, synergistic knowledge related capabilities.

This paper has contributed to the understanding of alliance dynamics by developing a new, conceptual dichotomy of types of alliances based on complementarity of knowledge related capabilities. By defining and operationalizing the antecedents of synergy and testing them empirically, future research will be able to better explain the process of knowledge creation as it relates to strategic alliances. More specifically, questions like how to select (the right) partner, how to govern the network relationship, how to share and develop new knowledge, and how to internalize this knowledge still need to be analyzed in detail in order to enhance the understanding of alliance dynamics and increase the likelihood of successful collaboration.

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