

# Dyadic Alliance Governance Structures and Product Innovation Project Decision-Making

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**Abstract:** Product innovation within strategic alliances differs from product innovation within firms due to coordination problems with respect to decision making. This exploratory study, drawing on alliance research, strategic decision-making research and product innovation literature explains these problems at the level of product innovation projects in dyadic strategic alliances. In particular, the empirical case study results reveal that strategic decision-making effectiveness in product innovation projects is dependent upon the nature of the decision-making process that in turn is affected by alliance governance structure characteristics.

**Keywords:** Alliances, Governance Structures, Product Innovation Projects, Decision Making.

## 1 Introduction

Most studies describe new product innovation from the perspective of one organization that is responsible for managing projects from idea-generation to launching the product onto the market [1]. Nowadays, though, developing new products is increasingly a jointly managed activity within a strategic alliance of two or more firms [2]. Alliances are defined as “any voluntary agreement between firms that involves exchange, sharing, or co-development, and it can include contributions by partners of capital, technology, or firms-specific assets” [3]. Product innovation within a strategic alliance differs from product innovation in one organization due to coordination problems, amongst others, with respect to decision-making. While decision-making affects the project success [4] and product innovation success [5], it is bound to be affected by the idiosyncrasies of cooperation. For example, Gerwin and Ferris show that shared decision-making in contractual alliances is subject to cooperative conditions, such as alliance newness, cooperation history and diversion of competences. In addition, the

alliance governance structure (e.g. contractual versus institutional) may influence the product innovation projects [6].

Product innovation research mostly investigates managing projects from the perspective of one firm that carries the responsibility even if this firm collaborates with suppliers or customers [7]. Furthermore, alliance management and product innovation literature show many studies that relate alliance motivation or governance structures (such as joint ventures and non-equity alliances) to new product development [8]. However, hardly any studies examine how these structures influence the decision-making in general [9], not to mention decision-making in product innovation projects. In addition, studies on product innovation acknowledge the influence of new product characteristics and new product development context, while few studies take this influence into account when examining product innovation within various alliance governance structures [10]. So the question remains as to whether decision-making within the product development process stages is more effective within a joint venture than for example in bilateral contractual alliance due to its larger interdependence and control.

The purpose of this study is to contribute to both product innovation and alliance research by means of explaining how differences in alliance governance structures affect the decision-making process and its effectiveness in the context of product innovation projects. The scope of this study is limited to vertical alliances and alliances between two firms, which are called dyadic alliances [11]. The paper is organized as follows. First, our initial theoretical framework is presented, based on alliance management research, decision-making research and product innovation literature. Next, we describe the case research method used, followed by the empirical results. The last sections describe the conclusions and managerial implications as well as the limitations and suggestions for future research.

## **2 Theoretical Framework**

Product innovation within an alliance differs from product innovation within one firm due to differences in decision making amongst others [12]. Decision-making within firms takes place at various levels and in various forms. This study focuses on strategic decision-making at the level of product innovation projects in dyadic alliances. The effectiveness of decision making may be related to the alliance governance structure. Our conceptual framework builds the proposition that decision-making effectiveness is affected by decision making process antecedents that in turn are influenced by the alliance governance structure.

### *Decision-making effectiveness*

Decision-making and its effectiveness is important for product innovation success. Eisenhardt and Brown conclude that product innovation process performance is determined by the number, diversity and organization of decision-making processes in addition to the resources that decision-makers can allocate [13]. Also Van Riel and colleagues who investigated high-technology service innovations found that decision-making effectiveness affects innovation performance [14] In our research the decision-making within product innovation projects is concerned with physical new products and important stage-gate decisions, such as selecting new product ideas, screening the one best idea, and selecting the development strategy for subsequent stages [15]. The

effectiveness of strategic decision-making is defined as the extent to which a decision that is taken meets management objectives made at the time [16]. While some of these objectives may refer to the organizational outcome of the implemented strategic decision, our interest from a product innovation project point of view mainly lies in the objectives at the start of and with respect to decision implementation. In this regard, an important objective is the commitment to actions [17]. Commitment is defined as the willingness to act upon the decision and is dependent upon decision consensus [18], and affects implementation success (at the cost of implementation speed). Consensus is defined as the outcome of the decision-making process to which all parties agree that the chosen alternative was most feasible [19]. Decision-making effectiveness is determined by decision-making process factors.

### *Decision-making process*

Decision-making processes play an important role in product innovation processes. In every stage of the process decisions are made about the progress of the project [20]. Similar to strategic decision problems, decision making in product innovation processes is subject to market, process and technical factors that create uncertainty [21]. This makes product innovation decisions unstructured, non-routine and complex [22] especially with respect to more radical innovations. Product innovation in an alliance adds an additional factor of uncertainty: coordination with the partner.

A review of the literature shows that mainly two decision-making process factors are important to characterize the type of decision-making process [23] and affect its strategic decision-making effectiveness: procedural rationality and political activity [24]. All these factors are within the realm of managerial control. Procedural rationality, which refers to relying upon the rational analysis (compared to intuitive analysis) of information relevant to the decision - including the collection of relevant and complete information for making the decision - positively affects decision-making effectiveness [25]. According to Mintzberg et al. political activity reflects power influence among individuals and groups within a decision-making process [26]. It consists of bargaining to protect self-interest among those who have some choice control [27] Political activities may bring about consensus and commitment when individual or group interests coincide with organizational interests [28] or may negatively influence decision-making effectiveness when organizational goals do not match those of individuals or groups [29]. Political activity needs to be distinguished from control procedures such as a dialectical or devil's advocate approach - used to arrive at a decision that may affect decision-making effectiveness in terms of consensus and commitment to decision as well as decision outcomes [30].

So far, these factors have not been investigated in the context of product innovation processes within dyadic alliances. According to Van Riel the decision-making model, rational versus intuitive, is determined by the phase of the innovation process, the availability of information, the degree of tacit knowledge, complexity, time pressure, and the structure [31]. Here, we focus on structure characteristics with respect to alliance governance.

### *Alliance governance structure*

While alliance governance structures such as institutional alliances (joint venture), equity alliances and contractual alliances, are studied in relation to new product

development [32] and decision-making [33], the relationship between alliance governance structure and decision-making within a product innovation process received scant attention. Alliance governance structure can be typified in terms of two main characteristics 1) interdependence and knowledge transfer [34], and 2) control mechanisms [35], and 3) flexibility [36].

#### Interdependence

Interdependence strongly relates to coordination costs [37]. The extent of interdependence is associated with the need for ongoing task coordination (in case of division of labor) and for joint decision making. The higher the degree of ongoing task coordination and joint decision making, the more partners integrate processes [38], the more information partners must process [39] and the more knowledge partners must transfer [40]. On the other hand, uncertainty may hinder knowledge transfer [41]. Processing more information and knowledge transfer is positively associated with procedural rationality. In addition, task coordination increases shared experiences and mutual understanding. Joint decision making is creating ‘mutual hostages’. Therefore, both task coordination and joint decision making may decrease the potential for political activity [42]. The extent of interdependence may lead firms to anticipate the need to control risk in an alliance.

#### Control mechanisms

Control mechanisms affect the degree of control in the alliance. Ownership structure, hierarchical structure and contracts are formal (hierarchical) control mechanisms, whereas trust is an informal control mechanism and sometimes seen as a substitute for control [43]. Alliance governance structures that are characterized by more formal control mechanisms better process information and coordinate the alliance [44]. While formal procedures and routines may hinder creativity in decision-making processes [45], a high degree of formalization may simplify decision-making due to role ambiguity reduction, conflict resolution and facilitating goal congruence [46]. In addition, a high degree of centrality, which is another control mechanism, may lead to dominance of individuals, non-integrated decisions and delays due to lower efficiency in the decision-making process, when decision making is concentrated at higher levels. Although a low degree of centralization may also lead to delays and non-optimal decisions, it stimulates agreement on decisions [47]. Trust on the other hand may reduce the potential for politics and facilitate managing the alliance [48]. Therefore the degree of formal control mechanisms may affect the decision-making procedural rationality, while similarly the degree of informal control mechanisms may reduce political activity.

### **3 Research Method**

This conceptual framework is studied in greater depth and elaborated upon using empirical research. The aim of the empirical research was to further develop theoretical propositions based on context-specific explanations. Because of the exploratory, contextual, complex and uncontrolled nature of the phenomenon a multiple cross-sectional retrospective case study method was used [49]. A case study is defined as an empirical inquiry within the – not clearly circumscribed – context of reality, investigating a contemporary phenomenon [50]. In the case studies, the unit of

analysis is the decision-making process at the level of product innovation projects within dyadic strategic alliances.

#### *Alliance case selection*

Three case studies based in the Netherlands were conducted. The cases consisted of dyadic alliances, two of which are contractual alliances and one of them is an institutional alliance (a joint venture). The contractual and institutional alliances forms were chosen, because these forms represent extremes in terms of major governance structure characteristics, such as control and interdependence. These alliances were all aimed at obtaining complementary resources to develop a new product. The alliance cases were selected in different lines of business to allow for control variety in product innovation processes and products. The two contractual alliances are concerned with Airplane Parts and Insulation Products, whereas the joint venture involved Biogas Plant Equipment (see table 1). The names are fictitious for reasons of confidentiality. Whereas in the Biogas and the Airplane case the products and technologies were new to both the firm and the market, the product in the Insulation products case was only an adjustment of previous products. All cases are vertical alliance types, though the Biogas case is not a customer-supplier relationship. These three main case studies were preceded by a mini pilot case of a joint venture based on one interview. This mini pilot case was aimed at verifying interview questions, structures and skills.

**Table 1 Alliance, product innovation and respondent characteristics**

Alliance name	Alliance form	Product innovation	Alliance partner	Respondent job description
Biogas Plant Equipment	Joint Venture	Radical	Vertical higher-level partner 1	Sales manager & shareholder
			Vertical lower-level partner 2	Project participant & share holder
Airplane Parts	Contractual	Radical	Customer partner 1	Director R&D
			Supplier partner 2	Director R&D
Insulation Products	Contractual	Incremental	Supplier partner 1	Business Development manager
			Supplier partner 1	New Business manager

#### *Data collection and analysis*

Within each alliance, two project-informed respondents have been interviewed in-depth. In two alliances, Airplane Parts and Biogas Plant Equipment, the respondents came from both partners to enhance the data reliability on the one hand and data completeness on the other. In the Insulation product alliance two respondents came from the same partner, because the other partner did not permit informants to participate in the research. The respondents have all been involved as key informants in main decisions within product innovation projects in the alliances. Table 1 gives an overview of the respondent characteristics. The in-depth interview can be characterized as a standardized semi-structured interview, allowing the respondents to elaborate upon answers, which adds to the depth of the explanations.

Our constructs were operationalized in the following way. Interdependence has been measured in terms of resource dependence, task and process integration and task

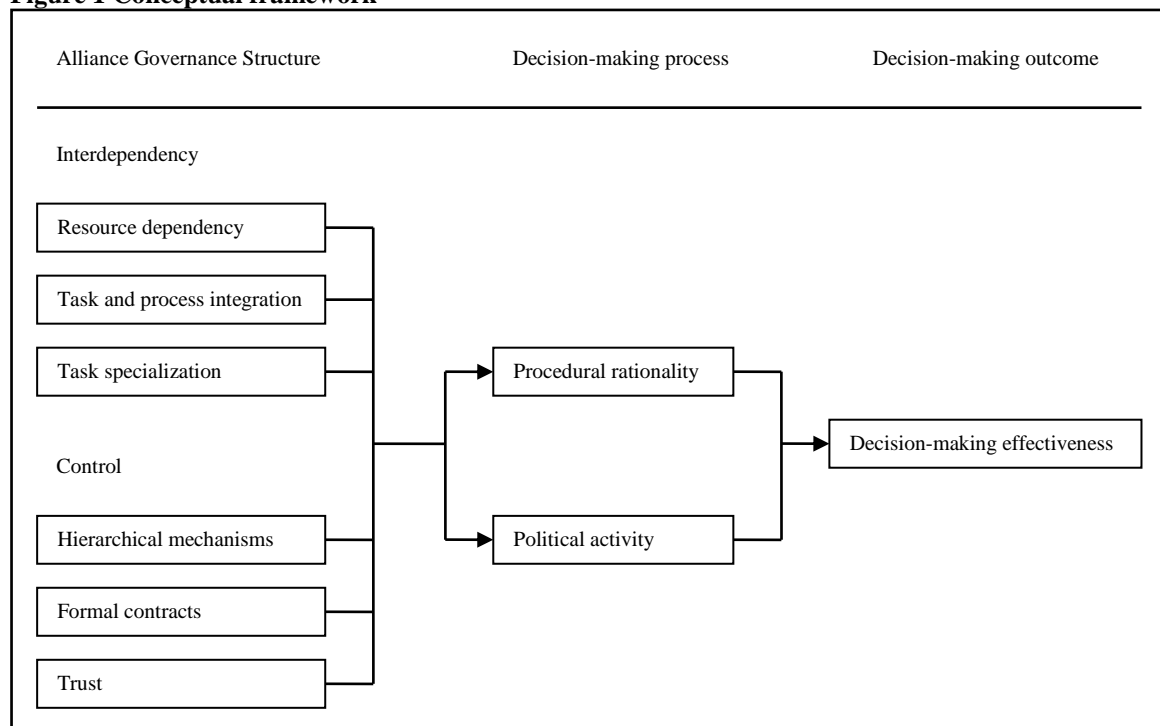
specialization [51]. For control mechanisms we used indicators such as the degree of hierarchy [52], contract completeness and trust [53]. Procedural rationality has been operationalized in terms of rational analysis through the search and sharing of complete and relevant information [54]. Political activity has been measured as accepted difference of opinion, bargaining and compromises [55], opportunistic behavior [56] and use of power and conflicting goals/interests [57]. Consensus is measured as agreement over a decision and best possible decision [58], whereas commitment is operationalized in terms of ‘my decision’, defending the decision, changeability of the decision and resources allocated according to the decision [59].

The interviews have been recorded, transcribed and reported in case descriptions. The interview data were processed using a combination of literal and interpretive procedures [60]. We analyzed the data using a pattern-matching logic according to procedures as described by Yin [61]. Empirically-based patterns within cases were compared back and forth with patterns described in theory and - within the boundaries of our initial conceptual framework - developed into propositions. The procedures for cross-case analysis were based on the theoretical replication logic comparing the patterns within the cases across the polar alliance contexts.

#### 4 Results

The results can be subdivided into two parts. The first part consists of the empirical data that characterize the governance structure in terms of alliance forms. The second part contains the empirical data with respect to the relationships (as shown in figure 1) between, firstly, governance structure characteristics and the decision-making process characteristics of product innovation projects and, secondly, decision-making process characteristics of the product innovation projects and its decision-making effectiveness characteristics.

**Figure 1 Conceptual framework**



### *Alliance governance structure forms and characteristics*

In order to obtain a broad indication of the genetics of the case alliances, both alliance forms, contractual alliance (CA) and the joint venture (JV) have been classified in terms of the governance structure characteristics on the basis of 6 respondents perception scores (see table 2).

**Table 2 Alliance governance structure forms and characteristics of the three cases**

<i>Alliance governance structure</i>	<i>Contractual (4 respondents)</i>			<i>Joint Venture (2 respondents)</i>		
	Low	Medium	High	Low	Medium	High
- hierarchy	4	-	-	-	-	2
- strived for completeness of contracts	2	1	1	-	-	2
- trust relationship	-	-	4	-	-	2
- resource dependency of partners	1	2	1	-	2	-
- tasks specialization of partners	-	2	2	-	-	2
- tasks / process integration	4	-	-	-	2	-

Table 2 shows that the contractual alliances are less strong in terms of control and interdependence compared to the joint venture. The degree of hierarchy and the degree to which is completeness of contracts is strived for is more frequently perceived as higher, while the task specialization and task/process integration are more frequently perceived as lower. With respect to the perceived degree of trust relationship and resource dependency the contractual alliances cannot be distinguished from the joint venture.

### *Governance structure and decision-making process*

#### *Interdependence*

The interdependence consists of the resource dependency, the task/process integration and the task specialization. The results show that although the resource dependency has a large effect on the decision-making process, there is no difference found between the contractual alliance and the joint venture. When the degree of dependency increases the dependent partner will put everything into a positive decision-making process. With respect to procedural rationality the respondent answers converge on the point that dependency makes the partner put more effort in collecting complete information. As the R&D-director of the Airplane CA supplier notes: “the more you are dependent on each other, the more you will search for complete information, because this is very much in your own interest”.

This dependency also decreases the political activity, because the partners are more inclined to accept a difference of opinion and are less inclined to use power and behave opportunistically. For example, the R&D-director of the Airplane CA supplier states that: “if you become more dependent on each other, the mutual relationship becomes more important, and as a consequence you will more easily respect each others opinion and also earlier water the wine, bargain and compromise to reach an agreement.” Also the Sales manager of the Biogas JV partner 1 agrees with this point when he states that

“you cannot afford to use improper power if you are dependent of the partner firm, but you can if you are the stronger party”. Therefore we suggest that:

P1: Increases in the resource dependency will increase the use of procedural rationality and decrease the use of political activity in both contractual alliances and joint ventures.

The interview results suggest that the degree of **task and process integration** differ between a joint venture and a contractual alliance. In addition, respondents support each other in the position that more task and process integration will increase the procedural rationality. For example, the R&D-director of the Airplane CA customer stated that: “If we were working as partners next to each other, then you would probably have shared more information, because the dissemination will be easier”. The supplier R&D-director (Airplane CA) and Business Development manager of the Insulation CA argue that the tasks are hardly integrated, but when the tasks and processes are more intertwined, there will be less search for complete information from the partner, because frequently there will be access to the same knowledge and information. The project member of the Biogas JV partner 2 supports this point saying that: “you have become a link within the chain and therefore you share more information with the partner”. He adds that “because we perform tasks together, you discuss more during daily work and therefore probably fewer negotiations are used and also fewer compromises have to be reached, because you are both completely informed”.

This also illustrates that the use of political activity tends to decrease with high task integration. Similarly, in the Biogas JV case, the Sales manager (partner 1) argues that there is less need to check partner information, because you both possess the same information. But the project participant (Biogas JV partner 2) warns that it is therefore more important to check partner information on completeness and relevance. Though, he adds that: “the positive use of power decreases when tasks performed are integrated, because the difference in knowledge also decreases”. Interestingly, New Business manager of the Insulation CA partner, said that: “when the process and task integration increases, the possibilities to behave opportunistically grow larger”. Thus:

P2: A higher degree of task and process integration results in a higher degree of procedural rationality and tends to lower the use of political activity in a joint venture, but may increase the use of political activity in a contractual alliance.

With respect to the degree of **task specialization** the interview results reveal that political activity increases with the degree of task specialization, while the effect on procedural rationality as well as the difference between the contractual alliances and the joint venture is not clear. In addition, not surprisingly, the degree of task specialization is strongly related to the degree of task and process integration. The reason is that task specialization makes it more difficult to integrate processes. The explanations of the contractual alliance respondents with respect to the effect of the degree of specialization on procedural rationality do not converge to the point made by the New Business manager of the Insulation CA partner on information completeness and relevance: “If the tasks of the partners are specialized, you have less knowledge



about each others task area and you will search less for completeness of information. Therefore, we also control the information around our field of expertise. In addition to the completeness of information, the focus on the relevancy of information is less strong, because as non-experts we cannot judge this information.” In contrast, in the Airplane CA, the supplier R&D-director states that “because we all have our own field of expertise, we exactly want to know from the partner under which conditions the problem emerges”. The first explanation seems to assume an atmosphere of trust, while the other explanation takes a more rational viewpoint. This is likely to be related to the difference between the types of innovation. The Airplane CA develops a radical innovation, which gives far more uncertainty than an incremental innovation as developed in the Insulated CA. The same contrast holds for information distribution. Both respondents in Biogas JV give the same explanation as the New Business manager of the Insulation CA partner with respect to procedural rationality. This issue deserves further research.

All respondents are similar in their statements on the effect on political activity. Differences of opinion are more easily accepted and resolved in favor of the partner with the relevant field of expertise. A partner may use this power position not only to serve their own interests, but also to serve the common interests. Thus we suggest that:

P3: A higher degree of task specialization will decrease the potential for political activity in both contractual alliances and joint ventures.

#### Control

Control consists of the hierarchical mechanisms, contracts and trust.

With respect to **hierarchical mechanisms** the interview results show inconsistent data of an effect of hierarchy on procedural rationality and therefore do not justify a proposition. Conversely, ample explanations show a negative relationship between the degree of hierarchy and political activity. Hierarchical mechanisms such as centrality and formal procedures may diminish the potential of difference of opinions and conflicts. For example, the customer R&D-director (Airplane CA) said that: “In our contractual alliance the degree of hierarchy is low, but a higher degree of hierarchy has a negative effect on the acceptance level of a difference of opinion, because a higher degree of hierarchy means that the decision-making process can be influenced and differences of opinion can be eliminated”. This suggests that in a contractual alliance the potential for differences of opinion and conflicts - and consequently the bargaining potential - is larger due to lower degrees of hierarchy. In a joint venture, the effect of hierarchy seems to be overruled by the effect of ownership structure. According to the Sales manager in the Biogas JV: “In this cooperation we are dealing with one joint corporation with mainly a common objective, and as a result bargaining and discussing among managing directors is less needed”. Consequently, we propose that:

P4: A higher degree of hierarchy reduces political activity in contractual alliances, while in joint ventures the effect of hierarchy is overruled by the effect of ownership structure.

Both in contractual alliances as well as the joint venture, **contracts** are used and utilizable to establish agreement with respect to product innovation tasks and processes

and consequently to avoid undesirable behavior. In the contractual alliances, formal contracts may diminish information processing, and therefore negatively affects procedural rationality, under the assumption that the situation does not change. The supplier R&D-director in the Airplane CA makes this point clearly: “through formalization of contracts the need to have complete information from the partner firm is lower, because one can be judged on the execution tasks. However, establishing issues in contracts can also result in more bargaining, because situations change and are never identical. This is also the reason that we establish few things.”

However, the Sales manager of the Biogas JV partner 1 stated that the way in which information has to be searched for and distributed is established in a contract. This means that contracts actually enhance procedural rationality.

The interview results also reveal that using formal contracts reduce the potential to use power and as a result decrease the political activity. For example, the Business Development manager in the Insulated CA explained that: “the more issues are established in a contract, the fewer possibilities are left to use power”. Also in the Biogas joint venture, the project member (partner 2) who gave a similar explanation as the Sales manager (partner 1) noted that: “bargaining and compromises will also be necessary, but because issues are well established in contracts, they will become less important”. The Sales manager added that establishing the positions of the partners in contracts particularly determine the use of power. Consequently, we propose the following two propositions.

P5: Formal contracts in contractual alliances reduce information-processing and therefore decrease procedural rationality in stable situations - while increasing procedural rationality in unstable situations - , and decrease political activity.

P6: Formal contracts specifying information-processing procedures in joint ventures increase the procedural rationality, whereas the completeness of formal contracts (e.g. also including the positions of the partners) decreases political activity.

**Trust** appears to have an ambivalent effect on procedural rationality as well as on political activity in both contractual alliances as well as the joint venture. While trust reduces the need to search for complete and relevant partner information, it stimulates sharing (not confidential) information between partners. From the perspective of the contractual alliance, New Business manager in the Insulated CA clearly states that: “if the partner is trusted, one assumes that the delivered information is complete and relevant. The degree of trust has a positive effect on sharing information, that is supposed to be relevant for the other party and is not consisting of confidential information”. In addition, according to the other respondent in the Insulated CA (the Business Development manager) said the following. “When you have trust in a partner you will more easily share information. When you have trust in a partner firm, you do not see a difference of opinion as a threat, but as an opportunity to arrive at a better decision through new information.” The R&D-director of the Airplane CA customer agrees: “The degree of trust determines how you deal with power. A lot of trust makes the use of power less/not necessary”. Also in the Biogas JV the Sales manager (partner 1) states similar things and adds that more trust lead to more watering the wine during negotiations. However, the project member of Biogas JV partner 2 remarks that: “If

you trust each other well, then you'll allow more positive power [e.g. devil's advocate] to be used." This gives rise to formulate two propositions.

P7: While trust has a negative effect on the search for complete and relevant partner information, it positively effects the sharing of (not confidential) information between partners.

P8: While trust has a negative effect on political activity, it may positively affect the use of the devil's advocacy control procedures.

### **Decision-making process characteristics and decision-making effectiveness**

Two decision-making characteristics, procedural rationality and political activity have been investigated empirically in association with decision-making effectiveness in terms of the degree of consensus and commitment.

With respect to **procedural rationality** the interview results display a positive effect on consensus as well as commitment. The effect of the degree of sharing information seemed not strong, but appeared to be positive for both consensus and commitment. The degree of searching information is strongly associated with relevant and completeness of information, but also appeared to have a negative effect on commitment in terms of decision changeability. The respondents were also consistent with regard to the influence of the degree of complete and relevant information on consensus (degree of agreement and best possible decision) and commitment (defending the decision, non-changeability of the decision and allocation of resources). Thus, we give the following proposition.

P9: Procedural rationality positively affects decision effectiveness.

Concerning **political activity** the respondents were consistent with respect to the effect on consensus and commitment. The degree of bargaining and finding compromises is very important and found to be positive in relation to consensus and commitment. However, processes of bargaining and compromising may also lead to astray from starting-points that strongly differ between partners and negatively affect commitment. Opportunistic behavior is associated with socially undesirable behavior and appeared to negatively relate to consensus and commitment. The degree to which differences of opinions are accepted relates also positive to consensus and commitment. The use of power with respect to self-interests has a negative affect consensus (indicated by the degree to which a decision is the best possible) and commitment (in terms of 'my decision' and defending the decision). However, the use of expertise power is also found to be related to consensus and commitment. Therefore, we hypothesize the following.

P10: Political activity negatively affects decision effectiveness, except for astray-leading bargaining and finding compromises due large differences of starting-points and except for the use of expertise power.

## **Conclusions**

Concluding, the case study results on the one side give empirical evidence that product innovation project decision-making effectiveness is dependent upon strategic decision-making process characteristics in terms of the presence of procedural rationality and the absence of political activity. On the other side, our empirical research indicates that procedural rationality and political activity are affected by the interdependence and control mechanisms of the governance structure. Furthermore, control mechanisms (except for trust) and interdependence (except for resource dependency) were found to distinguish contractual alliances from joint ventures. Moreover, we found some evidence though further research is needed that product innovativeness, radical versus incremental may affect the degree to which task specialization as an interdependence measure is related to procedural rationality of the decision making process.

## **Discussion**

These conclusions contribute to the recent debate in the product innovation literature whether and how product innovation within alliances differs from product innovation within a firm [62]. Specifically, it suggests that while strategic decision making is important for new product innovation success, strategic decision making within product innovation projects executed in dyadic strategic alliance is determined by the alliance governance structure. This is in line with other studies on the topic such as Bierly and Coombs who found that the stage of product development is related to alliance governance structure and instability [63]. These conclusions also contribute to alliance research studying alliance idiosyncrasies at the level of product innovation projects rather than at the firm or product development level. The conclusions also have managerial implications and are subject to limitations and future research efforts, which are described in the following sections.

### *Managerial implications*

Although limited in scale, the results of this study imply that managers may want to take the governance structure in relation to decision-making characteristics into account - in addition to industry-related, firm-specific as well as technological and partner-related factors - when choosing an alliance governance structure in pursuing new product innovation objectives. This gains importance if research evidence is mounting that product innovation success is a solid base of competitive advantage and future growth. These choices are likely to be related to the recurring strategic decision whether to develop the new product within the firm, within strategic alliance cooperation or within a newly acquired or recently merged firm. In addition, regarding strategic alliance cooperation, it does raise questions such as what priorities and objectives do managers need to set when determining with whom to cooperate, which product innovations to invest in and what product innovation projects to foster.

The results of this research also have implications for managers currently involved in decision making in product innovation projects within strategic alliances. It may help managers finding explanations for the decision-making problems and causes at hand in product innovation projects. In particular, it might facilitate managers searching for and using decision-making styles and methods that smooth the progress of decision making aligned to the alliance governance structure.

### *Limitations and suggestions for future research*

The two main limitations of our study are presented here. Firstly, the empirical research is limited to the number of factors that could maximally be handled examining relationships between concepts in in-depth interviews. With respect to the main governance structure characteristics only interdependence (resource dependency, tasks and process integration and task specialization) and control (hierarchical mechanisms, contracts and trust) have been included. Additional research is needed to investigate the association between hierarchical mechanisms and procedure rationality, due data inconsistency. Moreover, academic research on alliances suggests that in addition to interdependence and control, the flexibility may be associated with decision-making and commitment [64]. Furthermore, decision-making process factors are confined to the most important factors such as procedural rationality and political activity with corresponding indicators [65]. But other factors may also play a role with regard to governance structures and decision-making effectiveness such as leadership style [66], and decision-making method [67]. Further analysis is required to distinguish these factors clearly from governance structure control as well as decision-making effectiveness and subsequently include them into future empirical research.

Second, our in-depth analysis of the three dyadic alliances included in our empirical research strongly limits the generalizability of the conclusions to the population of alliances. Finding dyadic alliances that are willing to participate in case study research and to provide access to respondents from both partners proved to be difficult. Nevertheless, first, a thorough understanding of the antecedents and consequences of decision-making requires future researchers to incorporate more dyadic alliances in various industries and with different characteristics in the domain of decision-making and product development [68]. For example, not only dyadic alliances may be investigated as alliance constellations consisting of at least three alliance partners are expected to change the influence on decision-making in product development projects [69]. Furthermore, as cooperation within product development and product innovation success become increasingly important for modern-day firms, future research must be aimed at investigating the effect of governance structure characteristics on decision-making and its effectiveness at a far larger scale. Controlling for industry, firm, alliance and product innovation effects, survey methods may be used in combination with sophisticated analysis techniques to determine the relative size effects and arrive at more generalizable conclusions.

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