

Enabling Effective Alliance Capability Building

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Keywords: alliance capability - Top management team - knowledge management

Enabling Effective Alliance Capability Building

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Abstract

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1 Introduction

More and more, firms tend to call on external partners to meet the increasing uncertainty in the (inter)national business world, resulting in a growing pressure on margins, higher quality standards, advanced customer demands and fast changes in technological developments. The use of collaboration has become particularly acute in capital- and knowledge-intensive business sectors. Product and technological complexity, and the shortening of the innovation cycles have made companies increasingly dependent on external parties in their product development, leading to the so-called *open innovation model* (Chesbrough 2003). These pressures have also led to a more relational and network approach to business marketing (Hakansson and Snehota 1990, Anderson et al. 1994, Ford et al. 2006).

Many researchers have analyzed alliance success, which has been measured by a variety of variables such as increases in stock market prices (Baum and Oliver 1991), the

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speed to announce an IPO (Stuart et al. 1999), the innovation rate (Hagedoorn, John and Schakenraad, Jos 1994), survival rates (Uzzi 1996, Mitchell and Singh 1996) and interorganizational learning opportunities (Hamel 1991, Powell 1998). Despite the high rate of engaging in alliances, firms often fail to get the results they had hoped for. Several studies have shown that the rate of success of strategic alliances is surprisingly low - on average between 30-50 percent (Spekman et al. 1996, Duysters et al. 1999).

As Stuart (2000) notices, it is remarkable that current literature has focused so much on the structural characteristics of the alliance to explain alliance success and that firm-specific characteristics have been neglected. Alliance success has often been assigned to the type of alliance, the strategic or cultural *fit* between the partners, the status of the partners and to the level of trust, commitment and communication (e.g. Larson 1992, Das and Teng 1998, Kale, Prashant et al. 2000). We argue that alliance success can in fact also be influenced to some extent by specific firm characteristics and more specifically by the degree to which partners are adept at managing their alliance processes, referred to as their level of *alliance capability*.

Authors within the field of alliance capability research have investigated how firms can improve alliance outcome through sound alliance management and by internalizing the firm's acquired experiences. Up to now, research has focused on the role of alliance experience (e.g., Zollo, Maurizio et al. 2002, Hoang and Rothaermel 2005) and the alliance function as drivers for alliance capability (e.g., Spekman et al. 1996, Dyer et al. 2001, Kale et al. 2002, Hoffmann 2005). Here, we argue that insufficient attention has been paid to other possible drivers of alliance capability building. The studies previously mentioned have shown that firms have different levels of alliance capability, yet they have not analyzed in detail how these differences can be explained. Argote et al. (2003) points out the importance of the context within which knowledge management occurs, referring to both environmental factors (for example turbulence, degree of competition), the properties of the unit (e.g. a person, company or BU) and relationships between units and the knowledge itself. In similar vein we argue that the level of alliance capability should be analyzed within its specific context. Alliance capability will be determined on the one hand by certain external market pressures, which will drive professionalization of alliance handling and by firm-specific characteristics on the other hand. The need to elaborate on the drivers of alliance capability and success has already been expressed before in the literature. According to Zollo, Maurizio et al. (2002, p.710) there is "*plenty of room to explore the effects that environmental conditions (industry growth rates, regulatory changes, etc.) as well as partnering-firm-level characteristics (strategic orientation, structural and cultural features, etc.) might have on the performance of the collaboration*". Further, Rothaermel and Deeds (2006, p.430) argue that empirical research that investigates factors impacting a firm's alliance management capability is scarce and state that "*understanding how alliance-specific and firm-level factors impact a firm's alliance management capability is an important, yet underresearched, question, especially in the entrepreneurial context*". Finally, Anand and Khanna (2000) call for additional in-depth research on the organizational determinants of alliance capability, using empirical data on each firm's alliance management processes. In

this article we try to fill this gap in the literature by investigating the effect of both organisational characteristics and environmental contingencies on the development of alliance capability.

We start with a discussion on the concept of alliance capability. Next, we present the factors that can have an impact on the level of alliance capability. We consider both organizational characteristics and environmental factors that can increase the elaboration of alliance knowledge management systems. Then follows the description of our sample and the results of our study. We conclude with an overview of the main findings.

2 The concept of alliance capability

Research on alliance capability deals with the importance of internal processes, tools, specific functions and/or structures that aim to capture and diffuse alliance knowledge that is gathered through alliance experience. Through alliance capability, firms can leverage knowledge on the alliance management process which will not only improve the firm's ability to manage a single relationship but also its ability to manage the portfolio of all relationships (Gemunden and Ritter 1997). The concept is rooted in theoretical perspectives that emphasize knowledge and competence creation, accumulation and integration, such as the *competence based view of the firm* (Sanchez et al. 1996), the *learning organization* (Levitt and March 1988), *absorptive capacity* (Cohen and Levinthal 1990, Zahra and George 2002, Lane et al. 2006) and the *Knowledge - Based Theory of The Firm* (Grant 1996). The common idea behind these theories is that competitive advantage is closely linked to the organizational knowledge or competences a firm possesses.

With respect to alliance learning and the transfer of knowledge, authors within the network literature have focused primarily on circumstances and factors that facilitate the improvement of the *interorganizational* transfer of knowledge and learning between firms. The concept of "learning races" (Gulati, Ranjay et al. 2000), which refers to the firms' efforts to outlearn their partners, is a typical example of this focus. Although there has been research on the impact of *alliance experience* on alliance outcome (e.g. Zollo, Maurizio et al. 2002, Hoang and Rothaermel 2005, Sampson 2005), with mixed results, few authors have investigated the *intraorganizational* alliance knowledge processes, which aim at gathering and diffusing knowledge on the alliance management process within the firm. The terminology on these processes has been very diverse, the most frequently used terms are *alliance competence* and *alliance capability* and often the two terms are used intertwined.

According to Sanchez (1996), a competence can be described as the "*ability to sustain the coordinated deployment of assets in a way that helps a firm to achieve its goals*" (Sanchez et al. 1996, p.8). Both tangible and intangible assets can be distinguished. Capabilities form a special category of intangible assets and are defined as "*repeatable patterns of action in the use of assets to create, produce and/or offer a product to a market[. . .] Capabilities arise from the coordinated activities of groups of people who pool their individual skills*

in using assets” (Sanchez 2004, p.519). Based on these authors and other literature on competences and (dynamic) capabilities (Nelson and Winter 1982, Kogut and Zander 1992, Teece et al. 1997), we argue that the concept *alliance capability* is the most accurate, as it specifically refers to the firms’ deliberate and emergent learning processes with regard to alliance management, which are translated in firm-specific routines. Furthermore, the use of the word “capability” implies that the concept is understood as a dynamic process and a higher order resource (Amit and Schoemaker, 1993 and Teece et al., 1997). This description is similar to discussions on competences as series of activities and a process (Li and Calantone, 1998; Winter,2003).

Table 1 summarizes the studies on this topic and shows the different concepts and definitions that have been used. In this paper we will adopt the definition of Kale et al. (2002, p.750), who define *alliance capability* as *the firm’s ability to effectively capture, share and disseminate the alliance management know-how, associated with prior experience*. Central to this definition is the idea that companies need to accumulate and spread alliance knowledge, which is gathered through alliance experience.

Table 1: Alliance capability: concept review

Author	Year	Term	Definition
Ritter et al.	1999, 2003	Network Competence	A company-specific ability to handle, use, and exploit interorganizational relationships
Spekman et al.	2000	Alliance Competence	Alliance competence is partly a function of individual skills and capabilities and firm-level attributes that enhance, encourage and support alliance-like thinking and behaviour throughout the firm.
Lambe et al.	2002	Alliance Competence	The organizational ability for finding, developing and managing alliances.
Kale et al.	2002	Alliance Capability	The firm’s ability to effectively capture, share and disseminate the alliance management know-how, associated with prior experience.
Rothaermel, Deeds	2006	Alliance Management capability	A firm’s ability to effectively manage multiple alliances.
Heimeriks, Duynters	2007	Alliance Capability	The degree to which firms are able to use mechanisms to integrate alliance related knowledge which enable them to create routines for managing alliances.
Kale et al.	2007	Alliance Capability	The firm’s ability to learn and accumulate alliance management know-how.

3 Factors that influence alliance capability building

In this section we present an overview of the factors that contribute to the level of alliance capability. We have divided these factors into two groups: internal *push* factors and external *pull* factors. We posit that the adoption of alliance management systems and the investment in their continuous improvement, will depend on both a favourable organizational context which *pushes* knowledge sharing on alliances and a pressure from outside the firm which *pulls* the firm towards the “professionalization” of its alliance management systems. As there is little known about the drivers of alliance capability building

(Rothaermel and Deeds 2006, Zollo, Maurizio et al. 2002), we draw upon related research on the drivers of innovation success, new product development (e.g. Cooper et al. 1999, Cooper and Kleinschmidt 1996, 2007) and knowledge theory (e.g. Nonaka 1994, Grant 1995, 1996, Cohen and Levinthal 1990, Levinthal and Myatt 1994, Sivadas and Dwyer 2000).

3.1 Organizational characteristics

The first group of factors that will impact the level of alliance capability consists of organizational characteristics. Some of these factors have been analyzed more in depth (such as alliance experience), while others (such as corporate strategy and organization culture) have received less attention. In this paper we attempt to present an integrated view of several organizational characteristics. We explore the impact of the corporate strategy and culture on alliance capability and the influence of the top management team.

3.1.1 Alliance experience

Alliance experience has become a central theme within the alliance capability literature. Scholars have used alliance experience both as an antecedent and proxy for alliance capability. In line with previous research we posit that *alliance experience* leads to know-how on alliances which is generated through the firm's engagement in prior alliances (Gulati 1995, Kale et al. 2002, Heimeriks and Duysters 2007, e.g.). Often alliance experience has been measured as the number of alliances the firm has been involved in during a period of time (Draulans et al. 2003, Sampson 2005, Heimeriks and Duysters 2007, e.g.). Several studies have analysed the direct effect of alliance experience on alliance outcome and have found mixed results. Some studies have emphasized a strictly positive relationship such as Shan et al. (1994), who showed that high-tech start-ups with prior alliance experience managed to increase their innovativeness. Experience seems to play a significant role in joint venturing, especially in R&D - joint ventures, where firms with more experience are found to create more value than firms without previous alliance experience (Anand and Khanna 2000).

While the previous studies found a positive linear relationship between prior alliance experience and alliance outcome, Rothaermel and Deeds (2006) and Draulans et al. (2003) find that there are diminishing returns to alliance experience: increases in alliance experience do not continuously improve alliance performance. The research of Rothaermel and Deeds (2006) links innovativeness of bio-tech firms to alliance experience and shows that there exists an inverted U-shape relationship between the number of alliances the biotech firm entered and its performance: after a certain threshold there is a negative return on alliance experience. Several reasons can be found: first, there is a limitation with respect to dedicated financial and human resources, the more alliances a firm enters, the more these resources get stressed. Second, firms may become stuck in a competency trap (Quynh and

Martens 2008). They have developed routines, processes or structures to deal with certain specific alliances and fail to adapt to changes in the environment (inertia). Third, it is possible that firms enter the most promising alliances first, this way limiting the alliance opportunities with other partners. The disappointing outcome of the subsequent alliances may be due to the fact that these alliances only represent “second best” options (Hoang and Rothaermel 2005). Finally, companies may become less eager to learn from new experiences. The incentive to learn from new alliances may diminish over time, leaving them less “open” to new learning possibilities.

The studies mentioned above have investigated the relationship between experience and alliance outcome, but do not analyze the relationship between experience and alliance capability or how experience actually affects alliance performance. According to Simonin (1997), alliance experience will contribute to the increase of alliance capability, because experience creates learning effects on alliance processes. This idea adheres closely to the concept of “learning by doing” and to the “organizational learning theory” (Levitt and March 1988) which - applied to alliance management - predicts that companies can learn to improve the management of alliances through repetition. In general, the link between experience, alliance capability and alliance performance has not yet been clearly defined (Rugman, 2002).

Scholars have suggested that experience in itself will not cause performance improvement, such as suggested in studies on the “experience curve”. The underlying explanation is that performance improves due to learning effects, caused by experience. Organizational learning occurs through the firm’s inferences of past experiences and the translation of these inferences for future actions (Levitt and March 1988). These inferences are firm-specific and can explain the differences in alliance outcome. Anand and Khanna (2000) investigated whether firms could learn to manage interfirm alliances as experience accumulates and find strong evidence that companies differ widely in their ability to create value based on experience, which they accrue to differences in alliance capabilities between firms. They argue that “the importance of learning increases with the difficulty in specifying the process or knowledge in question” and that “the potential for firm learning will depend on the extent of ambiguity or complexity” and they find that experience with “challenging” joint-ventures leads to more learning effects than experience with “easy” licensing contracts. We aim to further explore these findings by analyzing whether different kinds of experience have an impact on the level of alliance capability. More specifically we posit that experience with *strategic* alliances will have a stronger impact on the alliance knowledge systems than experience with non-strategic alliances. Strategic alliances can be considered more complex and important to the firm as they are formed to enhance and/or strengthen the competitive position of the firm. We argue that companies that have closed many strategic alliances will have invested more in their management to make sure they will succeed.

H1: Strategic alliance experience will cause higher levels of alliance capability than general alliance experience

3.1.2 Corporate culture

Several terms have been used to describe the sense of “awareness” within the firm about the importance of alliances, the positive feeling about interfirm relationships and the will to commit to the firm’s alliances that is crucial for alliance performance. De Man (2005) use the concept of “Alliance Thinking” in companies such as Microsoft, Sun and Cisco which has urged them to invest more extensively in alliance management systems. People need incentives and motivation in order to codify and share their knowledge (Hansen et al. 1999) and the organizational culture can play an important role in this process. Moller and Svahn (2003) state that differences in the cultural orientation of the firms participating in a network can have a significant impact on the ease with which knowledge is shared both *within* and *between* firms. They argue that culture influences the kind of information people prefer and the manner in which that information is processed. Ritter found that network competence was positively affected by the network orientation of the personnel and an open organization culture (Ritter 1999, Ritter and Gemunden 2003). Finally, Spekman et al. (2000) bring forward the concept of “alliance mindset”, which they describe as follows: *An alliance mindset encompasses a perspective that enhances the firm’s ability to partner and effectively leverage the skills and capabilities of others.* Spekman et al. (2000) hereby put forward a couple of broad characteristics of such a “mindset” such as openness and integrity, but do not further specify exactly which organizational characteristics need to be present to foster the development of alliance capability.

Based on these findings, we argue that the development of alliance capability is associated with the specific organizational culture characteristics, more specifically a positive alliance climate. With alliance climate we refer to a corporate culture that (1) emphasizes a positive attitude towards external collaboration and that (2) fosters internal knowledge creation and sharing.

With regard to research on the relation between a *positive attitude on collaboration* and alliance capability, only the first very few steps have been mapped. The alliance literature offers many insights on the importance of an “open” attitude towards collaboration and its effect on learning *between* firms. Research has emphasized the not-invented-here (NIH) mentality and its negative impact on *interfirm* learning. Less research has been conducted on the impact of culture on internal learning and more specifically on alliance capability development. Exceptions are the studies of Beugelsdijk et al. (2006) and Ritter (1999), who find that companies with a corporate culture characterized by a positive (open) orientation towards alliances score high on their level of relationship skills or network competence. Beugelsdijk et al. (2006) point out that “[...] *in order to successfully pursue a cooperative strategy, an organization needs more than a particular management approach, like the use of ‘relationship’ promoters (Walter, 1999) or a ‘dedicated alliance function’ (Kale et al. 2002); the culture of the organization is also important.*”

We argue that the level of alliance capability can be positively affected by companies that have an external, open-minded focus. Similar research by Cooper et al. (2004) on the

impact of culture on new product development has shown that a culture with a focus on innovation, open communication and corporate entrepreneurship, leads to more new product successes. In the same vein we argue that companies that have a innovative culture and that foster entrepreneurship and creativity will have higher levels of alliance capability. We expect this effect being caused by the firms' higher level of alliance experience. Innovative firms tend to call more often on external partners for new ideas, information and knowledge. Therefore they will have more alliance experience which will lead to higher levels of alliance capability (see section 3.1).

H2: Companies with an open, innovative culture will have higher levels of alliance capability

3.1.3 Involvement of the top management team

As the strategic direction of organizations is driven by senior management, the development of competences can only reside under the influence of senior management (Hamel and Prahalad 1994; Prabhu and Robson 2000; Sanchez et al.1996). In a study on competence transfer mechanisms, Prevot and Spencer (2006) find that the transfer of competences that are considered to be of strategic importance, will be handled with much more attention and accurate transfer mechanisms. If the TMT signals that alliances and alliance management in particular are of strategic importance, chances are that the company will follow up on its alliance management procedures. Within the strategic management literature, the effect of the involvement of the top management team has been researched in several fields such as new product development (Cooper et al. 1999), innovation and quality management. In this latter field, Benson et al. (1991), finds that the top can enhance quality norms by setting policies and goals in the area of quality, treating it as a strategic variable, rewarding business unit managers on the basis of the quality of its products and/or services and making resources available for quality improvement.

Although there has been some research on the impact of the commitment of top management on alliance outcome and alliance formation (Eisenhardt and Schoonhoven 1996), there has been little research on the influence of the TMT on the development of alliance capability. A notable exception is the study of Lambe et al. (2002) who find that *joint* alliance competence is strongly influenced by the commitment of *joint* senior management. An illustration of the impact of the TMT commitment has also been nicely illustrated by Hoffmann (2005). He describes how Siemens initiated an alliance management system, after top management decided alliances became of strategic importance to the firm. The shift in alliance policy led to a sound and elaborate management system with communities of practice and centres of competence.

Bases on the above, we hypothesize that the commitment of the top management team towards its alliances will positively influence the level of alliance capability of the firm because they can provide the necessary resources, policies and motivation for developing an elaborate alliance management knowledge system.

H3: Top management team commitment to its alliances will positively influence the level of alliance capability

3.1.4 Organization Strategy

In his literature review on “organizational learning”, Dodgson (1993) states that corporate strategy plays an important role in encouraging learning within the firm. More specifically the corporate strategy needs to create both the operational structure and the mindset which leads to knowledge creation and sharing. With regard to knowledge management, Franken and Braganza (2006) investigate the impact of the corporate strategy on the knowledge management strategies of the firm. They notice that “*the knowledge management strategies typically described in the literature are all very similar in nature, creating the perception that a standardised knowledge management approach with universal applicability exists (Davenport, De Long and Beers (1998); Paik and Choi (2005); Soo et al. (2002)). The validity of this perception is, however, arguable as it would imply that each organization operates and competes in the same way. Reality and disciplines like strategic management and organizational theory (Miles and Snow (1978)) quickly provide empirical proof that this is not the case.*”

The importance of aligning alliance strategy with corporate strategy has been analyzed in a wide array of studies that describe how alliances can support both exploitation (focused on cost benefits) and exploration (focused on innovation) strategies (Hoffman 2007, Rothaermel and Deeds 2004, Dyer and Singh 1998, e.g.). Alliance strategy forms an important part of corporate strategy: not only the type of alliances the firm engages upon, the amount of collaborations, partner selection processes but also the alliance management style, are driven by the firm’s goals and objectives. We argue that the corporate strategy of the firm will affect the level of alliance capability in two important ways: first, by having an impact on the amount of alliances a firms engages in and second, by influencing the mindset of the top team of the firm.

We have classified firm strategy in terms of the Miles and Snow typology. Miles and Snow (1978) distinguished between three effective types of firm strategies: Analyzer, Prospector and Defender¹. Prospectors are the most entrepreneurial of the strategy types in that their primary capability is in finding and exploiting new product and market opportunities (Miles and Snow, 1978). Strategy making is dominated by the active search for new opportunities rather than by solving problems. We expect prospectors to have higher levels of alliance capability because of their increased alliance experience and the commitment of the TMT. Its focus on innovation and novel ideas will spur its sense for collaboration with other firms (exploration). We think this type of company is the most likely to adopt an open-innovation approach (Chesbrough 2003). This increased dependence on other companies leads to a higher number of alliances and as we noted above, companies

¹Consistent with previous studies, we find that Reactors account for a small proportion of the businesses in this study and we do not consider them in either hypothesis development or analysis.

with a large alliance experience are expected to have higher levels of alliance capability. Furthermore, the top management team might be more committed to its alliances and their management when alliances form an important way to collect new ideas, uncover new markets and give access to new technologies.

H4: Firms that pursue a prospector strategy will have higher levels of alliance capability

3.2 Environmental factors

Environmental turbulence refers to an environment in which frequent and unpredictable market and/or technological changes within an industry accentuate risk and uncertainty. This could be caused by *technological turbulence* and/or *competitive intensity*. Technological turbulence may cause short product life cycles due to quickly changing technology and frequent technological breakthroughs. Turbulence can also be caused by strong competition in the market, which causes price and promotion wars and forces firms to be flexible and efficient (Calantone et al. 2003, e.g.). Although the authors know of no specific research on the impact of turbulence on alliance capability, some work has been done in the adjacent field of new product development. Work by Henderson and Cockburn (1994) on the determinants of effective product development in turbulent environments suggests that high performance is associated with the use of organizational mechanisms that actively encourage the exchange of information across 'component' boundaries within the firm. For example the work of Clark and Fujimoto (1991), Hauser and Clausing (1988), and Lansiti (1993) suggests that in rapidly changing environments organizations that invest in cross-functional boundary-spanning mechanisms that explicitly focus on the need to rethink the systemic nature of complex products and deepen the flow of information across functional boundaries significantly outperform those that do not. Similarly the work of Henderson and Clark (1990), Christensen (1992) and Lansiti (1993) suggests that in turbulent environments firms that systematically revisit the "*architectural knowledge of the organization-deeply embedded knowledge about the ways in which the components of the system should be integrated together-are likely to substantially outperform their competitors*". The study of Henderson (1994) concludes that "*the ability to integrate knowledge both across the boundaries of the firm and across disciplines and product areas within the firm is an important source of strategic advantage*". In a similar vein we argue that firms facing turbulent environments will benefit the most of elaborate alliance management systems. In line with these findings, we expect firms in turbulent environments to invest more in organizational mechanisms that support the exchange of information on the firms' alliances both on their content and their management. Moreover, we expect these firms to engage upon *more* alliances than firms in stable environment. Firms will need partners to get access to new technology, ideas and information and to share risks and costs in innovative projects. If competition is fierce, firms may try to close more alliance deals with suppliers and customers in order to alleviate competitive pressure. This increase in the amount of alliances, will cause more elaborate management systems (see 3.1).

H5a: Firms that face high levels of technological turbulence will have higher levels of alliance capability

H5b: Firms that face high levels of competitive intensity will have higher levels of alliance capability

4 Research Design

Our empirical design is based on a large-scale survey which was based on as many validated scales as possible. Before developing this survey, we organized a focus meeting with several Dutch companies to understand the nature of the alliance management process in firms. Based on this meeting and a thorough study of existing literature, we developed our theoretical arguments and model. In sum, we try to test following model:

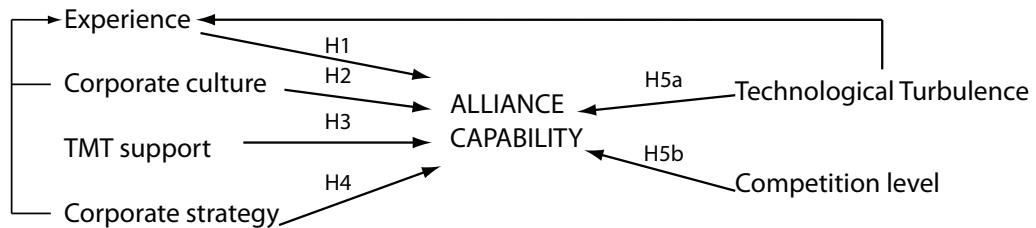


Figure 1: Model: the antecedents of Alliance capability

4.1 Sample

The sample consists out of Flemish companies with more than 100 employees. We chose this criterion in order to address companies that were very likely to have had strategic alliances during the five-year-period 2003-2008. The population was developed using a database that was composed by Spectron, a supplier of database business solutions. The database contained the e-mailaddresses of the CEOs of 825 companies. The survey was e-mailed to the CEO of each of the companies in the list, with the request to fill in the questionnaire in person or to forward it to a person within the company who was responsible for the management of the alliance portfolio of the firm. We sent out the survey and e-mail in Dutch and English. After the first round of e-mails we got back 113 fully completed questionnaires. A follow-up e-mail that was send two weeks later resulted in an additional 68 completed responses, which makes a total of 181 completed questionnaires (a 22% response rate)².

²The authors think that the good response rate was mainly caused by the offer to provide a summary report and personal benchmark of each of the participating firms.

We eliminated companies that indicated that had no alliance experience (29), companies that indicated they pursued a reactor strategy (8) and further outliers (4) which resulted in a final sample of 140 companies. This sample consists of 57 production companies, 62 service companies, 10 product & services companies and 11 "other". The respondents came from different management levels: the majority was filled in by someone of the top management team (116 responses). The rest was filled in by middle managers (16), operational managers (6) and "other" functional levels (2).

4.2 Variables

Almost all variables were measured using multi-item scales. Careful review of the literature helped us putting scales together which were already tested and used in one or more other empirical studies. For a detailed overview of all items we refer to the original sources that are being mentioned. The survey was developed by one researcher and then reviewed by three other academic researchers to check for clarity, accurateness and user-friendliness. This was done in several rounds and the survey was adapted every time to take into account comments and remarks.

Table 2: Variable measurement

Concept	Number of items	Likert	Source	Chronbach alpha	Remarks	Sample mean/modus
Alliance capability	19	7	Kale(2007)	0.927	Calculated as mean score	2.99
General alliance experience	1		Zollo(2002)		Total number of alliances 2003-2008 period. 5 answer categories	16-25
Strategic alliance experience	1		Heimeriks(2007)		Number of strategic alliances 2003-2008 period. 5 answer categories	4-6
TMT commitment	6	5	Cooper(1995,2007)		Factor analysis with Varimax rotation revealed two factors:	
<i>TMT incentives</i>	3	5	Cooper(1995,2007)	0.744	Bonuses and rewards of TMT that are linked to alliance performance	2.96
<i>TMT commitment</i>	3	5	Cooper(1995,2007)	0.812	Personal involvement of TMT in key alliance decisions	4.10
Strategic type	4		Miles and Snow (1979); James(1995); Slater (2006)		Self typing paragraph was used. In line with other studies, the reactor type was left out of further analysis because of lack of respondents	
Culture	16		Cameron and Quinn (2006)		We use the adhocracy/ clan/ hierarchy/ market framework	
Competitive intensity	6	5	Jaworski(1993); Slater (2006)	0.806	Factor analysis revealed only 4 items load on one factor (K-M-O:0.77), these four were taken into account	3.30
Technological Turbulence	4	5	Jaworski(1993); Calantone (2003)	0.897	Factor analysis revealed the 4 items load on one factor (K-M-O:0.78)	3.27
Firm Age	1				Continuous variable expressed in years	49
Firm size	1				Number of employees. 5 answer categories. A dummy was created: medium versus large sized companies	M:54 L:86

5 Results

To test our hypotheses we used linear regression (method: Enter). In a first step we calculated the bivariate correlations between the variables using the Pearson correlations (see table 3). When we look at the first column it immediately becomes clear that the level of alliance capability is significantly correlated to the involvement of the top management team, the amount of technological turbulence and the level of experience the company has with alliances. Somewhat surprisingly, culture nor strategy does not seem to significantly correlate with alliance capability nor alliance experience. There do not seem to be a risk for problems with multicollinearity, as the correlations are below the 0.6 cutoff (except for the two types of experience, but they will not be used in the same model) (Wijnen et al. 2002).

Table 3: Bivariate Pearson correlations

	1	2	3	4	5	6	7	8	9	10	11	12	13
1 Alliance capability level	1												
2 TMT commitment	0,33**	1											
3 TMT incentive	0,57**	0,20*	1										
4 Prospector	-0,06	0,02	0,03	1									
5 Defender	-0,10	0,00	-0,04	-0,55**	1								
6 Adhocracy	0,12	0,07	0,04	0,15	-0,17*	1							
7 Hierarchy	-0,08	-0,06	0,01	-0,17	0,19*	-0,61**	1						
8 Gen all exp	0,23**	0,03	0,21	0,07	-0,14	0,07	0,03	1					
9 Strat all exp	0,18*	0,06	0,16*	0,07	-0,08	0,09	0,01	0,84**	1				
10 Tech Turb	0,31**	0,03	0,28**	0,05	-0,16	0,14	-0,10	0,26**	0,23**	1			
11 Competition	0,15	-0,01	0,14	0,19*	-0,18*	0,02	-0,07	0,11	0,13	0,05	1		
12 Age	-0,11	-0,04	-0,10	0,19*	-0,11	-0,01	-0,15	-0,02	0,07	-0,01	-0,03	1	
13 Size	0,16	0,05	-0,01	0,09	-0,16	0,22**	-0,09	0,21*	0,22**	0,11	-0,03	0,08	1

** p<0,01 (2-tailed)
* p<0,05 (2-tailed)

5.1 General versus strategic alliance experience

To check whether it is better for firms to build up *strategic* alliance experience versus *general* experience (H1), we conducted linear regression analysis. In table 4 the two models are shown, whereby Model A shows the results for regression with the independent variable general alliance experience, while model B includes strategic alliance experience. By comparing the overall model fit, one can decide which type of experience is the most important.

Although we find that alliance experience leads to higher levels of alliance capability, the regression results make clear that *general* alliance experience is more important than *strategic* alliance experience. The adjusted R of model A is slightly higher than of model B. Moreover the significance of the (unstandardized) coefficient of general alliance experience (sig.=0.016) is higher than of strategic alliance experience (sig=0.029) and so is the significance of the F value (0.01 versus 0.03) which indicates that model A is more meaningful than model B. This means that hypothesis 1, where we argued that strategic alliance experience would lead to higher level of alliance capability, should be rejected.

Table 4: Linear regression: effect of experience on alliance capability

Dependent variable: level of AC		
Independent variables	Model A	Model B
Age	-0.112	-0.127
Size	0.123	0.132
General Exp	0.205 (0.016)**	
Strat Exp		0.161 (0.061)*
R square	0.079	0.064
Adj R square	0.059	0.043
F value	3.899**	3.089**

() contain p values:**p<0,05 *p<0,10
Note: standardized coefficients are shown

5.2 Determinants of alliance capability

Linear regression was further used to test the other hypotheses. The bivariate correlations already showed that culture nor strategy seem to correlate with any of the dependent and independent variables. This was further confirmed when the authors applied regression analysis on these variables. We conclude that H2-on the impact of culture- and H4 -on the impact of strategy on alliance capability- should be rejected. The results of the other regression models are presented in table 5. To test hypothesis 3, we take into account both TMT commitment and TMT incentive systems. Hypotheses 5a and 5b, on the impact of environmental factors on the level of alliance capability are shown in Model B. Finally we represent the complete model, including all relevant variables. To make sure our results would not be affected by multicollinearity problems, we analyzed the Condition index and Tolerance values. Both statistics showed that there were no multicollinearity issues.

Table 5: Linear regression: dependent variable alliance capability

Independent variables	Model A TMT	Model B External factors	Model C Complete model
Age	-0.055	-0.107	-0.057
Size	0.139**	0.115	0.130*
General Exp	0.091	0.128	0.064
TMT commitment	0.271***		0.221***
TMT incentives	0.499***		0.464***
Competivity		0.119	
Technological Turb		0.257***	0.141**
R square	0.402	0.156	0.419
Adj R square	0.380	0.124	0.393
F value	18.032***	4.952***	16.018***

***p<0.01 **p<0,05 *p<0,10
Note: standardized coefficients are shown

We can observe the significant effect of the involvement of the top management team on the level of alliance capability in Model A. From the (adjusted) R value, we infer that the explanatory power of this model is 38%. It is clear that both the commitment of the TMT (p<0.001) to the firm's alliances as the incentive system of the TMT (p<0.001) are important explanatory variables of the level of alliance capability. These results indicate that top management teams that are closely involved with the firms' alliances and which also rewarded themselves when the alliances perform well, affect the level of formal alliance

management knowledge systems. In sum, we find strong evidence for hypothesis 3.

Model B shows the results of the linear regression, including environmental factors as independent variables. Here we find strong support for hypothesis 5A on the positive impact of technological turbulence on alliance capability ($p < 0.001$). Hypothesis 5b on the impact of the level of competition can not be confirmed. The model has significant F values, but the explanatory value of the model is rather low (adjusted $R = 0.124$).

Finally, model C contains all relevant variables. We can see that TMT commitment, TMT incentive system and technological turbulence are all significant explanatory variables. Experience does not longer seem to be significant in this model, we come back to that in the next paragraph. Model C has a significant F value and explanatory power of 39.3%. To analyze whether model C has a significant higher explanation value than model A, we calculated the significance of the changes in R, using SPSS. The results indicate a change of F value of 3.958, significant at the 0.05 level, which indicates model C has a significantly higher explanatory value than model A. Technological turbulence should be taken into account as one of the determining factors of alliance capability.

As to our control variables, we find that size positively affects ($p < 0.1$) the level of alliance capability. The larger the firm the more it has invested in alliance management systems. The link between alliance capability and age remains unclear, as there was no significant relation between the two variables. However, analysis of the sign of the Beta value in the regression and of the Spearman correlations, seem to indicate a negative relation between age and alliance capability. This indicates that younger firms seem to have more elaborate alliance management systems.

5.3 Mediating effects

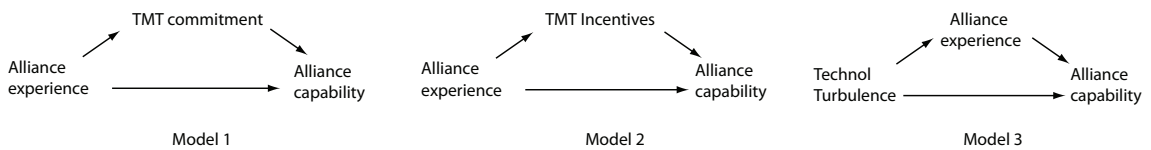


Figure 2: Mediating relationships

In our second series of regressions we can see that alliance experience does not longer have a significant impact on alliance capability. This might indicate a mediating relation between variables. To test for this, we use the four-step method as proposed by Baron and Kenny (1986): (a) regress the mediator on the independent variable, (2) regress the dependent on the independent variable, (3) regress the dependent variable on both the dependent and mediator variable. Perfect mediation holds if the independent variable has no effect when the mediator is controlled. According to Kenny et al. (1998) the latter is not a requirement for designing a model (partial mediation is also possible). We tested three mediation models (see figure 2).

In models 1 and 2 we test whether alliance experience leads to a more involved Top management team, which in turn leads to higher alliance capability. For model 1, we could not confirm relation A: experience does not affect the commitment of the alliance team. This also implies that no mediation effect takes place. For model 2, on the other hand, we do find support: alliance experience leads to a significant increase (Beta:0.212; p:0.012) in the development of TMT reward systems that are coupled to the alliance outcome. When we regress alliance capability on both alliance experience and TMT incentives systems, we find the effect of alliance experience drops a significant amount. Although there is no perfect mediation (alliance experience also directly affects alliance capability), we find an indirect effect of experience on alliance capability through the development of TMT incentive systems. As for model 3, where we see whether the effect of technological turbulence on alliance capability is caused by having more alliances, the results are not clear. We do find a significant relation between technological turbulence and experience (Beta:0.256; p:0.002), which could indicate that firms in turbulent environments, where technology changes often take place, engage in more alliances with other firms. Each of the independent variables individually affects the dependent variable alliance capability. However, when we regress alliance capability on both technological turbulence and alliance experience, we find both variables losing explanatory power. This means we do not find convincing evidence for the mediating relation, represented in model 3.

6 Discussion

In this paper we have analyzed which company-specific factors and environmental factors play a significant role in the development of alliance management systems, also referred to as the level of alliance capability. Previous studies have shown that companies with higher alliance capability can count on better alliance (and company) performance (Ritter and Gemunden 2003, Heimeriks and Duysters 2007, Kale and Singh 2007, e.g.). Up to now, scholars have investigated mainly the role of alliance experience and the presence of a specific alliance function to explain the level of alliance capability. Here, we have generated a model in which company-level and environmental attributes are investigated. Data was gathered through a questionnaire and our hypotheses were tested on a sample of 140 medium to large companies.

Our most important finding is that the involvement of the top management team is a crucial factor in explaining the level of alliance capability (H3). We investigated two aspects of TMT support: their (time and intellectual) commitment to the firm's alliances and the structure of their incentive package. Both seem to play a very important role in explaining the level of alliance capability. The top team's involvement with the company's alliances, causes a "professionalisation" of the alliance management procedures, leading to more formal systems of knowledge management on the firm's alliances. Having the top management team's bonuses linked to the alliance performance, has the strongest impact on the level of alliance capability. Further analysis showed that companies with

more alliance experience tend to have these bonus systems in place more often.

In line with other studies (Zollo, Maurizio et al. 2002, Sampson 2005, e.g.), the results of our study show that alliance experience is a significant antecedent to alliance capability. For our first hypothesis we further analyzed whether it is better to have experience with *strategic* alliances, which are more demanding, complex and important to the firm, than to have *general* alliance experience (with non-strategic alliances). In contrast with Anand and Khanna (2000) we find that although *both* types of experience are significant, having experience in *general* is more relevant than having *strategic* alliance experience (hence we reject H1). Having some experience apparently leads to processes and routines to handle the management of alliances. We did not investigate the impact on the alliance results, it could be that having specific experience can help to improve the results of these types of alliances.

In contrast with the work of Ritter (1999,2003), we do not find an effect of corporate culture on alliance capability. We do not find support for hypothesis 2, which stated that companies with an open culture would have higher levels of alliance capability. A possible explanation could be that in this study, the level of alliance capability is measured by looking at which formal guidelines, processes and functions on alliance management are installed and used in the firm. One could reason that firms that emphasize rules, policies and procedures in their corporate culture, also formalize their alliance management system more than firms that rely on informal communication and processes. This would mean that firms having a formal corporate culture would be more likely to have directions on how to articulate, share and codify knowledge on their alliances. Therefore, it is possible we could not find a difference between “open” and “bureaucratic” culture.

Hypothesis 4 on the effect of corporate strategy on alliance capability was rejected. Having a strategy that focuses on innovation and creativity on the level of alliance management systems does not seem to affect the firm’s alliance capability level, nor were these companies more likely to have *more* alliances than others. We conclude that the three strategic types, defender, analyzer and prospector, are each equally (in)efficient in handling their alliances. The fact that prospectors do not engage more in alliances, could be explained by assuming that prospectors may engage more in explorative collaborations to get access to new ideas and knowledge, while defenders and analyzers might engage more in exploitative alliances to increase their cost-efficiency and/or quality.

Finally, we find the company’s environment to play a significant role in the development of alliance capability. Although the level of competitiveness does not seem to be an important factor(H5b), the level of technological turbulence (H5) does play an important role. Rapid and numerous technological changes within a company’s industry drive a company towards professionalizing their alliance management approach.

6.1 Limitations and further research

Despite the potential contributions of this study towards better understanding of the antecedents of alliance capability, more work is necessary to fully grasp the concept of alliance capability. The fact that we found no effects of culture nor strategy on the firms' alliance management (or experience) might have to do with measurement issues. Although we carefully selected our measurement scales to avoid measurement issues, quantitative research might not be ideal for analyzing such complex relations. Therefore, we think a case study approach might deliver more insights in this matter. We are convinced that the proxies that are used in this study to measure the concept of alliance capability are the most representative, we acknowledge the difficulty in accurately measuring capabilities and skills. In further work we also like to further analyze the relation between the firm's environment and the alliance experience and management style the company adopts.

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