

CONTROL OF INNOVATIONS IN INTERNATIONAL PRODUCT DEVELOPMENT COLLABORATIONS

ABSTRACT

Applying a grounded theory approach, this study explores which control mechanisms MNCs apply in vertical product development projects and whether the chosen control mechanisms depend on the innovativeness of the respective project. Moreover, the study analyzes whether the institutional distance between supplier and customer influences the relationship between a project's innovativeness and the control mechanisms applied. By examining these relationships in a multinational company with strong R&D activities and extensive experiences with R&D collaborations while simultaneously integrating previous literature on related topics, our study contributes to both organizational control literature and the international business field.

CONTROL OF INNOVATIONS IN INTERNATIONAL PRODUCT DEVELOPMENT COLLABORATIONS

INTRODUCTION

It has been widely acknowledged that innovations are a critical capability of multinational companies. They are important drivers of a firm's performance and have significant influences on its success (e.g. Quinn, 2000; Carson, 2007; Handfield et al., 1999; Schilling and Hill, 1998). Firms increasingly involve a number of different parties into their product development projects and build both horizontal and vertical strategic alliances. Studies show that especially suppliers can be a fundamental resource for the buying companies (e.g. Handfield et al., 1999; Koufteros et al., 2007; Petersen et al., 2005; Ragatz, et al., 1997; Ragatz et al., 2002; Schilling and Hill, 1998). However, in spite of the potential of such alliances, the involvement of suppliers into a company's product development processes may also generate severe difficulties. Examples are problems in the process management, inadequate results, misappropriation or hold-up problems. These challenges might become even more serious, when supplier-customer alliances are closed across borders, and international partners that are located in institutional distant environments, are involved. As pointed out by previous research on R&D alliances, an appropriate management and control of the alliance, hence, become very important aspects in collaborative innovation projects (e.g. Dekker, 2004; Hutt et al., 2000).

However, although a great number of researchers has dealt with control mechanisms applied in collaborative projects (e.g. Chen et al., 2009; Chen et al., 2010; Das and Teng, 2001; Dekker, 2004; Geringer and Hebert, 1989; Inkpen and Curral, 2004), this research stream suffers from three theoretical gaps when applied to control of innovations in international product development collaborations. *First*, the applicability of control mechanisms in specific contexts was up to now not sufficiently tested. Although former researchers found that radical and incremental innovation projects might require different management styles as well as an adapted organizational structure (Greenwood and Hinings, 1993; Story et al., 2009; Veryzer, 1998; Wagner et al., 2010), these findings have so far not penetrated studies on organizational control. Regardless the fact that different strategic contexts and distinct tasks demand specific control mechanisms (Fliess and Becker, 2006), there is still a lot of

literature assuming universal applicability of control mechanisms. In the study at hand, we suggest that a project's innovativeness significantly influences the effectiveness of particular control types and, hence, causes an application of different control mechanisms. As to the innovativeness, we distinguish radical and incremental innovations, whereas radical innovations excel existing technological competencies and incremental innovations comprise developments, improvements and exhaustion of already existing technologies and processes (Garcia and Calantone, 2002; Story et al., 2009; Wagner et al., 2010). *Second*, although previous studies have highlighted and applied a number of different control categorizations (see e.g. Cardinal et al., 2004; Carson, 2007; Chen et al., 2009; Chen et al., 2010; Das and Teng, 2001; Dekker, 2004; Eisenhardt, 1985; Jaworski, 1988; Lange, 2008; Richtnér and Åhlström, 2010), hardly any entirely reflects the specific characteristics of control mechanisms applied in strategic alliances. We argue that Lange's (2008) control matrix, which has previously – due to a lot of critique (see Brenner and Ambos, 2012) – not been applied in the international business context, is a very comprehensive concept of control, and well suited for analyzing control mechanisms applied in the context of strategic alliances. We, therefore, integrate this conceptualization into our study and base our examination on Lange's (2008) control dimensions. *Third*, although the relevance of considering a firm's institutional context has been recognized by MNC research, no previous study has examined whether control is the same in an international and a national context. By integrating the concept of institutional distance into our analysis and supposing that it may affect the relationship between a project's innovativeness and the control mechanisms applied, we analyze a relationship, which has not received any attention by previous literature.

In our qualitative examination we, hence, explore on the one hand the link between the innovativeness of a collaborative product development project and the control mechanisms applied by the customer. We, thereby, focus on the control types that MNCs apply to ensure a sufficient level of control over their innovation processes and investigate, whether the chosen control systems depends on the project's innovativeness. On the other hand, we examine whether the relation between the type of innovation and the control mechanisms applied is affected by institutional distance. By conducting our qualitative examination in a multinational company with strong R&D activities and extensive experiences with vertical product development collaborations worldwide, we aim at closing these

research gaps. Applying grounded theory, we, thereby, simultaneously analyze our data and integrate previous studies on the differentiation of radical and incremental innovations, on control processes in R&D projects as well as on the accentuation of the partner's institutional environments into this paper. Although we apply grounded theory and adhere to Glaser and Strauss' (1967) suggestion to conduct research iteratively by a simultaneous collection and analysis of the data, we decided to structure our paper sequentially and begin with theoretical foundations. This sequential approach is in line with Suddaby's (2006) argumentation and was followed by other qualitative researchers as well (e.g. Ladge and Greenberg, 2012; Mantere et al., 2012). The paper, hence, is structured as follows: In the next section we outline the three literature streams we draw from in our study. Building on these theoretical insights we give an overview of the methods we applied and delineate how we collected and analyzed our data. In the fourth section we present our findings and discuss them thoroughly. Basing on these results we highlight the contributions of our examination, compile the implications that pave a way for theory development, and discuss the limitations of our study.

THEORETICAL FOUNDATIONS

There are three streams of literature upon which we can build our study. The first is research on vertical R&D alliances and the management of innovations. The second is literature on organizational control and control mechanisms applied within R&D alliances. The third refers to institutional theory and the relevance of institutional distance in strategic R&D alliances.

Vertical Product Development Collaborations and the Management of Innovations

Research on the integration of suppliers into a company's product development processes has expanded significantly throughout the last three decades (for overviews see e.g. Fliess and Becker, 2006; Johnsen, 2009). Topics analysed within this research area are, amongst others, the different models of supplier integration (e.g. Bonaccorsi and Lipparini, 1994), its timing (e.g. Bidault et al., 1998), the selection process (e.g. Koufteros et al., 2007; Petersen et al., 2005) and the relationship development with the supplying firms (e.g. Johnsen, 2009; Ragatz, et al., 1997). A smaller number of researchers has focused on technological uncertainty and related issues such as the coherence between supplier involvement and technological uncertainty (e.g. Eisenhardt and Tabrizi, 1995; Swink, 1999;

Wasti and Liker, 1997), the selection of suppliers in technologically uncertain settings (e.g. Hoetker, 2005; Primo and Amundson, 2002) and the development and adaptation of relationships between suppliers and customers in uncertain situations (e.g. Petersen et al., 2003; Ragatz et al., 2002). This last mentioned stream is specifically important for the study at hand as technological uncertainty in many cases has been linked to the novelty of innovation projects (e.g. Johnsen, 2009) as well as to the amount of technical difficulty (e.g. Johnsen, 2009; Primo and Amundson, 2002). It, therefore, can be associated with the newness, complexity and degree of change of a technical invention within a product or process and be differentiated as being high in so called radical innovations and low in so called incremental innovations (Johnsen, 2009; Ragatz et al., 2002; Swink, 1999). The distinction between radical and incremental innovations was frequently made (e.g. Gatignon et al., 2002; Song and Swink, 2002; Story et al., 2009; Wagner et al., 2010) as these two types build “the two ends of the innovation scale” (Wagner et al., 2010: 3070).

Generally, the literature on collaborative vertical product development highlights the potential of such cooperative ventures. Nevertheless, critical aspects, when innovations are achieved together with a second party are the management of the alliance as well as the control types applied. Previous literature found that radical and incremental innovation projects might differ greatly with regard to innovation culture and necessary management styles and may require different managerial capabilities and a different organizational structure (Greenwood and Hinings, 1993; Story et al., 2009; Veryzer, 1998; Wagner et al., 2010). However, so far explicit evidence on control mechanisms in radical as compared to incremental innovation projects is scarce. This question, indeed, plays an important role in the product development environment, as it is recognized that specific tasks and strategic contexts require distinct control mechanisms (Fliess and Becker, 2006).

Control Mechanisms applied within R&D Alliances

The failure rate of strategic alliances is reportedly high (e.g. Barringer & Harrison, 2000; Madhok and Tallman, 1998). One approach to increase the probability of a successful collaboration is an adequate management and control of the alliance (e.g. Dekker, 2004; Hutt et al., 2000). Control is substantial to all organizations and contributes significantly to the achievement of a company’s overall objectives (e.g. Ambos and Schlegelmilch, 2007; Brenner and Ambos, 2012; Chen et al., 2009; Cardinal, 2001;

Geringer and Hebert, 1989; Jaworski, 1988; Kirsch, 1996). It can be defined as a “process by which one entity influences, to varying degrees, the behavior and output of another entity [...] through the use of power, authority [...] and a wide range of bureaucratic, cultural and informal mechanisms” (Geringer and Hebert, 1989: 236-237).

Previous literature has widely discussed control in multinational companies in general (an early review is e.g. provided by Martinez and Jarillo, 1989) and focused e.g. on MNC control over their subsidiaries (e.g. Baliga and Jaeger, 1984; Björkman et al., 2004; Chang et al., 2009; Doz and Prahalad, 1984; Peng, 2012). Furthermore, control mechanisms applied in IJVs and strategic alliances were frequently examined (e.g. Chen et al., 2009; Chen et al., 2010; Das and Teng, 2001; Dekker, 2004; Inkpen and Curral, 2004; Geringer and Hebert, 1989), as were the consequences of control on firm performance (Chen et al., 2010; see e.g. Choi and Beamish, 2004; Mjoen and Tallman, 1997). Beyond that, also the various control types that companies might apply, were discussed. One of the most applied categorization is the classification into process, outcome and social control (e.g. Chen et al., 2009; Chen et al., 2010; Das and Teng, 2001; Dekker, 2004; Eisenhardt, 1985; Richtnér and Åhlström, 2010). Other classifications are provided by Carson (2007), who differentiates between ex ante and ex post control systems as well as by Cardinal et al. (2004) and Jaworski, 1988, who distinguish formal and informal control mechanisms (Brenner and Ambos, 2012). Lange (2008) integrated all previously identified perspectives into his model and distinguishes two dimensions: the orientation dimension (outcome versus process control) and the transmission channel dimension (social/cultural versus administrative control) (Lange, 2008).

-- Insert here figure 1 --

As regards the orientation dimension, *outcome control* comprises all mechanisms that are directed towards outcomes accomplished within a specific project (e.g. Brenner and Ambos, 2012; Chen et al., 2010; Turner and Makhija, 2006). *Process control* includes all mechanisms that control the adherence of predefined development activities and processes (Chen et al., 2010; Kirsch, 1996). In terms of the transmission channel dimension, *social and cultural controls* are mechanisms driven by norms, values and beliefs in the organization and being applied to reach a feeling of social obligation (Chen et al., 2010; Lange, 2008; Ouchi, 1979). *Administrative controls* are “transmitted by formal structures and

routines, particularly through hierarchies of authority internal and external to the organization” (Lange, 2008: 712).

It became clear that ‘control’ is specifically important in product development collaborations (see also Fliess and Becker, 2006). Thereby, companies aim at applying a reasonable combination of various control mechanisms and reaching a state of a balance between the different control types (Chen et al., 2010; Cardinal et al., 2004). In this context, we assume that companies apply other control mechanisms in radical innovation projects, which usually go along with a higher degree of technological uncertainty, than in incremental innovation projects. However, we do not only focus on this interrelation, but expand the model and include the variable institutional distance between the two collaborating parties into our model.

Understanding the Relevance of the Institutional Background of Collaborating Firms

As industrial competence is not only organizationally, but also geographically widely dispersed (Teece, 1992), the number of strategic alliances formed within an international context is constantly increasing (Shin et al., 2009). Nevertheless, especially vertical alliances have received only little attention in the scientific literature. There is a lot of early and recent literature on the management of globally dispersed technology networks (e.g. Ambos and Schlegelmilch, 2004; Kim and Park, 2010) as well as on the control of a MNC’s extra-national units (e.g. Ambos and Schlegelmilch, 2007; Baliga and Jaeger, 1984; Björkman et al., 2004; Chang et al., 2009; Doz and Prahalad, 1984; Peng, 2012; Rosenzweig and Singh, 1991). Focusing on MNCs, researchers, thereby, found that national borders significantly influence operations and processes of companies (Rosenzweig and Singh, 1991). Moreover, there is literature arguing that the cultural distance between a MNC and its subsidiaries has an influence on the control mechanisms applied (e.g. Ambos and Schlegelmilch, 2007). In addition, Ambos and Schlegelmilch (2007) pointed out that due to the raising international dispersion of a MNC’s R&D units, the importance of applying suitable control mechanisms has increased. However, the management of strategic alliances between e.g. suppliers and customers has only rarely been researched in terms of the alliances’ internationality. Nevertheless, also in the context of vertical strategic alliances authors have highlighted the role of national borders and pointed out that a

supplier's origin can affect the collaboration in terms of interactions, product time ability and conflicts (Petersen et al., 2005; Dröge et al., 2000; Kale et al., 2000).

One way to measure cross-country differences between firms is the introduction of the variable 'institutional distance' (Xu and Shenkar, 2002; Kostova and Zaheer, 1999). Institutional distance is derived from institutional theory (Xu and Shenkar, 2002; Kostova and Zaheer, 1999; Scott, 1995), and is defined as the "the difference or similarity between the regulatory, cognitive, and normative institutional environment" (Kostova and Zaheer, 1999: 68) of collaborating firms. The *regulatory pillar*, thereby, refers to formal rules, laws and enforcement mechanisms sanctioned by the state to ensure legitimacy (Kostova and Zaheer, 1999; Peng, 2003; Xu and Shenkar, 2002). The *cognitive pillar* highlights a society's cognitive structure and refers to internalized cognitive values and beliefs (Kostova and Zaheer, 1999; Peng, 2003; Xu and Shenkar, 2002). Dealing with social and cultural values, the *normative pillar* exceeds the regulatory and cognitive structures (Kostova and Zaheer, 1999). Generally, the higher the institutional distance, the more complex it is for companies to achieve organizational legitimacy being "the acceptance of the organization by its environment" (Kostova and Zaheer, 1999: 64).

Although institutional distance has been frequently applied in the international business context (Kostova et al., 2008), the specific role of institutional distance in buyer-supplier innovation processes has, to the best of our knowledge, never been explicitly analyzed. This is particularly surprising as especially MNC research has recognized the relevance of considering a company's institutional context as well as the firms' reactions on their environment (Westney, 1993; Xu and Shenkar, 2002). Even more, it was shown that institutional distance can significantly influence the collaboration of two companies (Kostova and Zaheer, 1999). Considering this, we integrate the concept of institutional distance into the previously discussed relationship of innovation and control and argue that institutional distance affects the control mechanisms applied within specific product development collaborations. Doing so, we examine not only internal influences on control, which were frequently examined, but also external contingencies that were up to now largely neglected (Chen et al., 2010).

Subsuming all three streams of literature outlined above, it can be stated that there is a highly relevant and underresearched area in the field of control mechanisms in the international product development environment. By demonstrating and testing a relationship between a project's innovativeness and the control mechanisms applied in a complex research model we are able to analyze these processes in a real setting and close an interesting and extremely relevant research gap. Moreover, the role of the institutional distance and its consequences on the product development collaborations is relevant but has not been addressed by existing research.

EMPIRICAL SETTING AND METHODS

We applied a qualitative methodology as we analyze processes and interactions taking place within product development collaborations. These can be comprehended best with the help of experience-related knowledge (Cropley, 2002). We, therefore, conducted multiple interviews within one firm and applied grounded theory to analyze the data from our explanatory case study. Pertaining to the concept of 'constant comparison' we collected and analyzed our data simultaneously (Suddaby, 2006), although we retain our sequential approach also in this section. Simultaneously, we pursued the principle of 'theoretical sampling', signifying that the theory developed determined our decision about which interview was conducted next (Suddaby, 2006). We chose a multinational electronics and electrical engineering firm to be our case company and incorporated restrictions on both the industry and the firm level. Thereby, we kept both contexts stable to avoid biases and to be able to comprehensively provide evidence of the studied process (Eisenhardt and Graebner, 2007; Siggelkow, 2007; Yin, 1994). In the following we refer to our case company as "the customer".

Data Collection

At the customer we conducted interviews with experts on two levels: At the beginning of our examination, we interviewed two experts that have overall responsibility for all R&D projects within this company division. Both interview participants have long term professional work experience and been active in the division for many years. As one of the interviewees is an administrative employee on the management level and the other one occupied a leading technical position, we were able to gain a comprehensive insight into the customer's R&D projects from two different perspectives already

throughout this first step of our examination. The respondents, moreover, are aware of most past and all actual projects and, hence, able to differentiate the projects with regard to its innovativeness. Even more, as they also know the origin of all collaborating suppliers, they are able to distinguish projects accomplished with regional suppliers from those executed with international suppliers. Together with the two interview participants we were, hence, able to identify four different types of projects.

-- Insert here figure 2 --

Throughout this first step we received the impression that the customer applies different control mechanisms in radical innovation projects compared to incremental innovation projects. Besides that it became clear that also the institutional distance between supplier and customer may affect the control mechanisms applied. As a consequence, we regarded it as specifically interesting to examine the four types of projects separately and additionally conducted interviews with people being responsible for the respective projects. The decision, which interview was conducted next, was, thereby, determined by the theory being developed. After interviewing two people on this level that covered all projects, we decided to consult a third interview partner in order to ensure a comprehensive and detailed picture of the projects. However, the gain of additional information was only incremental in this last interview leading to the assumption that we have covered all necessary information by examining the four different projects from two perspectives. In addition, we had numerous short meetings with one of the interviewees to clarify further questions. Throughout the whole process, we steadily revised the literature on control of innovation projects as well as institutional distance and adapted our interview protocol accordingly.

All interviews were conducted by one of the authors, lasted from 40 minutes to 2 hours and were tape-recorded and professionally transcribed verbatim. Although the structure of the interviews slightly differed from each other, all interview protocols were semi-structured and contained questions on the same areas. Throughout the interviews, we encouraged the respondents to give examples and cover any topic they regarded as important. Thereby, all interviewees were ensured of confidentiality.

Data Analysis

Our analysis followed a grounded theory approach (Glaser and Strauss, 1967; Strauss and Corbin, 1990) as we intended to expose new aspects of the above mentioned theoretical perspectives and

establish links between them. We, thereby, conducted our analysis with the help of a constant comparison of our coded data and existing theories. First, two researchers independently went through the data and coded it. As our analysis proceeded in three stages (open, axial and selective coding; see Gibbs, 2002), each of the researchers completed the particular steps individually. Once both researchers had completed each part, the findings were compared, discussed in detail and conclusions drawn for further processing. Overall, all discussions made a contribution to both the decision which codes were to be used in the next iteration of coding as well as to the building of theory in the end. As proposed by Strauss and Corbin (1990), we accomplished several rounds of coding, comparing the codes, viewing literature and recoding. Due to our specified sampling and the adaptations of the interview protocol made after the first interview, the codes were similar after analyzing two more interviews. Nevertheless, we conducted and analyzed one more interview to reach the point of theoretical satisfaction and to make sure that no more codes were generated. This multistep approach supported our endeavor to attain a conceptual understanding of the interview material and ensure a “dynamic interplay of data collection and analysis” (Dunne, 2011: 111).

FINDINGS & DISCUSSION

Our data shows that MNCs that have established product development collaborations with suppliers use different mechanisms of control with regard to the innovativeness of a project. Specifically, radical innovations entail different types of control mechanisms than incremental innovations. Besides that, our findings also reveal that this relationship between innovation and control is affected by the institutional distance between the two parties. More precisely, we found that suppliers which are located in institutionally different environments are controlled differently compared to those located in a similar institutional environment than the customer, although the project’s settings (e.g. innovativeness) are comparable. Table 3 provides a rough overview of the findings that will be outlined in the following chapters.

-- Insert here figure 3 --

Control Mechanisms applied in Vertical Product Development Collaborations

Before outlining specific relationships, we consider it as necessary to address a few basic general findings on control in product development projects of our case company. First, our data reveals that our case company always has the power to control its innovation projects. To assure this for all projects it concludes either a contract or a research agreement with each collaborating supplier. This is specifically important, as control mechanisms can only be applied in relationships in which one company has the power to influence decisions made by and processes controlled by the collaborating firm (Carson, 2007; Geringer and Hebert, 1989). Moreover, our data reveals that the decision for or against specific control mechanisms within the respective project mainly depends on the product's innovativeness, its value and criticality as well as possible costs of misconduct. Thereby, we received the impression that the interview participants have a very clear idea of which combination of control mechanisms are beneficial for which projects. Generally, firms aim at reaching a state of a control balance, which can be defined as a "harmonious use of multiple forms of control" (Cardinal et al., 2004: 412). How this balance looks like in projects of our case company will be outlined in the following.

As mentioned before we take Lange's (2008) control matrix (figure 1) as a basis to describe, understand and discuss our findings on the company's control processes. We, thus, structure this chapter according to Lange's (2008) distinction of the two control dimensions, and begin with an illustration of the orientation dimensions and a discussion of our findings regarding outcome and process control in radical and incremental innovation projects.

Outcome versus Process Control in Radical and Incremental Innovation Projects

Data analysis revealed that in projects in which *radical innovations* are developed, generally, all four of Lange's (2008) control types are applied. However, focusing on the orientation dimension, it became clear that the control of the process is more important than the control of the outcome. Our findings, moreover, show that in radical innovation projects the collaboration generally starts at a very early stage and the product development process is built up together by both parties. This, however, also signifies that radical innovation projects are subject to intense control from the very beginning. Thereby, our data reveals that in radical innovation projects the effort put on the control of the process

is much more intense than the one put on the outcome. Our interview participants in this context consider process control to be the basis for an efficient process, which, subsequently, contributes significantly to the outcome. Moreover, our data reveals that process control is considered indispensable due to the product's newness and the fact that nobody knows before what might happen. Nevertheless, the outcome is controlled as well. However, the customer puts less effort on outcome control than on process control in radical innovation projects.

Projects, in which *incremental innovations* are developed, are controlled differently. Our findings reveal that in these types of projects the focus clearly lies on the control of the outcome, while the process is controlled to a much lower extent. If the outcome is satisfactory, the customer may even not control the process at all. Nevertheless, our findings reveal that process control might come to the fore, if the desired result is not achieved or problems arise. It might happen that the company originally plans to solely control the outcome, but starts with process control at a later point of time. In incremental innovation projects the control of the outcome is, hence, valued higher than the control of the process.

The argumentation that process control mechanisms (preferentially applied in radical innovation projects) are in general more intense than outcome control types (paramountly in incremental innovation projects), is in line with previous literature: Researchers found that control is more important in situations characterized by a high degree of uncertainty (Davila, 2000), which we expect to be higher in radical and lower in incremental innovation projects. In the same context, strong control mechanisms are specifically important in radical innovation projects, as control mechanisms in many cases are intended to lower uncertainty in the product development process (Fliess and Becker, 2006). As companies have to "exercise control over NPD projects while at the same time providing enough freedom and flexibility not to constrain the projects' inherent creativity or impede their progress and ultimately their ability to create knowledge and be innovative" (Richtnér and Åhlström, 2010: 1007), it is obvious that the problem solution might differ with regard to a project's innovativeness. To sum up our findings regarding the orientation dimension we derive the following propositions:

Proposition 1a: In radical innovations, MNCs tend to apply a higher level of process and lower level of output control.

Proposition 1b: In incremental innovations, MNCs tend to use a lower level of process and higher level of output control.

However, also results on the transmission channel dimension vary when radical innovation projects are compared to incremental ones.

Social versus Administrative Control in Radical and Incremental Innovation Projects

Our findings show that also the application of social and administrative control mechanisms varies significantly with regard to a project's innovativeness. In detail, our data reveals that social control mechanisms are specifically important in *radical innovation projects*. As stated by one interviewee it is, particularly then, important to know the project partner well and 'have a good chemistry between the actors' to ensure a project's success. Social control mechanisms, hence, build the basis for an effective cooperation in radical innovation projects, as, according to our interviewees, 'through a personally spoken word much more information is given than with the help of an email'. Nevertheless, our analysis reveals that also administrative control mechanisms are applied and e.g. rules of measurement or compliance of criteria established to ensure the quality of radical innovation projects. However, our interview participants highlighted that an exclusive administratively conducted control would hinder developments, strain the development process, and harm the overall cooperation. Moreover, it is difficult to apply due to the uncertainty about the course of the project. Social control, in contrast is considered to be much more effective and should not in any case be missing. In sum, our findings reveal that our case company places great emphasis on the achievement of a suitable mixture of administrative and social control mechanisms, which is in line with previous literature (Chen et al., 2010; Cardinal et al., 2004). However, while our case company in radical innovation projects clearly prefers the application of social control mechanisms and applies administrative control mechanisms only additionally, the balance of control mechanisms is different in *incremental innovation projects*. Although also in these project types social control mechanisms in many cases have become an integral part of the project they are used to a much lower extent than in radical innovation projects – or even not at all. Administrative control mechanisms such as timeframes and configurations given to the

suppliers play a much higher role. This difference between radical and incremental innovation projects might be due to the fact that formal control mechanisms have a different impact on the collaboration and the creativity of the supplier than informal control mechanisms (see also Carson, 2007). As incremental innovation projects are less technologically uncertain and more predictable, the customer has to put less emphasis on pushing a supplier's creativity in incremental innovation projects.

Our data, consequently, revealed that also with regard to the transmission channel dimension, the type of innovation has a significant influence on the control mechanisms applied. Previous literature, in this context, reports that formal, viz. administrative, control mechanisms "may undermine trust, because the employment of strict rules and objectives means that members do not have the autonomy to decide what works best" (Das and Teng, 2001: 263). This may lead to an atmosphere of mistrust (Das and Teng, 2001) and, hence, negatively influence a collaborative product development project. Especially in radical innovation projects, however, a good atmosphere is indispensable, as the output of the collaboration depends significantly on the supplier's creativity (see illustrations above). In incremental innovations, on the other hand, a state of trust between the supplier and the customer is less important, as the extent to which a supplier has to contribute creative skills, is much lower compared to radical innovation projects. An application of administrative control mechanisms might, consequently, cause less damage in this type of innovation projects. Moreover, our data reveals that incremental innovations projects are usually less critical to the customer than radical innovation projects as less money from the part of the customer is involved. This, however, gives rise to the idea that our case company takes the risk of not receiving the desired result, when mainly focusing on the application of administrative control mechanisms. Social control mechanisms, on the other side, positively influence the establishment of trust, create a feeling of mutual understanding between the business partners, and, therefore, positively influence the cooperation with the help of shared norms and goals (Das and Teng, 2001). Due to the above mentioned reasons, it is consequently, specifically important in radical innovation projects. Summarizing, we derive the following propositions:

Proposition 2a: In radical innovations, MNCs tend to apply a higher level of social and a lower level of administrative control.

Proposition 2b: In incremental innovations, MNCs tend to use a lower level of social and a higher level of administrative control.

Throughout the analysis it, moreover, became clear that the two dimensions of Lange's (2008) matrix (orientation and transmission channel dimension) are closely linked to each other also in practice. Thereby, we were able to compile a ranking of the control mechanisms applied in our case company. Our main results are summarized in the following figure.

-- Insert here figure 4 --

Focusing on Lange's (2008) control matrix, it has to be mentioned that while social control mechanisms are mainly applied to control the process, administrative control mechanisms are preferably used for outcome control. Nevertheless, our findings revealed also exceptions showing e.g. an administrative control of the process. How important the individual control mechanisms are in both project types specifically, will be outlined in the following.

As outlined above, in *radical innovation* projects our case company clearly focuses on the control of the process. Thereby, the most important control mechanisms are the socially conducted ones (Type 1). To support the processes of radical innovation projects with the help of 'stronger' control mechanisms, also administratively conducted control mechanisms are employed (Type 2). Although the output is, generally, less controlled than the process, our case company administratively controls the outcome to ensure the quality of a project's results (Type 3). A social control of the outcome was hardly mentioned in the context of radical innovation projects. We, therefore, consider it to be the least important control mechanism in radical innovation projects (Type 4).

While in radical innovation projects the focus lies on the socially conducted control of the process, our case company in *incremental innovation* projects usually prefers to rely strongly on administratively conducted mechanisms controlling the project's outcomes (Type 3). In the same context, we gained the impression that the importance of other control mechanisms usually only grows if problems, such as an unsatisfactory outcome or difficulties throughout the process, arise. In this case, our case company would first either discuss the outcome as well as the problems aligned to it with the supplier (Type 4), or interrupt and control the process. Process control then is both socially and administratively conducted. We, thereby, had the feeling that the social control of the process (Type 1) becomes more important than administratively conducted process control (Type 2).

The Moderating Effect of Institutional Distance on the Innovation-Control Relationship

We already mentioned that our data not only reveals information on control mechanisms applied in vertical product development alliances, but also on the influence of the institutional distance between the collaborating parties on the relationship between a project's innovativeness and the control mechanisms used. We consider the integration of the variable 'institutional distance' into our study as specifically important, as we examined supplier-customer-collaborations in different institutional contexts and perceived significant differences with regard to the control mechanisms applied. Generally, our data shows that the same demands and rules regarding the development of a product (e.g. quality) apply to all of them - irrespective of its origin and the degree of institutional distance between the two parties. Nevertheless, our findings reveal that the institutional differences between the collaborating parties significantly affect the cooperation as well as the management practices applied. To mention just a few examples of negative consequences of institutional differences in our case company, these were e.g. the non-fulfillment of the expected results, technical problems or delivery difficulties. We argue that the origin of these problems lies in cognitive, normative and regulatory differences of the collaborating parties, which can significantly influence the cooperation between two organizations due to e.g. false interpretations, difficulties of understanding or adjustment challenges, as the institutional environment in which an organization operates may be considerably reflected in the company's structures, behaviors and rules (Kostova and Zaheer, 1999). Thereby, our data shows that especially cognitive and also normative differences are of great importance throughout the management of the collaboration. Nevertheless, it became clear that institutional differences can also have positive effects on the cooperation due to e.g. the openness, an uncomplicated way of problem solution or the mental flexibility of institutionally different suppliers. In specific cases, our case company even consciously searches for companies being institutionally different. As regards the general influences of *regulatory distance* between the supplier and the customer on the product development collaboration our findings reveal that – although our interview participants are aware that regulatory differences exist – they try to work with them. Our case company in this context tries to generate an acceptance for regulatory differences and aims at preparing those employees that have to work with international suppliers and are affected by regulatory differences between project partners.

It is specifically important to pay attention to the consequences of regulatory differences, as regulatory institutions at the country level might set the ‘rules of the game’ and, herewith, influence a company’s behavior and strategy (Chen et al., 2010; Peng et al., 2008). Examples for aspects connected to regulatory distances in our case company are political uncertainties or a less pronounced legal framework. The situation is different when having a look at the *cognitive distance* between supplier and customer. Our findings clearly show that our interview participants perceive a cognitive distance and are aware that it might have a significant influence of the cooperation of the two parties. Examples for problems in our case company are diverse expectations, a different philosophy, diverging perceptions of quality and task accomplishments as well as a more difficult communication and understanding due to the language barrier. Problems like these likely harden the handling of the collaboration, which is also reflected in a direct comparison between a regional and an international supplier in a similar project: Our interview participants reported less problems within a cooperation with the regional supplier than with the international one. Moreover, our findings reveal that the quality is believed to be better in the home country compared to a foreign market and that the international suppliers tend to have a much higher perceived average error rate compared to regional suppliers. Last, our data reveals that there is also a *normative distance* between the customer and its international suppliers visible. However, it is not as clear as the cognitive distance and, hence, given less attention by the interview participants. Nevertheless, although our interview participants emphasize that they do not adhere to cultural differences between supplier and customer, our findings show that they yet exist, but are less important for the management of the alliance.

To sum up, it became clear that in international collaborations the institutional distance between supplier and customer can significantly affect the control mechanisms applied within the respective alliance. We structure the following chapter according to Lange’s (2008) control dimensions and concentrate on process and outcome control mechanisms first, before we focus on socially and administratively conducted control types.

The Influence of Institutional Distance on the Relationship between a Project's Innovativeness and the Orientation Dimensions' Control Mechanisms

We already outlined above that in *radical innovation* projects the control of the process in general is much more important than the control of the output, although the outcome is controlled as well. This relationship proved to be true in collaborations with both national and international suppliers. However, our findings reveal that the process is more intensively controlled in radical innovation projects with national suppliers compared to collaborations in which international suppliers are involved. It, hence, can be concluded that the institutional distance between supplier and customer influences the relationship between a project's innovativeness and the control mechanisms applied. The reason for this, thereby, seems to be primarily the fact that for our case company it is easier to control the process of regional suppliers than supervising the process of suppliers located further away. Former researchers found that culture significantly impacts a firms' ability to conduct innovations (Kaasa and Vadi, 2010). In a similar context, other authors recommend to apply strong control mechanisms in uncertain situations that might result from cultural distance between collaborating partners (Chen et al., 2010). We argue that the regulatory, cognitive and normative differences between supplier and customer may be the crucial factor for the case company to make differences in the control mechanisms applied. It was outlined above that an organizations' values have to be consistent with the ones of the respective society to reach a state of organizational legitimacy and to be able to cooperate with the supplier of the respective company intensively (Kostova and Zaheer, 1999; Xu and Shenkar, 2002). As this, however, is not possible in all cases, we suppose that our case company avoids this problem and applies less process control compared to collaborations with regional suppliers. Moreover, the geographical closeness of regional suppliers may facilitate a more frequent execution of control mechanisms. Nevertheless, it has to be mentioned that although the process control of projects in which international suppliers are involved are often less frequent, they are usually comparably intense. To sum up, we derive the following proposition:

Proposition 3a: Institutional distance has a negative influence on the relationship between radical innovation projects and high process control.

The situation is different when looking at *incremental innovation* projects, in which the control of the output has a much higher priority than the control of the process. This is true for both collaborations with national and international suppliers. However, our findings show that in incremental innovations being conducted with international suppliers the company's focus on the outcome of a project is even more clear than in collaborations with national suppliers. In these cases, the process is hardly controlled at all and/or only interrupted when severe problems arise or either the required process performance or the desired results cannot be provided.

The reason for this different influence of institutional distance on the innovation-control-relationship can be related to the necessity of a state of organizational legitimacy. Specifically, we argue that although a company's values have to be consistent with the ones of a foreign society (Kostova and Zaheer, 1999; Xu and Shenkar, 2002), this is not as important when the outcome is controlled compared to when the focus is on the control of a project's process. We, hence, believe that our case company does not have to carry out as many adaptations in order to apply outcome control mechanisms across borders compared to the use of process control mechanisms. With regard to incremental innovation projects we, hence, derive the following proposition:

Proposition 3b: Institutional distance has a positive influence on the relationship between incremental innovation projects and high outcome control.

The Influence of Institutional Distance on the Relationship between a Project's Innovativeness and the Transmission Channel Dimensions' Control Mechanisms

As outlined above, social control mechanisms in general work more effective than administrative control mechanisms in both radical and incremental innovation projects. Nevertheless, our data reveals that while in radical innovation projects our case company focuses on socially conducted control of the process, its mainly relies on administrative control of the output in incremental innovation projects. As regards the influence of the institutional distance, our findings reveal that this variable significantly influences also the relationship between the projects' innovativeness and these two control mechanisms applied.

Our data shows that in *radical innovation* projects with national suppliers, our case company intensively applies social control mechanisms, focusing mainly on the process, and was e.g. present at

the suppliers' production site almost every day. The supplier's geographical closeness has, thereby, supported this focus on social aspects significantly as it took our case company less effort to get to the supplier. In radical innovation projects with international suppliers, on the other hand, social control is not as easy and requires more investments with regard to time, costs and necessary adaptations due to institutional differences. Our case company, consequently, applies less social control mechanisms in radical innovation projects conducted with international suppliers than in projects executed with national suppliers. This situation is underlined by a statement of one of our interview participants: As 'you cannot easily drive to a site in country XY', the case company has 'outlined the tasks and waited for the result'. We, however, argue that this development is more a question of time and costs than of intention, as our findings clearly reveal that our case company is fully aware of the benefits of social control in radical innovation projects also with international suppliers. We, consequently, derive the following proposition:

Proposition 4a: Institutional distance has a negative influence on the relationship between radical innovation projects and high social control.

The situation differs, when *incremental innovation* projects are examined. In incremental innovation projects, administrative control mechanisms are more important than social control mechanisms. This, on the one hand, can be traced back to the fact that social and process control mechanisms are closely linked to each other and the same is true for outcome and administrative control mechanisms. On the other hand, especially the high degree of regulatory, cognitive and normative distances between supplier and customer requires a rise of administrative control mechanisms. In this context, our data reveals that when collaborating with an international supplier in incremental innovation projects, the administrative control mechanisms applied are more intense than in alliances with national suppliers.

Specifically, while the relevance of administrative control mechanisms has increased, the importance of social control mechanisms was diminished in incremental innovation projects with international suppliers. However, while in collaborations with regional suppliers also social control mechanisms are important and applied, this is not as true for collaborations in which an international supplier is integrated. We argue that this can be explained with the help of two factors: First, as outlined above, we assume that due to a lack of time and costs, social control mechanisms are harder to apply in

international collaborations compared to national ones. Moreover, we argue that in incremental innovation projects, the degree of innovativeness is a lot lower than in radical innovation projects. As consequently the supplier's creativity is not as necessary in radical innovation projects (see explanations above), it allows an increased application of administrative control mechanisms in combination with a higher institutional distance. This, consequently, leads to the following proposition:

Proposition 4b: Institutional distance has a positive influence on the relationship between incremental innovation projects and high administrative control.

CONTRIBUTIONS, IMPLICATIONS & LIMITATIONS

This study examines how MNCs exercise control over their product development projects being executed with suppliers. It also explores whether the institutional distance between the customer and its suppliers has an influence on the relationship between a project's innovativeness and the applied control mechanisms. We found that the control mechanisms used differ depending on a project's innovativeness, whereas we distinguished two different types of projects: radical and incremental innovations. As regards the influence of the institutional distance between supplier and customer on the innovation-control-relationship, our findings reveal that suppliers located in different institutional environments are controlled differently compared to suppliers located in a similar institutional environment as the customers. Our findings contribute to various streams of literature. All of these theoretical contributions as well as the practical implications of our findings and the limitations of our study will be discussed in detail in the following chapters.

Theoretical Contributions

By applying a grounded theory approach and iterating between literature and data we have created a comprehensive insight into the relationship between the innovativeness of a project and the control mechanisms applied within product-development collaborations between supplier and customer. Moreover, we have generated a deep understanding of how the institutional distance between the two collaborating parties affects the relationship between a project's innovativeness and the implemented control types. Hence, our study makes several theoretical contributions, which we will outline in the

following. *First*, although many scholars examined the process, the characteristics and the prerequisites of supplier integration into new product development activities, there is hardly any literature that examines the relation between the innovativeness of a project and the mechanisms used to control these projects. Furthermore, although early literature was mainly exploring incremental innovations and recent researchers have increasingly laid the focus on situations of technological uncertainty and specialized on supplier integration in radical innovation projects (Johnsen, 2009), there is only little literature that actually compares incremental with radical innovation projects. By investigating whether the innovativeness of a project influences the mechanisms of control used within product development collaborations we, therefore, address a strategic issue that was previously not addressed yet. *Second*, we apply a control matrix that has hardly been applied neither in the control literature nor in an international business context. Despite all previous criticism and its predominant application in the area of corruption control, we believe that Lange's (2008) control matrix is well suited for analyzing the different control mechanisms applied and, hence, for achieving the goals of our study. By distinguishing between the orientation and the transmission channel dimension, Lange has summarized all control mechanisms applied in organizations (Lange, 2008) and integrated all previously identified control concepts into his matrix. We found that his distinction quite accurately reflects the characteristics of control mechanisms applied in strategic alliances, although his distinction between the two transmission channel dimensions still leaves room for discussion (Brenner and Ambos, 2012). Overall, we fully support Lange's (2008) approach to accord to a basic suggestion of control theory that distinguishes the different control types into external measure-based control on the one hand and internal value-based control on the other hand (Das and Teng, 2001; Eisenhardt, 1985). Our study, therefore, is a first step in spreading a comprehensive and extensive concept of control and significantly contributes to the organizational control theory. *Last*, we brought the relationship between the innovativeness of a project and the applied control mechanisms into an international context by examining the influence of institutional differences on the relationship between a project's innovativeness and the control mechanisms applied. Although institutional theory has been acknowledged by the international business field and especially MNC research has recognized the relevance of considering a company's institutional context as well as the firms'

reactions on their environment, there is hardly any literature that considers consequences and effects of institutional theory. Specifically, there is no literature that has integrated the concept of institutional distance into an examination of product development collaborations and analysed the influence of institutional distance on the relationship between the innovativeness of a project and the control mechanisms applied. Moreover, previous research in many cases disregards the fact that internationally collaborating companies do not only operate in culturally different environments and with culturally different partners. Rather, firms operate in environments that differ also in other aspects. In this context, Xu and Shenkar (2002) argue that cultural distance (e.g. the cultural distance index developed by Kogut and Singh, 1988) “does not capture the complexity of cross-country differences [...] [and] neglects the critical role of societal institutions in articulating, disseminating, and arbitrating cultural and social cues” (Xu and Shenkar, 2002: 608). To capture “the rich diversity of ways in which countries differ” (Berry et al., 2010: 1461) and comprise various types of distances that might influence a firms behavior, it is, hence, crucial to include not a single, but multiple dimensions of distances into an analysis (Berry et al., 2010). By integrating institutional distance into our examination, we, consequently, close this research gap and contribute significantly to the augmentation of literature on institutional theory.

Practical Implications

Our findings have important practical implications for managers and units as this paper provides managers with an extensive framework on how to manage various types of innovations within the company and how to deal with institutional distance. Specifically, our findings *first* reveal that managers should think about the innovativeness of a project as the nature of one type of innovation differs significantly from another. In the same context, it became clear that these different types of innovations require different control mechanisms. Hence, by reflecting the processes and managing them accordingly, managers and units are able to structure their product development collaborations efficiently and receive the maximum use of their innovative capacity. *Second*, by examining the actual status within a company as well as questioning and discussing the results with existing literature, managers are able to identify potentials for improvement and derive strategic recommendations. Particularly, managers are supported in structuring their innovation process within national and

international product development projects with suppliers more efficiently. *Third*, by including institutional distance into our study this framework is much more comprehensive than other, previously existing frameworks, and reflects the actual situations in practice more precisely, as in practice not only national, but also international product development collaborations are closed. Managers are provided with an overview why international collaborations differ from national ones.

Limitations and Directions for Future Research

Our study has provided a comprehensive overview on the relation between the innovativeness of a project and the control mechanisms applied in product development collaborations as well as on the influence of institutional distance on the relation between a project's innovativeness and the control mechanisms applied. Our grounded theory approach added to the creation of a comprehensive insight into the topic by going back and forth between theory and literature. Nevertheless, we are aware that our study contains several limitations which offer opportunities for future research. *First*, we have consciously applied a single case-study to avoid biases and to be able to display the studied processes as accurate as possible. However, we believe that due to this single case approach there are limitations to the generalizability of our examination. We, hence, encourage future researchers to include more companies, e.g. from different industries into their studies. However, when including various industries, future researchers, consequently, have to ensure the explanatory power of their study. The *second* limitation, which is very closely related to the first limitation, refers to the number of participants in our study. As we applied a single case approach and were consciously choosing the participants for our study, the number of interviews was rather small. As a second step, we, consequently, encourage other researchers to test and approve the outlined relationships between the innovativeness of product development processes, applied control mechanisms and institutional distance on a larger scale. Thereby, we assume that control mechanisms in different industries might differ as every industry sets its own benchmarks – especially in the area of R&D. *Third*, we have applied Lange's (2008) control matrix and clearly see it as a major strength of our paper. Nevertheless, we are aware that this control matrix also provokes some limitations. Although Lange's (2008) conceptualization of control was well suited for our study, we are aware that especially the differentiation between socially and administratively transmitted control types is not clearly defined

and leaves room for discussion. We, hence, encourage future researchers to either narrow this conceptualization further down or apply a different conceptualization to approve and augment our findings.

REFERENCES

- Ambos, B., & Schlegelmilch, B. B. (2004). The use of international R&D teams: an empirical investigation of selected contingency factors. *Journal of World Business*, 39(1): 37.
- Ambos, B., & Schlegelmilch, B. B. (2007). Innovation and control in the multinational firm: A comparison of political and contingency approaches. *Strategic Management Journal*, 28(5): 473-486.
- Baliga, B. R., & Jaeger, A. M. (1984). Multinational Corporations: Control Systems and Delegation Issues. *Journal of International Business Studies*, 15(2): 25-40.
- Barringer, B. R., & Harrison, J. S. (2000). Walking a Tightrope: Creating Value Through Interorganizational Relationships. *Journal of Management*, 26(3): 367-403.
- Berry, H., Guillén, M. F., & Nan, Z. (2010). An institutional approach to cross-national distance. *Journal of International Business Studies*, 41(9): 1460-1480.
- Bidault, F., Despres, C., & Butler, C. (1998). The drivers of cooperation between buyers and suppliers. *Research Policy*, 26(7/8): 719.
- Björkman, I., Barner-Rasmussen, W., & Li, L. (2004). Managing knowledge transfer in MNCs: the impact of headquarters control mechanisms. *Journal of International Business Studies*, 35(5): 443-455.
- Bonaccorsi, A., & Lipparini, A. (1994). Strategic partnerships in new product development: An Italian case study. *Journal of Product Innovation Management*, 11(2): 134-145.
- Brenner, B. & Ambos, B. (2012). A Question of Legitimacy? A Dynamic Perspective on Multinational Firm Control. *Organization Science (Articles in Advance)*: 1-23.
- Cardinal, L. B. (2001). Technological Innovation in the Pharmaceutical Industry: The Use of Organizational Control in Managing Research and Development. *Organization Science*, 12(1): 19-36.
- Cardinal, L. B., Sitkin, S. B., & Long, C. P. (2004). Balancing and Rebalancing in the Creation and Evolution of Organizational Control. *ORGANIZATION SCIENCE*, 15(4): 411-431.
- Carson, S. J. (2007). When to Give Up Control of Outsourced New Product Development. *Journal of Marketing*, 71(1): 49-66.
- Chang, Y. Y., Mellahi, K., & Wilkinson, A. (2009). Control of subsidiaries of MNCs from emerging economies in developed countries: the case of Taiwanese MNCs in the UK. *International Journal of Human Resource Management*, 20(1): 75-95.
- Chen, D., Paik, Y., & Park, S. H. (2010). Host-country policies and MNE management control in IJVs: Evidence from China. *Journal of International Business Studies*, 41(3): 526-537.
- Chen, D., Park, S. H., & Newburry, W. (2009). Parent contribution and organizational control in international joint ventures. *Strategic Management Journal*, 30(11): 1133-1156.
- Choi, C.-B., & Beamish, P. W. (2004). Split management control and international joint venture performance. *Journal of International Business Studies*, 35(3): 201-215.
- Cropley, A.J. (2002). *Qualitative Forschungsmethoden. Eine praxisnahe Einführung*, Eschborn.
- Das, T. K., & Teng, B.-S. (2001). Trust, Control, and Risk in Strategic Alliances: An Integrated Framework. *Organization Studies (Walter de Gruyter GmbH & Co. KG.)*, 22(2): 251.
- Davila, T. (2000). An empirical study on the drivers of management control systems' design in new product development. *Accounting, Organizations & Society*, 25(4/5): 383-409.
- Dekker, H. C. (2004). Control of inter-organizational relationships: evidence on appropriation concerns and coordination requirements. *Accounting, Organizations & Society*, 29(1): 27.
- Doz, Y., & Prahalad, C. K. (1984). PATTERNS OF STRATEGIC CONTROL WITHIN MULTINATIONAL CORPORATIONS. *Journal of International Business Studies*, 15(2): 55-72.
- Dröge, C., Jayaram, J., & Vickery, S. K. (2000). The Ability of Minimize the Timing of New Product Development and Introduction: An Examination of Antecedent Factors in the North American Automobile Supplier Industry. *Journal of Product Innovation Management*, 17(1): 24-40.

- Dunne, C. (2011). The place of the literature review in grounded theory research. *International Journal of Social Research Methodology*, 14(2): 111-124.
- Eisenhardt, K. M. (1985). Control: Organizational and Economic Approaches. *Management Science*, 31(2): 134-149.
- Eisenhardt, K. M., & Graebner, M. E. (2007). THEORY BUILDING FROM CASES: OPPORTUNITIES AND CHALLENGES. *Academy of Management Journal*, 50(1): 25-32.
- Eisenhardt, K. M., & Tabrizi, B. N. (1995). Accelerating Adaptive Processes: Product Innovation in the Global Computer Industry. *Administrative Science Quarterly*, 40(1): 84-110.
- Fliess, S., & Becker, U. (2006). Supplier integration—Controlling of co-development processes. *Industrial Marketing Management*, 35(1): 28-44.
- Garcia, R., & Calantone, R. (2002). A critical look at technological innovation typology and innovativeness terminology: a literature review. *Journal of Product Innovation Management*, 19(2): 110-132.
- Gatignon, H., Tushman, M. L., Smith, W., & Anderson, P. (2002). A Structural Approach to Assessing Innovation: Construct Development of Innovation Locus, Type, and Characteristics. *Management Science*, 48(9): 1103-1122.
- Geringer, J. M., & Hebert, L. (1989). Control and Performance of International Joint Ventures. *Journal of International Business Studies*, 20(2): 235-254.
- Glaser, P. G.; Strauss, A.L. (1967). *The discovery of grounded theory: Strategies for qualitative research*. New York: Aldine.
- Gibbs, G. R. (2002). *Qualitative data analysis. Explorations with NVivo*. Buckingham: Open University Press.
- Greenwood, R., & Hinings, C. R. (1993). UNDERSTANDING STRATEGIC CHANGE: THE CONTRIBUTION OF ARCHETYPES. *Academy of Management Journal*, 36(5): 1052-1081.
- Handfield, R. B., Ragatz, G. L., Petersen, K. J., & Monczka, R. M. (1999). Involving Suppliers in New Product Development. *California Management Review*, 42(1): 59-82.
- Hoetker, G. (2005). How much you know versus how well I know you: selecting a supplier for a technically innovative component. *Strategic Management Journal*, 26(1): 75-96.
- Hutt, M. D. S., E. R.; Walker, B. A.; Reingen, P. H. (2000). Defining the Social Network of a Strategic Alliance. *Sloan Management Review*, 41: 51-62.
- Inkpen, A. C., & Currall, S. C. (2004). The Coevolution of Trust, Control, and Learning in Joint Ventures. *ORGANIZATION SCIENCE*, 15(5): 586-586-599.
- Jaworski, B. J. (1988). Toward a Theory of Marketing Control: Environmental Context, Control Types, and Consequences. *Journal of Marketing*, 52(3): 23-39.
- Johnsen, T. E. (2009). Supplier involvement in new product development and innovation: Taking stock and looking to the future. *Journal of Purchasing & Supply Management*, 15(3): 187-197.
- Kaasa, A., & Vadi, M. (2010). How does culture contribute to innovation? Evidence from European countries. *Economics of Innovation & New Technology*, 19(7): 583-604.
- Kale, P., Singh, H., & Perlmutter, H. (2000). Learning and protection of proprietary assets in strategic alliances: building relational capital. *Strategic Management Journal*, 21(3): 217-237.
- Kim, C., & Park, J.-H. (2010). The Global Research-and-Development Network and Its Effect on Innovation. *Journal of International Marketing*, 18(4): 43-57.
- Kirsch, L. J. (1996). The Management of Complex Tasks in Organizations: Controlling the Systems Development Process. *ORGANIZATION SCIENCE*, 7(1): 1-21.
- Kogut, B., & Singh, H. (1988). The Effect Of National Culture On The Choice Of Entry Mode. *Journal of International Business Studies*, 19(3): 411-411.
- Kostova, T. (1999). TRANSNATIONAL TRANSFER OF STRATEGIC ORGANIZATIONAL PRACTICES: A CONTEXTUAL PERSPECTIVE. *Academy of Management Review*, 24(2): 308-324.
- Kostova, T., Roth, K., & Dacin, M. T. (2008). INSTITUTIONAL THEORY IN THE STUDY OF MULTINATIONAL CORPORATIONS: A CRITIQUE AND NEW DIRECTIONS. *Academy of Management Review*, 33(4): 994-1006.
- Koufteros, X. A., Edwin Cheng, T. C., & Lai, K.-H. (2007). “Black-box” and “gray-box” supplier integration in product development: Antecedents, consequences and the moderating role of firm size. *Journal of Operations Management*, 25(4): 847-870.

- Ladge, J. J., Clair, J. A., & Greenberg, D. (2012). CROSS-DOMAIN IDENTITY TRANSITION DURING LIMINAL PERIODS: CONSTRUCTING MULTIPLE SELVES AS PROFESSIONAL AND MOTHER DURING PREGNANCY. *Academy of Management Journal*, 55(6): 1449-1471.
- Lange, D. (2008). A MULTIDIMENSIONAL CONCEPTUALIZATION OF ORGANIZATIONAL CORRUPTION CONTROL. *Academy of Management Review*, 33(3): 710-729.
- Madhok, A., & Tallman, S. B. (1998). Resources, Transactions and Rents: Managing Value Through Interfirm Collaborative Relationships. *Organization Science*, 9(3): 326-339.
- Mantere, S., Schildt, H. A., & A. Sillince, J. A. (2012). REVERSAL OF STRATEGIC CHANGE. *Academy of Management Journal*, 55: 173-196.
- Martinez, J. I., & Jarillo, J. C. (1989). The Evolution of Research on Coordination Mechanisms in Multinational Corporations. *Journal of International Business Studies*, 20(3): 489-514.
- Mjoen, H., & Tallman, S. (1997). Control and Performance in International Joint Ventures. *Organization Science*, 8(3): 257-274.
- Ouchi, W. G. (1979). A Conceptual Framework for the Design of Organizational Control Mechanisms. *Management Science*, 25(9): 833-848.
- Peng, G. Z. (2012). FDI legitimacy and MNC subsidiary control: From legitimation to competition. *Journal of International Management*, 18(2): 115-131.
- Peng, M. W. (2003). INSTITUTIONAL TRANSITIONS AND STRATEGIC CHOICES. *Academy of Management Review*, 28(2): 275-296.
- Peng, M. W., Wang, D. Y. L., & Jiang, Y. (2008). An institution-based view of international business strategy: a focus on emerging economies. *Journal of International Business Studies*, 39(5): 920-936.
- Petersen, K. J., Handfield, R. B., & Ragatz, G. L. (2003). A Model of Supplier Integration into New Product Development. *Journal of Product Innovation Management*, 20(4): 284-299.
- Petersen, K. J., Handfield, R. B., & Ragatz, G. L. (2005). Supplier integration into new product development: coordinating product, process and supply chain design. *Journal of Operations Management*, 23(3/4): 371-388.
- Primo, M. A. M., & Amundson, S. D. (2002). An exploratory study of the effects of supplier relationships on new product development outcomes. *Journal of Operations Management*, 20(1): 33-52.
- Quinn, J. B. (2000). Outsourcing Innovation: The New Engine of Growth. *Sloan Management Review*, 41(4): 13-28.
- Ragatz, G. L., Handfield, R. B., & Petersen, K. J. (2002). Benefits associated with supplier integration into new product development under conditions of technology uncertainty. *Journal of Business Research*, 55(5): 389-400.
- Ragatz, G. L., Handfield, R. B., & Scannell, T. V. (1997). Success Factors for Integrating Suppliers into New Product Development. *Journal of Product Innovation Management*, 14(3): 190-202.
- Richtnér, A., & Åhlström, P. (2010). Top management control and knowledge creation in new product development. *International Journal of Operations & Production Management*, 30(10): 1006-1028.
- Rosenzweig, P. M., & Singh, J. V. (1991). ORGANIZATIONAL ENVIRONMENTS AND THE MULTINATIONAL ENTERPRISE. *Academy of Management Review*, 16(2): 340-361.
- Schilling, M. A.; Hill, C. W. L. (1998). Managing the new product development process: Strategic imperatives. *Academy of Management Executive*, 12(3): 67-81.
- Scott, W. R. (1995). *Institutions and organizations*. Thousand Oaks, Calif. [u.a.]: Sage.
- Shin, N., Kraemer, K. L., & Dedrick, J. (2009). R&D, Value Chain Location and Firm Performance in the Global Electronics Industry. *Industry & Innovation*, 16(3): 315-330.
- Siggelkow, N. (2007). PERSUASION WITH CASE STUDIES. *Academy of Management Journal*, 50(1): 20-24.
- Song, M., & Swink, M. (2002). MARKETING-MANUFACTURING JOINT INVOLVEMENT ACROSS STAGES OF NEW PRODUCT DEVELOPMENT: EFFECTS ON THE SUCCESS OF RADICAL VS. INCREMENTAL INNOVATIONS. *Academy of Management Proceedings & Membership Directory*: B1-B6.
- Story, V., Hart, S., & O'Malley, L. (2009). Relational resources and competences for radical product innovation. *Journal of Marketing Management*, 25(5/6): 461-481.
- Strauss, A.; Corbin, J. (1990). *Basics of qualitative research: Grounded theory procedures and techniques*. Newbury Park: CA: Sage.

- Suddaby, R. (2006). FROM THE EDITORS: WHAT GROUNDED THEORY IS NOT, *Academy of Management Journal*, Vol. 49: 633-642: Academy of Management.
- Swink, M. (1999). Threats to new product manufacturability and the effects of development team integration processes. *Journal of Operations Management*, 17(6): 691-709.
- Teece, D. J. (1992). Competition, cooperation, and innovation : Organizational arrangements for regimes of rapid technological progress. *Journal of Economic Behavior & Organization*, 18(1): 1-25.
- Turner, K. L., & Makhija, M. V. (2006). THE ROLE OF ORGANIZATIONAL CONTROLS IN MANAGING KNOWLEDGE. *Academy of Management Review*, 31(1): 197-217.
- Veryzer Jr, R. W. (1998). Discontinuous Innovation and the New Product Development Process. *Journal of Product Innovation Management*, 15(4): 304-321.
- Wagner, H. T., Morton, S. C., Dainty, A. R. J., & Burns, N. D. (2010). Path dependent constraints on innovation programmes in production and operations management. *International Journal of Production Research*, 49(11): 3069-3085.
- Wasti, S. N., & Liker, J. K. (1997). Risky Business or Competitive Power? Supplier Involvement in Japanese Product Design. *Journal of Product Innovation Management*, 14(5): 337-355.
- Westney, D. E. (1993). Institutional theory and the multinational coirporation. In S. W. Ghoshal, D. E. (Ed.), *Organization theory and the multinational corporation*: 53-76. New York: St. Martin's Press.
- Xu, D., & Shenkar, O. (2002). INSTITUTIONAL DISTANCE AND THE MULTINATIONAL ENTERPRISE. *Academy of Management Review*, 27(4): 608-618.
- Yin, R. K. (1994). *Case study research. Design and methods*. Thousand Oaks, Calif: Sage Publ.

APPENDIX

Figure 1: Lange's conceptualization of control

Source: Lange (2008)

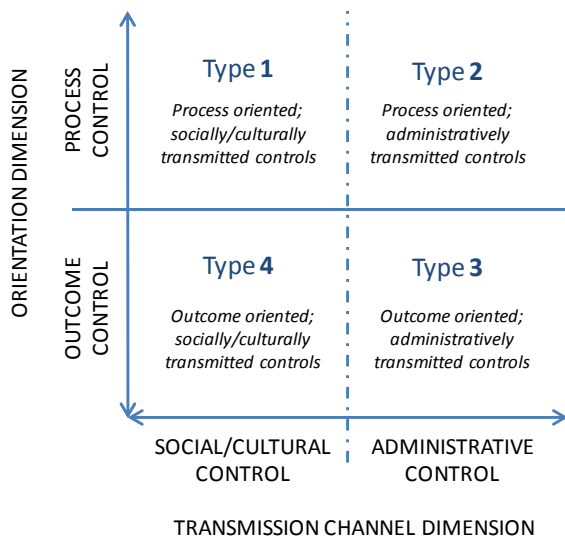


Figure 2: Overview of interviews

Source: Own illustration

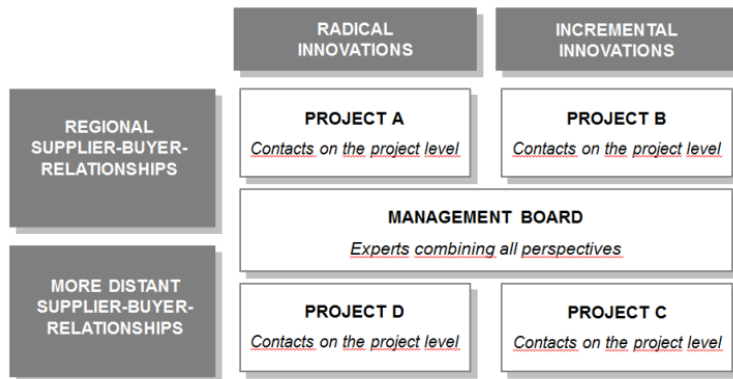


Figure 3: Overview of findings

Source: Own illustration

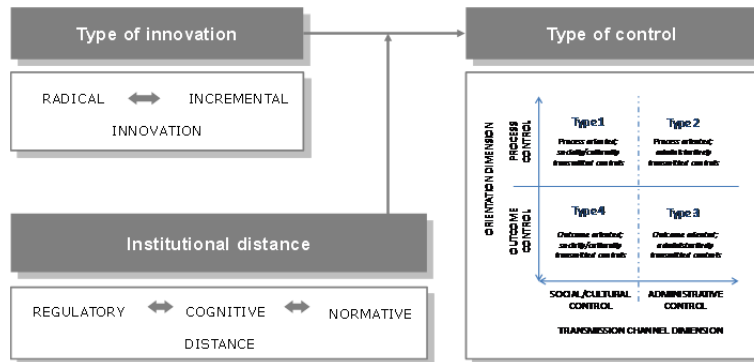


Figure 4: Overview of findings on Lange's (2008) matrix

Source: Own illustration

