

The Affects of Practices of Governance and Leadership on Capabilities and Performance of Alliances

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In this study we aim to verify whether heterogeneity in alliance capabilities and performance can be attributed to the use of certain intra-firm governance practices and associated leadership behaviors. Our hypotheses build on the co-occurrence of stewardship governance and transformational leadership and the co-occurrence of agency governance and transactional leadership behavior. We suggest that transformational leadership behavior has a significant influence on the development of dynamic capabilities and subsequent alliance performance when it co-occurs with stewardship governance, whereas transactional leadership behavior has a significant influence on the alliance when partnering firms choose principal-agent type governance. Data from 369 alliances show that the positive relationship between transformational leadership and the development of dynamic capabilities is stronger with stewardship governance, and weaker with agency governance. In the case of stewardship governance, transactional leadership behavior too is significantly associated with dynamic and operational capability development. We conclude that alliance partners concentrating on stewardship governance and the full range of leadership behaviors improve their alliance performance by augmenting the dynamic and operational capability base.

INTRODUCTION

Many organizations form alliances in order to combine and develop capabilities with external partners and to create competitive advantages that help achieve strategic objectives and superior rents. Numerous studies show that overall alliance activity and related alliance-dependent revenue has been growing extensively (e.g. Gulati, 1998; Harbison, Pekar, Viscio, & Moloney, 2000; Margulis & Pekar, 2001; Park & Zhou, 2005). However, despite the continuously growing and changing portfolio of alliances—due to shifting needs for resources—and the evident and increasing importance of alliances, the outcome of alliances is not always satisfactory (Ellis, 1996; Hennart, Kim, & Zeng, 1998; Parkhe, 1991; Pearce, 1997).

Organizations differ significantly in their ability to deal successfully with their alliance portfolio and to achieve anticipated performance outcomes (Dyer, Kale, & Singh, 2001; Reuer, Zollo, & Singh, 2002b). Several authors have identified different factors that influence strategic alliance performance, including the partners' ability to match resources and align cultures, decision-making processes, and systems in the alliance team (Kale, Singh, & Perlmutter, 2000); the ability to create trusting relationships (Ariño, de la Torre, & Smith Ring, 2001; Zeng & Chen, 2003) and to manage conflict (Doz & Hamel, 1998); and the ability to handle rivalry and managerial complexity (Park & Ungson, 2001; Sampson, 2005). It is the mastery of these factors that enhances the strategic performance of alliances.

In this study we focus on the role and influence of governance and leadership as two distinct but associated determinants of alliance success. The alliance partners' governance practices as well as the consequences of alliance managers' leadership behaviors have repeatedly been considered critical when implementing alliance strategies and managing alliance teams (e.g. Gulati & Singh, 1998; Ring & Van de Ven, 1992). We examine how different types of governance and leadership behaviors affect the development of operational and dynamic capabilities within the alliance team, and we study the relationship between those capabilities and alliance performance. Our theoretical conception is substantiated by empirical results from a survey of 369 alliances.

Governance in alliances covers the means of authority and influence that determine the integration of alliance partners' interests, the use of alliance resources, the relationship between the partnering organizations, and the relationship between the partnering organizations and the alliance team. Hence, governance in alliances is intertwined with factors such as co-ordination costs and appropriation concerns (e.g. Gulati et al., 1998; Oxley, 1997); alliance risks; alliance task-scope and transaction-level characteristics (e.g. Oxley, 1999; Oxley & Sampson, 2004); strategic motivation (Nielsen, 2003); division of labor (Reuer et al., 2002b); task complexity and partner diversity (White & Lui, 2005); trust among partners (e.g. Gulati, 1995; Krishnan, Martin, & Noorderhaven, 2006; Lui & Ngo, 2004; Nooteboom, Berger, & Noorderhaven, 1997; Zaheer, McEvily, & Perrone, 1998); contracting (e.g. Reuer & Ariño, 2003; Reuer, Ariño, & Mellewigt, 2006; Sampson, 2004); and inter-organizational structures (e.g. Gerwin & Ferris, 2004; Ring & Van de Ven, 1994; 1992). This research focuses on explaining alliance governance based on the characteristics of the partners' relationship. For example, Oxley and Sampson (2004) find that when otherwise directly competing partners form alliances, they tend to limit the scope of their joint activities rather than employing protective governance forms such as equity joint ventures, which provide only meagre protection, to avoid wide knowledge sharing. White and Lui (2005) suggest that forms of alliance governance are influenced by co-operation costs and transaction costs that result from task complexity of alliances and partner diversity. And, Reuer, Ariño and Mellewigt (2006) find that contractual and governance arrangements in alliances have distinct antecedents including transaction-specific investment, relational capital, search costs and so forth; yet, different forms of governance occur with no more or less complex contracts. These and other related studies greatly advance our understanding in identifying the determinants and categorizing the mechanisms of governance in alliances.

However, few studies have focused on the consequences of governance mechanisms. Although many studies suggest that forming strategic alliances has a positive effect on innovation, learning, and knowledge (Cegarra-Navarro, 2005; Dussauge, Garrette, & Mitchell, 2000; Ireland, Hitt, & Vaidyanath, 2002; Larsson, Bengtsson, Henriksson, & Sparks, 1998; Lyles & Gudergan, 2005; Simonin, 1997), relatively few studies clearly deal with the effects that different types of governance have on alliance outputs. For example, one study (Linnarsson & Werr, 2004) classifies functions, actors, and activities of governance on an operational, intermediate, and strategic level and identifies its effects on an alliance's innovation capabilities. Another study (Mowery, Oxley, & Silverman, 1996) finds that equity arrangements promote greater knowledge transfer within alliances, and yet another study (Gudergan, Devinney, & Ellis, 2002) finds empirical evidence for the influence of decision-making processes on the performance of the alliance. Finally, Sampson (2004) finds that alliance governance that is based on a transaction cost perspective improves alliance performance, but at the same time excessive bureaucracy reduces alliance performance more than the concurrence of excessive contracting. While these studies have made significant progress in explaining the consequences of alliance governance, the performance implications of governance have been less well explored. Furthermore, no studies have so far considered how different types of governance relate to leadership behavior within the alliance teams and whether this has an effect on the capabilities of the alliance and its subsequent performance.

Alliance leadership, on the other hand, is the influence process that facilitates the performance of the alliance team. Full-range leadership theory (Bass, 1985) explains the effect of leadership on innovation and performance in organizations (e.g. Jung & Avolio, 1999); it emphasizes a systematic impact of transformational and transaction behaviors on strategic, organizational, and individual processes and outcomes. For example, transformational behavior has been shown to support organizational learning (e.g. Vera & Crossan, 2004), team effectiveness (e.g. Jung & Sosik, 2002), and individual performance (Jung & Avolio, 2000); yet, whether these effects also apply within the alliance context has not been studied.

Two other practices of leadership are particularly relevant in alliances: shared and informal leadership practices. Shared leadership is the dynamic, interactive influence process among individuals whose objective is to lead one another to achieve goals within a group or organization (Pearce & Conger, 2003). Despite its apparent importance, the concept has not been examined at the inter-organizational level. Moreover, few authors deal with it from a top-executive perspective or a self leading team perspective (e.g. Judge & Ryman, 2001; O'Toole, Galbraith, & Lawler, 2002; Pearce & Barkus, 2004), both of which are, however, incomplete in explaining the sharing of leadership in alliances.

Informal leadership, on the other hand, describes the influence process of an individual who, without authority, exerts influence over others by interpreting events, setting goals, and giving advice or feedback (Alvesson & Deetz, 2000; Pescosolido, 2001). Again, informal leadership practices have not been examined much either. One early study (Whyte, 1944) shows how informal leaders emerge and maintain their position in a previously leaderless context, and some other studies (Neubert, 1999; Pescosolido, 2001) find that team efficacy and performance are positively associated with informal leadership practices.

In sum, although governance and leadership play an important role at the inter-organizational level, there is insufficient understanding about their roles in the development of the capabilities that reside and develop within the alliance, and their influence on alliance performance. Thus, the underlying intricacies of governance and leadership in alliances have not been fully unpacked. Further conceptual and empirical research is required to adequately explain the effects of the partnering organizations' governance and leadership on alliance team capabilities and subsequent performance. The aim of this paper is to address this important gap.

To explain the influence of alliance governance and leadership practices on the development of operational and dynamic capabilities we interpret types of alliance governance as co-existing with particular leadership behaviors based on the logic of stewardship theory (Davis, Schoorman, & Donaldson, 1997) and full-range leadership theory (Bass, 1985). Furthermore we illustrate how the development of operational capabilities is influenced by the co-occurrence of agency type governance with predominantly transactional leadership and how the development of dynamic capabilities is influenced by the co-occurrence of stewardship type governance with predominantly transformational leadership. We take a dynamic capability perspective (Helfat et al., 2007; Teece, 2003) to explain differences in alliance performance as a consequence of operational and dynamic capabilities that are created as they apply to the alliance team. The application and integration of these theories expands our theoretical understanding of how capabilities residing in the alliance are influenced by

different governance mechanisms and leadership behaviors, and how these capabilities contribute to strategic alliance performance.

The paper proceeds with a review of theory on dynamic and operational capabilities, governance, and leadership in the context of alliances. We present a conceptual framework and hypotheses relating to the influence of different governance and leadership practices on capability development and performance in alliances. We describe the development of the measurement instrument and the method used for data analysis. We then discuss the study results capturing 396 alliances and conclude with an assessment of whether stewardship governance and transformational leadership indeed support the development of dynamic capabilities and superior alliance performance in a different way than the combination of agency governance and transactional leadership.

THEORY AND CONCEPTUAL MODEL

Dynamic and operational capabilities

A dynamic capability is defined as “the capacity of an organization to purposefully create, extend, and modify its resource base” (Helfat et al., 2007). At the inter-organizational level, as much as at the organizational level, a dynamic capability serves two functions: first, a search and selection of winning resources, and second, deployment of those resources in order to create superior rents (Eisenhardt & Martin, 2000; Makadok, 2001). Our focus is on resource deployment, which for alliances relates to implementing, integrating, and innovatively deploying the newly pooled resources. Following the logic of dynamic capabilities (Teece, Pisano, & Shuen, 1997)—which provides the basis for recent work on collaborative rent creation (e.g. Madhok & Tallman, 1998), alliance performance and innovation (e.g. Gudergan, Devinney, & Ellis, 2003), and inter-organizational knowledge transfer and learning (e.g. Cegarra-Navarro, 2005; Mowery et al., 1996)—we consider dynamic capabilities in alliances as routines and procedures enacted by the alliance team members in conjunction with their managerial behavior that enhance productivity and innovativeness of the given resources. This perspective includes the alliance teams’ ability to sense and seize opportunities of reconfiguring its asset base (Eisenhardt et al., 2000; Teece et al., 1997; Winter, 2003) and refers to entrepreneurial and intrapreneurial aspects of management. Intrapreneurship is associated with governance mechanisms and managerial activity within the alliance and entrepreneurship relates to managerial activity in the environment of the alliance. Both activities are essential for the development of operational and dynamic capabilities (Zahra, Sapienza, & Davidson, 2006); they help select resources, which, in conjunction with existing learning capabilities, create operational capabilities, and support the formation of dynamic capabilities. Dynamic capabilities can help alter the alliances’ knowledge base, transform operational capabilities, change existing alliance routines, increase its performance, and inform future entrepreneurial choice.

In summary, the development of operational and dynamic capabilities and subsequent strategic performance at the inter-organizational level is determined by processes and structures reflecting entrepreneurship, intrapreneurship and learning as well as the existing knowledge base within the alliance. This dynamic

capability view explains the differences in the strategic performance of alliances. We suggest that alliance governance mechanisms and the alliance manager's leadership behavior affect entrepreneurship, intrapreneurship, learning, and the existing knowledge base within the alliance, and that dynamic capability theory provides further insights into the different effects of governance mechanisms and alliance leadership behavior on alliance capability development and subsequent strategic performance.

Governance

Various theories have explained the role of different mechanisms in organizing governance relationships. Agency theory (Jensen & Meckling, 1976), for instance, takes a perspective that is based on a model of economic rationality and opportunism. It assumes that the manager (agent) has an economic self interest that might conflict with the goal of the owner (principal). Control, monitoring, and sanctioning mechanisms are put in place so that an agent's activities serve the parent organization's best interests. Control and monitoring mechanisms record and measure the output of the efforts and strivings of the agent, whereas sanctioning mechanisms provide selective rewards and punishments to motivate the agent. Although the agency perspective offers important insights into the design of governance structures for alliances, it emphasizes unilateral governance mechanisms without addressing the bilateral nature of alliances; additionally, it overlooks the social context in which the alliance partners' relationships are embedded.

Stewardship theory (Davis et al., 1997), on the other hand, merges economic and behavioral views in explaining governance. The underlying assumptions are that the interests of parent organizations (principals) and alliance managers (stewards) can converge, and that stewards derive higher utility from pro-organizational, co-operative, and collectivist behavior than from individualistic and opportunistic behavior (Sundaramurthy & Lewis, 2003). The focal point of the principal-steward relationship is goal alignment, trust, and intrinsic motivation. Stewardship focuses on learning and growth directed towards higher levels of performance and, as the dominant model, it is inclusive rather than exclusive as it can encompass mechanisms from agency theory. Governance features associated with stewardship are: (1) a high level of autonomy and involvement that facilitates, empowers, and motivates, rather than monitors and controls; (2) ownership and organizational structures which are informal and support decentralized decision making, so that thinking and doing are combined rather than separate; (3) long-term relationships that are based on trust and shared values to support continuing goal congruence, efficiency, and quality rather than short-term cost control and performance; (4) empowerment and education to reduce and avoid the risk of adverse behavior and to promote entrepreneurial action; and (5) the principals' deployment of personal power, respect, and expertise rather than institutional power and transactional behavior to build mutual trust and motivation. Since underlying assumptions of stewardship and agency governance diverge, these features of principal-steward governance can be seen as the stewardship end of a governance continuum for which principal-agent governance represents the other end. Actual governance is located in between the two, depending on the preference of principals and agents/stewards towards either agency or stewardship characteristics of the relationship.

Although stewardship theory has not been applied to explain governance issues in alliances, it provides a suitable ground for alliance governance because it allows for the integration of agency and transaction cost theory perspectives with a behavioral perspective. Firstly, stewardship theory addresses the bilateral nature of alliances in that it acknowledges situations where multiple principals can have differing preferences for maintaining governance relationships. This is relevant for the governance between the alliance team manager and the principals of partnering firms, which, on a stewardship-agency continuum of governance could be in irreconcilable positions. Secondly, stewardship theory accounts for the social context in which the governance relationships are embedded because it implies that the principal-steward relationship invokes sources of personal and social power, rather than merely institutional or legitimate power. Likewise, the emphasis of trust and shared values in support of goal congruence among principals and stewards leads to social liaison between the steward and principal, rather than only with other agents. Finally, the assumptions that underlie the stewardship perspective are consistent with the alliance context. That is, stewardship theory provides a rationale for the occurrence of both principal-agent governance and principal-steward governance, since it assumes that both types are archetypes of governance relationships representing different psychological and sociological patterns among individuals at the two ends on a governance continuum. Alliances are characterized by multiple principals with often diverging approaches to controlling and structuring the alliance. Thus, stewardship theory can explain and accommodate diverging governance approaches within the alliance context.

In sum, stewardship theory recognizes a plethora of mechanisms that affect the functioning of governance in alliances; it integrates the strength and breadth of the agency perspective, accounts for behavioral and social aspects of governance in addition to the economic dimension, and is thereby likely to account for a more accurate explanation of managerial behavior in alliances than other governance theories. In addition, it focuses, among other factors, on learning, intrinsic motivation, and entrepreneurial behavior, which have been linked to innovation in and performance of alliances (e.g. Bucic & Gudergan, 2003), the effectiveness of leadership behavior (e.g. Vera et al., 2004), and the development of operational and dynamic capabilities (e.g. Teece et al., 1997). We therefore argue that stewardship theory provides a suitable theoretical foundation for explaining the role of governance in alliances.

Leadership

Leading an alliance involves unique challenges since informal leadership structures can evolve, partnering firms often agree to design alliance leadership as a shared function, and alliance managers might be engaged in leading multiple alliance teams, facing different contingencies in every single one of them. Hence, for each situation important factors like the characteristics of the relationship between alliance partners, the strategic context, contractual agreements, or the characteristics of the alliance team members can differ greatly and require that the alliance management make use of different leadership behaviors. Full-range leadership theory explicitly accounts for the situational context and suggests that managers will exhibit different leadership behaviors depending on the situation and the task at hand. It addresses shared and informal aspects of leadership and includes two main leadership behaviors—transformational and transactional.

Transformational behavior is charismatic, inspirational, intellectually stimulating, and individually considerate. This behavior is particularly relevant in situations of change and has been linked to motivation and creativity (e.g. Shin & Zhou, 2003), organizational performance (e.g. Jung et al., 1999), and innovation and effectiveness (e.g. Jung, Chow, & Wu, 2003). It emphasizes an individually considerate behavior, which encourages alliance team members to share ideas and influences their decisions. It also emphasizes an inspirational and stimulating conduct, which empowers team members to think critically and develop individual solutions. Transformational leadership supports not only a shared leadership function and informal leadership structures, but also the development of intrapreneurial behavior amongst alliance team members.

Transactional leadership, on the other hand, motivates individuals primarily through contingent-reward exchanges and management by exception. Transactional leaders set goals and articulate explicit agreements. In alliances, transactional behaviors inhibit shared leadership and, particularly when organizational cohesion among partnering firms is low, discourage the development of informal leadership. Intrapreneurial behavior amongst team members would be difficult to maintain when alliance leadership is transactional. Transactional leadership is, however, supportive of maintaining and improving established operational capabilities because of its focus on goal and task achievement.

Hence, leadership behaviors have a systematic impact on various strategic, organizational, and individual processes and outcomes. And, given that partnering organizations increasingly rely on self directed team structures, it is very important to understand the occurrence and consequences of shared and informal leadership structures. Transformational leadership includes shared and informal leadership facets, and stresses a positive impact on intrapreneurship and learning. Transactional leadership, on the other hand, although not supporting shared or informal leadership structures, supports the management of mature capabilities in alliances. However, despite full-range leadership's widely researched theoretical and practical relevance, related studies have not yet focused explicitly on examining how effective transformational or transactional leadership behaviors are in alliances. More so, no study has yet explained how alliance leadership that ranges between transformational and transactional behaviors is related to the development of dynamic and operational capabilities. Yet, the theoretic assumptions of full-range leadership fit the alliance context. Consequently, we suggest that the theory is an appropriate foundation for explaining the role of different leadership behaviors in alliances.

Alliance governance and leadership

Given the appropriateness and relatedness of the underlying situational and socio-psychological mechanisms that determine governance and leadership, Davis, Schoorman, and Donaldson (1997) suggest that associated theories be integrated. It is, however, important to note that theories of alliance governance and alliance leadership explain conceptually different phenomena. While alliance governance concerns the mechanisms that establish authority and control and determine the integration of the alliance partners' interests, their relationship, the use of joint resources, and the relationship with the managers of the alliance, leadership involves behaviors of alliance managers that influence other alliance team members and facilitate their

performance in order to achieve set objectives. Both conceptualizations explain possible occurrences of governance and leadership on a continuum. Whether the governance takes a principal-agent nature or principal-steward one is determined by situational and socio-psychological characteristics that underlie and influence behaviors. The same characteristics influence different leadership behaviors. Corresponding aspects are the managers' motivation (e.g. Manz, 1986), their identification with an organization's mission and vision (e.g. Burns, 1978), their use of power (e.g. French & Raven, 1959), and the role of situational factors like management philosophy, organizational culture (e.g. Dickson, Den Hartog, & Mitchelson, 2003), risk orientation, and trust (e.g. Mayer, Davis, & Schoorman, 1995).

Based on the co-existence of governance and leadership we argue that the alliance manager who is in a principal-steward governance situation is likely to demonstrate more transformational than transactional leadership behavior, whereas the alliance manager who is in a principal-agent governance situation is likely to exhibit more transactional than transformational leadership behavior. A steward is highly autonomous, empowered, intrinsically motivated, and committed to employing available alliance resources to achieve personal objectives as well as those of the partnering firms. Likewise, transformational leadership reflects the behavior of a manager who is highly self motivated, inspiring, and supportive towards the alliance team. Agents, however, are controlled because of their possible self interested behaviors. Agency governance focuses on incentive alignment, extrinsic motivation, and other control and monitoring systems. Likewise, transactional leadership reflects behaviors that are associated with extrinsic motivation, contingent-reward exchanges, and management by exception. The agent's display of transactional leadership in the alliance is hence a reflection of the principal-agent governance, which relies on the same mechanisms of control and influence.

Yet, although alliance managers might display mainly transactional leadership behavior in accordance with the characteristic of principal-agent governance, it is not unlikely for some manager who works within a principal-steward governance arrangement to also exhibit transactional behaviors since stewardship governance clearly includes agency-type characteristics. Following this logic we can expect a steward to draw on both transformational and transactional leadership behaviors.

Capability development

The development of capabilities in alliances is influenced by the structure of the alliance governance and the behavior of its leaders. The governance structure that the alliance partners (principals) implement in order to align the manager's behavior with the objectives of the alliance provides the context in which the alliance leaders' actions take place. Governance mechanisms can restrict or enable the alliance leaders' autonomy regarding, for example, operational objectives. So while the mechanisms of governance guide the alliance managers, the alliance manager's leadership behavior in turn influences the alliance team's interactions and its joint effort in working towards a common goal. The leader provides a tangible vision of alliance outcomes; selects and combines resources; and agrees on objectives, timeframes, roles, and responsibilities. Hence, the governance context in conjunction with the co-occurrence of leadership behavior affects the development of operational and dynamic capabilities within the alliance. Operational capabilities represent established

resources and competencies that require merely the management of known routines and decision making based on the agreements between partners; dynamic capabilities, on the other hand, require entrepreneurship, intrapreneurship, learning, and knowledge within the alliance team (Teece, 2003; Zahra et al., 2006).

Our conceptual model is based on the rationale that the influence of governance mechanisms and leadership behaviors on alliance capabilities can be assessed using a framework rooted in dynamic capability, stewardship, and full-range leadership theories. We interpret different types of alliance governance as being co-existent with certain leadership behaviors within alliance teams following the principles of stewardship theory and full-range leadership theory. The dynamic and operational capabilities which then develop are influenced by the co-occurrence of alliance governance and alliance leadership. A graphical representation of the hypotheses that we advance to encapsulate these theoretical arguments is presented in Figure 1 in the Appendix.

HYPOTHESES

Transformational leadership

Transformational leadership behavior encompasses four behavioral dimensions: idealized influence, inspirational motivation, intellectual stimulation, and individual consideration (Bass, 1985). Given that these behaviors support entrepreneurship, intrapreneurship, learning, and/or the creative use of existing knowledge within the alliance, we propose that they influence the development of dynamic and operational capabilities. To support our argument we draw on research that not only documents the direct and indirect effects of transformational leadership but also clarifies how an individual's characteristics influence innovation and creativity at the group level.

The first dimension of transformational leadership, idealized influence, refers to behavior that represents a clear vision and sense of purpose. Transformational leaders who show this behavior foster a collective identity for their organization, its vision, and its values, (Jung et al., 2003) and maintain high levels of intrinsic motivation and creativity among followers (Shin et al., 2003). Intrinsic motivation, in turn, forms an integral aspect of entrepreneurial behavior and is a prerequisite for organizational learning (Osterloh & Frey, 2000). In accordance with this view, we suggest that the extent to which the alliance manager displays idealized influence supports the intrinsic motivation of alliance team members. Likewise, we argue that the leaders' effort in aligning the personal values of followers with the alliance objectives supports internalization, cooperation, and congruence among team members (Shamir, House, & Arthur, 1993). Furthermore, idealized influence behavior affects the alliance culture and communication among alliance team members. Zollo and Winter (2002), for example, argue that both vibrant communication among alliance team members and a collective culture support learning which, in turn, is essential for capability development.

Inspirational motivation, the second dimension of transformational leadership, refers to inspiring followers by communicating a convincing vision of the future and challenging them with high standards while providing encouragement and meaning for the tasks at hand (Hater & Bass, 1998). Inspirational motivation behavior too

influences followers' intrinsic motivation and the communicative interaction within the alliance team, both of which support learning mechanisms within the alliance team (Lyles, 1988).

Intellectual stimulation, as the third dimension of transformational leadership, involves encouraging followers to be creative and innovative by challenging their beliefs and values, and questioning underlying assumptions and the status quo. The extent to which an alliance team leader intellectually stimulates team members influences their critical thinking and entrepreneurial conduct since it reflects the ability to think cogently and to put thoughts into action. Further, in an intellectually stimulating work environment, followers are likely to seek innovative approaches when doing their work and to achieve superior performance (Howell & Avolio, 1993). Indeed, Dvir *et al.* (2002) argue that followers with a transformational leader have high self confidence and take a critical and independent approach toward their work. Thus, when transformational leaders show intellectual stimulation behavior, they support a culture that values creative thought processes, risk taking, and innovative work approaches. For that reason we argue that the extent to which a transformational leader intellectually stimulates followers influences the risk orientation within the alliance team. A risk-taking attitude among alliance team members permits entrepreneurial action and supports the development of dynamic capabilities.

The last dimension of transformational leadership, individualized consideration, refers to the leaders' unique way of caring for their followers and showing empathy, appreciation, and support for individual initiatives, so that followers are likely to take risks when experimenting with ideas (Shamir *et al.*, 1993). A culture that supports risk taking also encourages the development of new ideas and knowledge within the alliance. We suggest that the extent to which an alliance team leader individually considers team members affects the alliance team's risk orientation. In addition, individually considerate leadership behavior focuses on the development of followers' competencies in providing information and resources and giving followers discretion to learn and act. Therefore followers are more likely to engage in new and different approaches to their work and to develop the capacity to think on their own. This implies an influence of the alliance team leaders' individualized consideration on followers' job autonomy, which is an additional integral part of entrepreneurial behavior.

The four dimensions of transformational leadership behaviors also support shared and informal leadership structures. A leader who, for example, motivates and stimulates the alliance team to work independently and in a self responsible manner and who directs them to be critical towards established routines is likely to share responsibility with a co-leader and those alliance team members who have no formally appointed leadership role. Supporting this view, Avolio and Gibbson (1988) propose that transformational leaders aim to develop followers' self management and self development skills by letting them implement actions without directly supervising or intervening. Hence the extent to which a transformational leader intellectually stimulates, motivates, and inspires followers increases the team members' job autonomy.

In addition, we argue that creativity among alliance team members is the foundation from which the recombination of pooled resources results in new capabilities. Various related studies found that through

explicit leadership behavior managers can control aspects that influence the organization (Damanpour & Evan, 1991) and contribute to a work environment (Amabile, Conti, Coon, Lazenby, & Herron, 1996; 2004), which enables creativity and innovation (Dess & Picken, 2000; Mumford, Scott, Gaddis, & Strange, 2002). In conclusion, there is ample support for linking the behavioral dimensions of transformational leadership to antecedent factors of alliance capability development. This fundamental influence of transformational leadership on the development of dynamic and operational capabilities leads to the following two hypotheses:

H1a: Co-occurring stewardship governance and transformational leadership behavior promote the development of dynamic capabilities in the alliance.

H1b: Co-occurring stewardship governance and transformational leadership behavior promote the development of operational capabilities in the alliance.

Transactional leadership

Transactional leadership behavior includes contingent-reward behavior and management by exception (Bass, 1985), both of which affect the development of operational capabilities. Contingent-reward behavior refers to an understanding that a follower's performance can be exchanged for rewards provided by the leader. Contingent-reward exchanges are positively related to followers' commitment, satisfaction, and performance (Bycio, Hackett, & Allen, 1995). The provision of rewards is usually formalized, so that the followers' participation in contingent-reward exchanges and their co-operation are mainly influenced by the leader's ability to clarify goals, provide feedback, and motivate followers by highlighting desirable outcomes upon successful task completion (Eisenberger, Armeli, & Pretz, 1998). The extent to which a transactional leader displays contingent-reward behavior influences the alliance team members' extrinsic motivation, which is in itself insufficient in motivating followers to perform in an entrepreneurial way or in encouraging learning. Contingent-reward behavior rewards the anticipated outcome and does not foster the development of dynamic capabilities. Yet, we assert that for the management of existing operational capabilities, that is, resources and established routines within the alliance, contingent-reward behavior helps support what Teece (2003) termed operations management.

The second dimension of transactional leadership, management by exception, refers to the supervision of task completion and dealing with any problems that might arise and correcting them to maintain performance. When employing management-by-exception behavior, the transactional leader specifies standards for compliance and ineffective performance. Decision making is formal and centralized, with formalized procedures reflecting a mechanistic, inflexible system of control. Such mechanistic practices in alliances hinder creativity and learning (Bucic & Gudergan, 2004) and reduce intrinsic motivation, with corresponding decreases in creativity and the ability to cope with problems and demands (Amabile et al., 1996). Following this notion, we propose that the extent to which a transactional leader follows a management-by-exception approach affects formality of procedures and centrality of decision making within the alliance. This results in a decrease of entrepreneurial activity and obliterates the grounds on which dynamic capabilities can develop. The management of operational capabilities, however, can benefit from a management-by-exception approach because operational capabilities

require maintenance, not development. In addition, the development of capabilities within the alliance diminishes with restrictions in available inputs, employees, time, and state of managerial practices. Operational capabilities are leveraged through their continual employment, that is, routines that form operational capabilities are habitual and require less and less conscious thought (Helfat & Peteraf, 2003).

Overall, transactional leadership supports the preservation of operational alliance capabilities through extrinsic motivation, formalized structures, and procedures. However, transactional leadership is of no consequence for the development of dynamic capabilities since centralized decision making, formality of procedures, and extrinsic motivation, as a result of transactional leadership, do not support entrepreneurial and intrapreneurial action or learning within the alliance. In accordance with the aforementioned co-occurrence of transactional leadership behaviors with agency and stewardship governance we suggest the following two hypotheses:

H2a: Co-occurring agency governance and transactional leadership behavior promote the preservation of operational alliance capabilities.

H2b: Co-occurring stewardship governance and transactional leadership behavior promote the preservation of operational alliance capabilities.

DATA AND METHOD

The empirical part of this paper is based on a survey that we conducted in order to assess the prevailing leadership behavior within alliance teams and to collect information on the practices, routines, and mechanisms that partnering firms use to govern the alliance and to develop capabilities. The survey was aimed at collecting data on managerial assessments of a single alliance experience. An invitation to participate was sent via email to 6,028 alliance managers worldwide.

Instrument development

An extensive review and synthesis of the literature was followed by a definition of constructs to enable empirical testing. Existing measurement scales were adopted and where it was not appropriate to directly replicate existing scales, modifications were made to suit the research context. In order to assess the prevailing leadership behavior and the performance of the alliance we reverted to original or slightly modified adaptations of previously tested and successfully applied measurement items of related studies. For the measurement of dynamic and operational capabilities and for alliance governance practices we adopted various existing scales and designed new ones following the steps suggested in Rossiter's (2002) C-OAR-SE approach for scale development. The C-OAR-SE procedure is a six-step approach that is characterized by a precise definition of constructs, a thorough generation and selection of items, and an emphasis on the reflection of the meaning of answer categories and reporting scale results.

The assessment of the literature and the scale development procedure yielded a set of questionnaire items that were comprehensively pre-tested to omit irrelevant aspects or aspects that could unnecessarily cause bias. We first used the questionnaire in personal interviews and early pre-tests with two professionals who were involved

in strategic alliances and two experienced researchers. The interviewees were selected based on their established reputation, prior experience, and related knowledge in the field. All interviews were semi-structured and lasted between 40 and 60 minutes. The objective was to verify the clarity of the items and to assess whether the content of the items tapped the conceptual domain of the focal construct (DeVellis, 1991). During the interviews a draft of the questionnaire was evaluated, wording of the statements was simplified, and possible misunderstandings were identified. The interviews helped gain a realistic understanding of the practices within alliances and significantly supported the appropriateness of the constructs for the theoretic measurement model and the relationships between them. As a result of the pre-test, we modified the wording of some items and improved several measures, further strengthening the content validity of the measurement models.

In a subsequent pilot study we sent a first wave of 300 email invitations to alliance managers who were registered members of the online professional business networking platform Xing.com. From the pilot study we gained 38 complete data sets, representing a response rate of 13%. The pilot data was analyzed to evaluate the relevance, validity, and reliability of the reflective and formative measurement model and the structural model. In addition, in using the partial least squares (PLS) estimation technique, the evaluation of the structural equation model indicated that the direction of predicted effects and the significance of related path coefficients were satisfactory. As a result of the analysis and additional feedback that we collected from pilot study participants, we were able to pre-confirm the constructs and reduce the number of questionnaire items. Table 1 presents the measurement items for the main variables that were finally used in the survey instrument.

The alliance team as unit of analysis

The unit of analysis in this study is the alliance team which is formed as a result of the collaboration between two or more independent organizations. It is the group of individuals who represent the collaborating firms and manage the commercial (or operational) aspects of the alliance. Although it is the individual partners' competitive strategy that directs the reason for collaborating with other firms, it is the actual practices of management that determine the nature and effectiveness of working relationships (Yoshino & Rangan, 1995). The people who are directly involved in the alliance shape its functioning and performance by engaging in formal and informal relationships that allow boundary-spanning initiatives, collaborative management techniques, mutual interests, reciprocal relationships, and resource sharing. The roles, behaviors, and interactions of the team members and managers establish joint managerial practices and routines. Focusing on the alliance team is appropriate because it is consistent with the prescriptions of our theoretical framework, which aims to shed light on managerial practices of governance and associated leadership behaviors that affect capability development and alliance performance.

To collect data at the alliance team level we used the key informant method. As Tippins and Sohi (2003) note, the use of key informants is an established way of gathering data in strategy research and is frequently used when gathering information at the corporate level (e.g. Kale, Dyer, & Singh, 2002; Simonin, 1997). Key informants provide insights into managerial practices that enable the researcher to understand the phenomenon being studied (Borg & Gall, 1989) whilst potential difficulties that are related to collecting responses in a

limited amount of time can be avoided. Because the core variables of this study—alliance governance, leadership, capabilities, and performance—exist at the level of the alliance, we designed the research to target respondents who were highly knowledgeable about their firms' alliances.

In accordance with previous studies (Parkhe, 1993b; Simonin, 1999), we chose the alliance manager who had operational responsibility for the alliance to be the key informant (Kumar, Stern, & Anderson, 1993). The alliance manager is familiar with the operational and managerial aspects of the alliance's governance and the type of prevailing leadership within the alliance team, based either on the managers' reflection of his or her own leadership behavior or on observed leadership behavior. This detailed knowledge of the day-to-day and overall aspects is more accurate than that of any other potential respondents. The alliance manager, it is assumed, would also be willing to communicate relevant information (Kumar et al., 1993). Thus, asking the alliance manager to be the key participant can ensure the collection of appropriate data. Key informants were requested to identify one specific, preferably well-established alliance with which they had experience and of which they had detailed knowledge. To further validate the key informants' appropriateness to answer the questionnaire, alliance managers were asked to provide details regarding the focal alliance experience, such as their specific role, the developmental stage and duration of the alliance, the number of partnering organizations, and how long they had been working for the focal alliance. Alliance managers were asked to answer all questions in relation to that alliance only. This ensured that the unit of analysis was adequately addressed and that relevant information was collected.

Data collection

To collect sample data for the main study we directly contacted alliance managers who were members of the Association of Strategic Alliance Professionals (ASAP) or the professional business networking platform Xing.com. As a second source of data we used a U.S. senior manager panel. With these two primary sources, we were able to address the people that could be considered appropriate when gathering data on governance practices, leadership, and the performance of alliances. Participants were invited to respond with regard to one of their firm's alliances and related management practices. Overall, we received 436 responses representing a response rate of 22%, which is similar to other studies on alliances (e.g., Heimeriks, Duysters, & Vanhaverbeke, 2005; Kale et al., 2002; Reuer, Park, & Zollo, 2002a; Zollo, Reuer, & Singh, 2002). The final data set consisted of 369 valid responses, of which 113 were from participants who were members of ASAP or Xing.com, and 256 were from participants who were members of the U.S. senior manager panel. All responses to our survey were from individuals who were or had been directly involved in alliances; they included 111 senior executives with responsibility for all alliances of their organization, 152 alliance managers with leadership responsibility for the focal alliance, 42 operational alliance managers, and 64 other alliance managers and team members. The majority of participants (66.4%) had been working for their organization for more than five years and 77% had been working for the focal alliance for more than two years. We consider the overall response rate satisfactory, given the experience and seniority of the respondents and the generally intense surveying activity in the alliance sector.

The three most frequently stated industry affiliations of participating alliance managers were information technology (22%), healthcare and life science (14%), and consulting and professional services (11%). A detailed distribution of respondents' industries can be found in Table 2. The majority of participating organizations were based in North America (78%); the rest were from Europe (16%), Asia (5%), and the rest of the world (2%). Table 3 shows the size of the firms in our data set. Over 40% of the firms employed more than 1,000 employees, and 35% generated a sales revenue of over US\$100 million. The alliances that the participants focused on operated mainly at a global or multinational level (46%); fewer operated at a regional level (28%) or a national level (27%). More than half (65%) of the alliances were non-equity partnerships, and 21% of the alliances were public-private partnerships. Sixty six percent of firms reported being satisfied with their alliances, which is more than what was found in other studies (Park et al., 2001).

In order to ensure that our data did not have a non-response bias, we compared early and late respondents with respect to the number of employees of alliance partners, sales revenue, and alliance experience (Mohr & Spekman, 1994; 2002). Chi-square tests showed no difference between early and late respondents, implying that there was no significant non-response bias (Armstrong & Overton, 1977; Kanuk & Berenson, 1975).

Gathering cross-sectional data from key informants for independent and dependent constructs also creates the potential for common method variance to be an explanation for the interrelationships observed amongst the study constructs. To minimize this possibility we designed the measurement constructs and the survey questionnaire following the suggestions made by Podsakoff and co-authors (2003) and used Harman's single-factor test to verify that common method bias was not present. Accordingly, the study variables were entered into a principle components factor analysis and the results of the unrotated factor solution were observed (Luo & Tan, 2003). The presence of six factors with eigenvalues greater than one, which together account for 67.12% of the total variance, and the fact that no single underlying factor accounted for the majority of the variance among the variables suggests that there is no serious problem with the common method bias (Lane, Salk, & Lyles, 2001).

Measures

Explanatory variables

The two explanatory variables in our study were alliance leadership and alliance governance. To assess *leadership behavior* within the alliance team we used the Multifactor Leadership Questionnaire (MLQ) Form 5X Short (Bass & Avolio, 1997), the most frequently used measure of transformational and transactional leadership (e.g. Antonakis, Avolio, & Sivasubramaniam, 2003; Hunt, 1999; Lowe, Kroeck, & Sivasubramaniam, 1996; Shin & Zhou, 2003; Yukl, 1999). Extensive research on the MLQ has confirmed that it is a psychometrically sound instrument (Avolio, Bass, & Jung, 1999; Bass, 1998; Bass et al., 1997). The MLQ has four items for each of the seven sub-dimensions of transformational and transactional leadership: idealized influence (attributed), idealized influence (behavior), inspirational motivation, intellectual stimulation, and individual consideration as sub-dimensions of transformational leadership; and management-by-exception

and contingent reward as sub-dimensions of transactional leadership. Because we measured leadership at the alliance team level the measurement items were slightly modified to suit the alliance team context (Rousseau, 1985). For example, one item that measured idealized influence was: “The manager(s) of this alliance go beyond self interest for the good of the alliance team.” Participants were asked to indicate on a five-point scale ranging from 1, “not at all,” to 5, “frequently, if not always,” how frequently each statement fitted the prevailing behavior within the alliance, including their own behavior in case they had leadership responsibility.

To clearly distinguish governance practices from leadership behavior we designed a measurement scale for *governance* that assessed the extent to which commonly used alliance governance practices were used within the focal alliance. We identified 19 different strategic and operational practices of alliance governance. Strategic governance practices include: planning and approving alliance objectives, planning and signing off alliance/business strategy, clarifying and managing expectations of alliance partners and managers, specifying responsibilities for alliance managers, specifying and monitoring alliance performance metrics, developing and approving budgets and investments, determining salary and salary structures, providing access to training and development, establishing policies about knowledge exchange, specifying policies about bringing in additional alliance partners, managing intellectual property issues for the alliance, and developing operational alliance strategies (e.g. product/service, marketing, and sales). Operational practices include: establishing alliance engagement procedures, changing alliance structures and processes, evaluating performance of managers, providing feedback to alliance managers, promoting or replacing team members, promoting or replacing alliance managers, and reporting of alliance status and results.

Key informants assessed these practices in terms of four dimensions of alliance governance: decision-making centrality, formality, trust, and long-term strategic orientation. We define decision-making centrality as the degree to which decision-making rights and processes are concentrated among executives of the parent organizations. Key informants indicated for the 12 strategic and seven operational practices whether alliance team members, alliance managers, other managers of partner firms, or executives of partner firms were involved in the final decision making for that particular practice. Key informants were asked to rate formality on a five-point scale ranging from 1, “very informal,” to 5, “very formal.” Formality was defined as the degree to which the use of governance practices is agreed upon and communicated as rigid, mechanistic, and inflexible. Key informants rated trust on a five-point scale ranging from 1, “trust only,” to 5, “control only.” Trust was defined as the degree to which parent organizations and alliance managers based the use of governance practices on mutual understanding, confidence, and shared expectations. And lastly a reduced set of nine strategic and two operational governance practices were rated on a five-point scale in terms of long-term versus short-term strategic orientation, which we define as the degree to which the parent organizations use governance practices that support long-term effectiveness and quality as opposed to short-term efficiency and cost control.

Dependent variables

Dependent variables in our study include dynamic capabilities, operational capacities, and alliance performance. Following our conceptual definition of **dynamic capabilities** we defined seven dimensions for its measurement: proactiveness, innovativeness, risk taking, competitive aggressiveness, relational capital, knowledge, and learning. For each dimension we asked participants to evaluate randomly assorted statements on a five-point scale ranging from 1, “strongly disagree,” to 5, “strongly agree.”

The first dimension, *proactiveness*, is defined as the degree to which the alliance team members employ a forward-looking perspective and engage in using alliance resources, employing new technology and skills, uncovering and developing shared market opportunities ahead of the competition, and acting in anticipation of future requirements to create a shared competitive advantage and to improve the functioning and performance of the alliance. To measure the alliance team’s proactiveness we used six items adapted from Covin and Slevin’s (1986) corporate entrepreneurship scale.

The second dimension, *innovativeness*, is defined as the extent to which the alliance team establishes shared routines and procedures that support creativity and experimentation in developing new processes, and introducing the latest knowledge and technology to the alliance in order to research, develop, and introduce new products and services. We used six items based on Covin and Slevin’s (1986) corporate entrepreneurship scale.

As the third dimension of measuring dynamic capabilities, we define *risk taking* as the degree to which the alliance team engages in routines and behaviors that reflect a bold and determined attitude towards uncertainty about the availability of resources, the partnership situation, and the competitive and market conditions for the alliance. We measured risk taking using five items based on Brush’s (2003) scale of a firm’s risk propensity, Covin and Slevin’s (1986) corporate entrepreneurship scale, and Bucic and Gudergan’s (2002) scale for risk taking. The fourth dimension, *competitive aggressiveness* is defined as the degree to which the alliance team engages in routines and procedures that reflect the intention to take on and dominate competitors; it was measured using four items based on the work of Covin and Slevin (1989).

Relational capital, the fifth dimension, is defined as the degree to which the alliance team employs routines and procedures that facilitate personal interaction, friendship, mutual trust, respect, and high reciprocity among partners. We measured relational capital using three items previously introduced by Kale and Singh (2000). Finally, *alliance knowledge* is the level of accumulated expertise within the alliance compared to competitors, and *alliance learning* is the degree to which the alliance team acquires and develops new knowledge, information, and skills within the alliance compared to competitors. We developed four questionnaire items for alliance knowledge and four items for alliance learning.

An instrument to measure **operational capabilities** has not yet been developed in the literature. We therefore designed a scale that assessed operational capabilities by two dimensions: *task control* and *task proficiency*. Participants assessed these two dimensions in regards to a list of 12 general capabilities or functions of the

alliance, which included: research and development; business planning and strategy; finance and controlling; procurement and logistics; production and service delivery; marketing and sales; customer management and service; human resource management; training and development; IT and systems support; public, political, and legal management; and quality management. To measure the task control of one of these capabilities we asked key informants to indicate whether a task was performed by the alliance team, one of the partnering organizations, and/or by an external provider. The responses resulted in an index score from 1, “carried out by an external partner only,” to 11, “carried out by the alliance team only,” representing the degree to which the individual operational capability was performed by the alliance team. To measure task proficiency we asked key informants to indicate the alliances’ expertise for each of the 12 aforementioned general capabilities of the alliance in comparison to the perceived expertise of the alliances’ competitors. Participants rated each of the capabilities on a five-point scale from 1, “significantly worse,” to 5, “significantly better.”

The measurement of **alliance performance** has been dealt with extensively in the past and has resulted in the use of different scales (Ariño, 2003; Gulati, 1998; Park & Ungson, 2001). The apparent consensus is that a managerial assessment provides a sound reflection and an effective way to assess the alliance performance (Geringer & Hebert, 1989; Kale et al., 2002; Kale & Singh, 1999). We therefore measured alliance performance using a slightly modified version of the six sub-dimensions of output and process performance proposed by Ariño (2003). *Output performance* was designed as a combined measure of the importance of potential alliance goals multiplied by the degree of fulfillment of these same goals (Parkhe, 1993a). Goal importance was a five-point scale measuring informants’ consideration of the extent to which the possible goals were important to their firm. Goal fulfillment was a five-point scale measuring informants’ assessment of the extent to which each of the identified goals was fulfilled. The list of strategic goals included: reducing cost/obtaining scale economies, gaining access to a market in the same or another industry, developing new technologies, blocking the competition, meeting government requirements, developing new skills, sharing knowledge, and reducing risks. *Alliance process performance* had two dimensions: overall performance satisfaction, which was measured with a one-item scale from 1, “very unsatisfied,” to 5, “very satisfied,” and net spillover effects, representing informants’ assessment of the difference between positive and negative effects of the alliance on other activities of their firm (Parkhe, 1993b). Net spillover effects was measured on a five-point scale, ranging from 1, “strongly negative,” to 5, “very positive.”

Control variables

We included a number of control variables for other factors that might be related to aspects of alliance management and performance. First, a control for the *scope of the alliance* was incorporated. While less defined alliances are sometimes of greater strategic importance (Borys & Jemison, 1989), they are also more difficult to monitor and co-ordinate, possibly involving more rigid governance agreements. We measured the definition of alliance scope using one item asking participants to rate the extent to which objectives and activities of the alliance are defined on a five-point scale, ranging from 1, “very well defined,” to 5, “very poorly defined.” For a similar reason we incorporated a measure for the *governance mode* of the alliance. The involvement of shared equity in alliances can influence the characteristics of the governance mechanisms they

choose to manage the alliance (Gulati, 1995b; Oxley, 1999; Oxley & Sampson, 2004) as well as the performance of the venture (Osborn & Baughn, 1990; Saxton, 1997). We measured the governance mode using a binary variable, assigning 1 to alliances that used equity and 0 for non-equity alliances.

In addition, the extent to which partners are able to develop advanced capabilities might also be influenced by the *number of alliance partners* seeking to co-ordinate their activities. Hence we included a measure to control for whether the alliance was between multiple partners or two partners only. As a final control variable, we assessed the *alliance duration* because partners in long-lasting alliances typically developed reciprocal understanding, so that impeding conflicts were less likely (Lin & Germain, 1998; Martin, Swaminathan, & Mitchell, 1998). We measured alliance duration by an item capturing the number of years an alliance had been in existence at the time of measurement (Kotabe, Martin, & Domoto, 2003; Simonin, 1999).

Model specification

We specified four of the constructs in the model using reflective indicators and two of the constructs using formative indicators (Fornell & Cha, 1994). In order to verify that the indicators of each construct measured what they were supposed to measure, various tests of validity were performed.

Evaluation of the reflective measurement model

We conceptualized transformational and transactional leadership, as well as dynamic capabilities and alliance performance, as reflective measurement constructs. Reflective items represented different interpretations of a construct's meaning (Rossiter, 2002); their convergent reliability (Bagozzi & Phillips, 1982) was assessed by indicator (Nunnally & Bernstein, 1994) and construct reliability (Peter, 1981). We examined indicator reliability by looking at the construct loadings. All factor loadings for the reflective constructs in the model were significant at the 0.01 level and were above the recommended .70 parameter value. Significance tests were conducted using the bootstrap routine with 500 samples (Chin, 1998). Construct reliability and validity were tested by assessing the composite reliability (CR) and average variance extracted (AVE) (Fornell & Larcker, 1981). Table 4 presents values for CR and AVE for each construct and sub-dimension for the two sub-samples as well as the complete data set. The estimated indices for transformational and transactional leadership constructs were above the threshold (Bagozzi, 1988) of .60 for CR and .50 for AVE. For some sub-dimensions of the dynamic capability construct and alliance performance, the indices for AVE were slightly below the threshold; however, CR indices clearly exceeded the threshold value.

We next examined the discriminant validity of reflective constructs by examining cross-loadings, which were obtained by correlating the component scores of each latent variable with its indicators and all other items that were included in the model (Chin, 1998). The analysis of cross-loadings revealed that each item loaded higher on its respective construct than on any other constructs. We further examined discriminant validity by testing whether the AVE measures for any two constructs that were related in the conceptual model exceeded their squared correlations (Fornell et al., 1981) and found that this condition was also satisfied in every case. Overall, the analysis of the reflective measurement model implied discriminant validity for both sub-samples and the

complete data set. Table 5 presents the cross-loadings; factor loadings on respective constructs are shown in italics.

Evaluation of the formative measurement model

In this study the scales for alliance governance and operational capabilities were formative. While formative scales are seemingly heterogeneous from the respondent's perspective, they form a representative set of categorical responses that constitute the construct (Rossiter, 2002). We defined each item of the governance and operational capability scales as an independent dimension and we expected responses for each item to vary amongst each other. Fornell and Cha (1991) suggest that the criterion for indicator choice should be substantive theory, followed by predictive power. The items for the governance and operational capabilities construct have expert validity since their definition is based on managerial insights and pre-testing during the pilot study. As a further test for indicator relevance we compared the weighted scores of formative items and found significant estimates for the scales in this study. We also tested for multi-collinearity by looking at the variance inflation factor (VIF). None of the constructs revealed a VIF higher than the threshold of 10, indicating no critical levels of multi-collinearity (Höck & Ringle, 2006). Table 6 shows the variance inflation factors for the two formative scales.

Model estimation and evaluation technique

To estimate the hypothesized relationships, we used Partial Least Squares (PLS) analysis (Chin, 1998) with smartPLS (version 2.0 M3) (Ringle, Wende, & Will, 2005). PLS is an analytical approach to situations where theory is less established and where the available variables or measures would not necessarily conform to a rigorously specified measurement model (Chin, 1995; Wold, 1982); a growing number of researchers now use this approach (Duxbury & Higgins, 1991; House, Spangler, & Woycke, 1991; Kahai, Sosik, & Avolio, 1997; Sosik & Godshalk, 2000). The emphasis of PLS is on predicting responses rather than understanding underlying relationships between variables, which is why PLS is also referred to as "soft modeling" (Tobias, 1992). PLS uses a principal components measurement model, where the latent constructs are defined as linear composites of the measures associated with them. In restricted cases, these linear composites are equivalent to principal components (Chin, 1995).

PLS analysis thus overcomes many of the restrictive assumptions underlying maximum likelihood (ML) techniques; it is more suitable in our study compared to covariance-based structure equation modeling for several reasons. First, the data points of PLS analysis do not follow a multivariate normal distribution since the coefficient of multivariate kurtosis and skewness is smaller than -2 and greater than 2 for all variables in the model. Multivariate normal distribution is assumed for covariance-based SEM, but not for PLS (Chin, 1998). Second, we defined formative scales to measure governance and operational capabilities, which covariance-based SEM cannot easily account for, while both formative or reflective modes can be more easily modeled in PLS (Chin & Newsted, 1999). Finally, PLS has been considered suitable for the estimation of not yet well-established theoretical frameworks (Bagozzi & Yi, 1994; Fornell et al., 1994). Our framework represents a new

theory, which has not been tested before. Overall, given the explicit assumptions regarding constructs and theorized relationships of the proposed model, it is appropriate for this study to employ PLS analysis (Fornell & Bookstein, 1982; Hulland, 1999; Lorange & Roos, 1991).

The evaluation of the PLS structural model is typically based on three criteria: the size of the coefficient of multiple determination (R^2) for the latent endogenous variables, the direction and significance of the path coefficients, and the effect size (f^2) (Götz, Krafft, & Liehr-Gobbers, 2005; Hulland, 1999). We also conducted a Finite Mixture Analysis. *Finite Mixture PLS* is a model estimation technique that deals with the heterogeneity of data by generating class-wise improved estimates for the structural model, thus integrating data segmentation into PLS-based analyses of path models. Finite Mixture PLS assumes that the sample is a discrete mixture of a limited but unknown number of components and that each component is characterized by a specific distribution. In this study, Finite Mixture PLS also helps determine segments in the data set that might have different effects on leadership behaviors and capability development when only a limited number of segments are homogeneous in terms of the predicted model relationships. In particular, we expect variation among the researched alliances because of the different types of governance that co-occur with different leadership behaviors. In addition, other unobserved and discrete moderating factors, like organizational culture or political aspects, are likely to be present. In our analysis we follow the Finite Mixture procedure proposed by Hahn *et al.* (2002). In what follows we present the results and interpret our findings.

ANALYSIS AND RESULTS

Results of the PLS estimation

We tested the explanatory power of the entire model on alliance performance and the predictive power of the independent variables. First, the aggregate PLS result was analyzed to see whether the core relationships between leadership behaviors and capability development could be confirmed. Then the disaggregate Finite Mixture PLS models were estimated to analyze the role and influence of the underlying type of governance and the significance of the four hypothesized effects of co-occurring governance and leadership on capability development in the studied alliances.

The aggregate PLS result showed a significant and positive effect of transformational leadership (TFLS) on dynamic capabilities (DYC) and operational capabilities (OPC). Furthermore, we found a significant positive influence of transactional leadership behaviors (TALS) on the development of operational capabilities, and a significant positive effect of transactional leadership behavior on the development of dynamic capabilities. A comparison of the strength of leadership effects on capability development shows that the effect of transformational leadership behaviors on dynamic and operational capabilities is generally much stronger than the effect of transactional leadership behaviors. In particular, transformational leadership behaviors have a strong effect on the development of dynamic capabilities. The aggregate model also shows a significant, positive effect of dynamic capabilities and operational capabilities on alliance performance (AP). Overall, 46%

($R^2=.457$) of the variation in alliance performance can be explained by the explanatory variables in the model (see Table 11).

The analysis of the aggregate PLS estimation indicates the existence of strong and significant relationships between leadership behaviors and capability development in alliances and subsequent sustaining effects on alliance performance. However, the aggregate results alone cannot yet reveal the role and influence of the type of alliance governance since the results provide no evidence for the co-occurrence of specific alliance governance and leadership behaviors. This is expected, since our framework suggests that different types of governance have different effects on leadership behavior and subsequent capability development. We therefore anticipate two classes of cases among the data. To examine the heterogeneity of the data set, the Finite Mixture modeling procedure was applied for a varying number of segments (k). The results confirmed the existence of two segments ($k=2$). We validated these two latent data segments for the complete data set as well as independently for both sub-samples. Table 8 presents the fit indices for the PLS Finite Mixture results and model selection.

In order to verify whether the identified segments represented different types of alliance governance, we first compared the size of the segments with the size of a grouping that was derived from a governance index, and secondly, we conducted an independent sample t-test including all variables in the structural model. The governance index was based on the latent variable scores for the governance scale and shows whether a particular alliance has principal-agent or principal-steward governance. In keeping with our conception, low scores for stewardship governance co-occurred with transformational leadership behavior, while high index scores, representing agency governance co-occurred with transactional leadership behavior.

An independent sample t-test was conducted to determine if the difference between segments could be attributed to any of the core variables or control variables in the model. Values for mean, standard deviation, and significance (p -value) for governance, transformational leadership, transactional leadership, dynamic capabilities, operational capabilities, alliance performance, alliance scope, governance mode, the number of alliance partners, and alliance duration were compared. We found that cases in Segment 1 had a significantly higher governance score than cases in Segment 2. The calculated difference in the means of the governance score between the two segments was significant at the 0.05 level; no other core variable showed significantly different results within the two segments. Following the design of the governance scale and the results of the t-test, we identified Segment 1 as representing alliances with agency governance and Segment 2 as representing alliances with stewardship governance. The detailed results of the t-test are presented in Table 9.

Using the two segments, representing agency governance and stewardship governance, it is possible to analyze whether the variation in the effects of leadership behavior on capability development could be attributed to the type of alliance governance. Hence, the two segments were estimated individually using the PLS method. The detailed results are reported in Table 10. We first looked at the significance and strength of the relationship between the governance type and transformational or transactional leadership. Segment 1, the agency governance segment, had a significant and stronger relationship between agency governance and transactional

leadership behavior, while Segment 2, representing stewardship governance, had a significant and stronger relationship between stewardship governance and transformational leadership behavior. This result provides support for our assumption of co-existing agency governance with more transactional than transformational leadership behaviors and stewardship governance with more transformational than transactional leadership behaviors.

The estimation of the two segments revealed additional results. The stewardship governance segment showed a strong and significant relationship between transformational leadership and the development of dynamic and operational capabilities. We also found that in alliances with stewardship governance characteristics, transactional leadership behavior had a significant positive effect on dynamic and operational capability development. The r-square indicates that 54% ($R^2=.535$) of the variation in dynamic capabilities and 20% ($R^2=.200$) of the variation in operational capabilities can be accounted for by stewardship governance and transformational and transactional leadership. Furthermore, the influence of dynamic capabilities and operational capabilities on overall alliance performance was also significant, with the individual effect of dynamic capabilities being much stronger than the effect of operational capabilities. Overall, for stewardship governance, the PLS results showed that 50% ($R^2=.496$) of the variation in alliance performance could be attributed to independent variables.

On the other hand, when agency governance was present the PLS results revealed no significant relationships between leadership behaviors and the development of alliance capabilities. However, the effects of dynamic and operational capabilities on alliance performance were equally strong and significant. Overall, the results showed that when agency governance prevails, only 35% ($R^2=.351$) of the variation in alliance performance stems from the leadership and governance variables in the model.

Finally, the analysis of the effects of control variables in the model showed differences among alliances with agency governance and alliances with stewardship governance. In the former case the PLS results revealed a significant effect of the alliance mode (MODE) on alliance performance, while in the latter case we found that the definition of the alliance scope (SCOPE) and the alliance duration (DURA) significantly affected alliance performance.

Summary of results

We summarize our findings in terms of our hypotheses. In support of H1a we find that co-occurring stewardship governance and transformational leadership behavior support the development of dynamic capabilities in the alliance. In support of H1b, co-occurring stewardship governance and transformational leadership behavior support the development of operational capabilities. H2a, however, is not supported—that is, co-occurring agency governance and transactional leadership behavior do not support the maintenance and building of operational alliance capabilities in our study. Lastly, H2b is supported in the results which show that co-occurring stewardship governance and transactional leadership behavior support the development of operational capabilities.

There are three important additional findings. First, dynamic capability development and consequent performance in alliances that follow a stewardship governance approach are influenced by the full range of leadership behaviors, namely, transformational and transactional leadership behaviors. Second, dynamic capabilities have a significantly stronger effect on alliance performance when the alliance follows a stewardship governance approach, whereas operational and dynamic capabilities have an equally strong effect on alliance performance when alliance governance has principal-agent characteristics. And finally, while the governance mode represents an additional influence on performance in alliances with agency governance, the scope of the alliance and the alliance duration are additional influences of alliance performance in case of stewardship governance.

DISCUSSION AND CONCLUSION

Although there is generally an increased number of studies on alliances (e.g. Ariño, 2003; Gerwin, 2004; Gudergan et al., 2002; Hoang & Rothaermel, 2005), up till now no research has addressed and empirically validated the intricacies of governance, leadership behavior, capability development, and alliance performance. This study focuses on the relationships among these aspects of alliance management and contributes to the theoretical discussion by testing a new conceptual framework of capability development at the inter-organizational level. Based on the dynamic capability view of the firm (Helfat et al., 2007; Teece et al., 1997), stewardship governance theory (Davis et al., 1997), and full-range leadership theory (Bass, 1985), we clarify how the partnering firms' implemented governance practices and associated leadership behaviors within their alliance teams assist in the development of operational and dynamic capabilities.

The findings of our study have various implications for our understanding of strategic management. First, the empirical study confirms that even though different types of governance in alliances generally co-exist with the full range of leadership behaviors, agency governance particularly promotes transactional leadership, whereas stewardship governance encourages transformational leadership behaviors of the alliance managers. This is in accordance with our theoretical model and the underlying governance (Davis et al., 1997) and leadership (Bass, 1985) theories. Alliance managers adopt their leadership behavior to the situational context, which in this case embraces the governance arrangements for the alliance. So, when alliance governance has principal-agent characteristics, the alliance manager displays more transactional than transformational behaviors, and when the alliance governance has principal-steward characteristics, the alliance manager displays more transformational than transactional leadership behavior. The co-existence of different types of governance and corresponding leadership is a central conjecture of our framework and the basis for our discussion about the observed effects of leadership behaviors on capability development in alliances. Moreover, this study indicates that an integration of governance and leadership theories based on the relatedness of their underlying situational and socio-psychological mechanisms (Davis et al., 1997) is viable and results in consistent findings in regards to effects on alliance capabilities. Additional conceptual and empirical research is required to further examine how governance and leadership affect other aspects of alliance management.

Second, since the results clearly confirm H1a and H1b, we conclude that transformational leadership behaviors that co-occur with stewardship governance significantly direct the development of dynamic and operational capabilities in alliances. This is in line with earlier studies that have linked transformational leadership behavior at the organizational level to increased innovation and performance (e.g. Jung et al., 1999), learning (e.g. Vera et al., 2004), team effectiveness (e.g. Jung et al., 2002), and group or individual performance (Jung et al., 2000). We also find that transactional leadership behavior has a significant, though weaker, effect on dynamic and operational capability development in case of stewardship governance (H2b). That is, while full-range leadership theory (Bass, 1985) and dynamic capability theory (Teece et al., 1997) imply that only transformational behaviors affect the development of dynamic capabilities, our results show a considerable influence of transactional behaviors as well. This is in line with research that suggests that transactional contingent-reward style leadership can be effective (Podsakoff, MacKenzie, Moorman, & Fetter, 1990) and that it is positively related to followers' commitment, satisfaction, and performance (Bycio et al., 1995; Podsakoff, Todor, Grover, & Huber, 1984). Hence, given that stewardship governance allows alliance managers to act more autonomously and to be empowered, we find that successful alliance managers indeed draw on the full range of leadership behaviors to achieve alliance objectives and strategically manage alliance performance. Capability development in alliance teams with stewardship governance characteristics is consequently a function of the alliance managers' capacity to apply various leadership behaviors depending on the situational requirements. Yet, while both types of leadership in our study contribute to the development of operational and dynamic capabilities, transformational behavior has a much stronger influence on the development of dynamic capabilities than transactional behavior.

Third, turning toward the effects of co-occurring agency governance and transactional leadership in the disaggregate model, we find that transactional leadership behaviors do not support the development of dynamic and operational capabilities. The proposed positive effect of transactional leadership behavior for the advancement of operational capabilities (H2a) cannot therefore be confirmed. This finding implies that the transactional leadership behavior of managers who work in alliances that are characterized by agency governance mechanisms is not relevant for altering the alliances' capabilities. Accordingly, the r-square values for operational and dynamic capability variables indicate that only 12% ($R^2=.115$) of the variation in dynamic capabilities and 15% ($R^2=.152$) of the variation in operational capabilities can be explained by the co-existence of agency governance and leadership. That is, the alliance managers' display of leadership is not notably driving capability development and subsequent performance in agency governed alliances.

A possible explanation for the lesser importance of transactional leadership is that in alliances for which partnering firms arrange control, monitoring, and sanctioning mechanisms to avoid the risk of alliance managers' adverse behavior, managers are not empowered or motivated to sustain the advancement of the alliance's capabilities. Hence, the alliance manager mainly administers, without promoting change or development through leadership action. This is in line with earlier research which suggests that transactional leadership does not involve the leader's commitment toward the follower's personal development nor does it involve higher levels of identification and trust among the leader and team members (Jung et al., 2000;

Podsakoff et al., 1990). Hence, the alliance manager's lack of obligation in maintaining and developing alliance capabilities by promoting individual alliance team members' capabilities results in the observed insignificance of transactional leadership behavior for capability development for agency alliance governance.

Another explanation could be the role of the governance mode. We found that 63% of the alliances in the agency governance segment were non-equity alliances and that, according to the PLS estimation, the governance mode in the agency governance segment has a significant negative influence on alliance performance. Consequently, alliance performance is restricted by non-equity arrangements in alliances that follow a principal-agent governance approach. This is in accordance with research that suggests that the governance mode can influence the characteristics of the partnering firms' choice of governance mechanisms (Gulati, 1995b; Oxley, 1999; Oxley & Sampson, 2004) and its performance (Osborn et al., 1990; Saxton, 1997). However, whether this means that an equity or non-equity governance mode influences the effectiveness of the alliance manager's leadership behavior, or whether leadership behavior is less important for capability development in agency-governed alliances is not yet understood.

The most important contribution of this study is its implications for alliance partners and alliance managers. First and foremost this study clearly suggests that those alliances that are formed to facilitate strategic renewal, and to drive innovation and diversification, would suffer from principal-agent governance and transactional leadership but profit from principal-steward governance and the associated emphasis of transformational and transactional leadership behaviors. Secondly, it is critical for alliance partners to understand that alliance governance is interrelated with the effectiveness of the alliance managers' leadership behavior and emerging alliance capabilities. Partnering firms that choose principal-steward governance will support capability development by employing managers who use the full range of leadership behaviors. In particular, the managers' transformational leadership behaviors support entrepreneurship, learning, and knowledge transfer among alliance team members that can ultimately result in superior performance and competitive advantage.

A limitation of the framework and this study are the multiple levels of analysis. Although we measure leadership at the alliance team level, the results ultimately relate to individual characteristics, which are then compared to alliance level capabilities and performance outputs. However, since capability development and alliance performance is highly related to the processes, practices, structures, routines, and underlying behaviors at various levels of analysis, the advancement of strategic management research in this area requires studies that cross multiple levels of analysis while addressing related concerns by adopting an appropriate research process (Goldstein, 1995; James, 1982; Rousseau, 1985).

Finally, while we relied on established measurement scales wherever possible, we had to design the measurement constructs for alliance governance practices, dynamic capabilities, and operational capabilities. Although we followed a consistent approach for the scale development and tested the items in a pilot study, the measurement instrument requires further validation in subsequent studies. The measurement instruments as well as the conceptual framework should be tested in additional empirical studies before generalizations can

emerge. Further support for the proposed framework could come from case studies, cross-sectional studies, and longitudinal studies of alliances.

APPENDIX II

Figure 1: Structural model and hypotheses

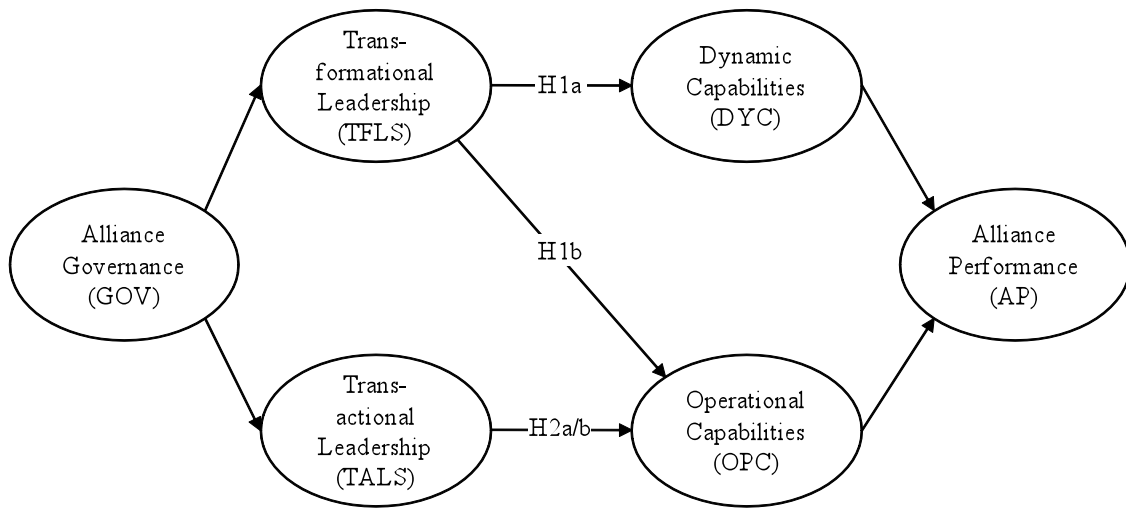


Table 1: Survey items for alliance leadership and governance study

Construct	Item/Scale
Transactional Leadership	The manager(s) of this alliance ...
Contingent Reward	(1) make clear what one can expect to receive when performance goals are achieved, (2) provide others with assistance in exchange for their efforts, (3) express satisfaction when others meet expectations
Management-by-Exception	(1) focus attention on irregularities, mistakes, expectations, and deviations from standards, (2) concentrate his or her full attention on dealing with mistakes, complaints, and failures, (3) keep track of all mistakes, (4) direct other team members' attention toward failures to meet standards
Transformational Leadership	The manager(s) of this alliance ...
Individual Consideration	(1) treat others as individuals rather than just members of the team, (2) help others to develop their strengths, (3) spend time teaching and coaching others, (4) consider everyone as having different needs, abilities, and aspirations from others
Idealized Influence (A)	(1) instill pride in others for being associated with him or her, (2) go beyond self interest for the good of the alliance team, (3) act in ways that build respect, (4) display a sense of power and confidence
Idealized Influence (B)	(1) talk about the most important values and beliefs, (2) specify the importance of having a strong sense of purpose, (3) consider the moral and ethical consequences of decisions, (4) emphasize the importance of having a collective sense of mission
Inspirational Motivation	(1) talk optimistically about the future, (2) express confidence that goals will be achieved, (3) talk enthusiastic about what needs to be accomplished, (4) articulate a compelling vision of the future
Intellectual Stimulation	(1) re-examine critical assumptions to question whether the assumptions are appropriate, (2) seek differing perspectives when solving problems, (3) suggest new ways of looking at how to complete assignments, (4) get others to look at problems from many different angles
Dynamic Capabilities	Please rate the extent to which you agree with the following statements reflecting the current or latest stage of the alliance ...

Construct	Item/Scale
Proactiveness	(1) In this team, we continuously engage in a process of finding and developing market opportunities, (2) In this team, we are proactive when implementing new products or services, (3) In this alliance team, we anticipate new trends and are normally the first to introduce new initiatives in the market, (4) We depart from established routines and behaviors to enhance the way we work with each other in the alliance, (5) In this alliance, team members are encouraged to actively identify new and better ways of working, (6) We proactively leverage alliance resources to foster best practices within the alliance
Innovativeness	(1) In this alliance, we have a strong emphasis on product and service innovation, (2) In this alliance, we jointly work on new solutions for our market(s), (3) In this alliance, we regularly bring in latest know-how on how to improve the way we work with our partners, (4) We always focus on identifying novel procedures and working routines for the alliance, (5) We encourage creativity among team members to improve internal operations within the alliance, (6) In this alliance, we support innovative approaches that help us work better together
Risk Taking	(1) The alliance often engages in high risk, high reward situations in its market(s), (2) We respond to uncertain market conditions with bold actions, (3) The business strategy of this alliance is characterized by a strong tendency to undertake high-risk projects, (4) We believe that bold, wide-ranging acts are necessary to achieve our alliance objectives, (5) We experiment with established routines and structures of the alliance, even if expected outcomes are uncertain.
Competitive Aggressiveness	(1) We engage in very aggressive and intensely competitive actions towards competitors, (2) In this alliance, we are forceful in working towards market dominance, (3) In this alliance, we often experience competitive clashes with our competitors, (4) In this alliance, we are very competitive, showing an “undoing-the-competitors” attitude
Relational Capital	(1) In this alliance, we interact closely and on a personal level with each other, (2) Alliance team members have mutual respect for each other, (3) Alliance team members trust each other
Alliance Performance	
Output Performance	(1) Overall, to what extent do you think your organization is satisfied with the performance of this alliance at this stage? (Very unsatisfied - Very Satisfied), (2) Alliances frequently produce positive or negative side-effects for the partnering organizations. For example, a positive side-effect is when new skills can be applied to other operations, while a negative side-effect is when a partner gains expert knowledge. In this alliance, the net side-effects for your organization have been: (Strongly Negative - Very Positive)
Process Performance	(1) How do you rate the importance of each of the following strategic goals for your organization at the beginning of the alliance? (Reducing cost/obtaining scale economies, Gaining access to a market in the same industry, Gaining access to a market in another industry, Developing new technologies, Blocking the competition, Meeting government requirements, Developing new skills, Sharing knowledge, Reducing risks) (Not Important – Very Important), (2) To what extent have these strategic goals been met? (Very Poorly – Very Well)

Table 2: Distribution of industries

Industry	Frequency	Percent
Information Technology (IT)	82	22.2%
Healthcare & Life Science	50	13.6%
Consulting & Professional Services	42	11.4%
Banking / Financial Markets	21	5.7%
Government	19	5.1%
Other	19	5.1%
Telecommunication	18	4.9%
Retail	13	3.5%
Education	12	3.3%
Consumer Goods	11	3.0%
Insurance	10	2.7%
Real Estate	10	2.7%
Travel & Transportation	9	2.4%
Non-Government Organization (NGO)	8	2.2%
Wholesale Distribution & Services	7	1.9%
Electronics	6	1.6%
Industrial Products	6	1.6%
Media & Entertainment	5	1.4%
Chemical & Petroleum	4	1.1%
Aerospace & Defense	3	0.8%
Agriculture	3	0.8%
Automotive	3	0.8%
Energy & Utilities	3	0.8%
Research	3	0.8%
Legal Services	2	0.5%
Total	369	100.0%

Table 3: Distribution of firm size

Number of employees	Frequency	Percent
1-100	109	29.5%
-1000	110	29.8%
>1000	150	40.7%
Sales revenue in US\$		
less than 2 million	65	18%
-50 million	142	38%
-100 million	34	9%
over 100 million	128	35%

Table 4: Indicator and construct reliability for reflective measurement scales

Construct	Items	Sample I (n=113)		Sample II (n=256)		Model (n=369)	
		CR	AVE	CR	AVE	CR	AVE
Transformational Leadership							
Individual Consideration	4	.85	.58	.87	.62	.86	.61
Idealized Influence (A)	4	.79	.56	.87	.70	.85	.66
Idealized Influence (B)	4	.79	.49	.81	.52	.81	.51
Inspirational Motivation	4	.86	.61	.87	.62	.86	.61
Intellectual Stimulation	4	.84	.58	.84	.57	.84	.57
Transactional Leadership							
Contingent Reward	4	.80	.50	.81	.51	.80	.51
Management-by-Exception	4	.87	.63	.87	.63	.88	.64
Dynamic Capabilities							
Proactiveness	6	.82	.44	.81	.42	.81	.42
Innovativeness	6	.85	.48	.85	.48	.85	.49
Risk Taking	5	.78	.42	.86	.55	.85	.52
Competitive Aggressiveness	4	.63	.38	.86	.61	.84	.58
Relational Capital	3	.81	.60	.83	.62	.82	.61
Knowledge	4	.87	.64	.83	.56	.85	.59
Learning	4	.77	.46	.82	.53	.81	.51
Alliance Performance							
Output Performance	9	.80	.31	.87	.42	.86	.40
Process Performance	2	.81	.68	.88	.78	.86	.76

Table 5: Cross-loadings for reflective measurement scales

Measurement Scale	Sample I (n=113)				Sample II (n=256)				Model (n=369)			
	TFLS	TALS	DYC	AP	TFLS	TALS	DYC	AP	TFLS	TALS	DYC	AP
Individual Consideration	.88	.63	.61	.32	.90	.68	.55	.45	.89	.66	.58	.43
Idealized Influence (A)	.87	.59	.48	.27	.90	.68	.57	.47	.89	.65	.55	.42
Idealized Influence (B)	.85	.58	.52	.33	.82	.60	.42	.39	.83	.58	.45	.38
Inspirational Motivation	.80	.60	.55	.30	.84	.60	.51	.45	.82	.58	.51	.41
Intellectual Stimulation	.89	.59	.62	.34	.88	.68	.56	.44	.89	.65	.58	.41
Contingent Reward	.69	1.0	.49	.26	.78	.97	.58	.48	.75	.97	.55	.42
Management-by-Exception	.07	.20	.07	.02	.05	.34	.12	.15	.09	.40	.11	.16
Proactiveness	.07	.17	.19	.05	.07	.22	.40	.27	.08	.23	.37	.22
Innovativeness	.60	.45	.90	.41	.52	.50	.89	.62	.55	.48	.89	.57
Risk Taking	.28	.22	.56	.25	.42	.43	.74	.56	.39	.36	.70	.46
Competitive Aggressiveness	.47	.38	.71	.34	.55	.47	.83	.63	.54	.44	.81	.57
Relational Capital	.52	.44	.84	.40	.62	.54	.91	.69	.59	.50	.89	.60
Knowledge	.52	.35	.68	.30	.48	.43	.72	.54	.48	.37	.68	.45
Learning	.33	.26	.51	.12	.16	.23	.49	.32	.22	.25	.52	.30
Output Performance	.12	.12	.17	.59	.36	.43	.65	.86	.31	.36	.54	.83
Process Performance	.38	.27	.46	.96	.50	.39	.58	.81	.47	.35	.55	.82

Table 6: Construct reliability of formative measurement scales

	No. of Items	Sample I (n=113)	Sample II (n=256)	Model (n=369)
		VIF	VIF	VIF
Alliance Governance				
Centrality	19	1.02	1.03	1.02
Formality	19	1.67	1.32	1.40
Trust	19	1.74	1.40	1.46
Strategic Orientation	11	1.10	1.06	1.07
Operational Capabilities				
Ownership	12	1.01	1.00	1.00
Proficiency	12	1.01	1.00	1.00

Table 7: PLS estimation results for aggregate model

Hypotheses/Effect		Model (n=369)	
		path	t-value
H1a	TFLS→DYC	.48	8.06**
H1b	TFLS→OPC	.29	4.01**
H2a/b	TALS→OPC	.16	2.12*
	TALS→DYC	.20	3.26**
	GOV→TFLS	-.41	1.90†
	GOV→TALS	-.35	1.78†
	DYC→AP	.59	16.41**
	OPC→AP	.16	3.44**

† p < 0.10; * p < 0.05; ** p < 0.01;
total effect-size (f^2) = path coefficient

Table 8: PLS Finite Mixture model selection

n=369	Selection Criteria*			
	AIC	BIC	CAIC	EN
Two Segments (k = 2)	4894	4999	4999	.42
Three Segments (k = 3)	5001	5162	5162	.44
Four Segments (k = 4)	5128	5343	5343	.44
Five Segments (k = 5)	5179	5448	5449	.47

* Model selection is based on Akai Information Criterion (AIC), Consistent Akai Information Criterion (CAIC), Bayesian Information Criterion (BIC), and Entropy Criterion (EN) (Hahn et al., 2002)

Table 9: T-test for disaggregate model

	Segment 1 (n=72)		Segment 2 (n=297)		Sig.	t-value	p-value
	Mean	S.D.	Mean	S.D.			
Governance	.23	.97	-.06	1.00	.99	2.17	.03*
Transformational Leadership	-.14	1.16	.03	.96	.00	-1.34	.18
Transactional leadership	-.09	1.17	.02	.96	.00	-.87	.38
Dynamic Capabilities	.02	.79	.00	1.05	.02	.17	.87
Operational Capabilities	-.01	.88	.00	1.03	.09	-.08	.94
Alliance Performance	-.05	.95	.01	1.01	.97	-.51	.61
Alliance Scope	2.19	.76	2.25	.87	.18	-.46	.65
Alliance Governance Mode	1.63	.49	1.66	.47	.30	-.56	.58
Number of Alliance Partner	2.07	1.17	2.01	1.20	.82	.40	.69
Alliance Duration	8.58	4.20	7.84	3.62	.02	1.51	.13

* p < 0.05

Table 10: PLS estimation results and segment comparison for disaggregate model

Hypotheses/Effect		Segment 1: Agency (n=72)		
		path	t-value	f ²
	TFLS→DYC	.29	.41	.07
	TFLS→OPC	.08	1.93†	.36
H2a	TALS→OPC	.33	.34	.06
	TALS→DYC	.06	1.85†	.28
	GOV→TALS	.62	9.12**	
	DYC→AP	.37	4.02**	
	OPC→AP	.34	3.28**	
	DURA→AP	.13	1.35	
	MODE→AP	-.30	2.81**	
	NUM→AP	-.05	.47	
	SCOPE→AP	-.15	1.47	
Hypotheses/Effect		Segment 2: Stewardship (n=297)		
		path	t-value	f ²
H1a	TFLS→DYC	.57	11.49**	.58
H1b	TFLS→OPC	.28	3.87**	.29
H2b	TALS→OPC	.20	2.69**	.19
	TALS→DYC	.21	3.49**	.20
	GOV→TFLS	.67	21.31**	
	DYC→AP	.64	16.25**	
	OPC→AP	.11	2.28*	
	DURA→AP	.11	2.13*	
	MODE→AP	-.02	.42	
	NUM→AP	.00	.07	
	SCOPE→AP	-.17	2.72**	

† p < 0.10; * p < 0.05; ** p < 0.01; total effect size (f²) = path coefficient, if not displayed individually

Table 11: R-square for aggregate and disaggregate model

Construct	Complete Model (n=369)	Segment 1 Agency (n=72)	Segment 2 Stewardship (n=297)
	R ²	R ²	R ²
Dynamic Capabilities (DYC)	.404	.115	.535
Operational Capabilities (OPC)	.180	.152	.200
Alliance Performance (AP)	.457	.351	.496

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