SUPPLIERS' RELATIONAL STRATEGIES UNDER CUSTOMERS' HYBRID GOVERNANCE STRUCTURES

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ABSTRACT

This study investigates suppliers' strategies under customers' hybrid governance in knowledge-intensive dyadic R&D collaborations between R&D suppliers and their customers. First, we illustrate the practical manifestations of relational hybrid governance structures. Secondly, and more importantly, we study the strategic maneuvering of R&D suppliers under the pressure created by the customers' hybrid governance structures. This study applies a qualitative comparative case method to analyze seven vertical R&D relationships selected based on a quantitative dataset and K-means cluster analysis data. Our results interestingly contextualize R&D collaborations by making by mapping the hybrid governance mechanisms applied by the customers and then by studying the supplier strategies to gain bargaining power in these relational contexts. These results facilitate further research on R&D suppliers' strategies in knowledge-intensive, asymmetric customer relationships.

Keywords: R&D collaboration, supplier's strategic maneuvering, hybrid governance, case study

Competitive paper

INTRODUCTION

Studies suggest that industrial customers operating in imperfect market settings apply hybrid governance structures to facilitate learning, innovation and performance in R&D collaborations of high knowledge intensiveness, information asymmetries and transaction costs. In these contexts, by application of combinations of market/price, hierarchy/authority and social/trust mechanisms, customer intend to benefit from the up-sides of different mechanisms – competitive bidding creating price benchmark and markets pressure, authority to steer the development work, learning and innovation, and trust to decrease transaction costs and increase knowledge sharing. Hybrid governance structures are being applied to create increase pressure towards suppliers. Where the R&D suppliers experience this, they may not stand still, but instead use different strategies to cope with these pressures to create collaborative advantages. The present study first contextualizes R&D collaborations based on the applied relational governance structures and then studying how the R&D suppliers' strategic maneuvers in the relational contexts.

Whereas the existing literature on relational governance demonstrates some evidence on relational governance practices, hybrid governance structures and their effects on learning, innovation and performance, the existing research lacks empirical evidence on supplier strategies under the pressure created by the hybrid governance structures. The existing research seems to implicitly suggest that suppliers' are satisfied in partnerships, which may be the reason why supplier strategies in the existing relationships are understudied. Yet, suppliers face increasing pressures in these networks, and cannot always rely on customers' goodwill when seeking future business. Thus, even in these highly inter-connected network relationships, which resemble partnerships, suppliers should consider coping strategies for improved competitive advantage, and some independency. Hence, the present study challenges and adds to existing network research that applies game-theoretical assumptions, and consider strategic network and partnership as entities, that benefit jointly, without firm-level strategies for sub-optimization. We suggest that suppliers seek firm-level competitive advantages also in inter-organizational partnerships and hence apply various strategic maneuvers.

This study tries to fill this gap in the existing inter-organizational network research by studying altogether seven R&D partnerships where R&D service offering and relational learning were extensive. The study applies comparative qualitative case study approach and the study's results are based on 26 interviews with senior managers from both sides of the firms in the relationships. This study contributes to the existing literature of hybrid governance (Adler, 2001; Heide, 1994) by reviewing how firms apply hybrid governance structures in R&D collaborations, and in particular on the literature on collaborative advantages when studying how R&D suppliers' apply different strategies under the pressure created by hybrid governance structures.

THEORETICAL BACKGROUND

R&D collaboration

R&D collaboration refers to complex R&D services product manufacturers provide to their customers in dyadic relationships. These R&D services include for instance product tailoring services, feasibility studies, prototype building services, prototype testing services and usability analysis (Kohtamäki et al. 2013). Because R&D relationships typically include high

information asymmetry between R&D suppliers and their customers, customers need to apply hybrid governance mechanisms to decrease suppliers' possible opportunistic behavior and reduce transaction-costs. Moreover, R&D relationships require active knowledge-sharing, sense-making and knowledge storage between the parties, as well as trust among the parties to gain benefits of the relationships. To maximize benefits of dyadic collaboration, customer firms often apply hybrid governance to stress benefits of single mechanism and reduce single mechanism's negative perspectives (Mitronen, 2002).

In this study, vertical R&D relationships are described as customer-supplier relationships where parties have deep mutual collaboration and parties share, integrate and save knowledge that enable firms to develop customers' products or processes. According to previous literature (e.g., Williamson, 1975), these business relationships are located between markets and hierarchies (networks). R&D collaborations are often complex relationships which generate high transaction-costs (Williamson, 1985**;** Baldwin, 2007; Rindfleisch & Heide, 1997; Stump, Athaide, & Joshi, 2002) thus setting high requirements for both suppliers and their customers. In addition, information asymmetries are typical for knowledge-intensive R&D collaborations and may cause inefficiencies in the form of transaction costs and productivity losses (Dyer, 1997; Dyer & Chu, 2003 Odagiri, 2003). From the supplier's viewpoint, R&D collaboration requires information of customer's products, processes, procedures and end-users' needs and preferences. From the customer's viewpoint, R&D collaboration requires trust on supplier's capabilities, reliability and commitment (Theoharakis, Sajtos & Hooley, 2009).

Hybrid governance

Early literature on network governance has underlined the importance of hybrid governance structure, when governing inter-organizational networks (Adler, 2001; Bradach & Eccles, 1989; Powell, 1990). Whereas the earlier literature applied broad variety of concepts to grasp the phenomenon, Adler (2001) provided an interesting synthesis on governance literature suggesting High-trust hybrid as a form of governance, where the governing body applies mechanisms, such as 1) price mechanism (market), 2) hierarchical mechanism (authority) and 3) social mechanism (trust) at high level to facilitate performance improvement, learning and relational performance (See also Heide, 1994; Kohtamäki et al. 2006; Kohtamäki, 2010).

Price mechanism refers to customer's ability to steer the relationship for instance through utilizing competition between various suppliers in the market. Hierarchical governance mechanism is related to formal way to steer relationship. Customers may use authority or formal hierarchical structures to govern relationship and may include for instance certain written rules or contracts (Dyer, 1997). Social governance mechanism refers to personnel collaboration within relationships and includes open interaction, mutual commitment and trust among the involved persons within the relationship (Adler, 2001; Zaheer et al. 1998). Moreover, social governance usually requires open knowledge-sharing and a feeling of shared destiny between the parties (Chang & Gotcher, 2007).

According to previous literature (e.g., Adler, 2001; Bradach & Eccles, 1989; Heide, 1994), hybrid governance refers to simultaneous use of these mechanisms. Several authors (Adler, 2001; Kohtamäki, 2010; Powell, 1987) have found evidence that the combinations of these mechanisms are more effective or flexible than utilization of only single mechanism. Hybrid governance may for instance facilitate relational learning (Kohtamäki, 2010) and reduce transaction-costs (Dyer, 1997).

Table 1 presents theoretical frameworks/empirical studies of hybrid governance forms which are reviewed basically from the new institutional economics perspective (Kohtamäki, 2005). Adler (2001) highlights the importance of innovations and knowledge-sharing and presents altogether eight variations ranging from relationship where all of the mechanisms take low form (laizzes-fare) to hybrid, where all three mechanisms (price, hierarchy and trust) take high forms (ideal type). In his field study, Bradach (1997) studied restaurant chains' governance mechanisms and found that firm tries to *model* procedures and processes and gain effectiveness through controlling and comparing firm-owned units and franchise-units. Firm can also utilize social control through *ratcheting* (e.g., managers may become franchise entrepreneurs and represent firm's values, hence acting as practical examples/role models). Eventually, franchising entrepreneurs and firm should facilitate joint learning and they should possess complementary capabilities. Bradach and Eccles (1989) emphasize that three control mechanisms (price, authority and trust) are not mutually exclusive but they can be combined in various ways. Heide (1994) studied governance in marketing channels and found that three governance mechanisms (market, hierarchy and network) can be applied simultaneously if they do not take extreme forms. In his in-depth single case-study, Mitronen (2001) studied hybrid mechanism in one Finnish retail trade firm and found that three governance mechanisms can be applied simultaneously. This hybrid form is efficient and it enables combining both external and internal effectiveness. It also enables firm to utilize mechanisms' best aspects and inhibit negative aspects. However, mutual values, trust and social communities, which are often described as "soft" factors, have significant effect on firm's governance. Respectively, Powell (1987; 1990) concentrates on describing hybrid organization stating that it is more flexible than hierarchical organization.

Table 1. Research papers on hybrid governance.

Author(s)	Research focus	Research method/data	Results/main contribution
Adler, 2001	Three governance mechanisms (price, hierarchy, trust)	Theoretical paper	Three governance mechanisms (price, hierarchy, trust) can be applied simultaneously. Altogether 8 different variations based on dimensions of price, hierarchy, trust (low/high)
Bradach, 1997	Plural form restaurant chain organizations: firm-owned units and franchise-units	Field study of altogether five large U.S. Restaurant chains. Study's results are based on 90 semi-structured interviews and observations of meetings between firms and the franchise-units.	Entrepreneurial governance enables learning. Researcher found four processes between the firm and the franchise entrepreneurs: 1) modeling 2) ratcheting, 3) socialization and 4) joint learning. They help firm to achieve objectives of uniformity and system-wide adaptation
Bradach & Eccles, 1989	Three control mechanisms (price, authority, trust) are not mutually exclusive control mechanisms. Instead, they are independent and can be combined in various ways to generate effects.	Theoretical paper	Price and authority are often played off each other within firms, while trust and price are sometimes intertwined to control transactions between firms. Plural form: organizations simultaneously operate distinct control mechanisms for the same function

Heide, 1994	Governance in marketing channels (market, hierarchy, network)	Author develops a typology of three different governance forms and shows results of preliminary empirical study.	Non-market governance is a heterogeneous phenomenon and different relationship management strategies are appropriate under these conditions. Three governance mechanisms can be applied simultaneously: hierarchical mechanism as a governance mechanism of networks. Symmetric, high dependency supports flexibility when unilateral dependency reduces it
Kohtamäki et al., (2006)	Relational governance the suppliers' experiences	Comparative case study on 29 customer-supplier relationships with 13 customer interviews and 16 supplier interviews	Application of different governance mechanisms should be balanced to co-create experience of reasonable and caring partnership. Study underlined the suppliers' experience of 'reasonable'.
Kohtamäki (2010)	Hybrid governance and learning in manufacturing relationships	Quantitative study with 199 customer-supplier relationships	Found 4 different relational governance structures from an empirical data of customer-supplier relationships: market, social, supportive hierarchical and hybrid. Hybrid governance structure and supportive hierarchical governance were most effective with regards to joint learning.
Mitronen, 2002	Governance mechanism of retail trade	Case study of one Finnish supermarket chain's hybrid organization (both firm owned and franchising units)	Market, hierarchy and network mechanisms rarely occur alone but they take a hybrid form. In studied retail trade chain (network), "soft" mechanisms, such as mutual values, norms, trust and social communities occurred significantly. Hybrid form is also efficient and it enables combining both external and internal effectiveness. It also enables firm to utilize mechanisms' best aspects and inhibit negative aspects
Powell, 1987	Hybrid organization	Theoretical paper	Hybrid organization provides flexibility in comparison hierarchical organization. Hybrid organizational forms are being applied in car manufacturing, textile, publishing and construction industries
Powell, 1990	Hybrid organizational arrangement	Theoretical paper which is based on previous papers and practical firm illustrations	Network is separated from market and hierarchy. Author compares characteristics of each governance mechanism and suggests also some hybrid forms.

Suppliers' strategies

Existing literature of business networks has focused on antecedents of joint learning such as trust, relationship-specific investments and relational structures neglecting the role of Porter's (1980; 1985) definition of supplier's negotiation power. Porter (1980; 1985) defines that the supplier's negotiation power depends for instance on the scarcity of supplier's resources, degree of product differentiation or supplier's concentration ratio. As a counterattack towards governance mechanisms applied by customers, suppliers may raise prices, lower quality or decrease the product's availability. In R&D collaborations, where customer's knowledge of the products may be weak or the supplier's products are highly differentiated, the supplier's negotiation power should be stronger. On the other hand, if most of the sales come from the particular customer, the supplier's negotiation power is typically weaker.

Yet, Porter's model is covering strategic issues in firm-level rather than operational issues in relational-level. In practice, people within relationships play remarkable role and their actions affect the applied strategies/maneuvers or counterattacks. For instance, trust among personnel between firms or financial hostages have remarkable effects on applied practices by both of

the parties. In this study, we highlight the suppliers' strategies and practices (or counterattacks) they apply in relational level in R&D collaborations.

DATA AND METHODOLOGY

This paper relies on a multiple case study approach based on the analysis of seven dyadic R&D collaborations. The qualitative multiple case study approach enables the collection of in-depth information through interviews and provides information on the hybrid governance customers apply in these relationships as well as practices suppliers apply to respond to this governance. Considering the complexity and sensitivity what relies in these dyadic business relationships, qualitative comparative case method was selected this study's method to get deeper understanding of the studied phenomenon (Brennan & Turnbull, 1999; Wilson, 1996). However, issues related to hybrid governance during interviews were emergent as the discussions of the interviews covered topics such as firms' histories, capabilities, relational processes and collaborative learning. To increase the study's reliability, we applied a data triangulation technique (Beverland, 2010; Huberman & Miles, 1994) by collecting information from three different sources: 1) firms' websites and annual reports, 2) customers' senior managers and 3) customers' senior managers or specialists. Data triangulation enabled us to review relationships' management practices from different perspectives. We also follow Brennan and Turnbull's (1999) and Wilson's (1996) suggestions for researchers to interview both sides of the relationship to understand more comprehensively studied relationships.

The seven R&D collaboration cases were selected based on K-means cluster analysis conducted based on quantitative dataset collected in Finland in 2010. The selected cases represented extreme cases where both R&D service offering and relational learning were extensive. The total sample of quantitative dataset consisted of 91 cases out of 404 total cases (response rate of 22.5%). The R&D suppliers' respondents who answered this questionnaire were first confirmed from the CEOs of the firms by a phone call. CEO's were requested to name the person responsible for their most important customer-relationship. Respectively, customers' key decision makers were nominated by the suppliers' representatives based on their knowledge of and responsibility for the relationship.

Based on the K-means cluster analysis, we identified 22 relationships where both the R&D service offering and joint learning were extensive. From this group, we selected seven relationships that had highest values in terms of both R&D services and relational learning. The cluster on the upper right describes 22 cases from which we chose the seven (according to Eisenhardt, 1989, cases between 4 and 10 usually works well) for further analysis to achieve data saturation. The cases on the upper left represent low R&D service offering in relationship but high joint learning (n = 33), and the 36 cases in the lower left corner demonstrated both low R&D service offerings and joint learning.

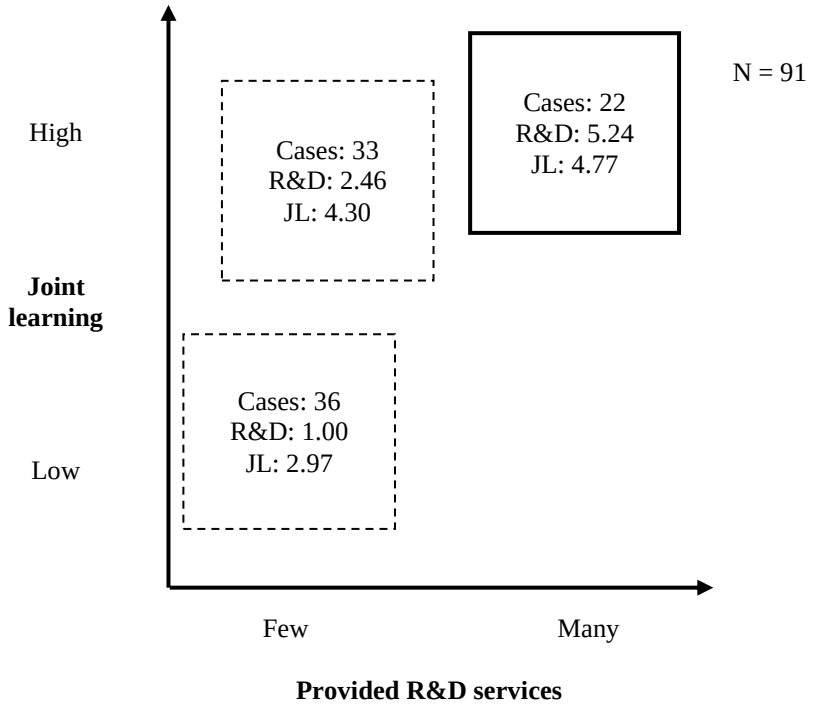

Figure 1. Results of the K-means cluster analysis and the selected seven cases from the upper right corner (altogether 22 cases) for study's purpose.

Pilot study and data collection process

First, we conducted a pilot study to familiarize ourselves with the applied method and possible concerns that may have otherwise arisen during actual data collection/analyzing process. The pilot study focused on R&D relationships where information asymmetry and customer's strong bargaining power were remarkable between the firms. The pilot study gave us knowledge how to develop our semi-structured questionnaire and prepared us to confront possible problems which may have occurred in forthcoming actual cases. (Yin, 2003.)

Before starting an actual data collection process, we had to develop a comprehensive method to collect and analyze data. The data collection started with a phone call to the R&D suppliers' managers who had earlier replied to the quantitative questionnaire. However, in one case, respondent had changed before researchers contacted him, so we interviewed respondent's successor. During the first phone call, we appointed a proper time for both phone interviews and face-to-face interviews. Phone interviews purpose was to gain general knowledge of the relationships, for instance how the relationship had begun, how the relationship had developed during the history and what different R&D services suppliers offered in the relationship. Hence, when face-to-face interviews took place, interviewees already knew the study's purpose and they were more familiarized with the interviewer and the topic. Face-to-face interviews were conducted after the phone-interviews in suppliers' headquarters typical interview lasting approximately 70 minutes. After the interviews, researchers requested to name the most suitable person from the customer side to participate the research. Customers' representatives were typically business managers responsible for developing the particular relationship and they held positions such as 1) CEO (in two cases), 2) business manager, 3) maintenance specialist and 4) business division director (in two

cases). Respectively, seven R&D suppliers' interviewees held the following positions: 1) sales and marketing director, 2) key account manager, 3) marketing manager, 4) sales manager, 5) area manager, 6) export manager and 7) director of sales support. Because of one supplier's politics of not giving any customer contact information, we were not able to interview one customer. Hence, we conducted altogether 26 interviews, including 13 telephone interviews and 13 face-to-face interviews with key decision makers/senior managers from both sides of the relationships during late 2011 and early 2012. We selected seven relational cases to establish an area of focus, achieve an in-depth view of each relationship and to obtain data saturation.

Two project researchers used an equivalent semi-structured interview template to enable an open and rich discussion on the covered topics and only one researcher participated in each interview. All of the interviews were audiotaped with permission and transcribed verbatim shortly after the interview was conducted. The quotations in this article are identified only by the firm's type and code to protect respondents' confidence. Thus, as promised to the interviewees, an individual respondent or firm cannot be identified based on the text. Promise for totally respondent anonymity, leading researchers were able to encourage respondents to more open interaction during the interviews.

Table 2a. General descriptions of the reviewed relationships.

	Pilot study		**Relationship A**		**Relationship B**		**Relationship C**	
	Pilot customer	Pilot supplier	Customer A	Supplier A	Customer B	Supplier B	Customer C	Supplier C
Total revenue	1000 million €	20 million €	1300 million €	15 million €	300 million €	12 million €	100 million €	7 million €
Number of employees	800	20	3000	100	1000	30	200	15
Main products/ services	Plants and delivered turnkey projects.	Metal components.	Product machines and turnkey technological solutions.	Industrial valves, pumps and services.	Pipe systems and delivered turnkey technological solutions.	Specific technology products and subcontracting. Modernization and maintenance services for installed base.	Material-handling systems.	Metal components for material-handling systems.
R&D services provided in the particular relationship	Product tailoring, product-design services and building prototypes.		Product tailoring, product development, prototyping and testing services.		Product tailoring, product development, prototypes to some extent and modernization.		Product tailoring, consultation in product configuration, product development, prototyping, technical testing of materials, inspections during the lifetime of the product.	
Type of R&D collaboration	White box/gray box.		Gray box/black box.		Gray box/black box.		Gray box.	
Partner's evaluated switching time	< Three months.	24-36 months.	6-12 months.	24-48 months.	1-3 months.	36-48 months.	2-4 months.	36-48 months.
Hybrid governance (see Adler, 2001)	Hybrid		Supportive hierarchical		Hybrid		Supportive hierarchical	

Table 2b. General descriptions of the reviewed relationships.

	Relationship D		**Relationship E**		**Relationship F**		**Relationship G**	
	Customer D	Supplier D	Customer E	Supplier E	Customer F	Supplier F	Customer G	Supplier G
Total revenue	500 million €	16 million €	20 million €	25 million €	400 million €	60 million €	600 million €	6 million €
Number of employees	1500	50	60	100	700	150	1500	30
Main products/ services	Infrastructure maintenance.	Maintenance equipment.	Power transmission equipment.	Spare parts, maintenance services, product tailoring and design services.	Paper products.	Lubrication systems (including ICT systems).	Investment goods.	Special technology and services related to specific technologies.
R&D services provided in the particular relationship	Product tailoring, dedicated product development, prototype construction (testing facilities offered by the customer).		Product tailoring, particularly for demanding products.		Mainly process-related services (process-analyzing services).		Product development services, product tailoring, product-design services, prototype construction, prototype components, special component manufacturing and modeling services.	
Type of R&D collaboration	Gray box.		Black box/gray box.		Gray box/black box.		Gray box.	
Partner's evaluated exchange time	6 months.	> 36 months.	-	-	12-24 months.	3-6 months.	24-36 months.	12-24 months.
Hybrid governance (see Adler, 2001)	Relational contracting		Supportive hierarchical		Hybrid		Hybrid	

RESULTS

Descriptions of studied relationships

Firms within the *relationship A* have a long mutual history since the supplier is originally a customer's spin-off. Customer used to own remarkable shares of the supplier until few years ago it sold all of them back to this family-owned supplier. In this relationship, customer is more than 80 times bigger than the supplier. Thus, partner's evaluated exchange time is remarkably higher for the supplier. Supplier's developed products are a minor part of the customer's end product but these products enhance the performance of the end-product marketed, sold and maintained by the customer.

Firms within the *relationship B* belong to the same company group after customer acquired the supplier more than 10 years ago. However, these firms operate independently, even though the division manager of the customer is also a CEO of the supplier. In this relationship, the customer is 25 times bigger than the supplier. Products developed by supplier play remarkable role in the end product and their development requires specific technological competencies. These products are critical for the customer even though various suppliers are available.

In *relationship C*, both firms have same owners to some extent and they are dependent on each other even though firms do not have cross-ownership. Originally, customer decided to divest this supplier into a separate firm to increase these supplier's produced metal components' sales growth. Today, this particular customer accounts for approximately 20% of supplier's revenue. The customer is almost 15 times bigger than the supplier and supplier's products are relatively easy to be replaced by other firms' products. However, the supplier's products functionality is essential for the reliability of customer's sold end-products and parties try to achieve the benefits of vertical integration such as effectiveness. Simultaneously, firms' try to achieve the benefits of vertical disintegration by selling supplier's products to multiple customers (even customer's rivals).

Customer firm in *relationship D* has faced dramatic changes in its recent history because of market deregulation. As a consequence of market deregulation, customer has changed from monopoly-firm towards state-owned firm, thus facing increased competition within the industry. Supplier, on the other hand, is more than 30 times smaller than its customer. This supplier develops specific products for the maintenance equipment customer needs to run its core business.

Exceptionally in the *relationship E*, supplier is 1.5 times bigger than its customer. Firms belong to the same company group and the responsibilities between these firms have been described precisely because firms' parent firm wants to accelerate individual firms' distribution of work globally. Hence, the firms have been built on mutual dependency in different regions.

Both firms within *relationship F* operate globally. However, key numbers presented in table 2 represent these firms' Finnish business units. In the Finnish context, customer is more than six times bigger than the supplier whereas supplier possesses lot of data derived from the customer's core process. This data are vital for the customer. The collaboration has benefited the customer in forms of decreased downtimes and breakdowns and the joint-development is active as the trust between firms is at high-level.

Customer in *relationship G* acquired the supplier few years ago to get access to the growing technology within the industry. Despite the fact that the supplier is 100 times smaller than the customer, the supplier has been able to develop vital technology required in the market. The supplier's capabilities are related to developing specific high-technology whereas customer is responsible for marketing and selling entire systems within the industry. Almost 70% of supplier's sales come from this particular customer and indirectly, R&D supplier enables the customer to gain 10% of its total revenue.

Case analyses

According to Eisenhardt (1989, p. 540), main idea in within-case analysis is to "*become intimately familiar with each case as a stand-alone entity."* Even though there are lot of ways to conduct within-case analysis such as tabular displays or graphs (Leonard-Barton, 1988), within-cases allow unique patterns of each case before researchers start generalizing phenomenon. Thus, it is a good base before cross-case comparisons. (Eisenhardt, 1989.) Cross-case analyses, on the other hand, enable researchers to cover topics that were not discovered first time and force researchers to go beyond their initial impressions, thus helping researchers to capture novel findings that exist in the data. Huberman and Miles (1994) underline that cross-case analysis helps researchers to look at multiple actors in multiple settings, hence enhancing study's generalizability and validity. By combining within-case analysis and cross-case analysis (suggested by e.g., Beverland & Lindgreen, 2010; Eisenhardt, 1989; Huberman & Miles, 1994), researchers try to avoid situation where multiple cases are analyzed at high levels of inference which make study too broad and general. Therefore, there is a danger that the findings do not apply to any single case anymore.

By applying both within-case and cross-case analyses, we try to capture novel findings related to customers' hybrid governance and strategies or counterattacks suppliers in relationships try to deploy against these hybrid governances. In within-case table (see table 2), we describe customers' hybrid governance in each relationship and R&D supplier's maneuvers to respond these mechanisms.

Within-case analysis

Within-case table shows the form of hybrid governance customers apply in each relationship. In addition, table presents R&D suppliers strategies and maneuvers in particular relationship. In relationship A, due to long mutual history and also because of traditions formed earlier (when the supplier used to be part of the customer), social mechanism is evident. However, social relations are good both in top-management-level and operational-level, but the middle-management-level lacks support from the top-managers since their hands are tied for instance in price negotiations (decisions have already been made in relationship's highest level). R&D supplier has been able to affect customer heavily through social interaction in top-management level by creating strong ties with customer's top managers. In addition, R&D supplier's owners have acquired remarkable share of customer's shares (market cap of customer is approximately 2000 million euros in spring 2013), which may have affected customer's business managers' attitude towards this supplier.

> *"For instance today, we operate in every organizational level, but the key decisions have been made in extremely high-level…Our relations are decorous and intimate and we are in contact*

with each other in weekly basis. There is no threshold to get close to the customer." (Supplier/relationship A)

"Technology supplier provides is not unique. Instead, other suppliers provide this technology and sometimes even with better price…Personal relations are good and warm…But because of our history, this is not a normal supplier-customer relationship…Top managers emphasize close interaction with this supplier but honestly, our cooperation is not that intimate as presumed." (Customer /relationship A)

"Supplier's owner acquired our firm's shares and he possess remarkable share of our stocks. When firm's owner discusses with our firm's directors, it has certain benefits." (Customer/relationship A)

Customer in relationship B adopts price mechanism ostensibly. R&D supplier feels that the price pressure from customer is intensive which forces supplier to develop products incrementally (exploitation). Interestingly, customer's price mechanism is only window dressing as the customer's respondent answered that they always chooses this particular R&D supplier. Together with ostensible price mechanism, customer applies hierarchical mechanism. As the firms belong to the same company group, customer's top executive is also a CEO of the R&D supplier (administrative CEO though). Firms have also mutual IT-systems to enhance knowledge-sharing and productivity. Because of the pressure created by customer, R&D supplier has been able to develop technology of this important product incrementally. Thus, R&D supplier has adopted advantage-seeking behavior in its business activities (exploitation).

"Sometimes the rivalry is more brutal within the group than with other customers…Our chairman is customer's division director…We have also discussed a lot of transparent organization, which means that the information need to be shared as fast as possible. That information shouldn't be stuck at principles or chemistry etc."(Supplier/relationship B)

"If needed, the collaboration can be formal, but I think that our personal relations can be described as friendship because we also have operated with them for so long time…It's nice to collaborate with them."(Supplier/relationship B)

"Many times we could get this product cheaper from other suppliers, but because of our deep collaboration [with R&D supplier], *our reliability in the eyes of our customer increases." (Customer/relationship B)*

"We have developed this system for 20 years to achieve these products' efficiency-levels." (Supplier/relationship B)

Price mechanism in relationship C is not quintessential part of relational governance mechanism as the hierarchical and social mechanisms are more relevant to manage effectively this particular relationship. Even though the firms do not have straight cross-ownership, the firms have the same persons as owners. Hence, the owners and top-managers are strongly interconnected with each other and the knowledge-sharing, openness and trust between the parties are all at high-level. For instance, joint IT-systems, and weekly basis communication and reporting between top-managers reflect active knowledge-sharing. Both of the parties follow differentiation strategy and focus heavily on developing product quality and delivery times. Thus, R&D supplier adopts incremental advantage-seeking behavior rather than opportunity-seeking behavior when developing products (exploitation).

"We can affect how the product looks like, how the product is and we can affect the delivery times. We can also reduce our stocks because this supplier can storage the products on our behalf…Because our owners have authority in this supplier firm, it enables these benefits." (Customer/relationship C)

"I think that open communication belongs to it [refers to successful relationship with R&D supplier]. *And I also believe that mutual work in firm's board of directors and mutual ownership enables success in relationship." (Customer/relationship C)*

"One thing has been also that the customer can better control this product's price-level and quality…We don't have any contract, it's based on our old practices. The price-level has been mutually agreed…Our CEO is responsible for knowledge-exchange with owners..We are good friends with the customer" (Supplier/relationship C)

Information asymmetry between firms in relationship D is remarkable. Even though customer is many times larger than the R&D supplier, this supplier possesses valuable knowledge of products that are essential for the customer to operate its core processes. While there are not many players in supplier's industry and supplier has one of the largest product-portfolio and best-quality products in the market, supplier has been behaving opportunistically. Customer has responded to supplier's opportunistic behavior by applying multiple-sourcing policy, which has antagonized R&D supplier. R&D supplier even stated that they have discussed about lowering product quality if the customer will use cheaper suppliers in the future. Customer's top managers are also in crossfire inside the firm because this particular R&D supplier has been able to convince customer's product users. Product users have even purposefully broken the substitute products firm's managers have purchased from competing suppliers. Hence, R&D supplier has been able to increase its negotiation power through exploration and influencing main users' preferences (social mechanism).

"[In the top management level] *We sit around the same table and try to develop new things. On the other hand, in our purchasing activities the situation is rather different, because we have the power, we are the customer…We are quite strict customer in a manner that we force them* [R&D supplier] *to fix things if we require." (Customer/relationship D)*

"Sometimes, when the trust has deepened, also the price has started to increase too. Then we start to dissolve it. It's like divide and rule type of action."(Customer/relationship D)

"Their products are slightly more expensive, but our own employees, our own drivers, are more or less fanatical about them and enchanted by this supplier…A few of them [users] *even broke them* [complementary products] *by design."(Customer/relationship D)*

"In last meeting with the customer when they [customer] *had started to use Estonian manufacturer's products, we said that we have to seriously consider to decrease the quality of our products*." *(Supplier/relationship D)*

Firms within relationship E has originally been built on mutual dependency. Firms try to achieve the benefits of vertical integration such as effectiveness in mutual processes. Because the firms belong to the same company group, customer applies both hierarchical and social mechanisms when steering the relationship. Customer's CEO is also a member of board of directors of the supplier and the formal mechanisms such as joint IT-systems and mutual management systems are basis for developing the relationship. However, customer actively discusses supplier's managers and the knowledge-sharing is frequent as the top-managers of firms meet approximately once a month. Parties also have mutual trust between them and they may even have mutual tax-planning activities. Supplier has gained trust by developing

its technical competencies and focusing on production effectiveness and in general, cost-efficiency.

> *"When we have a global product portfolio, we have to have disciplined and controlled* [mutual] *processes…We can communicate whenever is needed, so we are not sequestered." (Supplier/relationship E)*

> *"The power comes from concentration. It wouldn't be efficient if everybody did everything…We are built on strong sales organization* [refers to particular customer], *and we have factories and service organizations inside whose job is to support sales function. These activities are completely built-in that we represent only one firm if looked from outside." (Supplier/relationship E)*

> *"We meet the supplier at their site when we discuss issues related to deliveries, R&D and future. We are also facing this global organization change which affects our roles and responsibilities in a global scale. Operationally we discuss in daily basis and between managers we meet few times a month." (Customer/relationship E)*

Table 3a. Within-cases of relational governance mechanisms and R&D suppliers' strategies.

	Relationship A	**Relationship B**	**Relationship C**	**Relationship D**
Hybrid governance	Middle-management tries to deploy price-mechanism in operational-level but as the general guidelines have already been decided in relationship's top-management-level, utilization of price-mechanism in middle-management level is poor. Relationship's top-managers have agreed on main guidelines (such as expansion plans) in relationship's management group regarding to relationship's development. Communication and trust among firms' top-managers and operational-level is high.. However, middle-managers are "stuck-in-the-middle"	Customer pretends and threatens to use other suppliers to facilitate supplier's R&D work (in reality, customer admitted that they always chooses this supplier). Firms belong to the same company group. Customer's executive is also a CEO of the R&D supplier. Communication between personnel is active since the R&D development occurs basically during joint projects	Price mechanism is not relevant due to strong hierarchical mechanism. Increased product volumes benefit both firms. R&D supplier is an acquitance of the customer. Customer's owners possess R&D supplier's shares, but the customer firm does not. Joint developed products are first sold only to this customer. Social relations are deep especially among firms' top managers. Open discussion between firms, active knowledge-sharing and high-level of trust between the firms.	Customer utilizes multiple-sourcing policy to reduce R&D supplier's opportunistic behavior. Customer uses different persons when negotiating prices. Price negotiations have been separated from operational collaboration to ensure better development work. Parties have unwritten rule that jointly developed products are sold only to this customer in first years. Some evidence of lack of trust between the parties (caused mainly by multiple-sourcing policy and supplier's opportunistic behavior)
Supplier's strategies/maneuvers in relationship	Supplier's owners have acquired remarkable share of customer's stocks. Supplier has been able to create good relationships with customer's top managers. On the other hand, supplier's operational-employees discuss actively with customer's employees	R&D supplier invests heavily in product development (exploitation) to establish its position	Supplier focuses on developing product quality and advantage-seeking behavior (exploitation)	Supplier has been able to convince product's users. Supplier's salespeople discuss actively with product users about their concerns and development ideas. Supplier considers occasionally new product opportunities (exploration). Supplier has also threatened to lower product's quality if customer will use more other suppliers

Table 3b. Within-cases of relational governance mechanisms and R&D suppliers' strategies.

	Relationship E	**Relationship F**	**Relationship G**
Hybrid governance	Parties know each other's prices and marginals. Firms' belong to the same company group and their responsibilities have been decided corporate-level. Firms have originally been built on mutual dependency. Mutual management systems and IT-systems are widely applied to enhance effectiveness. Customer's CEO is member in supplier's board of directors. Communication between firms' top managers is deep and active. Mutual meetings between managers monthly basis	Price mechanism is applied to some extent. Customer may use other suppliers but price negoations play remarkable role in middle-management-level discussions. Local practices in different countries are systematically adopted in country-level relationships. Two-sided trust among the partners. Collaboration is deep and open in different relational levels (from global to local and from top-management level (global perspective) to operational level (local perspective)	Customer's policy is to utilize market-mechanism widely within the company group to enhance suppliers' cost-efficiency. Customer acquired this R&D supplier few years ago to gain vital technology in growing markets. Responsibilities in relationship between firms are clear as the customer is responsible for marketing and selling end-products and the R&D supplier is responsible for developing specific technology. However, R&D supplier is extremely independent and high-handed. Firms have high trust on each other's competencies. Communication between top-managers, project-managers and also in operational-level is frequent (weekly-basis) and open
Supplier's strategies/maneuvers in relationship	Continuous development, enhancing production effectiveness and cost-efficiency (exploitation)	R&D supplier has moved downstream and develops customer's core processes and obtains critical data for a customer. In addition, R&D supplier has offered performance-based pricing model to emphasize its commitment to customer and trust to its own capabilities. R&D supplier also gives discounts based on customer's buying volume	R&D supplier has been able to develop scarce and highly valuable technological solutions for this customer. At the same time it has been able to be cost-efficient (Supplier has combined exploration and exploitation)

In relationship F, collaboration between firms occurs in global scale and the contracts have been made in corporate-level (hierarchy). However, firms have lot of power locally and for instance prices are negotiated between firms' local units. Still, customer follows price mechanism only slightly and the social mechanism is remarkable in this relationship as the trust among the parties is high. Customer's respondent states that he believes that the R&D supplier does not want to milk them. Parties also share knowledge openly and joint-development activities take place frequently. R&D supplier has successfully transitioned from product business towards service business (see Wise & Baumgartner, 1999). As the R&D supplier operates customer's core process and obtains critical data from the process, it has developed new kind of capabilities and processes. For instance, R&D supplier has offered performance-based pricing for this particular customer. This means that the supplier can promise for example certain level of usability or reduced downtimes for the customer.

> *"There is this kind of mutual respect for each other, trust for another one's skills and mutual trust that neither of us will stab the other one in the back."(Customer/relationship F)*

> *"We are open but during the negotiations, it is always the price, price, price. Customer tells us how their costs have increased; raw-material costs have increased, salaries have increased and energy-costs have increased. However, you can notice a lot of things indirectly." (Supplier/relationship F)*

Even though customer in relationship G acquired the R&D supplier, hierarchical mechanism is only partially deployed to steer the relationship, even though parties have joint IT-systems. Instead, the relationship is based on firms' complementary resources/capabilities and mutual trust. Hence, social mechanism is dominant in this relationship as the collaboration and knowledge-sharing in every level (relationship's top-management level, project-management level and operational-level) is deep and frequent. Even the relationship's top-managers discuss weekly basis. In addition, price mechanism is deployed but rather differently. Customer applies price mechanism by letting various suppliers to compete against each other inside the corporation. This ensures that the suppliers' try to achieve cost-efficiency. Competition within the firm has led R&D supplier to combine both advantage-seeking behavior (exploitation) and opportunity-seeking behavior (exploration).

> *"The customer lets us independently to decide our procedures. Customer only designs these interfaces i.e. what kinds of procedures are utilized between internal units. That's the only thing they decide. They are heavily also following costs, so they know what's going on in corporate-level. That's why the cost-factors have been over-emphasized. Hence, we have to get acceptance for e.g., recruitments and what is the benefit of this recruitment." (Supplier/relationship G)*

> *"Basis for the corporate is that internal competition is beneficial for the whole organization. This enhances our own activities too. (Supplier/relationship G)*

Cross-case analysis

Huberman and Miles (1994) suggest that cross-case analysis can apply strategies which can be variable-oriented or case-oriented. Variable-oriented strategy is an approach to find themes that across the cases. Case-oriented strategy, on the other hand, enables to find cases that fall into clusters that share certain patterns or configurations. However, we utilize both of the approaches to obtain substantial issues derived from the data. Table 4

synthesizes previous within-case results by categorizing customers' hybrid governance in each case by classifying different mechanisms (price/market, hierarchical/authority and social/trust). We can notice slight patterns between the cases. For instance, relationships A, C and G get high values in hierarchical/social mechanisms and moderate values in price mechanism. Rest of the cases varies in terms of applied hybrid governance form. By applying variable-oriented strategy, excluding cases B and D, social mechanism (trust) gets high values. Similar occurs with relationships D and F in hierarchical dimension whereas price mechanism gets high values only in cases B and D. Price mechanism is also the only variable that ranges from "low" to "high" basically because in relationship E hierarchical mechanism is dominant. Hierarchical and social mechanisms range only from "moderate" to "high".

We can conclude that customers deploy different forms of hybrid governance in reviewed R&D collaboration. Measured by variables (low=1, moderate=2, high=3), both hierarchical and social mechanisms seem to get higher values than price mechanism. (Price mechanism 15/7=**2.14**, hierarchical mechanism 19/7=**2.71**, social mechanism 19/7=**2.71**). Respectively, when measured by cases, relationships A,B,C and G get equivalent values of 2.67. Relationships D, E and F get all value of 2.33 (A, B, C and G: 8/3=**2.67**, D, E and F: 7/3=**2.33**). As a consequence, price mechanism is less used whereas hierarchical and social mechanisms in hybrid governance are mostly adopted by customers in R&D collaboration.

Table 4. Synthesis of hybrid governance in studied cases.

		Relationship A	Relationship B	**Relationship C**	Relationship D	Relationship E	Relationship F	**Relationship G**
Price	Low					x		
	Moderate	**x**		**x**			x	**x**
	High		x		x			
Hierarchical	Low							
	Moderate				x		x	
	High	**x**	x	**x**		x		**x**
Social	Low							
	Moderate		x		x			
	High	**x**		**x**		x	x	**x**

Based on within-case results, R&D suppliers adopt several strategies/maneuvers to increase its relational power. These strategies include 1) *social strategy*, which include influencing customer's top managers, key decision-makers or product users, 2) *product/process strategy* which means developing existing products (exploitation), future products (exploration) or processes (efficiency) and 3) *adaptation strategy* which means for instance R&D supplier's internal change such as business strategy change (e.g., moving towards services) or decreasing dependency of particular customer (e.g., through new customer acquisition). R&D suppliers especially in relationships A, E and G had created strong ties with customers' top managers and thus, were able to influence customers' decisions. R&D supplier in relationship D was able to gain trust from customer's product users (drivers). These drivers were influential inside customer hierarchy and made customer's managers' price mechanism utilization more difficult and troublesome. R&D supplier in relationship F was able to communicate actively with both key-

decision makers and product users. Product exploration was applied especially in relationships D and G. Product exploitation and enhancing processes were applied especially in relationships B, C and E. R&D supplier in relationship D even threatened its customer by starting to decrease the product quality if the customer will use more supplier's rivals' products. Adaptation strategy was partly adopted by R&D supplier in relationship F who had moved vertically downstream. Hence, R&D supplier has started to operate customer's core process and obtain critical data derived from the process/products.

Table 5. Hybrid governance and R&D supplier's maneuvers.

R&D supplier's maneuvers (counterattacks)			
	Social strategy	Product/process strategy	Adaptation strategy
Customer's hybrid governance	Influencing top managers Influencing key decision-makers Influencing product users	Product exploration (new products) Product exploitation (incremental change to existing products) Decreasing product quality/availability Enhancing processes (production effectiveness)	Strategic change Decreasing customer dependency (e.g., new customer acquisition)

DISCUSSION AND IMPLICATIONS

Theoretical implications

The existing research has paid attention to different governance mechanisms and combination of these mechanisms (hybrid governance), yet relatively little research exists on hybrid governance in dyadic R&D collaborations. Existing hybrid governance research is often quantitative and thus lacks evidence of practical manifestations of hybrid governance. This study tries to fill this research gap by building on existing research of hybrid governance (Adler, 2001; Heide, 1994; Bradach & Eccles, 1989) and R&D collaboration (Kohtamäki et al. 2013). Our study is one of the first to identify also R&D suppliers' strategies/maneuvers in R&D collaborations where information asymmetry is often strong.

First, our study contributes to literature of hybrid governance (Adler, 2001; Heide, 1994; Bradach & Eccles, 1989) by providing qualitative evidence on hybrid governance in R&D collaboration. These findings provide rich evidence how combinations of governance mechanisms (price, hierarchy, social) appear in R&D collaborations and what are practical manifestations of these mechanisms. Our findings synthesize these combinations of different mechanisms. Adler (2001) suggests that these three mechanisms may take combinations of low/high forms whereas Heide (1994) claims that these mechanisms cannot take extremely forms simultaneously. Making distinction to these previous studies, we suggest that separate governance mechanisms (price, hierarchical and social) may take forms between low, moderate and high and that they are not mutually exclusive.

Our second main contribution is that we consider R&D suppliers' possible strategic maneuvers to respond to customers' hybrid governance. Our findings represent three different strategies R&D suppliers may apply in these dyadic relationships: 1) Social strategy, 2) product/process strategy and 3) adaptation strategy. Building on new institutional economics, our study present R&D suppliers' practical manifestations in these relationships to increase their bargaining power and reduce their dependency of the customer.

Managerial implications

Overall, managers responsible for developing R&D relationships should be aware of hybrid governance, its possibilities, disadvantages or threats. Our study represents interesting R&D collaboration cases where mutual learning and provided R&D services are extensive. Therefore, our paper provides interesting benchmarking opportunities for managers responsible for developing complex business relationships. Customers' managers should not be aware only customers' hybrid governance forms but also potential strategies R&D suppliers may apply to increase their relational bargaining power. Respectively, R&D suppliers' managers should identify hybrid governance forms applied in relationships and develop various strategies to react possible changes.

LIMITATIONS AND FUTURE RESEARCH

As with any empirical study, this study has several limitations that have to be addressed. The study is qualitative in nature, so the results are limited only to studied cases. Even though time issues were managed in the study, as all the interviews were conducted within six month time period. Thus, the study is cross-sectional by its nature and future research would benefit from longitudinal research settings. The study is also culturally biased because all the reviewed cases were Finnish (excluding one customer researchers were not allowed to interview). Hence, future studies would benefit from similar kind of research conducted in other regional context. As the Finnish business context can be considered somewhere between Japan and USA (intermediate role of trust, cross-ownership and market-mechanism), future studies would benefit from similar kind of research setting, where the outlying cases are selected from quantitative dataset/cluster analysis in different regional areas. Moreover, quantitative research of hybrid governance in R&D collaboration should be conducted to find out if different combinations of governance mechanisms are more beneficial in R&D collaboration.

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