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# *Journal of* Supply Chain Management

## **Managing Coopetition in Supplier Networks – A Paradox Perspective**

Miriam Wilhelm and Jorg Sydow

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### **ABSTRACT**

Scholars in the field of supply chain management have started to embrace the idea of simultaneous cooperation and competition (“coopetition”) in supplier networks but have mainly looked at coopetition from a structural perspective. In this paper, we complement the structural view with a paradox perspective to investigate the competitive tensions that evolve when buying firms are trying to engage both forces simultaneously in their relations with core suppliers. Our comparative case study of four major carmakers reveals different strategies buying firms use to manage coopetition in their supplier networks, the responses they trigger from their suppliers, and the resulting paradoxical tensions. Our inductive analysis reveals that irrespective of the managing approach chosen, the “coopetition capabilities” of the buying firm determines whether negative tension dynamics can be avoided. At the core of such coopetition capabilities are “evaluative capabilities” allowing the buyer to provide cost improvement suggestions to suppliers for the sake of joint value creation, and to control the division of value appropriation through a deeper understanding of the supplier’s cost structures. By highlighting the nature of coopetition capabilities as *organizational* capabilities, we also contribute to paradox research, going beyond its current focus on the individual cognitions of managers.

**Keywords:** Supplier Management, Partnering (Alliances), General Management Issues, Case Study

## INTRODUCTION

Recent debates on the dark side of buyer-supplier relations (Anderson & Jap, 2005; Fang, Chang, & Peng, 2011; Kim & Choi, 2015; Noordhoff, Kyriakopoulos, Moorman, Pauwels, & Dellaert, 2011) challenge the positive view on collaboration with suppliers in supply chain management theory and practice. These debates highlight the necessity of having both relational and transactional mechanisms (Liu, Luo, & Liu, 2009) in order to generate value and overcome the relational inertia that inhibits partners' capacity to meet changing market demands (Villena, Revilla, & Choi, 2011). This increasingly questions the traditional cooperative-competitive dichotomy that is commonly used to describe buyer-supplier relationships (Wu & Choi, 2005; Karatzas et al. 2015). This faces buying firms with the paradox when they structure relationships to derive the greatest benefit from cooperation and collaboration, while keeping the supplier competitive in terms of market price (Terpend et al., 2008: 41).

Supply chain scholars have started to embrace the idea of simultaneous cooperation and competition—*coopetition*—in supplier networks but have mainly looked at the phenomenon from a structural perspective (Choi & Wu, 2009; Pathak et al., 2014; Schmoltzi & Wallenburg, 2012). By viewing the smallest analytic unit of coopetition in networks—a triadic relationship between a buyer and two suppliers—scholars have advanced our understanding of the buying firm's strategic role in orchestrating the degree of coopetition in the network by creating structural holes (Pathak et al., 2014), or closing them (Wilhelm, 2011). In this paper, we complement the structural network perspective with a paradox perspective (Lewis, 2000; Lewis & Smith, 2014), providing an in-depth account of the tensions that evolve from structural changes in the composition of the network and how they can be successfully managed by supply chain managers.

A paradox is understood as contradictory yet interrelated elements that seem logical in isolation but seem absurd and irrational when they appear simultaneously (Lewis, 2000, p. 760).

Two core characteristics describe a paradox: contradictions and interrelatedness (Schad et al., 2016). Thinking in terms of paradoxes demands that supply chain managers accept and work with contradictory elements instead of suppressing one of the elements (Lewis & Smith, 2014; Stadtler & Van Wassenhove, 2016). Against this theoretical background and in a multiple-case study in the global automotive industry, we explore how buying firms manage the paradox of coopetition. We seek an answer to the following question: *How do buying firms manage the paradox of coopetition in their supplier networks?*

Buying firms can either accept this paradox and create synergies between them, or separate the conflicting elements, temporally or spatially (Cameron & Quinn, 1988; Lewis & Smith, 2014). Our case study suggests that buying firms' attempts to manage coopetition one way or the other triggers responses from their suppliers, which relate, positively or negatively, to tension dynamics. Our findings also show that irrespective of the actual strategy chosen by the buying firm, specific organizational capabilities, that we term "coopetition capabilities," are important to avoid unproductive conflict and the escalation of competitive tensions. Considering these insights, we engage in an iterative theory-building process (Gioia et al., 2013) by answering a second research question: *Which coopetition capabilities does the buying firm need in order to trigger positive responses from suppliers and avoid negative tension dynamics?*

Our study offers two main theoretical contributions: By studying practices of carmakers and their suppliers in a dyadic and processual fashion, as responses and counter-responses, we complement the structural, buying-firm centric perspective of coopetition taken thus far. Furthermore, we specify the concept of "coopetition capabilities" (Bengtsson et al., 2016) for buyer-supplier relations. Coopetition capabilities have been defined as the ability of a firm to manage competitive tensions in inter-firm collaborations in order to attain and maintain a moderate level of tension, regardless of the intensity of the coopetition paradox (Bengtsson et al. 2016: 19). So far, this concept has been analysed at the level of individual managers and

their ability to “think paradoxically” and embrace contradictions (Smith & Tushman, 2005). Thus, by moving beyond this narrow focus, we also contribute to emerging paradox theory by shedding light on the role of organization-level capabilities of the buying firm for managing the paradox of coopetition.

In the following, we first summarize current research on coopetition in supply chain management, and delineate the paradox perspective with a particular focus on different practices of managing coopetition. Then, we introduce our research design and methodology, before presenting the empirical findings from the global automotive industry. Finally, we discuss the novel contributions of our study to research on coopetition and organizational paradoxes.

## **THEORETICAL BACKGROUND**

### **Coopetition in buyer-supplier relations**

Traditional supply chain management was based on the belief that maximum competition, under the discipline of a free market, would promote a healthy supply base which secures low prices and on-time delivery. The focus on open-market negotiations that are heavily based on price-competition was eventually replaced by a new paradigm that shifted the focus of competition from the dyadic buyer-supplier level to a network of co-operating firms competing against other supply chains (Dyer & Hatch, 2006; Dyer & Nobeoka, 2000; Spekman et al., 1998). This collaborative paradigm<sup>1</sup> is still prevalent in the supply chain management literature today (Chen & Paulraj, 2004; Terpend & Krause, 2015); only recently scholars started to shift attention to the dangers of over-embedded supplier relations. Among them, Villena et al. (2011) revealed an inverted curvilinear relationship between social capital and a buying firm’s

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<sup>1</sup> Note that some authors explicitly differentiate between cooperation and collaboration in order to show the evolution of buyer-supplier relationships (e.g., Spekman et al., 1998). In line with the coopetition literature, we do not draw such a distinction here and use collaboration and cooperation interchangeably.

performance, indicating that too little social capital (i.e., an over-emphasis on competition) and too much social capital (i.e., an overemphasis on cooperation and a lack of competitive tensions) are both equally detrimental for performance. Their study points to the dangers of over-embeddedness that can reduce the buyer's ability to make objective decisions and lead to an increase of supplier opportunism. For example, Nissan's strong relations with its long-standing suppliers, once a source of competitive advantage, turned into a disadvantage in the 1990s. Nissan's purchasing prices were 20-25% higher than market levels on average (see also Stevens et al., 2015).

Supply chain scholars have thus started to embrace the idea that the parallel existence of competition and cooperation is actually desirable to the buyer–supplier relationship (Klein et al., 2007; Nair et al., 2011). A simplified depiction of coopetition in supplier networks is the triadic relation between one buyer and two suppliers (Choi & Wu, 2009; Pathak et al., 2014). From such a structural network perspective, cooperation is understood as the direct link between two companies, whereas the absence of a link between two companies suggests competition when at least one of the three following conditions are met: (1) the two firms can supply a product of equivalent functionality, (2) the firms require similar scarce resources or input, (3) the two firms have overlapping and complementary technology such that learning and value appropriation incentives exist (Pathak et al., 2014: 255). Competition between two suppliers is likely to also affect relations that these suppliers have with the buyer. Thus, a triadic perspective sharpens our understanding of competitive tensions in a buyer-supplier dyad that result from its embeddedness in a larger network with multiple and overlapping relational linkages (Wilhelm, 2011; Pathak et al. 2014).

In the context of automotive supplier networks, this means that suppliers with similar technological competences are regularly competing for the development and production of a specific part for the same project when the carmaker is following a dual or parallel sourcing

strategy (Richardson, 1993; Wu & Choi, 2005). Moreover, the respective existence of either latent or no ties (Mariotti & Delbridge, 2012) with a supplier who could win a delivery contract can lead to competitive tensions during price negotiations. These tensions will resurface again during annual price re-negotiations that have become practice in the automotive industry when buyers threaten to use alternative market suppliers.

It is important, however, that competitive tensions do not escalate, as this might undermine the potential for joint value creation. The value creation potential is highest in the early stages of the product development process, when carmaker and supplier pool their complementary technological capabilities to jointly develop the specifications of the vehicle in a way that reduces costs and/or adds further functionalities to the car. As suppliers possess more detailed knowledge of their parts, they can formulate functional specifics much more precisely, identifying potentials for the standardization and simplification of parts construction for the use of alternative materials, and potentials for the parallel usage of a part in other models (“carry-over-parts”) (Clark & Fujimoto, 1991). A rule of thumb in the industry states that 70% of the costs are determined in the pre-development phase. Competitive tensions already surface in this earlier stage of the cooperation process but become fiercest when the joint creation of value is appropriated by both partners, i.e., at the stage of series production, when economies of scale and specialization effect can be fully exploited. In practice, the uncertainty of the division of value between buyer and seller often leads to buyers deciding to distribute their business to a larger number of suppliers instead of maximizing joint value creation through deep relationships with single or few suppliers (Elfenbein & Zenger, 2017).

The critical issue here is, thus, to manage buyer-supplier relations so that “(b)oth of the contradictory elements of a paradox are accepted and present” (Cameron & Quinn, 1988, p. 2), and maximum value can be derived from buyer-supplier relationships, ideally to allow for the reciprocity that is considered necessary to maintain long-term interorganizational relations

(Sydow et al., 2016). Thus, in line with other researchers, we consider coopetition as desirable *and* paradoxical since the simultaneous focus on cooperation and competition causes conflicts and tensions (Terpend et al., 2008; Raza-Ullah et al., 2014; Ritala & Tidström, 2014).

### **Managing the paradox of coopetition**

Coopetition and other paradoxes are causing tensions for actors when they try to make sense of them. At the same time, tensions are an inherent part of every paradox (Smith & Lewis, 2011). Research on organizational paradoxes has resulted in a burgeoning stream of literature (for an overview see Schad et al., 2016), from which we distil three premises that constitute our paradox perspective. The first premise is that managers should accept rather than deny or suppress the contradictory nature of a paradox, and seek to create synergies between the paradoxical elements.

The second premise focuses on managing approaches—or responses—to paradoxes; that is, responses are either built on a structural separation of the contradictory elements, or the acceptance of the co-existence of these elements and the search for synergies between elements. The synergistic approach is the most favored one by paradox researchers but poses high requirements for managers in terms of their ability to deal with emotional uncertainties and ambivalence (Raza-Ullah et al., 2014). The synergistic approach thus requires managers develop a high level of “paradoxical cognitions” (Miron-Spektor et al., 2011; Smith & Tushman, 2005). The temporal or spatial *separation* of contradicting elements is also referred to as “splitting” (Andriopoulos & Lewis, 2009; Jarzabkowski, Le, & Van de Ven, 2013). The separation can be functional, spatial and/or temporary and allows managers to deal with ambiguities that often cause discomfort. Temporal separation allocates competing demands to sequential time periods. Spatial separation implies that opposing demands are structurally separated, for example by assigning one team to manage the cooperative aspects of a relationship, while another manages the competitive aspects (Bentsson & Kock, 2000). While



such splitting approaches might help to avoid or eliminate tension, they can also reduce the opportunity to tap into the energizing potential of paradox (Andriopoulos and Lewis 2009, Razah-Ullah, 2007). By contrast, a *synergistic* approach is based on “accepting the paradox and learning to live with it” (Poole & Van de Ven, 1989, p. 566). This requires that managers recognize that both elements that constitute a paradox are important and thus both need to be accommodated (Jarzabkowski et al., 2013). For example, Lüscher and Lewis (2008) unearthed how middle managers, in sparring sessions with intervening questioning by the researchers, worked collaboratively through paradoxes of organizational change by collectively overcoming thinking in dilemmas (e.g., “Should I manage, *or* should I let my employees manage?”) and sought to discover the link between seemingly contradictory elements (e.g., “Create optimal conditions for teams so they may become self-managing”). This again requires high cognitive capabilities of managers. For example, Bengtsson et al. (2016) discovered that a “coopetition capability” of managers moderates the relationship between the coopetition paradox and felt tensions. In their view, coopetition capability involves a “coopetition mindset” (Gnyawali & Park, 2011) and the cognitive complexity to hold contradictions in mind (Smith & Tushman, 2005). While these are important individual capabilities to manage coopetition paradoxes, we know little about the organizational capabilities that come into play at the formation stage of the paradoxical relationship (see also Raza-Ullah & Bengtsson, 2017).

Our third premise is that a paradox cannot be clearly broken down into antecedent-process-outcome relationships among core constructs but needs to be studied as a process reflecting cyclical dynamics (Hargrave & Van de Ven, 2017). A processual perspective also opens up the possibilities to study the dynamics between the actions of the involved parties, i.e., the recurrent interaction between the buyer’s managing response to the coopetition paradox and the responses they trigger from suppliers.

## RESEARCH DESIGN AND METHODOLOGY

Given the novelty of our paradox perspective on coopetition in the field of supply chain management, we relied on an inductive theory building methodology based on case study research (Eisenhardt, 1989; Eisenhardt & Graebner, 2007). Many operations management researchers including Barratt et al. (2011), Ketokivi and Choi (2014), and Meredith (1998) have argued for the usefulness of conducting inductive case studies for developing rich contextualized explanations about buying firm strategies and organizational behaviours. Equally, coopetition researchers have argued for the benefits of case study research to study paradoxical relationships (Bengtsson, Eriksson, & Wincent, 2010; Ritala & Tidström, 2014).

### Sampling and data collection

In our case study we investigated major carmakers and their networks of first-tier suppliers in two of the leading countries of the automobile industry, Germany and Japan. Through a theoretical sampling strategy, we tried to identify different carmakers' approaches with regard to the different cells of a 2x2 matrix that depict different scenarios of how cooperation and competition are addressed (see Figure 1). Cell 4 depicts the "ideal" situation from a paradox perspective but also from the view of most coopetition researchers (e.g., Das & Teng, 2000; Lado, Boyd, & Hanlon, 1997) as cooperation and competition co-exist to a high degree. At the same time, we acknowledge that this constellation is likely to put the highest demands on managing paradoxes, and may, thus be difficult to achieve in practice. For this reason, cell 4 is depicted with a dotted line.

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Insert Figure 1 about here

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We followed a maximum variance sampling logic (Eisenhardt, 1989) and based our case selection on major supplier satisfaction rankings, published yearly by *Automotive News* and *Planning Perspectives* (Snyder, 2006; Planning Perspectives 2007), which reflect suppliers' assessments of their relationships with their customers. Although these surveys are not based

on explicit measures of cooperation or competition levels in buyer-supplier relations, they include items such as “degree of price pressure” and “level of trust,” which speak indirectly to these levels. Thus, we used these rankings mainly as a heuristic to determine how cooperative suppliers perceive their relation with a particular carmaker. However, it was difficult to identify cases that clearly fall into the C4 or C1 category based on the supplier satisfaction rankings. Most carmakers in these countries seem indeed to fall into either the “cooperation-dominant coopetition” (C2) or “competition-dominant coopetition” (C3) category. We thus decided to sample two carmakers from the two countries for both the C2 (Toyota and BMW) and C3 (Nissan and Volkswagen) categories, but we expected that Toyota would fall into the C4 cell. The Japanese carmaker is often named as an example of a company that purposefully embeds paradoxical thinking into its manufacturing strategy (Bowen, Spear, & Kent, 1999; Eisenhardt & Westcott, 1988; Osono, Shimizu, & Takeuchi, 2008), and we assumed that this would also apply to its supplier management style.

The selection of suppliers was based on two major criteria: (1) suppliers had to develop and deliver a strategic part to the carmaker and (2) to have had a long-term relationship with the carmaker (> 5 years). Suitable supplier firms were identified through recommendations made by the carmakers, member directories of chambers of commerce, existing contacts, and by other researchers. The majority of interviewed suppliers are well-known and widely diversified companies with an annual turnover of over \$4 billion. While these suppliers typically supply more than one type of part to a customer, the interview focused only on the particular part for which the interviewee was responsible.

Through our interviews and document analyses, we gathered data on how organizational actors deal with the tensions involved in the respective supplier networks for every carmaker case. Semi-structured interviews were conducted with key informants from the carmaker as well as the first-tier supplier firm. At the carmaker organization, we interviewed managers from

the purchasing department in charge of strategic components at both the middle and lower management levels. At the supplier organization, we interviewed managers from both the sales and product development departments across different hierarchical levels ranging from the CEO to key account and project managers. At the time of the interview, the majority of respondents were in charge of one particular key account; in eight cases the respondent was in charge of two customers. We invited this group of respondents to draw systematic comparisons between certain practices and questioned to what extent they thought they were specific to their main customer compared to others. Moreover, the majority of respondents had experience with other carmakers before their current position and sometimes provided unsolicited comparisons between their practices during the interview.

A structured instrument guided the interviews wherein we asked general questions about sourcing and development practices (in two different versions for carmaker and supplier). The instrument can be found in the appendix. As each interview progressed, we engaged in probing the nature of specific issues and the interviewees responses by asking additional questions. Whenever possible, interview partners were asked to provide illustrations of their answers. This not only helped us to understand the specific issues at hand and how actors reconstruct and deal with them, but also increased the trustworthiness of the data (Lincoln & Guba, 1985).

All interviews took place on site with interview times ranging from 45 minutes to 3 hours. Unclear answers were clarified through email or follow-up questions in subsequent rounds. Interviews were conducted in English, German, or Japanese and were audio recorded and transcribed afterwards. Main data collection took place within three periods of three months in Japan and Germany between 2007 and 2008. A second wave of data collection took place between 2011 and 2016 to validate the currency of the data through thirteen additional interviews with representatives from buying firm and suppliers for Toyota, Volkswagen, and Nissan. In total, 58 interviews were conducted (see Table 1).

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Insert Table 1 about here

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The trustworthiness of the data was further ensured by the authors' prolonged engagement with the topic, through studying practitioner-oriented industry journals, attending industry meetings, and reviewing previous research in the automobile industry. In addition, multiple data sources were used including internal company documents, existing case studies, articles in business trade media, and discussions with industry experts such as other researchers and consultants (see Appendix for overview on measures that we undertook to address quality criteria throughout the research process).

### **Data analysis**

In the data analysis stage, we gradually transitioned from an inductive to an abductive approach (Alvesson & Kärreman, 2007) where data and existing theory form a tandem (see also Gioia et al., 2013). First, we produced a draft case study report with thick descriptions, which we asked nine key informants to review at two different stages. In the subsequent analysis process we encoded our data in four steps to move systematically from descriptive data to theoretical analysis, while moving between themes emerging from the data and the consultation of existing literature (Gioia et al., 2013).

In the first stage of encoding data, we sought evidence of tensions underlying the coopetition paradox by inductively developing codes from the real-life narratives of our interviewees. In line with earlier coopetition research (e.g., Brandenburger & Nalebuff, 1996; Ritala & Hurmelinna-Laukkanen, 2009; Ritala & Tidström, 2014), we focused on the central tension underlying the paradox of coopetition in buyer-supplier relations: that between value creation and value appropriation. In the context of automotive supplier networks it appeared that value creation was often expressed in terms of achieved cost efficiencies through the cheaper construction of parts in the product development phase, or through process improvements in manufacturing. As purchasing parts are the biggest cost lever for automotive

companies, carmakers often send consultants to suppliers' facilities to improve their production costs. However, the often (unequal) appropriation of the jointly created value sometimes caused fierce conflicts, surfacing during supplier selection decisions, price (re)negotiations, and the enforcement of open book policies on suppliers. We coded these instances as moments of competitive tensions.

In the second encoding stage, we identified carmakers' approaches to managing these tensions and paradoxes by trying to connect the real-life narratives with existing concepts from the literature. Here we paid attention to responses that were either aimed at a temporal or spatial separation of competitive and cooperative elements in the relation (that we coded as "splitting") and responses that did not aim at such a structural separation but addressed both elements simultaneously (that we coded as "acceptance").

In the third stage, we identified suppliers' responses to carmakers' strategies. As there was no previous analysis on dyadic responses to tensions and paradoxes, we generated codes inductively at this stage. Finally, we examined the effects of the suppliers' responses on the interorganizational relationships. We looked for carmakers' and suppliers' descriptions of the quality of the relationships, how they perceive the level of competition in them, and whether and how they perceive tensions. We were particularly sensitive to instances where buyers and suppliers' perceptions of the quality of the relationship were diverging, and attempts to initiate cooperation were interpreted as competition-inducing ones. Through repeated discussions within our research-team, we finally drew implications for the competitive tensions that were resulting from the buyer-supplier interaction, in terms of their enforcement (i.e., the relation with the carmaker was perceived as competitive despite collaborative efforts), or reduction (i.e., suppliers confirmed the collaborative intentions of the carmaker). During this stage, the importance of "evaluative capabilities" of the buying firm that emerged was decisive for

positively shaping the value creation value-appropriation tension. This insight was interpreted and further developed in light of the existing literature on organizational capabilities.

Interviews conducted in the second wave of data collection were analysed separately in a more deductive manner by assigning quotes and text excerpts from the transcripts directly to codes developed in the initial data analysis. While the additional analysis did not lead to any new insights it helped to corroborate the original analysis by providing additional empirical evidence for our observations.

## **BUYERS' AND SUPPLIERS' RESPONSES TO THE COOPETITION PARADOX**

### **Within-case analysis**

*Volkswagen and its supplier network.* Volkswagen was most clearly following a temporal splitting approach in the collaboration process with suppliers. In the concept phase (about 48 months before the start of production) the carmaker will usually choose a preferred supplier and develop a concept together. After a design freeze there is a “request for quotations,” when purchasing will ask a group of alternative suppliers to make their price offers based on predefined technical requirements. The price then forms an important basis for the subsequent supplier selection decision. The purchasing department (in consultation with development) will select one or more suppliers to collaborate in series development to adapt the part to a new vehicle model. After start-of-production, however, Volkswagen is again inducing competition with the so-called Global Sourcing practice, when asking for price quotations from other suppliers for this particular part. Even though an actual change in a supplier is rare, the market information is used to exert additional price pressures on existing contracts.

A main outflow of coopetition in the relationship between Volkswagen and its suppliers is the fight for profit margins, reflecting tensions between value creation and value appropriation. Purchasing managers from Volkswagen revealed a general mistrust that “suppliers are enjoying

high margins at the expense of our profit” (Volkswagen purchasing manager) and hide any cost efficiencies they might have realized without sharing them with Volkswagen. The price offered is an important supplier selection criterion. However, because the selection occurs before the beginning of the series product development process (36 months before series production), the actual price at the end of the development usually deviates from the one agreed upon, as engineering changes often occur during the development progress for which suppliers need to be compensated. Thus, Volkswagen introduced the Global Sourcing practice, whereby an additional bidding process with external suppliers is initiated after the development of the part has been finished, and series production has started:

The main purpose of Global Sourcing is not to bring in another supplier but to review the prices. Even though we fix the price when contracts are being signed, there are many changes to the part during series development because different parts need to be adjusted to each other, and there might be engineering changes which were not foreseeable at the beginning. These things might skew the price and we need to verify whether it is still in line with the market price. (Volkswagen purchasing manager)

The potential decoupling of the product development and series delivery—or value creation and value appropriation—phases poses economic risks for suppliers and decreases their trust in the collaboration with the customer:

We know this, we recognize this in a particular project, but you cannot really protect yourself against it. In these cases, we would decide strategically and offer such a low price that we know the others cannot deal with this. (Key account manager of a Volkswagen supplier)

Another initiative to help improve the cost structure of suppliers is the so-called Forum Material Costs that one Volkswagen purchasing manager described as a “collaborative approach” in order to jointly find “innovative solutions with suppliers to help them reduce their costs”. For this purpose, Volkswagen has built up a cost analysis department that conducts cost analysis workshops with their suppliers. A particular problem with the cost analysis, however, is that the carmaker often does not possess actual manufacturing experience with the part:

This [costs analysis workshop] really is of no use to us because what they calculate as potential savings is just pure fantasy. (...) They always assume an ideal process. We



have been manufacturing this part for 50 years and we know the costs better than Volkswagen, which has never manufactured this part. We know the technical details better. We know when we can use standard parts and when not because the technical requirements do not allow it. (Key account manager of a Volkswagen supplier)

As a result, there is naturally a high level of distrust and scepticism among suppliers regarding the cooperative intentions of the carmaker. Particularly, the cost analysis workshops are often seen as a pretence for price re-negotiations by Volkswagen suppliers, as one of them remarked sarcastically:

Yes, they have cost analysis workshops or purchasing price analysis as they call it, and they say: “Why don’t you show us your costs in detail? We will have a look at it together and we will tell you where you can realize some great savings.” (...) The next thing is the cost workshops that are taking place—as is the case in our project at the moment—and you will find yourself in the next round of price negotiations! (Key account manager of a Volkswagen supplier)

Consequently, suppliers were generally protective of information on their cost structure and more likely to hide any cost reduction effects they may have realized. They are also likely to display opportunistic behaviour when reacting to their customer’s request to fill out the cost breakdown: “We always do the cost breakdown so that there is a certain fuzziness. If you want my honest opinion, the world wants to be cheated and the system needs to be fed, that is the brutal reality” (Key account manager of a Volkswagen supplier).

*Toyota and its supplier network.* The Toyota case represents almost the opposite to the case of Volkswagen. The purchasing manager interviewed at Toyota was very reflective about the value creation-appropriation tension that characterises the relationship with suppliers. In this context, he stressed the importance of having a good internal power balance between those functions that deal with suppliers in this process to buffer this tension:

The “sanmittai,” the trinity of development, production and purchasing, is important. Naturally there is a tension between engineering—that mainly cares about innovation and quality—and purchasing—that cares about prices, and the supplier is caught somewhere in-between. There should be a good balance in a sense that negotiations can be tough, but the relationship with suppliers should be soft. (Toyota Purchasing manager)

Supplier selection is usually made by Toyota based on past relationship experiences, which implies that there is no bidding process for new projects. Toyota, thus, seems to emphasize continuity in collaboration with suppliers within projects and over time.

Moreover, the price is not negotiated at the beginning of the product development process (as it is not the basis for supplier selection) but at the end of the process. This allows Toyota to integrate suppliers early in the product development process, so that they are given an opportunity to bring in their ideas about how the construction of parts could be improved, but there is no fear of an undesirable lock-in, “Some of our suppliers have excellent capabilities in terms of technology, quality and cost. We encourage suggestions from such suppliers, particularly at an early stage of the development” (Toyota purchasing manager). As a result, suppliers perceive themselves as having more freedom to bring their ideas and expertise into the development process, and thus increase joint value creation while they express their trust that the value created would be appropriated fairly later.

While most of the value of a product is predetermined in the product development phase, additional value can be created through efficiencies in the series production stage. Hence, carmakers have a strong interest in learning about the cost structure of the purchased part and request more detailed knowledge from the supplier. One supplier who has previous experience with delivering Volkswagen describes a central difference with Toyota regarding carmaker’s respect of the supplier’s margin:

Toyota demands full transparency of our cost structure. It is an open book policy. They want to know exactly what each process step costs, have full control, but also give advice where we can improve things. Thus, they are always well-informed where we might have accumulated some slack. The advantage is, however, when the conditions for us change, when material prices go up, when wages go up, that they will immediately accept our calculation: ‘I see that steel has become more expensive, so we will share the burden with you.’ (Key account manager of a Toyota supplier)

In general, Toyota’s suppliers saw the advantages of sharing sensitive cost information with the carmaker and another interviewed sales manager of a German supplier was deeply

impressed by the accuracy with which level costs are being broken down and the in-depth manufacturing knowledge behind it:

Toyota has an in-house development for components that have been outsourced to 80 or 90%, just for them to get a realistic picture of what the actual costs are for manufacturing this part. They know for a specific part that comes out of a specific press, with this type of material, with this chamfer, with this specific tact, that this will cost this amount of money. They really have these amazing tables with meticulously compiled facts. (Sales manager of a Toyota supplier)

Another reason suppliers were willing to share detailed cost information with the buyer is that Toyota was able to provide them with helpful advice on how they could achieve cost reductions: “We are always grateful for Toyota’s advice, as it helps us to reduce costs in our processes. Toyota is the grandmaster of Lean Production. But they also understand our cost reduction potential really well” (Key account manager of a Toyota supplier).

*BMW and its supplier network.* In the past, BMW explicitly collaborated with suppliers as one of the five key strategies to sustain themselves against Japanese competitors (Kilper, 2000: 18). The announcement of the cost-reduction program “Number One” in 2008 has, however, undeniably introduced more competitive elements into BMW’s relations with suppliers ever since. For example, our interviewed BMW suppliers reported that the German carmaker had started to split product development contracts from the actual delivery contract. This means that the actual supplier selection for series will be made after the development of a part is finished, shortly before tools for series production need to be purchased. In extreme cases, this could lead to one supplier developing the part for series and another supplier receiving the actual delivery contract for it. Although series development will be paid for separately in this case, this approach is not economically attractive for suppliers. Asked for a possible reason for this, one German supplier states:

Competition, for sure. They want to postpone the decision on project awarding as long as possible, so that we suppliers can compete against each other for longer. That would be my assumption, so purchasing has more chances to iterate negotiations. (Key account manager of a BMW supplier)

BMW has strengthened its efforts to expand its knowledge of the cost structure of its purchasing parts, leading to the building up of a large “cost engineering” department with 200 employees within the strategic purchasing division. As a result, suppliers generally had more trust in the accuracy of BMW’s price-cutting demands compared to Volkswagen suppliers, as stated by one sales managers of who is in charge for both Volkswagen and BMW: “BMW is not just cutting costs across the board but they can show us in great detail how much our products are allowed to cost.”

This higher level of perceived accuracy in price calculations could be ascribed to the increase of in-house competencies for the manufacturing of critical components:

Our purchasing department has its own foundry and in-house manufacturing for axle transmissions and power trains. This has several advantages. Purchasing managers learn about technological relationships and manufacturing and commodity flows. It is also a reality check for our cost analytics department to show that their calculations are not just pure theory. And we can demonstrate to our suppliers in which areas we can be a benchmark for them. (BMW purchasing manager)

As a result, and despite similar supplier management practices, BMW was described as more “fair” when it comes to the sharing of realized cost efficiencies:

Of course it is in our own interest to reduce our costs. But for most cost reducing measures we need to inform and obtain approval from our customer and BMW is quite fair in sharing the gains with us. Other customers sometimes just claim the benefits solely for themselves. (Sales manager of a BMW supplier)

*Nissan and its supplier network.* With the announcement of the Nissan Revival Plan (NRP) in 1999, Nissan escaped from bankruptcy by introducing more competition in its supplier network. Before the NRP, Nissan was suffering from over-embeddedness with long-standing suppliers, and a lack of tension to encourage suppliers to improve performance continuously. This resulted in the complete restructuring of Nissan’s supplier network, including the sale of all but four of almost 1,400 affiliated companies and the reorganization of Nissan’s purchasing department. While this helped to achieve the desired cost reductions—mostly on the back of suppliers who sacrificed their profit margins—Nissan caused extreme damages to supplier trust, which they

sought to repair from 2004 on by the strengthening of collaborations with selected suppliers. Suppliers first had to qualify for a Component Panel. Sourcing contracts are now restricted to suppliers within this panel, which can be interpreted as a means to exclude market competition, but maintain network competition, similar to Toyota. Moreover, Nissan is strategically segmenting its supplier base—in line with the increase of equity ties—in order to strengthen collaboration with four suppliers.

Nissan practices a single sourcing strategy for a specific purchasing part as part of its Global Single Sourcing. This means that the best performing supplier among a group of system suppliers is given the chance to deliver parts for all of Nissan's production locations worldwide. In return, however, the supplier is expected to offer competitive pricing and annual cost reductions that "exceed the industry-common 3x5 rule" (sales manager of a Nissan supplier) (i.e., annual cost reduction of five percent over a period of three years). However, this strategy was seen very critically by suppliers for a number of reasons:

Of course it would be great if we won this order. These are big volumes. But it also creates huge risks for suppliers; this time we might win the contract but next time Nissan could say: 'Thank you very much.' (Sales manager of a Nissan supplier)

Despite the network internal restriction of competition at Nissan, Nissan suppliers are facing higher uncertainty regarding the continuation of their business with the Japanese carmaker. One supplier, in which Nissan increased their equity stakes after the NRP, highlighted that being part of Nissan's supplier network does not grant any privileges in terms of future business: "On a superficial level it might seem like a return to [former] relations. Nissan did increase its equity shares in our company. They did not increase business with us, however. That is an important difference" (Corporate executive of a Nissan supplier).

Moreover, suppliers seemed generally sceptical whether their efforts to reduce costs would be rewarded by their customer: "Even though Nissan is making profits again, they still do not

show any goodwill in compensating us for our past efforts to cut costs” (Sales manager of a Nissan supplier).

### **Cross-case comparison**

With respect to their approaches to managing the paradox of coopetition in their relationships with suppliers, we found the most noticeable differences between Toyota and Volkswagen (see Figure 2).

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Insert Figure 2 about here

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A comparison of these two approaches reveals that in Volkswagen clearly tries to separate competitive phases from cooperative ones in the collaboration with suppliers. Due to this splitting approach, however, we found that Volkswagen’s suppliers are more likely to interpret cost analysis workshops that were promoted by the carmaker as a means to enhance cooperation as competition-inducing practices, which leads them to retain rather than share sensitive cost information. By contrast, Toyota does not only involve the supplier at an early stage when value creation is determined (i.e., concept development), but does not replace the supplier with a competitor at the stage when value is actually appropriated and shared (i.e., series production). Toyota’s demonstrated respect for suppliers’ margins allowed suppliers to openly share cost information with their customer to jointly identify further cost reduction potentials. This encourages long-term relationships in the firm’s supplier network and shapes coopetitive tensions in a productive way, which is why we argue that Toyota’s approach comes closest to an acceptance approach to the paradox.

Due to changes in supplier management strategies, the two other cases, BMW and Nissan, are more hybrid and dynamic in character and thus harder to assign a particular approach to regarding managing paradox. BMW’s approach displays stronger elements of splitting as it

started to decouple value creation-phases from value appropriation-phases. Nevertheless, suppliers generally showed a higher level of trust in the legitimacy of BMW's price cutting demands and their intention of sharing value with suppliers. Finally, Nissan is an interesting case in the sense that it seemingly resembles an accepting approach because of practices like the Component Panel and Global Single Sourcing that highlight cooperation with selected network suppliers rather than market competition. However, unlike Toyota's case, Nissan's suppliers displayed a high level of distrust regarding the intentions of their customer to share value fairly with them and be loyal to them in future orders. One explanation for this apparent perceptual mismatch is the severe price-pressure that Nissan exerts on suppliers that have won an order: since only one winning supplier will get to deliver all of Nissan's global operations, the Japanese carmaker can demand that suppliers offer an extremely competitive price in exchange for an exclusive collaboration. Yet, this winner-takes-all logic poses huge risks for all suppliers who make investments to qualify for a new project at Nissan. Unlike Toyota's suppliers, Nissan's suppliers cannot expect the continuity of business with their customer, and there is fierce supplier competition before and after a project.

Figure 3 summarizes the identified differences between carmakers' approaches to managing the paradox of coopetition, suppliers' responses, and resulting tension dynamics.

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Insert Figure 3 about here

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## **DISCUSSION AND CONCLUSION**

Revisiting our two research questions, we present the main insights from our research in light of the supply chain management as well as organizational paradox literatures.

With regard to our first research question, *(1) How do buying firms manage the paradox of coopetition in their supplier networks?*, we found, in line with previous research on managing paradox (Andriopoulos & Lewis, 2009; Ashforth & Reingen, 2014; Smith, 2014), that *splitting*

seems to be the most prominent way to handle this paradox in practice in the global automotive industry. The separation of contradicting elements in a functional, spatial and/or temporal way allows managers to deal with ambiguities that often cause discomfort. While splitting can be an effective strategy temporarily, it can have unintended consequences at the level of the inter-organizational relation, when an integrative mechanism is missing (Andriopoulos & Lewis, 2009). In such a case, splitting is likely to resolve the paradox in one direction—typically resulting in buyer-supplier relations that are characterized by too much rivalry. Collaborative practices like concept-competition or cost analysis workshops are perceived as competition-inducing by suppliers, particularly when the buyer uses them to gain a higher share of the margin, as the cases of Volkswagen and Nissan demonstrate.

The case of Nissan is particularly interesting as it shows that the ostensible exclusion of competing suppliers in the network as a result of its Global Single Sourcing does not erase competitive tensions. This demonstrates the value of complementing a structural perspective of coopetition with a paradox perspective which focuses on processes and practices, reflecting past experiences and future expectations of competition. A paradox perspective also sensitizes the management of both buyers as well as suppliers for the transitory nature of network structures that can change with every new sourcing decision. While most suppliers have accepted recurring supplier selection competitions between projects as a normal part of business life, paradoxical tensions from anticipated competition will be fierce if the buyer and supplier engage in an adversarial, instead of synergistic, relational manner (Nair et al., 2011). The experience of Nissan's suppliers, that their efforts to reduce costs are not positively taken into account for upcoming supplier selection decisions, indicates a rather adversarial context, despite the strengthening of financial ties of Nissan with its key suppliers.

Moreover, and again from the paradox perspective, we find that the acceptance approach that Toyota follows offers the highest potential for synergistic outcomes of cooperation and



competition, which translates into higher cost efficiencies and profit margins. The profit ratios of both Toyota and its major suppliers in the period from 2003-2014 were higher on average than that of its Japanese and Western rivals (Aoki & Wilhelm, 2017). This can be explained with the responses of Toyota's suppliers who were openly sharing cost information details, as they felt that their customer possessed a deeper understanding of the underlying manufacturing processes so that they could provide suppliers with valuable cost-reduction suggestions. At the same time, however, we saw in the case of BMW that a splitting approach must not necessarily result in suboptimal outcomes. Similar to Toyota's suppliers, BMW's suppliers responded with higher levels of trust that they developed in the accuracy of the cost analysis of their customer and its fairness in sharing gains. This leads to our first observation:

*Observation 1: Both splitting and acceptance approaches to managing the paradox of coopetition can be successful in terms of avoiding negative tension dynamics when coopetition capabilities at the level of the buying organization are present.*

The importance of such capabilities is also reflected in the answer to our second research question, (2) *Which coopetition capabilities does the buyer need in order to trigger positive responses from suppliers and avoid negative tension dynamics?* For both approaches, splitting and acceptance, we saw that a pronounced competence of the carmaker to evaluate price and cost structures of the supplier can positively influence the tension between value creation and value appropriation. The importance of such "evaluative capabilities" for the buying firm has been highlighted before in the buyer-supplier relationship literature. For example, Brusoni et al. (2001) advocated that firms should know more than they make and should thus broaden their technological knowledge base despite their outsourcing of manufacturing activities. Component-related expertise helps buying firms to maintain outcome control in terms of technological system integration and design quality (Takeishi, 2002; Tiwana & Keil, 2007) through the formulation of appropriate quality metrics and levels, making these both strict and

achievable for suppliers (Parmigiani & Mitchell, 2010). The cases of Toyota and BMW made clear that the carmaker's control of purchased components not only extends beyond quality assurance and system integration but also involves the ability to understand the true manufacturing cost of each process step. This, in turn, allows Toyota to develop helpful cost reduction suggestions for suppliers. It can thus be argued that if suppliers perceive the buyer to have a deep-rooted understanding of the component-related manufacturing processes, they develop higher competence trust in their customer (Sako, 1992) and accept their customer's improvement suggestions. This leads to our second observation:

*Observation 2: When the buying firm has strong evaluative capabilities, it is better able to provide helpful cost improvement suggestions which, in turn, increases the potential for joint value creation through the creation of supplier (competence) trust.*

The literature on open book accounting practices has highlighted the one-sided nature of the risks that go along with cost data disclosure—especially if it is only the supplier who has to provide cost-relevant information—often resulting in the squeezing of the suppliers' profit margin as well as in an unequal share in cost savings (Carr & Ng, 1995; Munday, 1992). Naturally, suppliers are resistant to this practice. While the role of the relational context has been highlighted as an enabler of open book accounting practices (Kajüter & Kulmala, 2005), the specific role of supplier trust has been inconclusive (Möller et al., 2011). Our findings indicate that if suppliers have not only competence but also goodwill trust in the intention of their carmaker to not pursue its own benefits at the supplier's expense (Sako 1992), they are more likely to share this sensitive information. The repeated notions of “respect for the margin” and “fair sharing of gains” that was highlighted by both Toyota and BMW suppliers can be seen as an indication for goodwill trust, leading to our third observation:

*Observation 3: When the buying firm has strong evaluative capabilities, and demonstrates its intention for a fair division of value appropriation between both parties, higher levels of supplier (goodwill) trust makes open book policies more likely.*

We thus shed light on the functioning of evaluative capabilities by linking them to value creation and value appropriation through the development of two types of trust. By this, we also provide evidence for a “coopetition capability” at the organization-level that helps to mitigate competitive tensions irrespective of which strategy, acceptance or splitting, is chosen.

### **Contributions to theory**

Supply chain management scholars, since acknowledging the dark side of collaborative buyer-supplier relations (e.g., Kim & Choi 2015), have started to embrace the idea of coopetition in supplier networks. Coopetition in such networks has mainly been analyzed from a (network) structural perspective (Wu and Choi, 2009; Wilhelm, 2011; Mena et al., 2013) in terms of the presence and absence of ties between supply chain actors (Pathak et al., 2014). This stream of research has sensitized us to the interconnectedness of dyadic or triadic relations that can give rise to competitive tensions in supplier networks. By drawing on the emerging paradox theory from the field of management and organization studies (cf. Schad et al., 2016), we go beyond a structural consideration of coopetition and develop a greater sensitivity to competitive tensions: how they are dealt with by buying firms in practice and the resulting dynamics that arise when suppliers respond to the buying firm’s management approaches. A paradox perspective with its focus on processes and dynamics of response patterns, instead of responses to discrete issues (Jarzabkowski et al., 2013; Smith, 2014; Putnam et al., 2016), fruitfully complements the existing structural perspective on coopetition in supplier networks.

Applying a paradox perspective has also shifted our attention to the importance of “coopetition capabilities” (Bengtsson et al., 2016), as the ability to control competitive tensions while creating joint value from collaboration. There is recognition among supply chain scholars

that coopetition capabilities can evolve into an important relational capability (Li et al., 2011). Empirical studies using this concept are scarce, however, and build on an indirect operationalization of coopetition capabilities by measuring the strength of cooperation, on the one hand, and the degree of constructive conflict, on the other (Li et al., 2011). We offer a more concrete conceptualization of what exactly coopetition capabilities entail in a supplier chain context by highlighting the importance of evaluative capabilities of the buying firm. Our concept of evaluative capabilities resembles and complements the concept of “technical capabilities” discussed in the supply chain management field; this term refers to the understanding of the science and technology involved in producing and sourcing goods and services (Parmigiani, 2007; Parmigiani et al., 2011). Technical capabilities allow firms to better specify sourced materials and components, and have been linked to the buyer’s ability to efficiently coordinate supply chains (Parmigiani et al., 2011). Technical capabilities also help buyers to share knowledge with suppliers and facilitate supplier integration in the buyer’s product development (Petersen et al., 2005). Thus, while technical capabilities allow buyers to build up collaborative relationships with suppliers in order to enhance joint value creation, evaluative capabilities also enable the buyer to understand supplier’s cost structures. Thus, evaluative capabilities not only contribute to the value creation but also value appropriation aspects of the buyer-supplier relationship. When the buyer demonstrates its understanding of actual manufacturing costs of purchased parts and shows, in addition, goodwill and fairness in the process, this helps, in turn, to enhance supplier trust. In line with previous studies that highlight the importance of not only buyer trust, but also supplier trust for creating value in buyer-supplier relations (Johnston et al., 2004) we find that evaluative capabilities of the buyer can facilitate open book practices and joint cost reductions (i.e., value creation), and control the division of value appropriation between partners.

Our study not only contributes to the supply chain literature but also to research on managing paradoxes more generally. By identifying a buying firm's evaluative capabilities, we highlight the importance of understanding "coopetition capability" as an organizational capability (Collis, 1994) for managing supply chains. So far, coopetition capability has mainly been depicted as a manager's (Lewis, 2000; Raza-Ullah et al., 2014) or employee's (Stadtler & Van Wassenhove, 2016) cognitive ability to think paradoxically. Recent contributions highlight the importance to understand capabilities at different levels for managing coopetition: Organizational capabilities come into play at the formation stage of the paradoxical relationship and can help to structure cooperation and competition in a balanced way, while individual capabilities of managers help to regulate felt tensions that result from an existing paradox (see also Bengtsson & Raza-Ullah, 2017). Thus, capabilities at different levels of the organization are necessary to effectively manage the paradox of coopetition.

### **Managerial implications**

We have shown that accepting and splitting approaches can both be viable strategies for managing the paradox of coopetition in supplier networks, but both require strong cooperative and, in particular, evaluative capabilities of the buying firm. The cases of Toyota and BMW indicate the importance of building up—or preserving—residual in-house development and manufacturing capabilities for outsourced parts in order to maintain evaluative capabilities. Interestingly, Toyota's and BMW's in-house development and manufacturing of parts such as powertrain, steering, suspension, brake, wheel and tire, exterior, interior, and body electric components that other carmakers have typically outsourced fully are not an attempt to start competing with suppliers for vertical integration to make *and* buy as in "concurrent sourcing" (Parmigiani, 2007), but paradoxically are a necessary condition for the cooperative way of sharing information on costs. Evaluative capabilities enable a "reality check" of purchasing prices, as a BMW manager puts it, and prevent the distortion of supplier trust through unrealistic

price cutting demands. This is exemplified through Volkswagen's mere reliance on market mechanisms as a means to check the adequateness of prices.

Moreover, recent research has pointed out that buying firms deal with potential problems of over-embeddedness with suppliers by avoiding the concentration of exchange in the hands of a few suppliers, even though this means foregoing the chance of creating maximum appropriable value with a supplier (Elfenbein and Zenger, 2017). Thus, the uncertainties of the division of appropriable value leads buyers to tend to choose a "larger share of a smaller pie" by distributing rather than focusing their transactions. Thus, rather than focusing on structural metrics of the supplier network in terms of the number of suppliers selected, buyers might be better advised to invest in their coopetition capabilities and respective practices in order to create maximum appropriable value with selected suppliers *and* reduce uncertainties about how value will be appropriated.

### **Limitations and outlook**

The coopetition paradox can take many forms. We have focused on the most prominent one, the one between value creation and value appropriation (e.g., Brandenburger & Nalebuff, 1996; Ritala & Hurmelinna-Laukkanen, 2009; Ritala & Tidström, 2014). Thereby, we defined value creation quite narrowly in terms of achieved cost efficiencies in product development or manufacturing, which might be a reflection of the high market saturation and fierce global competition that the automotive industry is facing. Other competitive tensions—like the fight for vertical integration between carmaker and suppliers, or intellectual property rights after joint product development—surfaced peripherally but were beyond the scope of our study. These and other possible variations of coopetition deserve further investigation within and beyond the context of the automotive industry.

Furthermore, our analysis of coopetition was restricted to the level of buying firms and their first-tier suppliers. However, research in coopetition in supply networks indicates that there can

be “spillovers” of competitive tensions to the second-tier suppliers (Pathak et al., 2014). A single decision of a buyer to source from a particular supplier can lead to a cascading set of dissolutions of ties and the creation of new structural holes in the network. In this context, it would be interesting to study how coopetition evolves in multi-tier structures (Mena et al., 2013) and how open book accounting practices, like the ones we describe in our study, can be also used to manage the interdependences within entire supply chains, including second- and third-tier suppliers (see also Kajüter & Kulmala, 2005).

Finally, the paradox lens has proven to be a valuable theoretical lens to gain new insights on the management of coopetition as one of the most central tensions in supplier networks. While some supply chain scholars have highlighted paradoxical thinking as a general means to develop better and more pluralistic theory (Rindova, 2011; Matthews et al., 2016), we still see a large potential to apply paradox theory on contradicting demands other than coopetition that characterize supply chains. For example, meeting sustainability and business aims simultaneously is commonly considered a trade-off (Hahn et al., 2010; Wu & Pagell, 2011; Busse, 2016), which is often resolved in favour of business aims in practice. Applying a paradox lens to this highly contemporary challenge could help to overcome the dominant instrumental perspective and simplifying ‘win-win’-thinking in our field (see also Montabon et al., 2016). Moreover, such a lens offers a novel and more emphatic perspective on the struggles of those that are actually confronted with contradictory demands in their day-to-day work.

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## TABLES AND FIGURES

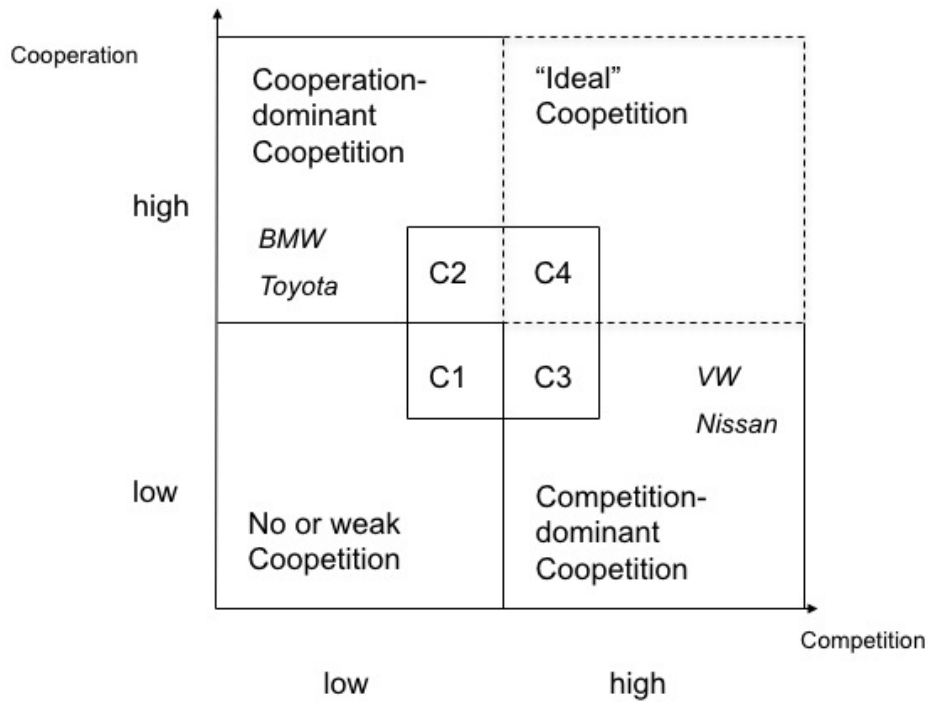


Figure 1: Sampling strategy

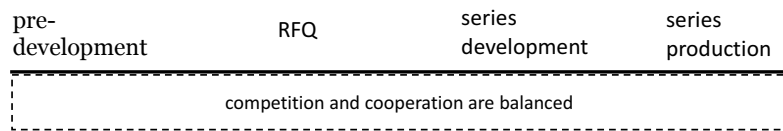
Buyer company	Buyer company's country of origin	Number of interviews at buyer company	Interviewee's role	Total number of interviews at supplier companies	Interviewee's role
BMW	Germany	1	PM	4	SM, KAM
Volkswagen	Germany	4	PM	13	SM, KAM, PJM
Toyota	Japan	5	PM	19	CE, SM, KAM, PJM
Nissan	Japan	1	PM	11	CE, SM, PJM
<b>Total</b>		<b>11</b>		<b>47</b>	

Abbreviation: CE: Corporate Executive, PM: Purchasing manager, SM: Sales manager, KAM: Key account manager, PJM: Project manager

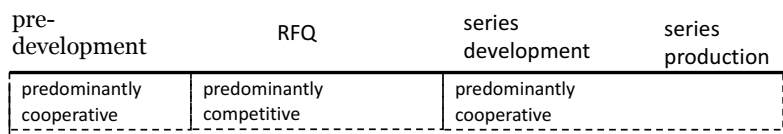
Note: We decided not to state what products suppliers mainly deliver in order to ensure their anonymity. In cases where respondents were in charge of more than one customer in their current position, the interview was double-counted and assigned to both respective carmaker cases. The total number of double-counted interviews included in the sample is eight.

Table 1: List of interviews

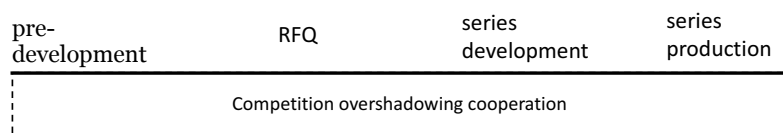
**Toyota: Simultaneous cooperation and competition across all stages**



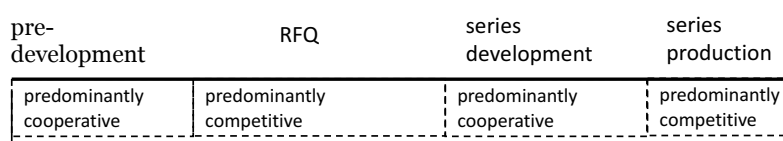
**BMW: Sequential cooperation and competition**



**Nissan: Cooperation within projects but fierce competition between projects**



**Volkswagen: Sequential cooperation and competition**



**Figure 2: Comparison of supplier integration in product development processes in four carmaker cases**

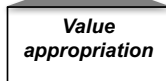
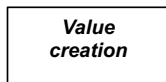
## Coopetition paradox

## Carmaker's approach

## Supplier's responses

## Resulting tensions

### Cooperation



### Competition

#### Splitting (Volkswagen)

- Decouple product development contracts from delivery contracts
- Use cost analysis workshops to increase share of value appropriation

#### Accepting (Toyota)

- Continuity in supplier collaboration over the whole development process and between projects
- Jointly identify cost reduction potentials and share benefits

#### Splitting (BMW)

- Decouple development contracts from delivery contracts
- Cost evaluative competence as integrative mechanisms

#### Splitting (Nissan)

- Restrict competition within network but only for the duration of one project
- Ask for abnormal price reductions to increase share of value capturing

- Persisting negative perception of cost analysis workshops
- Hiding realized cost efficiencies

- Higher willingness of suppliers to share cost information
- Efforts to reduce costs as gains will be shared

- Higher trust in accuracy of cost calculations
- Continued trust in shared value capturing intention of customer

- Cost reduction pressures are perceived as severe
- Continued distrust in shared value capturing intentions of customer

- **Enforced tensions:** collaboration initiatives are interpreted as competition by suppliers

- **Reduced tensions:** competition is restricted within networks leading to the perception of carmaker as collaborative

- **Reduced tensions:** perception of carmaker as collaborative despite competitive moments

- **Enforced tensions:** Single sourcing relation is overshadowed by competition as even selected suppliers have no security of continued business in the future

**Figure 3: Carmakers' approaches to managing the paradox of vertical coopetition, suppliers' responses and resulting tension dynamics**

## Appendix:

### A.1. Buyer's interview instrument

#### A.1.1. General information

- a) Career, current department, position and job description.
- b) Organization of the purchasing division.
- c) Responsible parts / sourcing strategy for this part (single, dual, multiple).

#### A.1.2. Sourcing process

- a) Please describe your company's general approach to supplier management.
- b) Please describe the process of contract awarding.
- c) When do suppliers typically get involved in the process?
- d) How many suppliers do you request for quotations?
- e) How do you select suppliers? What are the most important criteria for supplier selection?
- f) Who is involved in the selection at your organization? Which functions are represented?
- g) Do you make use on online auction methods?
- h) How are prices negotiated? When is the price contractually fixed?
- i) How do you determine whether the price you agree on is adequate?
- j) At which point in time are contracts awarded? For how long are contracts awarded?
- k) How do changes of the specifications during product development affect prices?

#### A.1.3. Cooperation

- a) How long have you been working together with this particular supplier? How would you describe the relationship? Where there any changes?
- b) Do you invest in this supplier (e.g. supplier development programs)?
- c) What kind of information do you exchange with suppliers? Are you satisfied with the current level of information exchange?
- d) Do you pursue joint development programs for new technologies and products? Please describe the process of supplier involvement in product development.
- e) Do you pursue joint efficiency programs?
- f) What kind of support to you provide to suppliers?
- g) Who is paying for dies and tools of suppliers?
- h) Are you compensating suppliers for lower than forecasted orders or changes of material prices?

#### ¶ A.1.4. Competition

- a) How many suppliers are available on the market for your sourcing part?
- b) Are you concerned about dependencies on single suppliers? Did this occur in the past? How do you prevent this?
- c) Do you actively try to enforce competition between your suppliers? Please provide an example.
- d) How do you ensure that purchasing prices are aligned with market prices?
- e) Do you evaluate your supplier's performance on a regular basis? Based on which criteria? How does this evaluation affect contract awarding?
- f) How do you deal with suppliers who (temporarily) cannot meet your price demands?
- g) Do you possess a good understanding of suppliers' pricing policies? Do you demand insights on their cost calculations? How do suppliers respond to your demands?
- h) How often are prices renegotiated? Do you operate with fixed price reduction targets? How are these determined?
- i) Do you support your suppliers in reducing cost reduction targets? Can you describe these initiatives?
- j) Do you take suppliers' efforts to meet your cost reduction demands positively into account for the upcoming sourcing decision?
- k) Are there any competitive tensions in the collaboration with a specific supplier? When do you perceive these tensions most strongly?
- l) Do you sometimes feel that the price pressure you exert on suppliers affects your cooperation with this supplier? Can you provide an example?
- m) What are typical conflicts that occur with suppliers? How do you resolve them?



## A.2. Supplier's interview instrument



### A.2.1. General information

- a) Career, current department, position and job description.
- b) Organization of the sales division.
- c) Responsible part and customer

### A.2.2. Sourcing process

- a) Please describe your customers' general approach to supplier management. Do you feel that your customer actively tries to enforce cooperation or competition or even both?
- b) Please describe your customer's sourcing strategy (i.e. single, dual, parallel, multiple) for the part you manufacture.
- c) Please describe a typical sourcing process for this part.
- d) At which stage do you typically get involved in the process?
- e) How many suppliers does your customer request for quotations?
- f) What do you think are important criteria for winning a contract with your customer? Which parties are involved from the customer's side?
- g) How are prices negotiated? When is the price contractually fixed?
- h) What are the regulations for tools and dies?
- i) At which point in time are contracts awarded? For how long are contracts awarded?
- j) Does the contract include a market-price clause? Which clauses do you consider problematic and how do you deal with them?
- k) How do changes of the specifications during product development affect prices later?

### A.2.3. Cooperation

- a) How long have you been working together with this particular customer? How would you describe the relationship? Where there any changes?
- b) Does your customer provide any form of assistance (e.g. supplier development programs)? Are there other forms of support given?
- c) What kind of information do you exchange with the customer? Are you satisfied with the current level of information exchange?
- d) Do you pursue joint development programs for new technologies and products? How does the customer involve you in its product development process?
- e) Do you pursue joint efficiency programs with the customer?
- f) Does your customer compensate you for lower than forecasted orders or changes of material prices?

### A.2.4. Competition

- a) Who are your competitors for this particular part?
- b) Does your rival also have business relationships with your customer?
- c) For your customer, what do you think makes a supplier competitive?
- d) At which moment do you feel competitive moments most strongly? Do you perceive these competitive moments as productive or destructive?
- e) Do you think that your customer is actively enforcing competition between suppliers? How do you respond to that?
- f) Does your customer rank supplier's performance on a regular basis? Based on which criteria? How does this evaluation affect contract awarding?
- g) Are there supplier performance rankings? How credible are they to you?
- h) Does your customer practice an open book policy? How do you respond to these demands?
- i) How often are prices renegotiated? Does your customer set annual price reduction targets?
- j) Do you receive any support from your customer for reducing costs?
- k) Are your efforts to meet reduction demands positively taken into account for future business?
- l) What are typical conflicts that occur with this customer? How are they resolved?
- m) If you had one wish regarding the relationship with your customer, what would that be?

TABLE A2: Validity and reliability issues addressed throughout the course of our research<sup>a</sup>

Reliability/Validity Criterion	Research Phase			
	Design	Case Selection	Data Gathering	Data Analysis
<b>Reliability</b> <i>(demonstrating that the operations can be repeated, with the same results)</i>	<ul style="list-style-type: none"> <li>Develop case study protocol</li> <li>Development and utilization of case study database</li> </ul>	<ul style="list-style-type: none"> <li>Selection based on publicly available supplier satisfaction rankings (Automotive News Annual Supplier Satisfaction Ranking, Planning Perspectives)</li> </ul>	<ul style="list-style-type: none"> <li>Semi-structured interview guidelines</li> </ul>	<ul style="list-style-type: none"> <li>Involvement of authors who have not been in the field gathering the data</li> <li>Coding according to the approach of Strauss and Corbin (1990)</li> </ul>
<b>Internal Validity</b> <i>(establishing a causal relationship, whereby certain conditions are shown to lead to other conditions, as distinguished from spurious relationships)</i>	<ul style="list-style-type: none"> <li>Thorough review of previous literature, and a theoretical framework (i.e., approaches of managing paradox)</li> </ul>	<ul style="list-style-type: none"> <li>Sampling criteria recorded in case study protocol</li> </ul>	<ul style="list-style-type: none"> <li>Multiple informants</li> <li>Recording of factors that might lead to alternative explanations</li> </ul>	<ul style="list-style-type: none"> <li>Pattern matching within and among cases</li> <li>Triangulation of questionnaire, semi-structured interview and secondary data</li> </ul>
<b>Construct Validity</b> <i>(establishing correct operational measures for the concepts being studied)</i>	<ul style="list-style-type: none"> <li>Adoption of questions from previous research in the field of buyer supplier relations and coopetition theory</li> </ul>	<ul style="list-style-type: none"> <li>N/A</li> </ul>	<ul style="list-style-type: none"> <li>Multiple sources of information</li> <li>Recording of interviews to improve completeness</li> <li>Confidentiality agreements</li> </ul>	<ul style="list-style-type: none"> <li>Data triangulation</li> <li>Validation of analysis through selected respondents and clarification of data analysis</li> </ul>
<b>External Validity</b> <i>(establishing a domain in which the study's findings can be generalized)</i>	<ul style="list-style-type: none"> <li>N/A</li> </ul>	<ul style="list-style-type: none"> <li>Theoretical sampling</li> </ul>	<ul style="list-style-type: none"> <li>Clear description of case firms' context and situation</li> </ul>	<ul style="list-style-type: none"> <li>Context based approach</li> <li>Comprehensive intra-case analysis</li> <li>Analytical generalization based on patterns</li> </ul>

<sup>a</sup> based on Yin (2014); Gibbert, Ruigrok, and Wicki (2008)