

Management of Alliances: Performance Effects of Project Managers' Participation

Abstract

Research on alliances largely neglects the empowered and participating employees who bring the alliance to life and promote its success. We thus explore the performance effects through participation of project managers in alliances. Specifically, we investigate in two classes of effects; primary and secondary effects. Primary effects relate to the effect of participation on the advantageous project management style. Through the project management styles, we found statistically significant implications on our secondary effects, on three dimensions of alliance performance: relational, innovation, and project management. We extend the investigation of participation into the affects of exogenous and endogenous uncertainties finding that technology uncertainty has a positive relation to a more social project management style.

INTRODUCTION

Success of alliances is not only rooted in a skilled selection of partners (Chung et al., 2000; Lorange & Roos, 1999), the formation routines and ties structures (Ahuja, 2000; Kale et al., 2002), and the maintenance of tie-structures (Gulati, 1995), but also the actual alliance management. To date, alliance management is still a rarely researched subject. In the pursuit of alliance performance, management has to be aware of the reason d' entrée of the alliance: generate surplus value through the synergistic inter-firm combination of heterogeneous knowledge. To generate surplus value, alliance project managers must articulate, reflect, and integrate different knowledge sets. Project managers are representatives of both the alliance and also of the allying firms. Therefore, the empowerment of project managers which promotes and actualizes their knowledge to the alliance is an important driver for alliance success. We argue

that with their blend of responsibility, alliance project managers must participate with their counterparts from the other firm for decision making and alliance management.

Little, if any, research has been conducted focusing on the participation issue as it influences the roles project managers, as boundary persons, have in alliance cooperation. Nor has research adequately investigated the factors that facilitate, support, or hinder the contribution participation makes to alliance performance. One may expect participation to favorably impact individual performance. Unfortunately, these effects have seldom been analyzed within firms and have not been introduced in the alliance literature. We argue that participation can have positive motivational, information processing, and knowledge creation advantages in alliances. Yet, participation in alliances is fraught with control costs. Control costs increase with the specialization of knowledge associated with alliances. Specialized knowledge, an underlying necessity of participation in alliances, is largely unobservable by the CEOs. This complicates the control in alliances as the transferring of decision rights to lower levels requires systems for measuring and evaluating project managers' performance.

Our study empirically explores the participation-performance link in alliances. Herein we introduce the participation issue into the alliance management literature. The aim of our study is to explore three components of alliance project performance, specifically innovative, project, and relational. We develop and test hypotheses with 179 alliances in the German Electronic Industry using structural equation modeling. Our study of the performance effects of participation also includes the consideration of uncertainty. Uncertainty has received considerable attention in the management and new product development literature (Lewis et al., 2002). Uncertainty is an important factor in the project manager's decision making. In an alliance, uncertainty may even be more influential than in an intra-organizational decision making setting.

The structure of the paper is as following. We present the theoretical development, literature review, and develop the hypotheses. The subsequent section discusses the method, including the sample and data. We then provide results of the empirical study. The last section concludes the paper.

THEORY

Understanding Alliances

The management of alliances are neither pure hierarchy nor pure market. Continual processes of adaptations and re-adaptations are present after the relationship is set up (Doz, 1996). Productive exchanges are engaged as both firms and their project managers are dependant on each other, and thus the project managers need to participate in order to achieve the goals of the alliance (Molm, 2001). Therefore, managers in alliances rely on continuous negotiations to develop knowledge and secure the rights of their participating firms (Lawrence & Phillips, 2002).

We extend Molm (2001) perspectives on social exchange to alliance management and the continuous negotiations with underlying communication and decision processes. Project managers as they engage in negotiations obey the logic that alliances generate their surplus value through synergistic inter-firm combination of heterogeneous knowledge. Singh and Mitchell (1997) develop that inter-firm cooperation can transfer knowledge of different competencies between the participating firms. Patel and Pavitt (1997) found that knowledge transfers are the basis of most innovations. These innovations require the integration of knowledge from different knowledge bases. Therefore, improved performance within alliances is dependant upon articulating, reflecting, and integrating different knowledge sets and opinions, respectively participation in alliance decision processes. Within these decision processes, ambiguities and uncertainties are numerous and influential (Scully, Kirkpatrick, and Locke, 1995, Hoffmann,

2007). Also, within these decision processes are uncertainties both exogenous (technology) and endogenous (relational) to the alliance (Folta, 1998). These uncertainties have affects on the managers' access to and evaluation of knowledge resources potentially moderating the managers' effectiveness (Hoffmann, 2007).

Literature is void of empirical analysis of the holistic affects of participation on the effectiveness of management within alliances. We first consider prior studies on the intra-organizational effects of participation and develop the similarities and differences within alliances.

Participation of Project Managers in Alliances

Project managers are embedded in one of the collaborating firms and are the boundary persons in the alliance. As boundary persons, project managers are responsible for the transfer of information and resources between the firms and among the participants. Much research has been conducted on the important role boundary persons play within companies by bridging organizational gaps (Ancona & Caldwell, 1992). Only recently exploratory research has been conducted to infer that higher cooperation of external boundary persons improves performances in projects (Hillebrand & Biemans, 2004). Boundary persons can bridge the differences of groups' mental maps, languages, time frames, norms, and coding schemes (Dougherty, 1992; Tushman, 1977). In alliances, project managers act as boundary persons transferring information between organizational groups and between organizations (Tushman & Katz, 1980). Project managers of the partnering firms either have the specialized knowledge or the knowledge where and by whom (transactive memory) it can be obtained. Not only do project managers participate in the control of project's processes, but also in decision-making. Within these decision-making

processes managers have a greater buy-in to goals if they have exhibited a high level of participation (Saxton, 1997).

H1: Greater participation of internal project managers will increase the participation of external project managers in alliances.

Participation and Alliance Management Approaches

Firms forming and operating in an alliance always are confronted with complexity, ambiguities, and the unintended spill-over of knowledge (e. g. leading to learning races) to a partner (Oxley, 1997). The heterogeneous knowledge available to a project within an alliance brings about high costs of control due to ambiguities associated with the specialized knowledge. An option to cope with these ambiguities and to reduce cost is the establishment of trust that is associated with mutual understanding and social controls. Firms then accomplish a more understanding orientated approach to alliance management. Prior studies stress the value of trust and understanding across boundary spanners (Currall & Judge, 1995; Perrone et al., 2003). As such the mutual understanding orientated approach to alliances management is beneficial to control cost increases with the transfer of specialized knowledge.

A different strategy to cope with the risks of opportunism embedded in the ambiguities of specialized knowledge in alliances (Kale et al., 2000) is to apply formal systems for measuring and evaluating the project progress. A formal control based approach to alliance governance is found to be a solution to free-rider problems (Lewis et al., 2002), for multi-partner contractual alliances (Garcia-Canal et al., 2003), and in R&D alliances (Pisano, 1989).

Das & Teng (2000) presents that in alliances managers face “internal tensions” (P: 1) of competing forces. Further, these forces can be represented as competing pairs. Taking this argument and understanding the complementarities of formal and social controls into account

(Poppo & Zenger, 2002), we argue for two options: control and understanding oriented alliance project management. Project managers have the option of creating controls that facilitate understanding by either: (1) use of mutually developed understanding or (2) through rigid adherence to pre-established criteria and milestones.

H2: Both control and understanding oriented alliances project management approaches are applicable to participation.

Participation-Performance Link

Indirect Effects. Participation is regarded as a variable of primary importance for improving the performance of organizations (Latham et al., 1982), and we posit for the performance of alliances. A meta-analysis by Miller & Monge (1986) showed a small but significant correlation between participation and performance within complex tasks. These findings on complex tasks are interesting for the study of alliances, which always consist of numerous complex and often only partially pre-defined tasks. Complex tasks that are the norm of alliances have often conflicting and ambiguous elements that require comprehension and creativity of the task-doer. Still, we lack knowledge of how project management styles associated with participation influence performance.

Literature directed at the investigation of alliance performance attributed to the actions of the project manager represents their dependent variable with more than changes in financial performance (a review maybe seen in Palmatier et al., 2007). Also, the use of financial performance metrics probably is not the correct performance measure for evaluating project managers (Arino, 2003). The strategy literature has shown that performance measures need to focus on the level of responsibility (Venkatraman and Ramanujan, 1986). We propose at the project manager's level of responsibility three measures of performance are most relevant in a rapidly evolving industry as represented by the electronic device industry: innovation, relational

and project performance. By doing this we extend the literature on alliance performance from the alliance level to the management level. Innovation as a component of performance in alliances has been represented in the literature (Vlaar et al., 2007; Sampson, 2007). We extend these investigations to focus on the participation construct, and its impact at the manager's level of responsibility. Theoretical based perspectives from transaction cost economics (Parkhe, 1993) and relational exchange (Murray & Kotabe, 2005) have been the basis for relational perspective in alliance investigations into performance. As to our final component of alliance performance, project performance, literature continues to find the importance of a manager's actions on the effectiveness of execution in the alliance's activities (Walter et al., 2008).

Innovation Performance. Achieving innovation in an alliance requires continuous complex tasking. As such innovation is largely dependent on discovery from unpredictable and non-routine findings. Formal controls can be designed to enhance innovation (Caldwell & O'Reilly, 2003). Formal controls allow project managers to adjust project resources and objectives necessary for the achievement of the innovation performance (Rosenau, 1998). Therefore, structure and discipline provides formal control orientated approach the positive effects of participation when pursuing innovation.

Conversely, it can be argued that a flexible management of participation will boost innovations. A more mutual understanding based approach of alliance management builds upon flexibility which increases experimental learning (Burns & Stalker, 1961) and develops knowledge as project managers experiment with diverse product designs (Moorman & Miner, 1998). This built-in informality with social controls was found to improve the innovation performance of teams (Vera & Crossan, 2005). In sum, we argue that the motivational and

information processing advantages of participation are better realized through a mutual understanding orientated than the control orientated approach.

H3: A mutual understanding orientated alliance management will achieve higher innovation performance effects than a control orientated alliance management approach realized through participation.

Relational Performance. The transaction cost economics (Rindfleisch et al., 2001), social exchange (Hibbard et al., 2001) and relational exchange (Cannon et al., 2000) theories support our inclusion of the relational component of performance. Relational performance directs how smooth interactions are carried out, and how easy barriers across firms can be overcome. Mohr and Spekman (1994) uncovered that if a project manager fails to spend the time to uncover the underlying problems within a relationship; the relational capital will diminish. Project managers may sense pressure for timely resolutions and limit discussions with unintended results on relational capital. For example, conflicts left unresolved will undermine the relationship and erode the relational capital (Bstieler, 2006).

H4a: Negative relational performance effects emerge through motivational and information processing advantages of participation that are realized through a formal control orientated alliance management.

The direct and informal ties among project managers within the mutual approach create commitment and provide a shield against the concerns in novel situations (Gulati, 1995). As such a mutual approach to alliance management is associated with participation (Lewis et al., 2002). It offers more freedom for the project managers leading to improvements in project and financial performance.

H4b: Positive relational performance effects emerge through motivational and information processing advantages of participation that are realized through a mutual understanding orientated alliance management.

Project Performance. The completion of an innovative project within budget and schedule requirements is a complicated undertaking. The formal style of project management is understood to enhance efficiency (Shenhar & Dvir, 1996). Milestones, a primary characteristic of the formal style, convert a project strategy into easy to comprehend pieces (technical, budget, time), give participants a frame of reference (Eisenhardt & Tabrizi, 1995), and an awareness of their scarce resources (Wheelwright & Clark, 1992). The monitoring implemented in the formal approach improves keeping track of the project's progress (Lewis et al., 2002). The pre-defined standards, the guideline and the monitoring will improve the project's efficiency achieving better project performance (Cooper 1999). Where as the mutual understanding orientated approach fosters progress of the project through how well participants interact (Hargrave & Van de Ven, 2006). We argue, that through increased effectiveness and setting guidelines, the control based management is advantageous for achieving project performance through motivational and information processing advantages of participation.

H5: A control orientated alliance management achieves higher project performance than the mutual understanding based approach realized through participation.

Role of Uncertainty. Uncertainty has received considerable attention in the literature as it is found to moderate project-performance relationships (Eisenhardt & Tabrizi, 1995). Alliance performance is susceptible to uncertainties in technological and relational contexts. Alliance uncertainty in the relational context is present as firms develop joint routines and procedures to facilitate processes. Uncertainty is present in the decision making process from the joint consideration of technology appropriateness to the choice of technological adoption. Uncertainty in both the technological and relational contexts directly affects the project managers' effectiveness of participation.

Lewis (2002) found that technological uncertainty demands greater technical flexibility. Moorman & Miner (1998) demonstrates that a more flexible based approach to alliance management achieves more knowledge building as project managers work through uncertainty by experimenting with diverse product designs. Therefore, we argue that the flexibility of the mutual understanding orientated approach will improve the benefits from improvisation and experimental learning. As such the mutual understanding orientated approach is better able to cope with the technical and relational uncertainties of alliances.

H6a: Both, technical uncertainty and behavioral uncertainty, will increase the application of a mutual understanding orientated approach to alliance management.

Riel et al. (2004) presented that technology uncertainty will be negatively impacted by greater and more accurate information gathering. This argument is complemented by Shenhar & Dvir (1996) who found a direct relationship between the level of a project's technological uncertainty and the more effective a planned style (formal control and reviews) will enhance the project's performance.

H6b: Technical uncertainty will increase the application of a control orientated approach to alliance management.

METHOD

Sample and Research Design

Executives whose firms are engaged in alliances in the German Electronic Devices industry were surveyed. The electronic device industry was chosen do to the technology uncertainty it has experienced through periods of volatile growth. Also, the electronic device industry not only has been experiencing evolutionary technology changes, but also with the emergence of micro- and nanotechnologies the industry is simultaneously experiencing disruptive changes (Kassakian, 2000; Collins and Avouris, 2000). The mailed questionnaire requested

information regarding their firm's relationships to the collaborating firms and their project management of the co-operations. Firms were retrieved through a recherche on the Internet. After three waves of letters to 1289 firms, we finally achieved 179 responses from people in charge of alliances. All data was collected within a 5 month period in 2006 with a response rate of 13.88%. To prevent common method variance, a cover letter guaranteed full anonymity and multi-item and in well-designed scales (see Spector, 1987). For several of the constructs, we adapted the scale by Lewis et al. (2002) that was double-translated into German and used to measure the elements in the developed constructs.

Measures

Participation. Our study focuses on the participation-performance link as a resultant of the decision making processes of the project management in alliances. Participation in decision making is important for achieving alliance performance as it increases the potential that firms invest in the outcomes of the decisions. With continued investment from their firms, alliance managers are more willing to engage in learning. There are several focuses of the learning process some external (e.g. environment) and others focused internal (e.g. how to collaborate) (Inkpen and Currell, 2004). The decision making process and the resultant learning constitutes a supplement to the contractual connection of the firms. To engage in this additional contribution is dependent on the manager's willingness to reach out across organizational boundaries to find new solutions.

Alliance Project Management Approaches

In an alliance the ability of either firm to conduct business as usual and disregard their partners concerns is greatly limited. After the initial establishment of an alliance the project managers as boundary persons accept the responsibility for the establishment of management

styles. The managers are presented with a choice of either formal or social management styles whose objectives are to both benefit the alliance and simultaneously protect each firm. Lewis et al. (2002), in their study on internal project management, provide us with the initial development of the management style and uncertainty indicators that represent the co-responsibilities of the alliance's project managers. Inkpen and Currall (2004:596) requests continued investigation into "what degree, if any, is one form of control, *formal and social*, viewed as the most important". The implementation of either set of controls gives the project managers a perception of safeguards to achieve benefits in the alliance while still protecting the manager's respective firm. This perception may be an incentive for the managers to engage in freer participation with their counterparts (Sitkin, 1995). We consider the management function of control as being oversight of formal controls similar to those specified by Lewis et al. (2002): achievement of intermediate targets, tough criteria, and meeting the deadline concerning mistakes.

While social controls exemplified by the actions of project managers are directed at the mutual concern of their partner's capabilities and comfort in the alliance. We posit that participation is a means to create as Krishnan et al., (2006) and Thompson (1967) both call: reciprocal interdependence. Pinto et al. (1993) noted that successful cooperation would be indicative of goal congruence such as project aims, time plans, criteria and the goal of decision termination. Therefore, we develop our indicators from these above concepts, specifically: 1) mutual understanding, 2) communication of tasks and goals, 3) clarification and specification of goals to insure usage of the current technologies.

Our measures of mutual oversight, namely a mutual orientated project management approach, were adopted from those used by Vera & Crossan (2005) in their constructs of Teamwork, Quality, Expertise, and Real-time Communication. These are adapted in our

investigation into the management within alliances to include the understanding of tasks and goals and their communication to insure that the knowledge of current technology is transferred. From Lawrence (2002), we adapt their collaboration characteristic measures of interaction and information flow. As with Lawrence (2002) we envision project managers will communicate until their counterpart understands with clarity the alliance's tasks, goals, and specifications.

Dependant Variable: Alliance Performance. We view alliance performance as having three primary types of performance: innovation performance, relational performance and project performance. Each type of performance has its separate measures and thus indicators. Innovation performance construct is a measure of change: product, technology, market and the achievement of change itself. Our measures are adapted from the resultant developments in the creative measures used by Vera and Crossan (2005) and Tierney et al. (1999). From Tierney et al. (1999) creative new products we adapted our measures of planned innovation, technological and market newness. From Vera and Crossan (2005) we adapt their experimental culture to our experimental work.

Relational performance construct is a measure of collaboration with your partner and within your firm's value chain. The few studies which investigate relational performance have used metrics of improvements in the satisfactory completion of the projects goals (Anderson & Tushman, 1990). But these metrics are more accurately used to measure project completion not relational capital. Recent literature has initiated the focus on to relational performance (Bstieler, 2006). Relational performance is an evaluation of the collaborative achievements of projects in alliances. For alliances relational performance is valuable, because it is indicative of potential for future partnerships between the participating firms (e.g. partnership efficacy). For our study we

have used previously validated indicators: satisfaction with the partners' collaboration and achievement of objectives for customers (Bstieler, 2006; Pinto et al., 1993).

Project performance construct is a measure of achievements related to the alliance's project and the project management parameters. Subjective indicators are often found suitable for non-equity alliances performance measures (Todeva & Knoke, 2005). Strong correlations between subjective and objective measures were found when they were made available (Geringer & Herbert, 1989). Measures of alliance and product development success obtained from the use of manager's evaluations are prominent in the literature (Isobe et al., 2000; Lin & Germain, 1998; Saxton, 1997). We use Vera and Crossan (2005: 222) "Job Characteristics" construct to perform structured tasks as those scheduled and within budget.

Uncertainty – Technological. Engwall and Westling (2004) in their case study of a complex R&D project noted that the rational process of structure, order and plans may not be the normal or even best practice to create an accepted conception of a new product. Instead of a normative process relying on controls they posit that the process is one of unstructured participation between members. These are held together by a shared desire to achieve sensemaking (Söderlund, 2002). Therefore, we adapted these findings into our two indicators that uncertainty within the development process will: 1) exhibit technical progress and 2) the setting of technical aims through cooperation of the members. From Lewis et al. (2002) we adopted their indicators of securing technical familiarity and experience across periods of uncertainty through a planned style. Planned style develops a comfort with the suitability of a technology.

Uncertainty – Behavioral. In periods of high uncertainty Krishnan et al. (2006) found that firms should invest in trust by increasing the interdependence between partners to improve performance. Interdependence between partners multiplies as the extent that participation

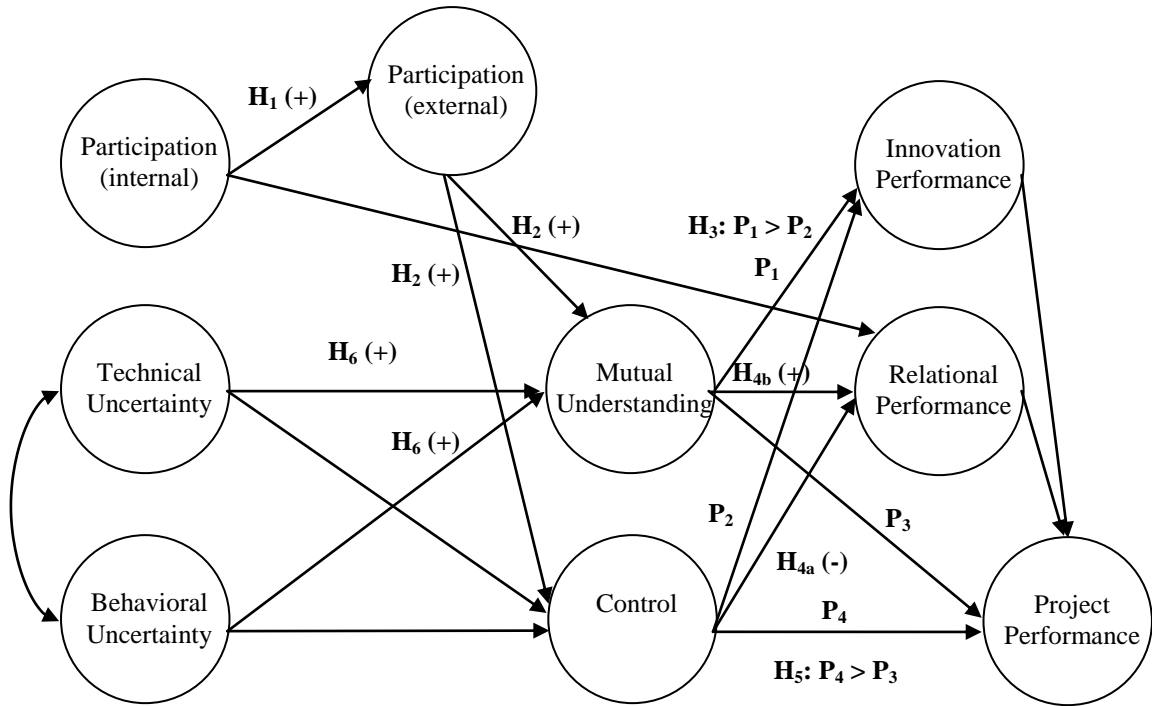
between partners of an alliance increases (Mitchell and Singh, 1996). With this greater interdependence and follow-on greater collaboration will increase the flow of information and contribute to the creation of usable knowledge.

RESULTS

Basic Model

Figure 1 presents our hypothesized model that is in the standard shape of LISREL models by Joreskog & Sorbom (1996). The sign and the statistical significance of the path coefficients and their corresponding t values serve as a test of the hypothesized relationships in H1, H2, H4a, and H4b, and H6a, b. To examine hypotheses 3 and 5 we conducted two Chi-square difference tests of the path coefficients to verify if the path coefficients are significantly different. If mutual understanding orientated alliance project management approach will achieve higher innovation performance than a control orientated alliance project management approach, as postulated in hypothesis H3, the Null hypothesis should be rejected that both path (P1 and P2) are equal. Analogous, hypothesis H5 is confirmed, if the estimates will be higher for path P4 than P3 and furthermore, path P3 and P4 are significantly different. The chi-square value should be significantly worse in the model with these two path coefficients set equal in comparison with the model estimating the two parameters P3 and P4 freely.

FIGURE 1
Research Model and Hypothesized Relationships



RESULTS

Measurement Validity

We estimated the model postulated in Figure 1 using AMOS 5. We provide multiple measures to assess the overall fit of the model. The normed Chi-square value of 1.54 is much lower than the threshold value of 3.0 (Kale et al., 2000). Bentler's comparative fit index (CFI) that compares the hypothesized model against an independence model as a baseline model (Arbuckle and Wothke, 1999) is 0.90, which is exactly the required value (Byrne, 2001). The RMSEA of 0.053 (90%-Intervall of 0.04 to 0.06) is lower than the threshold value of 0.08 that indicates a moderate fit (Browne & Cudeck, 1993). Altogether, the overall fit measures indicate a good model fit.

For local fit we find standardized factor loadings above 0.4 (except of the item financial performance), all respectively t-values are above 2.0 indicating none of the items to exclude from the model. Therefore, we did not show the t-values in detail in Table 1. Some of the indicators do not reach the necessary indicator reliability value of 0.4. Only the indicators of the two constructs "Control" and "Behavioral Uncertainty" always have an indicator reliability value higher than the threshold value. But we decided to leave them all in our model. Nearly all constructs fulfill the necessary condition at the level of the constructs for convergence validity. Cronbach's alpha and composite reliability almost always reach the necessary condition of 0.7 (Nunnally, 1994) respectively 0.6 (Bagozzi, 1988). Only the dependent latent variables "Relational Performance" has only a composite reliability value of 0.53 respectively "Project Performance" has only a Cronbach's alpha of 0.65 indicating a further need of developing a scale of alliance performance on the project level. Testing for discriminant validity on the basis of average variance extracted we found some times a bad fit (relational performance with a value of only 0.28) and some times

a very good (like internal performance with a value of 0.76). Half of the constructs reaches the threshold value of 0.5.

Assessment of Fit of Internal Structure of the Hypothesized Model

Construct	Item	Standard factor loadings	Indiv. indicator reliability	α	Composite reliability	AVE
<i>Participation (internal)</i>	Project aims	0.71	0.50	.82	0.80	0.76
	Time plans	0.80	0.64			
	Criteria	0.82	0.67			
	Decision of termination	0.56	0.32			
<i>Participation (external)</i>	Project aims	0.83	0.56	.87	0.79	0.48
	Time plans	0.90	0.71			
	Criteria	0.77	0.47			
	Decision of termination	0.65	0.30			
<i>Control</i>	Achievement of intermediate targets	0.79	0.56	.83	0.80	0.57
	Achievement of tough criteria	0.87	0.70			
	Meeting deadlines concerning mistakes	0.71	0.43			
	That parties understand task details	0.70	0.38			
<i>Mutual understanding</i>	Communicate with partners	0.76	0.46	.85	0.78	0.41
	Understanding of common goals	0.67	0.35			
	Clarity about technical goals and specs.	0.76	0.46			
	Usage of current technology	0.73	0.42			
<i>Technical Uncertainty</i>	Technical progress through cooperation	0.70	0.49	.83	0.85	0.54
	Technical aims of the cooperation	0.77	0.59			
	Familiarity with technology	0.81	0.66			
	Technological experiences of the area	0.77	0.59			
<i>Behavioral Uncertainty</i>	Suitability of technology	0.54	0.29	.93	0.94	0.79
	Competencies of partners	0.87	0.76			
	Reliability of the partners	0.96	0.92			
	Collaboration with partners	0.86	0.74			
<i>Innovation Performance</i>	Collaboration of the management	0.85	0.72	.76	0.72	0.40
	Planned innovations	0.74	0.51			
	Technological newness	0.66	0.40			
	Market newness	0.76	0.53			
<i>Relational Performance</i>	Experimental work	0.48	0.21	.74	0.53	0.28
	Good collaboration with partners	0.86	0.50			
	Improvement of customer needs	0.64	0.20			
<i>Project Performance</i>	Coping with problems with partners	0.69	0.24	.65	0.67	0.44
	Completions are on schedule	0.79	0.53			
	Financial performance	0.28	0.06			
	Completions are within budget	0.91	0.69			

a: All factor loadings are significant ($t > 2.0$), and therefore, they are not listed.

The most obvious examination of structural model fit involves the significance of the estimated path coefficients (t value > 2.0 and $p < 0.05$) (Kale et al., 2000). To evaluate each equation of the structural model we use the squared multiple correlation (SMC). At first glance (see Table 2), we can notice that the SMC values have a range from 0.14 to 0.65 explaining only 14% of the variance of the construct “Innovation Performance” and 65% of the variance of the construct “Relational Performance” indicating a good explanation rate. In total, the global fit and the internal structure of our model is moderate. As a consequence, the model should not be rejected.

Findings

Hypothesis 1 stating a positive effect through internal participation on performance is supported (see table 2). The corresponding standardized path coefficient is 0.64 and significantly positive. Just as the influence of external participation on control, respectively, mutual understanding oriented alliance project management approach as postulated in hypothesis 2. Both standardized path coefficient are significantly positive (0.57 with a t value of 5.68 respectively 0.44 with a t value of 4.85).

Structural Parameters and Hypotheses

Path	Hypothesis	Standardized Estimate	t-value	SMC	Confirmation (✓) / Rejection (x)
Participation (internal) → Participation (external)	1	0.64*	6.52	0.41	✓
Participation (external) → Mutual understanding	2	0.57*	5.68	0.36	✓
Participation (external) → Control	2	0.44*	4.85	0.24	✓
Mutual understanding → Innovation performance	3 (P ₁)**	0.36*	3.35	0.14	x
Control → Innovation performance	3 (P ₂)**	0.04	0.43	0.14	
Control → Relational performance	4a	-0.30*	-3.67	0.65	✓
Mutual understanding → Relational performance	4b	0.72*	6.51	0.65	✓
Mutual understanding → Project performance	5 (P ₃)***	-0.33	-1.64	0.29	✓
Control → Project performance	5 (P ₄)***	0.34*	2.89	0.29	
Technical uncertainty → Mutual understanding	6	0.33*	2.04	0.36	✓
Behavioral uncertainty → Mutual understanding	6	-0.25	-1.64	0.36	x
Technical uncertainty → Control	6b	0.38*	2.17	0.24	✓

standardized path coefficient significant at *p<0.05

** Chi-square difference test: $\Delta\chi^2 = 2.29$; p value = 0.13

*** Chi-square difference test: $\Delta\chi^2 = 26.73$, p value < 0.01

The influence of the mutual understanding orientated alliance management approach on innovation is significantly positive (0.36 with a t value of 3.35). Whereas, the control orientated alliance management approach has no significant effect on innovation performance. But the different of these two path coefficients is not significant. The Chi-square difference value is only 2.29 and therefore lower than the necessary threshold value of 3.84. Consequently, hypothesis 3

has to be rejected. In contrast, hypotheses 4a and 4b can be confirmed. As postulated, a control orientated alliance management approach has a negative effect on relational performance (path coefficient = -0.30, t value = -3.67). Whereas, the mutual understanding orientated approach to alliance management shows a significantly positive effect (path coefficient = 0.34). The influence of the two alliance management approaches on project performance is vice versa. The influence of mutual understanding approach on project performance is not significant (path coefficient = -0.33, t value = -1.64). Control orientated approach has a significantly positive influence on project performance (path coefficient = 0.34, t value = 2.89). The difference of the path coefficient is also significant as postulated in hypothesis H5 (Chi-square value of 26.73, p value is lower than 0.01). Finally, hypothesis 6a stating that technical uncertainty and behavioral uncertainty will increase the application of a mutual understanding orientated approach can only be partly confirmed. Both forms of uncertainty (technical and behavioral) have a positive effect on a mutual understanding orientated approach to alliance management. The path coefficient between technical uncertainty and the mutual understanding approach shows the expected sign. Consequently, a higher technical uncertainty will increase the application of the mutual understanding orientated project management approach. But the behavioral uncertainty shows no significant effect on mutual understanding orientated project management approach (path coefficient = -0.25, t value = -1.64). Hypothesis H6b stating that technical uncertainty will increase the application of a control orientated approach instead can be confirmed. The path coefficient between technical uncertainty and the control orientated approach shows the expected sign (path coefficient = 0.24, t value = 2.1).

CONCLUSIONS

Our investigation transfers the discussion of management approaches to the inter-firm level and provides new findings on participation that has not been explored in alliance research. Our empirical study in the electronic industry of 179 firms reveals that participation of internal projects managers is related to external project managers of the partnering firm to achieve performance. Also, we find that both project management approaches, contrastingly discussed in the literature of new product development and project management, are applied in participative decision making within alliances. Interestingly the different project management approaches realize different performance outcomes from participation. The mutual understanding based approach is positively related to innovation and relational performance, while the control orientated approach is positively linked to a different performance dimension: project performance. Still, in the comparison the mutual approach has a statistically significantly stronger relation with relational performance than the control approach. Therefore, we inform the literature on alliance management with a multi-facet picture on performance outcomes.

Our findings of a positive indirect effect through participation are consistent with many of the results of the previous studies on goal setting participation. Our results are consistent with goal-setting theory (Locke, 1968). The supportiveness in the mutual understanding approach appears to be primarily important. Mutual understanding approach gives subordinates and supervisors the confidence to set high goals which in turn lead to high levels of performance. Our findings also relate to the findings of Latham in his diverse studies: there is no direct relationship between supportiveness and performance (Latham, 1979). This finding highlights the importance of a managerial style to both intra- and inter-organizational settings.

Our study refers to the impact of uncertainty that is understood to play an important role in project management (Lewis et al., 2002) and related to complexity of tasks (Campbell & Gingrich, 1986). We tried to extend uncertainty to a genuine relational aspect. Our study showed technological uncertainty to have a positive relation with the mutual understanding orientated project approach that is consistent with Lewis et al. (2002). Possibly, this is indicative of the void in alliance management in that alliances do not actively practice relational management.

We find that since participation in alliances has to content with both the organizational and relational requirements of the alliance, the participation issue is similar and yet distinct from intra- and inter-firm contexts. The ongoing adaptation of the open arrangements present in alliances requires constant adaptation of information held by either firm. This adaptation is a core consideration within the project manager's decision making processes. In an alliance, project managers of each firm in their role as a boundary person interconnect the firms by communicating and valuing ideas. Project managers achieve this while administering both pre-existing goals and those developed in the relationship. Our argument on participation builds upon empirical studies of participation mostly conducted during its era of importance during the 1970's and 1980's. However, only few recent studies have been carried out and none of them are of participation in alliances. As such, we direct an important theme of the past to a new research framework

As all studies, ours has some drawbacks.. A study of participation in alliances could use a dyadic analysis. Still, the issue of participation requires a survey study and is confronted with low response rates. The implementation of a survey on dyads then will be confronted with serious respondent-barriers.

With the largely unexplored issue of participation in alliances, there is room for further research. First, we recommend further research of participation. As participation increases up-stream and down-stream communication, we suggest exploring as a new set of dependant variables the knowledge transfer outcomes of participation. Herein, participation both in planning and in execution can accomplish performance results. Knowledge transfer has been a hot issue in alliance research due to the great potentials but also high risks of spillovers. Also, one has to question; if all knowledge transfers are beneficial to alliances. We also recommend future studies link the participation in goal setting to leadership styles. The study of leadership (e. g. transactive vs. transformational, Bass, 1990) might bring across novel insights about fine-grained issues and the culture or “climate” of participation in alliances. Studies could gain insights about the actual or ideal or perceived leadership style of the internal project leader by the project members. The internal project management must also be knowledgeable of the external project managers’ styles. Interesting results might also result from a study of both managers’ differential or similarity of leadership styles on project-, relational-, innovation-, and knowledge performance of the allying firms.

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