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on Creativity and Learning in Alliances

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The Impact of Organizational Settings on Creativity and Learning in Alliances

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Data from a cross-industry sample confirm the effects of different organizational structures on dynamic capabilities in alliance settings. Our work integrates the literatures pertinent to organizational structure and the learning and creativity processes that characterize dynamic capabilities in alliances. Our results suggest that centralized structures in alliances hinder creativity and learning, and that formalization impedes learning in alliances. Supporting the arguments put forward by authors such as Burns and Stalker (1961), our results suggest that mechanistic structures in alliance teams hinder the development of dynamic capabilities, whereas organic structures are more conducive in these interorganizational settings.

INTRODUCTION

Collaborative efforts of businesses have gained significant importance in recent years. These efforts are illustrated in organizations such as alliances. Alliances, which are «relatively enduring interfirm cooperative arrangements» (Parkhe, 1991), are often formed with an intent of strengthening the partners' competitive position and improving their ability to take advantage of market opportunities. These outcomes can be accomplished through leveraging the partners' resources as well as «through entrepreneurial (...) actions [geared towards] ongoing modifications to adapt to new conditions and skill requirements» (Madhok and Tallman, 1998: 336). The latter processes relate to the organization's dynamic capabilities that reflect the ability to seek new resource combinations and relevant routines focusing on endeavours to facilitate and shape learning (Teece, 2003). Gudergan, Devinney and Ellis (2002, 2003) find support for the relevance of dynamic capabilities in alliances and show that the creativity and learning occurring in these organizations affect their performance.

The academic literature on alliances recognizes clearly the different functioning of different ownership, governance and organizational structures in cooperative arrangements (e.g., Gulati and Singh, 1998). However, there is no comprehensive understanding of the means by which alliance organization affects the creativity and learning in alliances. From the general management literature, we know organi-

zational structure influences innovation processes such as learning and creativity (Burns and Stalker 1961). Yet, the alliance literature concentrates nearly exclusively on ownership and governance structures and their impact on managing appropriation costs and concerns when leveraging resources in strategic alliances (e.g., Gulati and Singh, 1998) and the developmental processes of cooperative relationships and related organizational structures (Ring and Van de Ven, 1992, 1994), but places less notice on the equally important effect of the organizational structures that characterize an alliance on creativity and learning occurring in the cooperative arrangement.

This paper explores how organizational settings influence the dynamic capabilities within the context of alliances. We discuss and integrate the learning and creativity processes underlying dynamic capabilities and relevant facets of alliance organization. Our work integrates the literatures relating to organizational structure and the learning and creativity processes in alliances. Our results suggest that centralized structures in alliances hinder creativity and learning, and that formalization impedes learning in alliances.

ORGANIZATIONAL STRUCTURE AND DYNAMIC CAPABILITIES IN ALLIANCES

To explore the influence of alliance structure on dynamic capabilities within alliances, we examine the effects of centralization and formalization on creativity and learning—the processes underlying dynamic capabilities. The unit of analysis is the alliance team, which we define as the set of individuals representing the collaborating firms who administer the commercial (or operational) aspects of the alliance. The rationale for focussing on the alliance team is that although the broader purpose of collaborating with other firms or within networks is often directed by the competitive strategy of a firm, the nature of working relationships is determined by management (Yoshino and Rangan, 1995). The team directly involved in the alliance affects the performance of collaboration through the effective implementation of the partnership. Alliance teams are characterized by both formal and informal relationships that enable boundary-spanning initiatives, collaborative management techniques, mutual interests, reciprocal relationships and resource sharing. The roles, behaviours and interactions of the team members determine the creativity and learning in the cooperative arrangement and, thus, affect the dynamic capabilities in the alliance. The logic underpinning our framework is that structural facets of the alliance have an impact on the behaviours and interactions within the alliance team. This argument is based on the work of Burns and Stalker (1961) who outlined how organizational structures affect innovation processes such as learning and creativity. They associate organic structures—characterized by a low degree of centralization and formalization—with innovation and suggest that mechanistic structures—reflecting a high degree of centralization and formalization—hinder innovation. Similarly, authors such as Aiken and Hage (1971) argue

that organic structures would provide a suitable context for innovation to occur. The processes of creativity and learning that underlie innovation and characterize dynamic capabilities are therefore more likely to occur where organizations employ an organic structure as opposed to a mechanistic one. Thus, we argue that organizational structure in alliances matters in understanding whether creativity and learning transpire.

THE NATURE OF DYNAMIC CAPABILITIES IN ALLIANCES

Organisations engage more commonly in alliances when operating in dynamic environments. The logic underlying this rationale can be explained using the dynamic capabilities theoretic perspective (e.g., Teece, Pisano, and Shuen, 1997). Dynamic capabilities are defined as «the firm's ability to integrate, build, and reconfigure internal and external competences to address rapidly changing environments» (Teece et al., 1997: 516). Building upon Schumpeter's thinking (1934, 1942), Teece and co-authors stress the importance of managerial and organizational processes underlying a firm's capability to improve its ability to take advantage of market opportunities in dynamic environments that require changes in organizational procedures. The processes facilitating these changes comprise learning and creativity.

Recent empirical research has shown that the processes of creativity and learning facilitate innovation and, ultimately, performance in alliance settings (e.g., Gudergan et al. 2002, 2003); thus, providing support for the role of dynamic capabilities. Creativity in these cooperative arrangements captures the process of generating new ideas taking into consideration surrounding social and contextual influences within the setting of the alliance. This definition is aligned with the work of authors such as Cummings and O'Connell (1978) and Majaro (1992) who view creativity, in general, as a fundamental concept reflecting the process of developing novel and appropriate solutions to problems (Amabile et al., 1990). The importance of creativity in general arises from its conceptual link and positive correlation to innovation (e.g., Paolillo and Brown, 1978; Amabile, 1988). Alliance creativity is closely related to, and complemented by, learning in alliances, which takes on the role of evaluating and refining appropriate ideas generated during the creative process.

Alliance learning has been studied in a range of settings (e.g., Lyles and Salk, 1996; Lane, Salk and Lyles, 2001). Alliance learning comprises the evaluation of ideas, the acquisition of information and knowledge that is generated by, and evolves within, the alliance team. Along these lines, Tannenbaum (1997) suggests that creativity promotes learning and the exploration of the problem, helping develop new ideas and solutions. Other studies suggest creative problem solving gives group members an opportunity to articulate their thoughts, perceptions and assumptions, leading to the development of new combinations of information which leads to learning (Larson and Christensen, 1993; Reynolds, 1994; McFadzean, 1996). Bharadwaj and Menon (2000)

emphasize the relationship between creativity and learning by suggesting that creative thoughts are improved as they are streamlined through the process of learning. Moreover, Powell, Koput, and Smith-Doerr (1996) posit that in interorganizational relationships, flexible and durable learning is critical for dynamic capabilities.

In addition to its relationship with creativity, learning is increasingly studied for its role in knowledge creation and influence in the innovation process (e.g., Imai, Nonaka, and Takeuchi, 1985)—or in the context of an organization's dynamic capabilities. Huber (1991) describes organizational learning as the development of knowledge or insights that influence behaviour. Learning in the alliance team can therefore be referred to as the process by which the alliance knowledge stock is developed and shaped, and is linked to the creation of capabilities (e.g., Teece, Pisano, and Shuen, 1990) and competencies (e.g., Prahalad and Hamel, 1990). Learning directly influences the organization's dynamic capabilities (e.g., Grant, 1995).

In summary, the dynamic capabilities perspective suggests that the creativity and learning processes play an important role in cooperative arrangements. In this paper, we define alliance creativity as the generation of unique ideas and solutions within the alliance team; and alliance learning as the acquisition and development of information and skills within the alliance team. These insights and definitions provide the foundation to study the influence of organizational structure on dynamic capabilities in alliance settings.

ORGANIZATIONAL STRUCTURE

Organizational structure in general determines the allocation of tasks, methods of reporting and information sharing, coordination, control and interaction (e.g., Donaldson, 1985; Clegg, 1990). Building upon Burns and Stalker's work (1961), we focus on two main components that define the continuum of mechanistic versus organic organizational structures: formalization and centralization. Formalization is concerned with the degree of rules and procedures, and centralization refers to levels of decision making.

The way in which people interact, communicate and define power is affected by organizational structure (Hall, 1987). Structural issues such as centralization and formalization are influenced by the organization's approach to values (Quinn, 1988). For example, control-oriented value systems focus on consolidating management control by centralizing decision making and decreasing employee discretion and flexibility. This results in a highly mechanistic structure (Burns and Stalker, 1961) which emphasizes the importance of achieving high levels of production and efficiency through the use of formal procedures and centralised authority.

In contrast to those companies with a mechanistic structure are those with a more flexibility-oriented value system. These businesses attempt to decentralize decision making. As a result, employees possess relative autonomy and ability to resolve problems in a timely and

efficient manner, resulting in a highly organic structure (Burns and Stalker, 1961). Employees in organizations adopting this type of structure are required to be multi-skilled and to perform a variety of tasks. Decision-making authority is given to employees who are trained to diagnose problems and implement solutions. Integrating mechanisms across subunits such as cross-functional teams decrease reliance on direct, vertical control mechanisms and increase reliance on indirect control mechanisms such as horizontal coordination and communication (Hayes, Wheelwright, and Clark, 1988; Barker, 1993).

The central debate on organizational structure focuses therefore on the suitability of mechanistic (formal and centralized) and organic (informal and decentralized) structures. Burns and Stalker (1961) observed that organic systems provide a more suitable organizational context for innovation and, thus, the underlying processes of creativity and learning than mechanistic structures. Aiken and Hage (1971) also conclude that organic structures facilitate innovation. Zammuto and Krakower (1991) established empirically that inflexible value systems are correlated with mechanistic structures and flexible value systems are correlated with organic structures. However, there is inconclusive empirical support for the theoretical assertions that organizational structure is important in cooperative arrangements such as the alliance team and influences the creativity and learning occurring that characterize dynamic capabilities in these setting.

THE EFFECTS OF CENTRALIZATION ON CREATIVITY AND LEARNING

Structural centralization refers to the governing of organizational decision making (Wallach, 1983). The latitude of decision-making ranges from centralised—decision making is centrally organised within a small group of authoritative individuals—to decentralised structures—decision making occurs across a range of levels within an organization—(e.g., Fredrickson, 1986; Floyd and Wooldridge, 1996). Studies (e.g., Amason, Thompson, Hochwarter, and Harrison, 1995) show that in settings with low levels of centralization, individuals are exposed to more opinions and information, resulting in a creative integration of perspectives. Low levels of centralization are more likely to encourage creativity (Leenders, van Engelen, and Kratzer, 2003). This also facilitates information exchanges and interaction among individuals, leading to the generation of meaningful information and interpretations (Senge, 1990). In contrast, high levels of centralization can lead to conflicting perspectives and can hinder the development and implementation of new ideas (Mildavsky, 1979; Fiol, 1994). The argument concerning organisational structure, in general, applies also to alliance settings. That is, high levels of structural centralization in the alliance team restrict decision-making within the alliance to a designated set of people within that team. This limits interaction and information exchange between members within the alliance team, implying, in turn, that high centralization inhibits learning of the team members.

Leaning on work pertaining to organizational structure, Hage's work (1980) implies that centralization in alliance teams refers to the hierarchical position of the decision maker within the alliance. We define structural centralization as the concentration of decision-making within a small group of people within the alliance team. Applying the understanding of organizational structure to the interorganizational setting and the alliance team, in particular, we argue that low levels of centralization in alliance teams are more conducive for learning and encourage alliance team members to share and integrate their perspectives to produce new ideas, having a positive impact on creativity. This leads to the following two hypotheses:

Hypothesis 1: Greater centralization in the alliance team is associated with low levels of creativity in the alliance team.

Hypothesis 2: Greater centralization in the alliance team is associated with low levels of learning in the alliance team.

THE EFFECTS OF FORMALIZATION ON CREATIVITY AND LEARNING

Formalization is a primary dimension of organization structure (Pugh, Hickson, Hinings, and Turner, 1969) and is viewed as a design parameter of formal structure (Mintzberg, 1979). Structural formalization refers to a mechanistic orientation in organizations and is characterized by rigid guidelines that instill conformity among members, policies and methods. As a result, individuals are pressured to adopt mechanistic approaches to their work, interactions and approaches to problem solving (Burns and Stalker, 1961). Bartlett and Goshal (1991) suggest that organizational structures that are characterized by high levels of formalization lack effectiveness in current business environments because of their inflexibility and upholding of closed systems. Bonner, Ruekert and Walker (2002) add to this view by suggesting that while some degree of formal control is necessary for proficient management, excessive or inappropriate formal control may hinder a team's creativity. Overall, less formalization is beneficial for creativity (Brown and Duguid, 1991).

In contrast, structures that reflect a lower level of formalization make allowances for organizational slack and allow members to interact relatively freely. Burns and Stalker (1961) suggest that these structures are suitable for dynamic organizations which require constant change and adaptation. Collier and Esteban (1999) suggest that organizations in evolving and unsettled environments should be responsive and flexible to cope with continuous change. We suggest that a structure displaying a high level of formalization restricts individuals in the alliance team through imposing procedures and boundaries, limiting interaction opportunities, and hence reducing learning potential. In addition, we argue that extensive formalization is a hindrance to creativity. We define structural formalization as an inflexible system of control governing the alliance team reflected in norms and procedures and conclude with the following two hypotheses:

Hypothesis 3: Greater formalization in the alliance team is associated with low levels of creativity in the alliance team.

Hypothesis 4: Greater formalization in the alliance team is associated with low levels of learning in the alliance team.

We have developed a set of four hypotheses that articulate the effects of organizational structure—centralization and formalization—on the learning and creativity processes in alliances that characterize the dynamic capabilities in cooperative arrangements. By doing so, we have provided testable hypotheses that address Burns and Stalker's (1961) configurations of organic versus mechanistic organizational structures and their impact on dynamic capabilities within the alliance setting.

METHOD

To test the hypothesized effects of organizational structure on creativity and learning in alliances empirically, we employed a questionnaire survey methodology and estimated the hypothesized relationships using Partial Least Squares (PLS) analysis. This survey and analysis phase was preceded by an initial set of qualitative interviews.

The setting of this research focuses on a cross-industry sample of 4,500 medium-to-large-sized organizations which have formed at least one alliance—including both equity and non-equity alliances. To ensure sufficient variance in the data, the sample was selected to include organizations operating in diverse manufacturing and service arenas. The use of this sampling procedure introduced deliberate variations in relationships under examination. The unit of analysis in this research is the alliance team, which is formed as a result of the collaboration between two or more independent organizations. The questionnaire was directed to the alliance manager (key informant), which ensured collection of appropriate data. The key informants were asked to complete the questionnaire based on (only) one alliance with which they had experience and have detailed knowledge about. This method ensures the unit of analysis is adequately addressed and that relevant information is collected.

The first phase of our empirical research—the set of qualitative interviews—consisted of in-depth personal interviews with experienced alliance managers. There are three main objectives for these qualitative interviews, namely 1/to assess the relevance of the theoretical and substantive issue under investigation, 2/to ascertain the appropriateness and feasibility of the defined sampling frame, and 3/to conduct a preliminary test of the questionnaire for content validity and questionnaire wording.

We conducted detailed interviews with nine managers to gain an understanding of the phenomenon of interest; the creativity and learning processes in and structural settings of the alliance team. To conduct this, we randomly identified organizations. The alliance managers in these organizations were personally contacted over the telephone to determine the appropriateness of their organization for the purpose of

the study and to set up an interview. The average duration of these interviews was about 90 minutes. We also administered a preliminary draft of our questionnaire to these alliance managers. They were asked to evaluate the wording of the statements used and identify other problems. Their opinions were used to refine the questionnaire. This part of our empirical study provided initial support for the hypothesized relationships and resulted in measurement scales that had content validity.

The data collection method of personalized packages in the final survey was complemented by a reminder fax, designed to increase the response rate. The response rate of the survey was 12.5%, which is sufficient for testing the hypothesized theoretical relationships.

Appendix 1 provides descriptive statistics for our study.

The questionnaire consisted of reflective and formative measures. Reflective measures were evaluated using reliability analysis (Nunnally and Bernstein, 1994) and Cronbach alpha scores, and formative measures using Vanishing Tetrads (Bollen and Ting, 2000). The concepts and measurement scales are reported in the following paragraphs, with the individual items and scale characteristics being reported in **Tables 1** and **2**.

Alliance learning refers to the acquisition and development of information and skills within the alliance team. It is understood as a set containing heterogeneous, independent components. The components that were relevant, according to the literature and the interviews undertaken with alliance managers, consisted of the following: administration or managerial techniques/practices/policies, political and legal aspects, cultural aspects, marketing techniques, product related technologies, competitor products, customers, and production/manufacturing. Therefore, the construct was measured by an eight-item, seven-

Table 1. Reflective Scale Cronbach Alphas

Construct	Items	Cronbach alpha (for scale)
Structural Formalization	Please indicate the extent to which you agree with the following statements: - In this alliance considerable resources are spent in developing procedures and policies for all jobs; - People in this alliance rely on formal policies to guide decision making; - People in this alliance must rigidly follow procedures; - Individual decision makers at all management levels have wide latitude in making job-related choices	0.7481
Structural Centralization	Please indicate the extent to which you agree with the following statements: - Top level management makes all the important decisions and then delegates tasks; - In this alliance important decisions are made only at high management levels; - This alliance is very hierarchically organised	0.6870
Alliance Creativity	In this alliance we... - experiment with non-traditional methods in our decision making; - brainstorm for "out of the square" solutions; - have a positive attitude towards creativity; - have novel solutions during decision making	0.8851

point formative scale ranging from “People in this alliance don’t spend any effort in learning about...” to “People in this alliance spend considerable effort in learning about...” addressing the abovementioned components.

Alliance creativity is indicative of the generation of unique ideas and solutions within the alliance team. This construct was measured by a four-item, seven-point reflective Likert-type scale ranging from “completely inaccurate” to “completely accurate”. These items included, “In this alliance we experiment with non-traditional methods in our decision-making”; “... we brainstorm for ‘out-of-the-square’ solutions”; and “... we have radically different approaches to decision-making”.

Structural formalization is defined as an inflexible system of control governing the alliance team reflected in norms and procedures. This construct is measured using four reflective items with a seven-point Likert scale ranging from “strongly disagree” to “strongly agree”. They include the following statements: “In this alliance considerable resources are spent in developing procedures and policies for all jobs”; “People in this alliance rely on formal policies to guide decision-making”; “People in this alliance must rigidly follow procedures”; and “Individual decision makers at all management levels have wide latitude in making job-related choices”. All of these items address the reliance on norms and procedures within the alliance team. For instance, “wide latitude in making job-related choices” reflects rigidity based on norms and procedures.

Alliance centralization refers to the concentration of decision-making within a small group of people within the alliance team. This construct is measured using a reflective, four-item Likert scale ranging from “strongly disagree” to “strongly agree”. This scale includes the following statements: “Top level management makes all the important decisions and then delegates tasks”; “In this alliance important decisions are made only at high management levels”; and “This alliance is very hierarchically organised”. Our preliminary interviews of alliance managers confirmed that respondents considered all statements to focus on the decision-making concentration within the alliance team.

A range of control variables were included in our estimation to account for their effects on creativity and learning in alliance teams (see **Appendix 2** for a detailed report on the effects on control variables).

Table 2. Formative Scale p-values (Vanishing Tetrads)

Construct	Items	χ^2	d. f.*	p-value
Alliance Learning	People in this alliance don’t spend any (... considerable) effort in learning about... - administration or managerial techniques/practices/policies; - political and legal aspects; - cultural aspects; - marketing techniques; - product related technologies; - competitor products; - customers; - production/manufacturing	51.23	20	0.0001

*: d.f.: degrees of freedom

These factors included constructs such as extrinsic and intrinsic motivation, communicative interaction and diversity of alliance team members. All of these are discussed in the literature to have an influence on creativity and learning. However, as the focus of our paper is on whether organizational structure affects creativity and learning in alliances, we have limited our discussion to these aspects only. Structural equation modelling (SEM) (Jöreskog and Sörbom, 1982) employing Partial Least Squares (PLS) analysis (Chin, 1998) was used to estimate the hypothesised relationships. This allows making explicit assumptions regarding constructs and theorized relationships (e.g., Hulland, 1999)—a benefit leading to increased use of SEM in management when accounting for multiple relationships and modelling of unobservable variables (e.g., Bagozzi, 1980; Fornell and Cha, 1994). The complexity of the model (i.e., combination of hypothesized effects and those of the control variables) requires the employment of PLS.

RESULTS

The results of our analysis provide interesting insights which we will discuss in the following sections. **Table 3** briefly summarizes the path coefficients and significance levels for the hypotheses postulated in this paper.

Hypothesis 1 suggests that greater structural centralization in the alliance team is associated with low levels of creativity in that team. Supporting this hypothesis, the empirical results show that structural centralization has a negative and significant effect on alliance creativity (path coefficient: -0.112 ; t-statistic: -2.359). These findings confirm the literature that suggests that high centralization can restrict interaction and exchange and, in turn, impede creative behaviour.

Hypothesis 2 proposes that greater structural centralization in the alliance team is associated with low levels of learning in that team. Reinforcing this hypothesis, the empirical results demonstrate that, in fact, a negative and significant effect of structural centralization on alliance learning can be found (path coefficient: -0.085 ; t-statistic: -2.969). This result is consistent with the literature which argues that high levels of structural centralization restrict decision-making, interaction and information exchange between members; thus, limiting learning.

Table 3. Estimation of Effects (Partial Least Squares)

Construct	Path Coefficient	t value†	Significance Level
Effects on Alliance Creativity			
Structural Formalization	+0.002	-1.016	n.s.
Structural Centralization	-0.112	-2.359	***
Effects on Alliance Learning			
Structural Formalization	-0.169	-2.352	***
Structural Centralization	-0.085	-2.969	****

†: One-tailed test; ****: $p > 0.001$; ***: $p > 0.01$

Hypothesis 3 articulates that greater structural formalization relates to low levels of creativity in the alliance team. Our empirical results do not provide support for this hypothesis. The results are inconclusive as the effect of structural formalization on alliance creativity is not significant (path coefficient: 0.002; t-statistic: -1.016). The non-significant effect of structural formalization on creativity in the alliance team implies that a rigid structure governing the alliance team is not important when examining which structural factors promote or inhibit creativity within the alliance team.

Hypothesis 4 suggested that greater structural formalization in the alliance team leads to a low level of learning in that team. Supporting this hypothesis, the empirical results show a negative and significant effect of structural formalization on alliance learning (path coefficient: -0.169 ; t-statistic: -2.352). This result is consistent with the literature which outlines that organizational structures that are characterized by a high level of formalization impose boundaries and limit interaction among members of a team; hence, limiting the learning that can occur.

DISCUSSION OF RESULTS

Results from the model estimation were consistent with the literature with the exception of the result for Hypothesis 3—the effect of formalization on creativity within the alliance team. Implications of our empirical findings are that formalisation and centralisation have noticeably different effects on the alliance team's creativity. For example, introducing procedures to implement formalization has an effect that is different to that resulting from limiting decision-making (centralisation). Alliance teams require a structure that reflects a low level of formalization, while employing creativity methods. However, decision-making delegation within the alliance team is necessary in order for learning to occur and thus is necessary if an alliance is to have dynamic capabilities. This suggests that the debate should not be focused on an either/or application of centralisation or formality for the context of the alliance team, but on an approach that combines the two aspects of structure.

These findings are largely aligned with the earlier work of Burns and Stalker (1961). Their work implies that mechanistic structures exhibiting high levels of centralization and formalization are those that are most suited for stable environments where the role of dynamic capabilities is negligible. While their focus of analysis has been the firm, our findings suggest that the logic underlying their framework applies also to interorganizational structures that can be found in alliance teams. Thus, organizational structures in alliance teams that can be described as organic structures—characterized by low levels of formalization and centralization and displaying characteristics such as loose organization, lateral communication, minimal control for task definition and implementation, and delegation of decision-making to members of the alliance team—would fit best dynamic environments requiring change. Our findings support this notion and show that alliance teams that can

be characterized by an organic structure exhibit dynamic capabilities evidenced in the underlying creativity and learning processes.

Examining the effects of those control variables included in our estimation (see **Appendix 2**) suggests that the creativity that occurs within the alliance team is positively influenced by other factors than organizational structure. For instance, intrinsic motivation of the alliance team members, their engagement in critical thinking, the diversity of the team members, their attitude towards risk taking and the communicative interaction within the alliance team all affect creativity. In addition, creativity displayed in the alliance team is negatively affected by extrinsic motivation. These findings demonstrate that the organizational structure of the alliance matters but that managers need to address additional aspects in order to strengthen creativity in the alliance team and, ultimately, to enhance dynamic capabilities in the alliance.

Furthermore, the learning displayed within the alliance team is also influenced by additional aspects characterizing the alliance team. Creativity exhibited in the team, intrinsic and extrinsic motivation of the team members, critical thinking and communicative interaction amongst the team members affect learning in the alliance. Hence, in addition to the organizational structure depicting the alliance team, managers can address other factors to enhance the learning in the alliance team to improve the alliance's dynamic capabilities.

Dynamic capabilities in the alliance are fuelled by a group of members who are motivated, embrace diversity, engage in critical thinking and communicate effectively. High levels of formalization and centralized decision-making within the alliance team impede the development of dynamic capabilities. These features of the alliance team that influence the development of dynamic capabilities reflect those relating to organic systems (Burns and Stalker, 1961). Thus, our empirical findings support the theoretical assertions that organic structures are more suitable for developing dynamic capabilities than mechanistic structures are. Moreover, we demonstrate that this logic applies as well to the alliance setting.

CONCLUSIONS

This study provides explicit insights into the relationships between structural formalization and centralization and dynamic capabilities in alliances. Theoretically, we have specified how 1/the literature on organizational structure and Burns and Stalker's work (1961), in particular, can be linked to the literature on dynamic capabilities, and 2/the link between organizational structure and dynamic capabilities can be examined within an alliance context. Both of these contributions fill an important gap in the literature and provide a basis for additional studies on alliances and dynamic capabilities. For instance, future research can examine the effects of organizational structure on dynamic capabilities in alliances conditional on other factors such as the stability and durability of the alliance.

From a managerial perspective, this study provides important and actionable insights as well. Alliance managers can further increase creativity by reducing the concentration of decision making from a small group of people to more widely dispersed members of the alliance team. It is also important for managers to note that changing the degree of formalization—the use of formal norms and procedures—within the context of the alliance team will not have a consequence, when considering creativity. This indicates managers are more likely to accomplish better outcomes from the alliance team by focusing on other areas rather than the levels of formalization present when following procedures and reliance on formal policies.

The findings suggest that structural formalization and centralization negatively influence alliance learning. This implies that managers should focus their effort so that the alliance is organized loosely, people within the alliance team do not rely on formal policies in conducting their work, and that the alliance team is not very hierarchically organized. Furthermore, it is important that members of the alliance team are involved in determining objectives and have wide latitude in making job-related choices.

In conclusion, organizational structure matters in alliances and affects the development of their dynamic capabilities. Our findings provide support for the arguments put forward by authors such as Burns and Stalker (1961) who state that structure influences an organization's innovation processes such as learning and creativity. Our results suggest that mechanistic structures in alliance teams hinder the development of dynamic capabilities, whereas organic structures are more conducive in these interorganizational settings.

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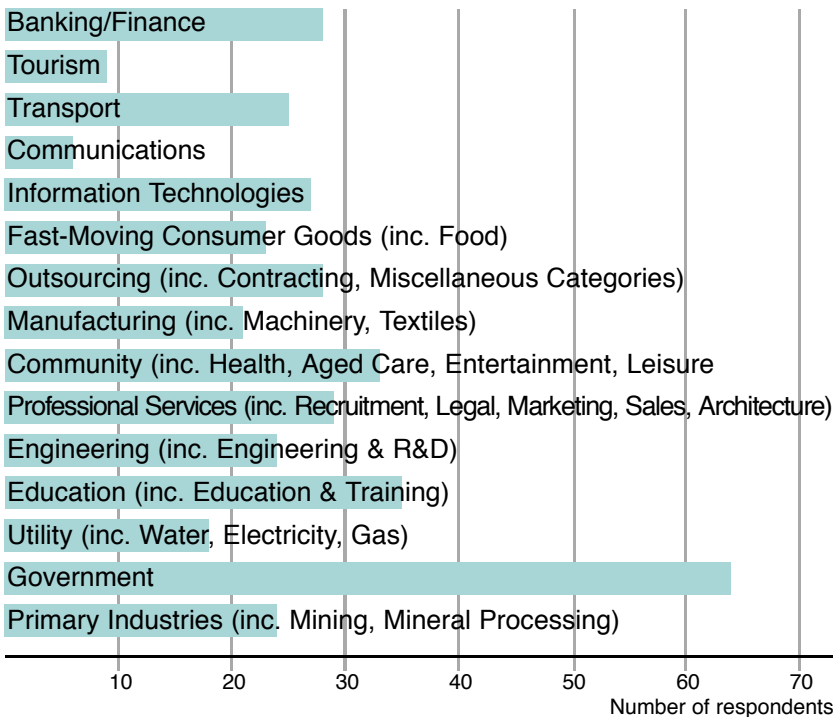
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APPENDIX 1: DESCRIPTIVE STATISTICS— NUMBER OF RESPONDENTS BY INDUSTRY



APPENDIX 2: ESTIMATED EFFECTS WITH CONTROL VARIABLES

Construct	Path Coefficient	T-value†	Significance Level
Effects on Alliance Creativity			
Structural Formalization	+0.0020	-1.0158	n.s.‡
Structural Centralization	-0.1120	-2.3590	***
Intrinsic Motivation	+0.1990	+3.5219	****
Critical Thinking	+0.2510	+6.3289	****
Extrinsic Motivation	-0.0370	-1.8421	**
Diversity	+0.1160	+3.5552	****
Job Autonomy	+0.0850	-0.4805	n.s.
Communicative Interaction	+0.1420	+3.3657	****
Culture- Risk Orientation	+0.2900	+9.6911	****
Effects on Alliance Learning			
Structural Formalization	-0.1690	-2.3528	***
Structural Centralization	-0.0850	-2.9692	****
Alliance Creativity	+0.0820	+2.9266	***
Intrinsic Motivation	+0.1770	+4.7102	****
Critical Thinking	+0.1810	+2.2407	**
Extrinsic Motivation	+0.0100	+1.4616	*
Diversity	+0.0300	+0.1929	n.s.
Communicative Interaction	+0.2040	+6.0014	****
Culture- Collectivism	-0.0510	-1.1130	n.s.

†: One-tailed test; ‡: not significant; ****: p>0.001; ***: p>0.01; **: p>0.05; *: p>0.1