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DETERMINANTS OF COOPETITION SUCCESS

THE COMPOSITION OF A STRATEGY MODEL

Master Thesis

of

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Abstract

Coopetition is gaining popularity among managers and scholars because the concept takes the real-life complexity of inter-firm relationships into account and expands the strategists' perspective beyond the limitations of a single firm approach. Although the academic world emphasizes the relevance of coopetition as a promising strategy for businesses, recommendations on how to apply and improve such a strategy are rare. The purpose of this paper is to shed light on the determinants and outcomes of successful coopetition by proposing a coopetition strategy model that helps managers to analyse coopetition projects. To achieve this research objective, this thesis draws on the coopetition strategy model by Chin et al. (2008) as well as the existing body of literature in regards to coopetition and successful coopetition in particular. The insights gained through the literature review are used to define 9 critical success factors, 8 external success factors and 10 key performance indicators, which thereafter serve to establish a new coopetition strategy model. The study finds that both types of success factors are essential for the success of coopetition and that the success is best evaluated using the identified key performance indicators. Moreover, the new model, called the DOSC-model, suggests that the identified key performance indicators are affected by the critical and external success factors. The DOSC-model can serve as a tool for practitioners to evaluate a coopetitive alliance and will stimulate the research in regards to the understanding of successful coopetition.

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1 Introduction

For decades, both strategic management theory and practice regarding inter-firm relationships were dominated by either a competitive, or a collaborative pattern of thought. Ever since the neo-classical economic school, where competition, or in Smithsonian terms, the "invisible hand" (Smith, 1776), leads to increased efficiency over time, the school of thought for managers was coined. A divergent paradigm stresses the advantages linked to collaborative efforts of firms (e.g. Contractor & Lorange, 1988; Kanter, 1994). Within latter model, firms or business entities are intertwined in interdependent networks, developed and maintained through collaboration, in order to mutually benefit from it (e.g. Astley, 1984; Borys & Jemison, 1989). However, each approach offers only an incomplete depiction of reality.

More recently, the view on management theory and practice has changed. As Brandenburger & Nalebuff (1996, p. 3) point out in their game-changing book, "there are few victors when business is conducted as war". Next to Brandenburger & Nalebuff, other scholars (e.g. Lado, Boyd, & Hanlon, 1997) as well as management practitioners realized the one-sidedness of the classical paradigms "competition" and "collaboration" and instead focused on the approach of combining them into what Brandenburger & Stuart (1996) coined with the term "coopetition": How can firms prosper by cooperating and simultaneously competing with other companies? Coopetition supposedly creates larger benefits for a firm than the sum of each individual strategy (Bengtsson & Kock, 2000; Morris, Kocak, & Ozer, 2007). Research on coopetition has been conducted within different scientific fields: Transactional-cost economics, resource-based view or game theory (Lado et al., 1997; Park & Russo, 1996). All provide useful insights for analysing coopetition. However, the managerial research has been largely focused on the oppositeness between competition and cooperation (Giovanni Battista Dagnino & Padula, 2002). Although numerous authors (e.g. Brandenburger & Nalebuff, 1996; Gnyawali & Madhavan, 2001; Lado et al., 1997) have emphasized the growing importance of coopetition strategies for today's companies, scientific research has not gone far beyond recognizing and eliciting it (Giovanni Battista Dagnino & Padula, 2002). Therefore, even about twenty years after Brandenburger & Nalebuff published their book and sparked interest in the concept of coopetition, researchers are still struggling to provide practitioners with clear advice in terms of models or frameworks on how to most

effectively engage in coopetition (Padula & Dagnino, 2007). Merely a few researchers (e.g. Chin, Chan & Lam, 2008; Le Roy & Czakon, 2016) devoted their work to determining and exploring success factors, which are critical to successful coopetition management. Particularly this area of research, however, is of importance when deducing managerial implications. Therefore, this paper focuses its attention on closing this gap in scientific research.

The purpose of this paper is twofold. First, with the goal of moving away from the mere theoretical recognition of coopetition to a more concrete understanding and identification of factors affecting a firm's likelihood to successfully undertake coopetition, this paper starts by establishing a thorough theoretical foundation. This will be achieved by reviewing current literature. Second, this paper aims to elaborate on the existing framework for coopetition by Chin et al. (2008). Currently, the coopetition strategy model by Chin et al. (2008) constitutes the only extensive coopetition strategy model and therefore will serve as starting and reference point for the establishment of a new coopetition model. Insights from the literature review will be used to revise the Chin-model in regards to contingency aspects. Moreover, in its current design, the Chin-model focuses mainly on aspects of cooperation instead of equally considering competition as part of coopetition. Therefore insights from the literature review will also be used to complete the model in its conceptual design in regards to competition aspects. By first analysing the model by Chin et al. (2008), and subsequently presenting a revised coopetition strategy model this paper provides a tool for coopetition management and sheds light on the currently only partially researched areas of coopetition studies. For this matter, the present thesis will identify and logically connect as well as combine determinants of coopetition success and suggest a coopetition strategy model visualising the findings of this study. In summary, the goal of this paper is to answer the research question "which factors determine the success of coopetition".

To achieve its intended goal, the paper will follow a certain structure: First, a theoretical foundation will be established by defining important concepts (2.1), elaborating on the course of the study (2.2), and presenting an overview of the current state of coopetition research (2.3). Next, the paper will elaborate on the identified determinants of coopetition success (3.1) and condense them into a model (3.2). The paper will then go on and discuss the findings of this study (4) before a conclusion is presented (0).

2 Theoretical foundation

The ideas behind coopetition have been proposed initially in order to comprehend the increasing complexity of inter-firm relationships (Brandenburger & Nalebuff, 1996). This thesis aims to examine determinants of coopetition success and develop a conceptual model facilitating the assessment of successful coopetition. For this purpose, a theoretical foundation of relevant topics first needs to be established.

The following chapter will first define key concepts that are going to be used in this thesis (2.1). Afterwards, the academic perspective on which the paper is based will be presented (2.2), and as coopetition research is substantial in size, an overview of the current status of research will be given (2.3). First, coopetition typology and its drivers will be in focus. The drivers for companies to engage in coopetition can be different (Lado et al., 1997). Therefore several organisational theories will serve to explain the rationale behind the drivers of coopetition. Due to the scope of this study and the complexity of the underlying organisation theories, a complete discussion of organisational theories is neither intended, nor can be provided. Next, challenges of coopetition and indicators of coopetition success will be pointed out. The chapter ends with an introduction to, as well as a critical assessment of the coopetition model after Chin et al. (2008), on which the analysis of this thesis is based

2.1 Definition of relevant concepts

The fundamental purpose of this paper is not only the presentation of information but rather lies within its communication to others. In the complex and often ambiguous world of business and management science, similar terms are often used meaning the same thing, or the same term is being used for multiple theoretical constructs. For this reason, it is important to first establish a common ground of communication, thereby guaranteeing clear understanding of the concepts being introduced. Therefore, the following section is dedicated to the definition of concepts relevant for the paper.

First coopetition, being the main concept of the paper, will be defined. Secondly, the following section will present a definition for key performance indicators. A common understanding of critical success factors is necessary, as well, and will therefore finish the definition section of this work.

2.1.1 Coopetition

"There is no consensus (and cannot be one) on a single definition of coopetition except that the phenomenon consists of both cooperative and competitive logics."
(Bengtsson & Raza-Ullah, 2016, p. 3)

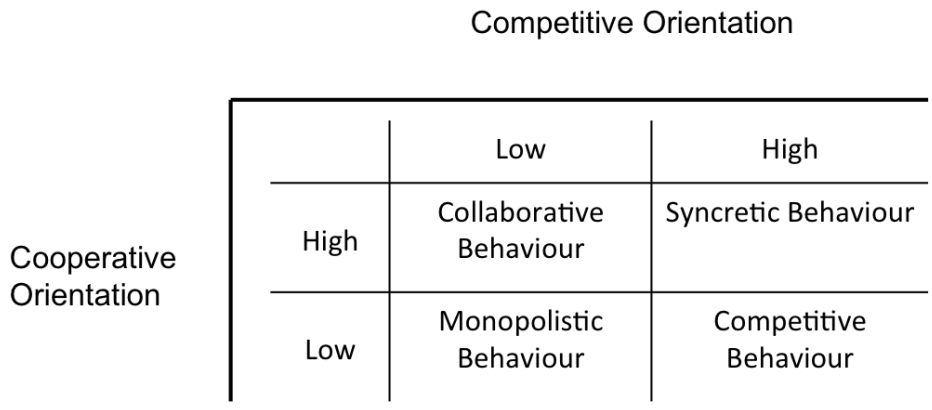
In management literature the composite behaviour consisting of competition and cooperation has been named coopetition. Although the term originally was coined by Ray Noorda, founder and former CEO of Novell, in the 1990s (Peng, Pike, Yang & Roos, 2012) but the phenomenon of cooperating competitors had been recognized even earlier (e.g. Jorde & Teece, 1990). Although most scholars consider coopetition the circumstance of coinciding competition and cooperation (e.g. Brandenburger & Nalebuff, 1996; Chen, 2008; Lado et al., 1997; Madhavan, Gnyawali, & He, 2004), other scholars use the term synonym for suppliers, customers, and complementors (e.g. Afuah, 2000), To avoid a diverging view on the concept of coopetition the following paragraphs will aim to develop a definition derived from the common understanding of coexistence, cooperation, and competition.

The concept of coexistence is used in the economic sense, when no economic exchange occurs between the relevant entities (Bengtsson & Kock, 1999). As companies do not interact with each other, though potentially know about each others' existence, no bonds between the companies are present (Bengtsson & Kock, 1999). Coexistence therefore describes the simplest form among the above-mentioned concepts. In contrast to coexistence, with cooperation, frequent exchange of business, information and on a social level is prevalent (Bengtsson & Kock, 1999). Cooperation is based on convergent interests (Padula & Dagnino, 2007) and the main purpose is to achieve common goals through collective actions (Bouncken, Gast, Kraus, & Bogers, 2015). By means of a cooperative approach, companies seek to establish or enhance their competitive advantage (Contractor & Lorange, 1988). Cooperation allows firms to access possibly rare or complimentary resources (Bengtsson & Kock, 2000).

Competitive interaction among competing firms mostly is direct and simple (Bengtsson & Kock, 1999): Competitors try to outmanoeuvre each other. Often an action-reaction pattern arises, resulting in an aggressive behaviour towards each other (D'Aveni & Gunther, 1994). It is also important to note that competitors formulate and follow their goals independently (Bengtsson & Kock, 1999). Competition encourages the exploration of new profit generating compositions of resources and skills (Giovanni Battista Dagnino & Padula, 2002).

Considering the exemplification of the three above-mentioned concepts, coopetition, due to its complexity, can be seen as the opposite of coexistence and a combination of cooperation and competition. Lado et al. (1997) notice that companies can combine competitive and cooperative strategies. The authors use the terminology *syncretic rent-seeking*[1] behaviour for the phenomenon when firms generate superior performance through simultaneous competition and cooperation. They further argue that the two concepts, competition and cooperation, are not to be regarded as two mutually exclusive concepts. Lado et al. (1997) hereby introduce four types of rent-seeking strategies (Figure 1) whereof coopetition is one. By depicting the two concepts cooperation and competition on the axis of a matrix and arranging the rent-seeking strategies according to their intensity in regards to the two concepts, Figure 1 helps to visualize the interaction and interconnection of both concepts. First a firm can decide to choose a *monopolistic behaviour*, being neither aggressive nor cooperative. Second, a firm can choose *collaborative behaviour*, emphasizing cooperation at the expense of competition. Third, a *competitive behaviour* can be chosen, aiming for an aggressive approach towards competitors. Lastly, a firm can choose *syncretic behaviour*, featuring both, aggressive and cooperative behaviour. Last option refers to the concept of coopetition although Lado et al. (1997) do not use the term.

Figure 1: A syncretic model of rent-seeking behaviour



Source: Adapted from Lado et al. (1997)

[1] "Rent-seeking refers tot he search for resources and capabilities that enable an organization to develop [...] value enhancing strategies and gain [...] economic returns." (Lado et al., 1997, p. 111)

Although the work of Lado et al. (1997) offers a pioneering milestone in coopetition theory and therefore is worth being mentioned, after 20 years of research, the definition of coopetition remains just as vague (e.g. Bengtsson, Johansson, Näsholm, & Raza-Ullah, 2013; Ketchen, Snow, & Hoover, 2004). Various and numerous definitions are employed, and differences regarding the scope of the definition still exist (Bengtsson & Kock, 2014). Coopetition is either vaguely defined as a value-net consisting of a firm's customers, competitors, suppliers and complementors (e.g. Afuah, 2000; Brandenburger & Nalebuff, 1996), or more confined as cooperation between two direct competitors (e.g. Bengtsson & Kock, 1999; Padula & Dagnino, 2007; Gnyawali & Madhavan, 2001). Yet another school of thought (e.g. Madhavan et al., 2004) includes triads, in which a company competes with one firm and collaborates with another, into the definition of coopetition.

The phenomenon's main characteristic is the simultaneity of competition and cooperation. Based on this property, it is possible to differentiate coopetition from other organizational interactions. A coopetitive relationship contrasts two opposing, but as Lado et al. (1997) show, combinable elements, which are both important for generating positive outcomes for the relationship (e.g. Bengtsson et al., 2013; Chen, 2008; Oliver, 2004). Smith & Lewis (2011) claim cooperation and competition can only be considered individually, and to apply both these concepts in combination on coopetition is ambitious. However, proposing a definition of coopetition that separates the two concepts between firms in a network suggests that actors are either competing or cooperating with each other, and this contradicts the common understanding of coopetition (Bengtsson & Kock, 2014) and also the understanding of coopetition in this paper. Moreover, if cooperation and competition are independent of each other and only one is able to be effective at a given time, coopetition even disappears (Y. Luo, 2007). Instead, for coopetition to occur, the same firms are to be simultaneously involved in competition and cooperation.

Additionally, a more recent view on the concept of coopetition argues that it needs to be described along two continua due to simultaneity of competition and cooperation (Bengtsson & Kock, 2014). Building on the work of Lado et al. (1997), Bengtsson & Kock (2014) suggest that competition and cooperation need not to be in a trade-off relationship but rather regarded as two interconnected continua. Besides, since the business world has become more dynamic and interconnected (Lavie, Lechner & Singh, 2007), it is advisable not to limit coopetition to a dyadic form but also consider that several firms can be simultaneously

involved in coopetition with each other (Bengtsson & Kock, 2014). Although one can generally agree with Bengtsson & Kock's (2014) argumentation, it creates additional complexity, impeding the goal of this paper. Hence, the scope of this paper is only on dyadic coopetition relationships and therefore this attribute will be implicated in the use of coopetition in this paper. Lastly, studies show that coopetition arises in both, horizontal and vertical relationships (e.g. Ross & Robertson, 2007; Zerbini & Castaldo, 2007). Concluding, this paper therefore defines coopetition as a dyadic relationship between two firms simultaneously engaged in competitive and cooperative actions, indifferent of whether the relationship is vertical or horizontal.

2.1.2 Key performance indicators

In today's dynamic and heterogenic business environment, companies increasingly are pressured to adapt to rapid market changes and to operate within an environment of shrinking budgets and heavy productivity demands (Shahin & Mahbod, 2007). To sustain such a level of productivity and efficiency, firms have to cooperate with each other (Chituc & Azevedo, n.d.) and track their performance which has been proven to enhance productivity (Locke & Latham, 2002). Furthermore, in order to execute a coopetition strategy successfully, businesses need to know details about the current status of the company (Marr, Schiuma & Neely, 2004). Most scholars agree that due to increasing complexity at the organizational level, financial measures cannot be solely used as criteria for accounting a company's performance (e.g. Johnson, 1983; Kaplan, 1984). Contemporary work, argues that performance measures should be categorized as result indicators and performance indicators.[2] The former relate to the fact that many measure consist of a summation of several input factors (Parmenter, 2010). Key performance indicators, on the other hand, can be connected directly to a single cause-result relationship (Parmenter, 2010). Other academics, such as e.g. Gunasekaran, Patel & McGaughey (2004), define KPIs as those performance indicators that have significant effect on the performance of a company in regards to its strategy and control.

Within the framework of this thesis, KPIs shall measure different aspects associated with successful coopetition. At the same time, one has to acknowledge the fact that these KPIs are actually dependent on the critical success factors (2.1.3). As such, they represent a

[2] Current literature even distinguishes between four different kinds of performance measures (e.g. Parmenter, 2010). However, an in-depth analysis of performance measures is not within the scope of this paper.

result at the same time and share characteristics with what Parmenter (2010) referred to as "key result indicators" (Parmenter, 2010, p. 2). Since the term KPI is more commonly used and understood in the academic and business world, and because this distinction seems unnecessarily detailed within the limits of this thesis, this paper will continue the use of the term KPI as a result of the combination of various critical success factors and as measurement for a particular dimension of successful coopetition.

2.1.3 Critical success factors

As mentioned in the previous section (2.1.2), tracking company's performance is an essential part for successful management. For the purpose of this study, KPIs ultimately inform about the success of coopetition. However, these KPIs are based on the accomplishment of critical success factors (CSFs). The concept of focusing executives' attention on a few, highly important success factors is not new. Managers should focus their efforts on a relatively small number of problems critical to the desired outcome (e.g. Drucker & Maciariello, 1967; Jenster, 1986; Bullen & Rockart, 1981). Moreover, not only successful management requires the implementation and pursuit of CSFs but also employees are able to better execute projects if CSF are officially in place (Jenster, 1986).

Grunert & Ellegaard (1992) present three different views on CSFs[3]. Their work classifies CSFs as business characteristics, planning tool and market description (Grunert & Ellegaard, 1992). The idea of CSFs being a business characteristic reflects that businesses and projects are incomparable; therefore it is not possible to proclaim general CSFs, but instead only to generate CSFs with regard to a single type of project or business (Grunert & Ellegaard, 1992). Regarding CSFs as a planning tool includes the assumption that CSFs provide input which helps decision makers in improving the quality of their decisions (e.g. Grunert & Ellegaard, 1992; Parmenter, 2010). Lastly, interpreting CSFs as market description leads to the assumption that strategy types can be linked to business success, therefore granting CSFs a causal relationship to success (Grunert & Ellegaard, 1992). Although the authors admit that the latter hypothesis has not been empirically proven (Grunert & Ellegaard, 1992), other scholars tested that hypothesis positively in regards to the influence of CSFs to

[3] The authors use the wording key success factors.

successful knowledge management (e.g. P.-L. Liu, 2011) or e-commerce strategy and management (e.g. Huang, Zhao & Li, 2007).

Multiple definitions as to what CSFs are have been proposed over the years in academic publications: Rockart (1979) emphasizes that CSFs are the limited number of factors which, if achieved, ensure successful outcomes. Moreover, CSFs are described as "key areas where 'things must go right'" (Bullen & Rockart, 1981, p. 7). Others propose that CSFs are those factors, the decision makers can influence and which affect the performance (e.g. Ariyachandra & Frolick, 2008; Hofer & Schendel, 1978; Korpela & Tuominen, 1996; Parmenter, 2010). An even more tangible definition is introduced by Freund (1988). For him, CSFs must be

- important to attain objectives
- measurable and controllable
- few in number since not everything can be critical
- not the end points of a process
- applicable to all similar project types
- hierarchical since some factors always are more critical than others

Unarguably, substantial body of literature has been devoted to the understanding and definition of CSFs (Pettit & Beresford, 2009). Within the scope of this paper, CSFs shall be understood as aspects of a coopetition project that have to be satisfactory in order to improve the likelihood of a successful coopetition.

2.2 Philosophy of science & Course of the study

Since the individual perspective and the way of thinking significantly determined how data was gathered, literature interpreted and thoughts connected, it is important to put in front of this paper a brief section that aims at giving an overview of the mind-set and way of thinking under which this thesis was written.

The research perspective of a study contains important assumptions about the way in which the researcher views the world, hence motivating the choice of research strategy and methods (Saunders, Lewis & Thornhill, 2009, p. 108). This choice is influenced both by practical considerations, as well as the researcher's own beliefs and assumptions of how knowledge is generated and which knowledge is considered important (Saunders et al., 2009).

Moreover, the researcher's personal view of what constitutes important knowledge essentially determines what is included and excluded from the scientific work (Saunders et al., 2009).

A social constructivist perspective is taken throughout this research, highlighting the subjective and meaning-oriented character of this study. A social constructivist view emphasizes the social component of knowledge construction (Phillips, 1995) and assumes that each individual person assigns subjective and divergent meanings to their experiences (Creswell, 2008). This meaning-making can happen actively, as well as passively through social interactions (Saunders et al., 2009). Within this worldview, the researcher acknowledges that his perception and research is context-dependent (Guba & Lincoln, 1994). This has influenced the choice in methodology, as well as the interpretation of literature and is taken into consideration especially during the empirical phase of this research, where information was gathered through a literature review.

Next to the social constructivist view described above, this research adopts an interpretive research philosophy. This means that the complexity of the research field and hence the challenge to generalize complex situations is taken into account (Saunders et al., 2009). This is particularly essential in this study of developing a coopetition model, where in reality, each coopetition relationship is unique and highly context-specific.

This paper has an explanatory conceptual goal, being in between operationalizing a coopetition model, and delineating a conceptual framework that maps out the focal entities of coopetition.

For this purpose, the research process carried out in this paper follows three consecutive stages. This study design is in adaption to other scientific publications (e.g. Chin et al., 2008; Sudhakar, 2012) related to the goal and topic of the present paper where similar research structure and process can be found.

In the first stage, a review of relevant literature (2.2.1) was carried out in order to initially grasp the current status on coopetition research (2.3). The goal of the literature review was to identify critical success factors, key performance indicators, and external success factors for successful coopetition, which thereafter were used to develop a revised coopetition strategy model. Although this method restricted the scope of potential findings, it at the same time increased the quality of the final coopetition model. This is because by extracting success factors, success factors and performance indicators from the existing body of

literature it was possible to generate a large pool of items that could subsequently be used in the second stage of the research process in which the previously identified items were, based on abstraction, grouped together (2.2.2). A large pool of items, each individual item initially developed by experts on the field of coopetition, ensured the significance and quality of the findings from the second stage of the research process. Moreover, by utilizing a literature review instead of deriving success factors, success factors, and performance indicators from own opinion, it was possible to prevent a subjective arbitrariness.

The third stage of the research process served the purpose of evaluating the undertaken categories according to their objectivity and logical reasoning (2.2.3). For this, an inter-rater agreement test (cf. Jones, Johnson, Butler, & Main, 1983) was performed.

2.2.1 Literature review

A systematic literature review provides a method to screen the existing body of literature relevant to a certain topic (Czakon, Mucha-Kuś, & Rogalski, 2014).

In accordance with popular practice of identifying success factors and KPIs (e.g. Czakon et al., 2014; Ferreira, Shamsuzzoha, Toscano, & Cunha, 2012; Marr et al., 2004; Pettit & Beresford, 2009) the present paper used data base selection and search to extract a set of journal articles relevant to the research agenda. The selection of articles for this study follows three phases (cf. Tranfield, Denyer, & Smart, 2003).

Firstly, EBSCOhost was chosen as database because it returned the highest number of search results (687)[4] compared to other databases (e.g. ISI with 415)[9] for the initial search query.

Secondly, EBSCOhost was screened for articles explicitly related to the research agenda by applying filters for key words located in the title, the abstract or the author keywords of peer-reviewed articles from 1996-2016.[5] Since no consensus around the spelling of

[4] Numbers are based on a search via EBSCOhost for peer-reviewed journals in the Business Source Premier database looking for the terms Co-opet*, Coopet*, Compet* AND Cooperat*, Collaborat* AND Compet*.

[5] EBSCO search query: (TI cooperat* AND TI compet* OR TI collaborat* AND TI compet* OR TI coopet* OR TI co-opet* OR AB coopet* OR AB co-opet*) AND (success OR factors OR enablers OR drivers OR capabilit* OR KPI OR performance OR indicat* OR outcome* OR measur* OR external* OR contingen* OR moderat* OR framework) NOT ("supply chain" OR "integration" OR "network*" OR "government"* Limiters: Peer Reviewed; Published Date from: 1996–2016; Publication Type: Academic Journal; Document Type: Article.

coopetition exists among authors, the use of different orthography seemed advisable. Moreover, some key words were also excluded from the search, as they appeared to deliver articles distant to the area of research. The year 1996 was chosen as a starting point because it is considered the beginning of current coopetition research due to the publication of "*Co-Opetition: A Revolution Mindset That Combines Competition and Cooperation*" by Brandenburger & Nalebuff (1996) in that year (Bengtsson & Raza-Ullah, 2016).

Thirdly, articles that were not written in English, used the word coopetition in connection with unrelated topics, or exhibited an irrelevant/too narrow focus of the concept were discarded. The remaining articles were then supplemented with journal articles that were cited among the body of remaining articles and also satisfied the requirements mentioned above.

Thus, from the initial data set of 208 articles, 35 were retained for the analysis. Figure 6 offers a visualisation of the selection process.

Figure 2: Literature review - Visualisation

Selection criteria	Number of papers
Initial search	208
Language	(27)
Off-topic	(104)
Wrong focus / Too narrow	(55)
First selection	**22**
Papers supplemented from external data base due to cross-references	13
Articles included in review	**35**

Source: Own figure

2.2.2 Categorization

The screening of literature for success factors, KPIs and external success factors resulted in numerous items of different but often also overlapping content and statements. For the purpose of combining the findings into a coopetition strategy model and to enable the interpretation of the data, it therefore appeared necessary to group and categorize the data (Belassi & Tukel, 1996). Categorization is the operation of labelling or classifying units of data (Spiggle, 1994). In essence, this means identification of commonalities among the units

of data and to abstraction in a way such that coherent meanings are translated into general concepts (Spiggle, 1994). For this purpose, items (CSFs, KPIS and external success factors) that have been identified through the literature review initially were grouped according to similarities in their (i) wording and (ii) meaning. This for example was the case for the success factors *adjustment of expectations* (Jap, 2001), *adjustment of resource allocation* and *adjustment of processes* (Morris et al., 2007). Those three items were combined into the CSF *operative alignment.* If neither similarities in wording nor meaning could be used to combine or categorize items, often their (iii) object of analysis was used in order to summarize items into more generic concepts as done with the items *company size, coopetition experience of the enterprise* (Gnyawali & Park, 2009) and *firm reputation* (Saxton, 2016). Since all three items have the company as object of analysis in common, they were combined into the external success factor *firm magnitude*. The latter transformation can also be referred to as "abstraction" (Spiggle, 1994, p. 493). The method of abstraction collapses data units into higher-order constructs (Spiggle, 1994). Abstraction was used when the identified items were combinable according to approach (i), (ii) or (iii) as was the case for *managers with coopetitive capabilities* (Bengtsson, Raza-Ullah, & Vanyushyn, 2015), *organizational culture* (Klimas, 2016) and *coopetitive mind-set* (Bengtsson & Raza-Ullah, 2016). Through abstraction, the three items were combined into the CSF *leadership & Cultural mind-set*.

Through either of the approaches or the use of abstraction, this study was able to determine general constructs (CSFs, KPIs and external success factors) and use them to design a coopetition strategy model.

2.2.3 Inter-rater agreement test

The process steps introduced in the previous section of abstracting and categorizing data units, by nature, leaves room for subjectivity and arbitrariness. To guarantee a sound and solid research process with reliable outcome, the following section elaborates on measures undertaken in order to prevent potential reliability issues associated with the arbitrariness of abstraction and categorization. To this end, the present thesis conducted an inter-rater agreement test, adapting this method of justification from Tsai (2002), one of the most cited scholars on coopetition of recent years (Czakon et al., 2014).

The purpose of inter-rater agreement tests is to discover to which extent responses or decisions can be considered generally valid (Jones et al., 1983). For this study this means it is

necessary to measure how consistent the categorization of an external observer is in comparison to the categorization performed in this study. The mean percentage agreement, defined as the number of corresponding responses divided by the number of total responses (Tsai, 2002), was chosen as measure of inter-rater agreement.[6] The value of the mean percentage agreement can range from 0 to 1 (e.g. Tsai, 2002). A value of 0 would represent complete inconsistency and vice versa a value of 1 perfect consistency.

In this study, the mean percentage agreement was 0.72 on average across both external observers (0.78 & 0.67) for the categorization of the CSFs, 0.82 (0.88 & 0.75) for the categorization of the external success factors, and 0.9 (0.9 & 0.9) for the classification of KPIs. To obtain that value, two participants were presented with a questionnaire (cf. Appendix). To ensure a maximum of objectivity, one respondent was familiar with the topic of performance measurement whereas the second respondent's area of expertise was not related to any relevant theory used within the research process of this paper. Moreover, both respondents categorized all performance indicators, critical success factors and external success factors using the provided questionnaire.

Table 1: Results of the inter-rater agreement test

	Mean percentage agreement value		
Classification of	Average	Observer 1	Observer 2
Critical success factors	0.72	0.78	0.67
Key performance indicators	0.9	0.9	0.9
External success factors	0.82	0.88	0.75

2.3 Overview of current research

The following paragraphs aim to introduce the reader to current coopetition research. To begin with, types of coopetition will be specified. Next, different organisational theories will be presented, explaining the drivers of coopetition. Following, risks and challenges of coopetition will be stated, before discussing the assessment of successful coopetition. The chapter concludes with the coopetition model after Chin et al. (2008).

[6] „Response", in this context, relates to the categorization of a data unit.

2.3.1 Coopetition typology

In regards to the typology of coopetition, differentiations can be made. The following sections will briefly address this topic.

First, coopetition will be distinguished according to the intensity of competition and cooperation predominant in the relationship. Second, the differences between horizontal and vertical coopetition will be delineated before subsequently dyadic and network coopetition are depicted. Lastly, characteristics of inter-firm and intra-firm coopetition will be compared.

Although vertical, network and intra-firm coopetition do not play a role for the scope of this paper, the different appearances of coopetition deserve being mentioned in order to create an overarching understanding of coopetition theory.

Horizontal vs. Vertical

Coopetition relationships can be developed both vertically and horizontally (Ross & Robertson, 2007; Zerbini & Castaldo, 2007). Vertical coopetition refers to coopetition emerging between actors on different levels of the value chain e.g. between a firm and its suppliers (Ross & Robertson, 2007). In contrast, coopetition is considered to be horizontal when actors on the same level of the value chain, i.e. direct competitors, engage simultaneously in competition and cooperation (Ross & Robertson, 2007). Although the similarities are numerous, horizontal and vertical coopetition relationships are different in nature and it is clear that trade-offs between cooperation/harmony and competition/conflict are different (Bengtsson & Kock, 2000). While vertical relationships are often based upon a mutual set of interests (e.g. Hunt, 1994; Bengtsson & Kock, 2000), horizontal competitors on the other hand, are often compelled to interact or respectively cooperate with each other due to market constraints (e.g. Lado et al., 1997; Padula & Dagnino, 2007). Bengtsson & Kock (2000) also argue that in contrast to vertical relationships, horizontal coopetition has more potential for conflicts as the interests of the involved players cannot be aligned or simultaneously fulfilled completely. Therefore, coopetition up- or downstream of the value chain is said to be more stable whereas horizontal competitors try to avoid too much interaction (Bengtsson & Kock, 2000). Moreover, coopetition relationships between vertical actors are often easier to determine because they are openly visible and built on an arrangement of activities and resources along the supply chain (Bengtsson & Kock, 1999,

2000). Horizontal coopetition, on the other hand, is less publically visible and in rare cases can even be informal (Bengtsson & Kock, 1999, 2000).

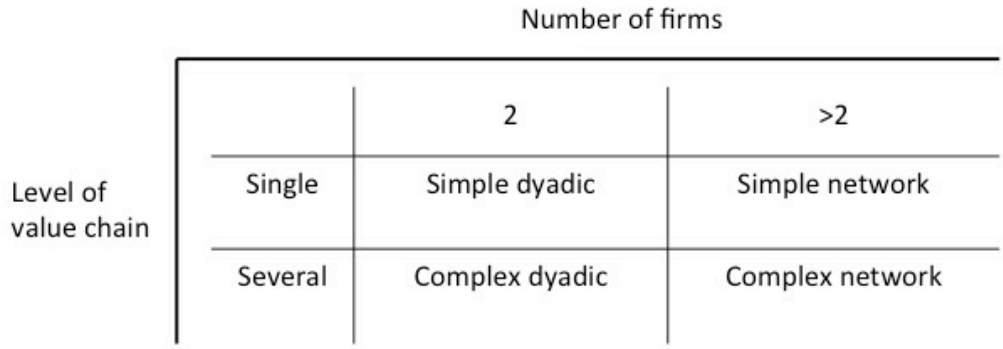
Dyadic vs. Network-Based

Regarding the typology of inter-firm coopetition, academia distinguishes between two basic forms: dyadic and network coopetition (e.g. Giovanni Battista Dagnino & Padula, 2002; Peng et al., 2012). Dyadic coopetition relates to relationships between two actors and can either be distinguished into coopetition between the same two firms on one level of the value chain, or between the same two firms along different levels of the value chain. The former type of coopetition traditionally appears in e.g. R&D-cooperation between competitors. Dagnino & Padula (2002) introduced the term *simple dyadic coopetition* for this type of relationship. The latter type of coopetition relationships e.g. often develop in the supply chain of the manufacturing industry. The literature refers in that case to *complex dyadic coopetition* (e.g. Giovanni Battista Dagnino & Padula, 2002; Janakwska, 2011).

Network coopetition on the other hand, relates to a structure of more compound relationships between more than two firms at the same time. It can either be described as relationship between several firms on one level of the value chain, or between several firms along different levels of the value chain. Parallel sourcing in buyer-supplier networks can be mentioned as an example for the former type of coopetition. Dagnino & Padula (2002) coined here the term *simple network coopetition*. For the latter type, multilateral agreements in firm clusters are an example. Such type of relationship has been labelled *complex network coopetition* (e.g. Giovanni Battista Dagnino & Padula, 2002).

Figure 3 summarizes the findings of this subchapter, positioning the aforementioned types of inter-firm coopetition in a 2x2 matrix along the parameters “number of firms” and “level of value chain”.

Figure 3: Matrix typology of inter-firm coopetition



Source: Adapted from Dagnino & Padula, 2002

Inter-firm vs. Intra-firm

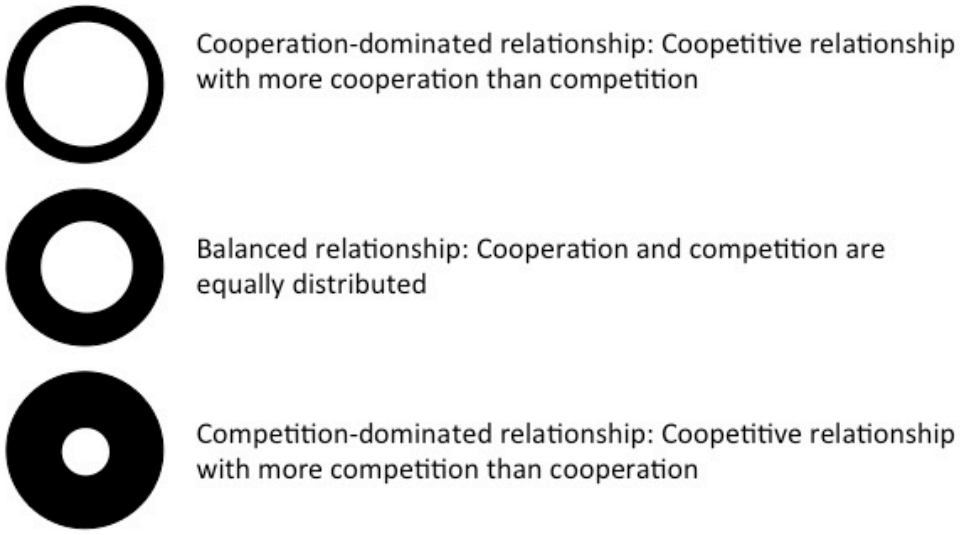
Academic literature discusses the concept of coopetition on an inter-firm level (e.g. Bengtsson & Kock, 2000; Luo, 2007), as well as on an intra-firm level (e.g. X. Luo, Slotegraaf, & Pan, 2006; Tsai, 2002). At the inter-firm level, competitors interact to plan and implement their coopetitive goals (Dahl, Kock, & Lundgren, 2016). On an intra-firm level, balancing and managing general conflicts and coopetitive tensions comes into focus (Dahl et al., 2016). Since inter-firm coopetition has already ben thoroughly introduced earlier in this paper, the following part will focus on aspects of intra-firm coopetition.

Coopetition inside a firm can occur among differ units (Tsai, 2002). Its emergence has similar drivers as inter-firm coopetition (such as knowledge creation, knowledge sharing, exploitation of economies of scale and creation of efficiency effects), only on a micro-level (Tsai, 2002). Within a firm, the competitive characteristics develop because the control of resources and especially knowledge can generate benefits for individual departments to outperform competing units (X. Luo et al., 2006). At the same time, departments need to cooperate in order to achieve the common interest of the firm (Tsai, 2002). Transferring and sharing resources across departments relates to the cooperative aspects of intra-firm coopetition. However, intra-firm coopetition also differs from its inter-firm counterpart because rivalry and interrelated conflicts are likely to be less serious on the intra-firm level compared to inter-firm relationships (X. Luo et al., 2006).

Intensity of coopetition

Coopetitive relationships are complex in nature as they are framed around different logics and types of interaction (Bengtsson & Kock, 2000). The combined relationship between the two opposing strategies cooperation and competition can occur in various shapes or intensities, depending on the degree of cooperation or the degree of competition in the relationship (Bengtsson & Kock, 2014). Bengtsson & Kock (2000) even argue that pure competition and pure cooperation do not exist. Coopetition relationships can range from strong cooperation to a very limited degree of cooperation between competitors and vice versa for competition. As mentioned in 2.1.1, both strategies, competition and cooperation can be viewed as continua and hence the possible degrees of coopetition are manifold. Bengtsson & Kock (2000) introduce a highly simplified illustration (cf. Figure 4) of the possible degrees of coopetitive relationships. In Figure 4, two different coloured circles, stacked over another, symbolize the degrees of either cooperation or competition. Although Figure 4 abstracts the levels of the relationship strongly and only identifies three different states, it offers a functional explanation and understanding of the concept of different levels of intensity in a coopetition relationship.

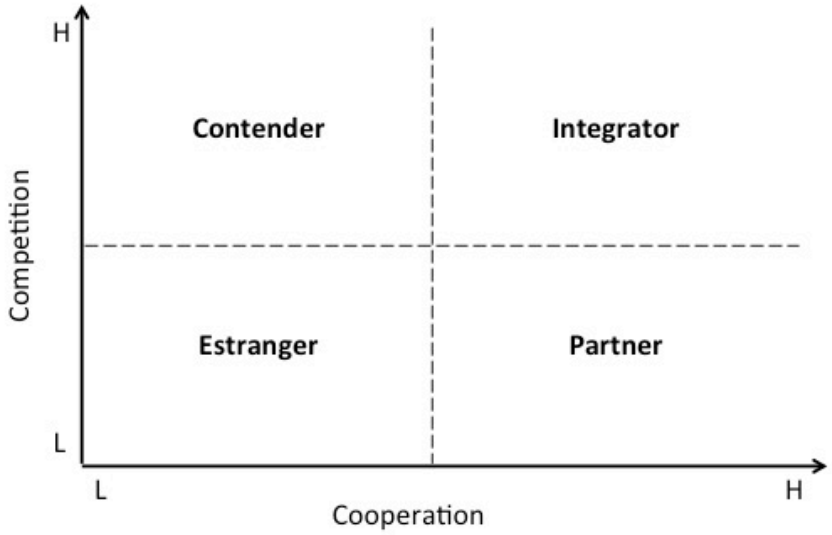
Figure 4: Different types of coopetitive relationships between competitors



Source: Adapted from Bengtsson & Kock, 2000

Another typology is proposed by Luo (2004)[7] who argues that the intensity of coopetition is mainly a result from the contributed resources and from mutual interdependency. With this perspective, he is able to propose four types of coopetitive relationships (cf. Figure 5). Coexistence can be located on the intersection of the x-, and y-axis. Each axes signifies the intensity for each relationship in regards to cooperation and competition. Firms can be assigned to one of the four categories depending on the intensity of competition and cooperation in the focal coopetitive relationship.

Figure 5: Intensity-based coopetition typology



Source: Adapted from Y. Luo, 2004

A firm displaying low intensity of cooperation and competition, is named *estranger* (Y. Luo, 2004) or monoplayer (e.g. Chin et al., 2008). Monoplayer-coopetition occurs when a firm does not significantly interact with its competitors (Chin et al., 2008; Y. Luo, 2007) and mostly relies on the use of its own resources (Y. Luo, 2004) and monopolistic power (Y. Luo, 2007). This kind of coopetition is expected to arise in deregulated markets and industries (e.g. Czakon & Rogalski, 2014; Y. Luo, 2004). The second type of relationship, namely *contender* relationship (e.g. Chin et al., 2008; Y. Luo, 2004) occurs when the relationship shows a high degree of competition and a low degree of cooperation. Within a contender relationship, firms compete over market dominance and market share (Chin et al., 2008). Such a situation usually

[7] Y. Luo (2004) focuses in his analysis on the degrees of coopetition between multinational corporations and governments. However, his ideas can also be generalized (e.g. Chin et al., 2008).

occurs on markets with high product and resource similarity because, according to Y. Luo (2004), the similarity reduces the firms' desire to cooperate. Furthermore, a firm following the strategy of *partner* coopetition maintains a high degree of cooperation and a low degree of competition. Firms within this category are in search for joint synergies and a complementary use of resources and capabilities (Chin et al., 2008). High resource complementary is a characteristic of situations fostering partner coopetition because resource and capability complementarity supports and emphasizes the collaboration between firms (Y. Luo, 2004). Lastly, an *integrator* (Y. Luo, 2004) or adapter (Chin et al., 2008) shows both high levels of cooperation and competition. Firms pursuing this type of coopetition mutually depend on one another in order to achieve their business goals (Chin et al., 2008). The latter type of a coopetition relationship is common among cooperation between main competitors (Y. Luo, 2004).

2.3.2 Drivers of coopetition

The overarching goal of coopetition is the generation of synergies (e.g. Bouncken et al., 2015; Eisenhardt & Galunic, 2000), or in other words, economic rents (Lado et al., 1997). Still, different theoretical concepts provide the conceptual basis to understanding the underlying drivers which incentivise firms to engage in coopetition as well as to which challenges (2.3.3) coopetition can lead for the firm. Furthermore, understanding the drivers and challenges of coopetition helps in deducting and proposing KPIs for successful coopetition and hence enables to operationalization of the topic in form of a model.

Before more definite drivers of coopetition can be discussed, it is worthwhile to first briefly elaborate on theoretical concepts (game theory, resource-based view, transaction-cost paradigm and network theory) in regards to coopetition to explain the motivation firms may follow when engaging in coopetition. Afterwards, external and internal drivers, as well as relation-specific drivers will be discussed.

Anticipating and aligning strategies

In game theory, actors aim to pursue benefits whilst avoiding related costs in order to achieve the best possible outcome for their game (e.g. Brandenburger & Nalebuff, 1995). In a game theory world, every single actors' interest is the distribution of a certain "pie" (Lado et al., 1997, p. 115) of fixed size in such a way as to maximise their own benefit (Lado et al.,

1997; Gnyawali & Park, 2009). Each player of the theoretical game has the option to compete with, cooperate with, or ignore the other players of the game (e.g. Brandenburger & Nalebuff, 1995; Lado et al., 1997). The key idea behind game theory is that each action of a player causes a reaction from a competitor that may neglect the desired outcome of the first player (e.g. Brandenburger & Nalebuff, 1995; Simoni & Schiavone, 2011). If the game were only played for one round and with only two players, mathematically a competitive strategy is more beneficial for the players than cooperation (Brandenburger & Nalebuff, 1995). However, the situation changes if the game, like in the actual business world, is played repeatedly. Under the changed circumstances, cooperation yields on average the highest payoff for the players (Axelrod, 1981). Coopetition therefore becomes rational because it increases the overall size of the distributable pie for the players (Brandenburger & Nalebuff, 1996). It is noteworthy that this school of thought separates cooperation and competition into independent actions (Bengtsson & Raza-Ullah, 2016), which opposes contemporary definitions (e.g. Y. Luo, 2007; Raza-Ullah, Bengtsson & Kock, 2014) as well as the interpretation of coopetition in this paper (cf. 2.1.1). Brandenburger & Nalebuff (1995, 1996) show how a company can attain rents by avoiding destructive behaviour. Game theory illustrates that it is superior for firms to intend win-win outcomes instead of engaging in difficult and less beneficial competition (Quintana-Garcia & Benavides-Velasco, 2004). Aiming for situations in which both actors win has several advantages (Brandenburger & Nalebuff, 1995). First, since the competitor is not forced to vacate the market, it shows less resistance to mutually beneficial outcomes, resulting in easier implementation (Quintana-Garcia & Benavides-Velasco, 2004). Second, plus-sum games are more sustainable in the long run because neither party is forced to give up ground on the market (Quintana-Garcia & Benavides-Velasco, 2004), and finally, win-win moves create a bigger pie to distribute between the actors (Gnyawali & Park, 2009). These advantages are, according to game theory, motivating forces behind coopetition. In spite of that, game theory sometimes is criticised due to the fact that is considers opportunism as a viable strategy and essential to understanding inter-firm collaboration (Lado et al., 1997).

Resource scarcity

Other drivers find their rationale in the heterogeneous allocation of resources on the market. Applying the concept of a resource-based view (RBV) therefore delivers another

conceptual perspective for examining the potential motivation of firms to engage in coopetition. Its view of strategy management contributes a useful theoretical framework for the understanding of the drivers of coopetition (e.g. Das & Teng, 2000; Lado et al., 1997; Quintana-Garcia & Benavides-Velasco, 2004). At the core, RBV is build on two assumptions: (i) each firm commands over different resources and (ii) those resources are not perfectly transferable from one company to another (Barney, 1991). Thus, differences in a firms' profit can be ascribed to the heterogeneity in resource profiles (e.g. Jorde & Teece, 1990; Penrose, 1959). Moreover, unique resources or capabilities give a firm the opportunity to generate economic rents and sustain a competitive advantage (e.g. Lado et al., 1997; Penrose, 1959). As certain resources cannot be easily traded on the market or are too complex in nature, alliances and other cooperative strategies are solutions that enable firms to access these resources (e.g. Barney, 1991; Das & Teng, 2000; Jorde & Teece, 1990). Yet, the strategy of accumulating resources in not enough to sustain a competitive advantage over time (Quintana-Garcia & Benavides-Velasco, 2004). Rather the sustainable competitive advantage of a firm depends on its dynamic capabilities[8], since sustaining a competitive advantage requires the exploitation of existing internal and external capabilities, as well as the development of new ones in order to match the requirements of a changing business environment (e.g. Lado et al., 1997; Quintana-Garcia & Benavides-Velasco, 2004). The RBV therefore can explain the motivation to engage in coopetition, such as risk and cost diversification and achievement of economies of scale through the bundling of resources (Das & Teng, 2000; Ritala, 2012). In a fast paced, uncertain business environment, these are important aspects to consider for a firm (Ritala, 2012).

Immobility of resources

The motivation for inter-firm coopetition can also be reasoned within the transaction-cost paradigm (e.g. Madhok, 2000; Williamson, 1985). According to transaction-cost scholars, coopetition is a firm's reaction to transaction costs caused by the imperfection of the market (Madhok, 2000). Within the transaction-cost school of thought, capabilities and resources are assumed to be limited and hence only transferable across a market for a premium (Quintana-Garcia & Benavides-Velasco, 2004), similar to the assumption of the

[8] The capacity to renew competences in line with the changing business environment (e.g. Jorde & Teece, 1990; Zahra, Sapienza & Davidsson, 2006).

RBV. Thus, coopetition presents a solution by establishing efficient access to otherwise restricted or more expensive resources (Quintana-Garcia & Benavides-Velasco, 2004). Since firms plan their activities aiming to minimize potential transaction costs (Simoni & Schiavone, 2011), the favourable transaction opportunities of cooperating competitors motivates firms to engage in coopetition (Quintana-Garcia & Benavides-Velasco, 2004). Summing up, coopetition is rational when the value of the coopetitive engagement exceeds the opportunity costs of firms' individual transactions (Jarillo, 1988).

Other than in game theory, opportunism is not seen as a strategic incentive but only as a risk in transaction-cost theory (Simoni & Schiavone, 2011). Hence, even though the transaction-cost paradigm explains motivations for coopetition, it also considers coopetition as a risky strategy due to the fact that it may induce opportunistic behaviour among firms, especially in highly competitive markets (Quintana-Garcia & Benavides-Velasco, 2004; Simoni & Schiavone, 2011; Park & Russo, 1996).

Advantages of networks

The theoretical stream of network theory also provides a conceptual basis to understanding the drivers of coopetition. Building upon the same assumptions as did the Resource scarcity (p. 26) and the Immobility of resources (p. 27), namely the heterogeneity of resource availability among firms and the imperfect mobility of resources, the network theory argues that cooperative ties in a network enable companies to seize opportunities such as learning about and from its partners and accessing resources of the partners and even the partners' partners (Gnyawali & Park, 2009). Firms differ in their ability to use and access resources and partnerships, or rather, networks increase firms' opportunities to gain access to resources (Madhavan et al., 2004). The better it is positioned within a network, i.e. the more ties it nurtures and partnerships it engages in, the easier it is for a firm to use resources to gain a competitive advantage (Gnyawali & Park, 2009). In addition, by engaging in networks, its members can also improve their bargaining power, as well as achieve cost reduction through increased operational efficiency (Peng et al., 2012).

External and internal drivers

After the section on Anticipating and aligning (p. 25), Resource scarcity (p. 26) and the Immobility of resources (p. 27) gave a theoretical overview on the general motivation of

companies to engage in coopetition, this section is devoted to present more tangible categories and examples of drivers of coopetition.

Drivers of coopetition may be both, externally and internally (e.g. Bengtsson & Raza-Ullah, 2016; Padula & Dagnino, 2007). The former are factors or forces that derive outside the firm and are provided by the business environment, industry characteristics, technological demands of the business or stakeholders' influence (Bengtsson & Raza-Ullah, 2016; Padula & Dagnino, 2007; Ritala, 2012). Dowling, Roering, Carlin, & Wisnieski (1996) suggest that highly concentrated and regulated environments impel firms toward coopetition. Moreover, maturity and structure (Y. Luo, 2004), as well as overall uncertainty in the industry (Padula & Dagnino, 2007; Ritala, 2012) drive firms to engage in coopetition. Developments in information technology such as the creation of technological platforms also drive companies toward coopetition (Feldmann, 2002). Additionally, companies engage in coopetition to address the challenges related to short product life cycles (Peng et al., 2012; Quintana-Garcia & Benavides-Velasco, 2004), increasing R&D costs and risks (Gnyawali & Park, 2009; Peng et al., 2012; Ritala, Golnam & Wegmann, 2014), as well as technological uncertainty and complexity (Afuah, 2000; Bouncken & Kraus, 2013). Often, technological demands in an industry are so high that one firm alone, especially small firms (Bengtsson & Johansson, 2014; Morris et al., 2007), cannot realise the requirements unless they find a coopetitive partner (Bengtsson & Raza-Ullah, 2016). Research also has found that external stakeholders, namely governments and influential customers push coopetition (Bengtsson & Raza-Ullah, 2016). For instance, governmental regulations can act as drivers of coopetition (Y. Luo, 2004). Furthermore, by creating interdependencies or a cooperative atmosphere among competitors, influential customers can incentivise or even force coopetition (Ho & Ganesan, 2013). Padula & Dagnino (2007) argue that less stable environmental conditions lead to unstable cooperation relationships, hence giving rise to competition among cooperative partners or ceteris paribus foster cooperation in competitive relationships.

Internal driver are forces that originate from within the context of the firm or its relational interactions (Padula & Dagnino, 2007). Internal drivers are given by the knowledge profile and expectations of the members of the coopetitive dyad (Padula & Dagnino, 2007). Such drivers concern specific motives or resources of a firm (Bengtsson & Raza-Ullah, 2016). Firms, on the one hand, can proactively pursue coopetition strategies, for example in order to penetrate new markets (Y. Luo, 2004), or improve performance (Chin et al., 2008). On the

other hand, firms may respond with coopetitive strategies to changes in their business environment, such as e.g. a reduced competitive advantage or a lack of certain resources (Gnyawali & Park, 2009). Bundling resources and capabilities in order to increase bargaining power and competitive position is another internal driver of coopetition (Gnyawali & Park, 2009; Ritala, 2012). Lastly, past participation in, and experience with coopetition has also been identified as an internal driver for the formation of coopetitive relations (Gnyawali & Park, 2011; Simoni & Schiavone, 2011).

Relation-specific drivers

Drivers of coopetition can also be categorised as relation-specific (Bengtsson & Raza-Ullah, 2016). Relation-specific drivers refer to characteristics of the relationship that encourage the formation of coopetition (Bengtsson & Raza-Ullah, 2016). The more useful or superior the resources a competitor controls are, the more likely it is for firms to engage in coopetition, as the outcome of such coopetition agreements is more beneficial for the focal firm (Gnyawali & Park, 2011). Moreover, resource similarity, and also in contrast resource heterogeneity, are relation-specific drivers (Y. Luo, 2007). The former enables to easy resource bundling; the latter promises the most increase in distant capabilities (Y. Luo, 2007). Firms are also more likely to pursue coopetition strategies if competitors exhibit similar goals (Gnyawali & Park, 2009; Morris et al., 2007). In addition, distance in the knowledge profiles of two firms has also been mentioned as a relation-specific driver of coopetition because the potential knowledge acquisition for the focal firm is greater (Hamel, 1991; Padula & Dagnino, 2007).

2.3.3 Risks, challenges & disadvantages of coopetition

Despite creating ties among competitors, coopetitive relationships are still based on rivalry and only power relations and common interest sustain the fragile equilibrium between the competitors (Pellegrin-Boucher, Le Roy, & Gurău, 2013) and hence bear major challenges and risks (Ritala & Hurmelinna-Laukkanen, 2009). The management of coopetitive engagements is difficult (Gnyawali & Park, 2009) and sometimes even described as "dangerous" (Pellegrin-Boucher et al., 2013, p. 74) as they provoke multiple sources of potential conflicts due to their paradox and complex nature.

Firms engaged in coopetitive relationships for one thing may have to deal with internal tensions (Tidstrom, 2014). Management of simultaneous cooperation and competition entails opposing roles due to conflicting logics which demand particular managerial attention in order to avoid costs or loss of efficiency (e.g. Bouncken et al., 2015; Dowling et al., 1996; Tidstrom, 2014). Tidstrom (2014) argues that tensions are "conflicts occurring in coopetitive relationships" (Tidstrom, 2014, p. 262) because of the incompatibility of goals and behaviours of competition and cooperation. Furthermore, Tidstrom (2014) notes that tensions can be found at the company as well as the individual level and stem from differences between competitive and cooperative orientation. In addition, tensions related to knowledge can arise since knowledge is a source of competitive advantage and therefore sharing it is problematic (e.g. Bengtsson & Kock, 2000; Tidstrom, 2014). Moreover, power imbalances can cause tensions when one firm exploits their relative strength (Osarenkhoe, 2010; Tidstrom, 2014).

Bouncken et al. (2015) point out a loss of managerial freedom and entrepreneurial flexibility due to the interdependence with an external partner can negatively affect the competitive position and ultimately the performance of the focal company. Moreover, opportunistic behaviour can be specified as a critical risk of coopetition (Bouncken et al., 2015; Ritala & Hurmelinna-Laukkanen, 2009). The sharing of knowledge and resources can tempt a competitor to pursue an opportunistic strategy by abusing their power to force the coopetitive partner to act in in ways which are mostly in favour of the opportunistic firm, or by using jointly developed knowledge for their own advantage at the expense of their partner (e.g. Bouncken & Fredrich, 2012; Pellegrin-Boucher et al., 2013; Ritala & Hurmelinna-Laukkanen, 2009). Under-commitment to the coopetitive partnership of one actor, leading to under-performance of the other actor is another possible result of opportunistic behaviour (Bouncken et al., 2015; Morris, Kocak, & Ozer, n.d.). Moreover, running the risk of knowledge leakage is also inherent to coopetition (Bouncken & Fredrich, 2012). Lastly, conflicting priorities among the partners are likely to occur and can prove to be challenging for the successful outcome of the coopetition (Bouncken et al., 2015) because resources may be misallocated (Bouncken & Fredrich, 2012).

Summing up, literature shows clearly that coopetition, next to its benefits, bears challenges, risks and disadvantages. This property of coopetition is best explained by describing it as a "double-edged sword" (Bouncken & Fredrich, 2012, p. 2060).

2.3.4 Indicators of successful coopetition

Do firms that engage in coopetition perform better and how to identify their success? Evidence suggests coopetitive strategies have positive performance implications (e.g. Morris et al., 2007; Quintana-Garcia & Benavides-Velasco, 2004). However, also a negative relation between cooperation and performance has already been argued for in the literature (e.g. Kim & Parkhe, 2009; Park & Russo, 1996).

Strategic partnerships among competitors ideally are designed to meet the goals of both the partnership and the individual firm, and will be will be considered successful if the value created through the partnership exceeds the costs of the coopetitive engagement (Quintana-Garcia & Benavides-Velasco, 2004). In order to determine the actual performance level of a coopetitive partnership, it is necessary to first identify the essential performance indicators or respectively the desired outcomes (Ferreira et al., 2012). Performance indicators can vary according to the particular partnership or firm in focus (Ferreira et al., 2012). However, Bengtsson & Raza-Ullah (2016) classify the desired outcomes of coopetition into four groups and thereby offer a general set of success indicators. The classification consists of: (i) *knowledge related*, (ii) *firm performance*, (iii) *relational* and (iv) *innovation* (Bengtsson & Raza-Ullah, 2016). Not only does this classification appear to comprehensively capture the set of desired outcomes of coopetition but it also allows for an interpretation of the success of coopetition, since in accordance with the definition of KPIs (cf. 2.1.2) the achievement of a desired outcome can be regarded as an indicator for success on this dimension of the partnership.

The classification of success indicators by Bengtsson & Raza-Ullah (2016) is in line with the findings of other scholars. Knowledge related outcomes have been analysed by several studies (e.g. Bouncken & Kraus, 2013; Ritala & Hurmelinna-Laukkanen, 2009) and are often even referred to as being the main result of cooperative part of coopetition (Ho & Ganesan, 2013). Traditional firm performance outcomes such as financial performance (e.g. Bengtsson & Raza-Ullah, 2016; Combs & Ketchen, 1999), efficiency (e.g. Morris et al., 2007; Ritala, 2012) and competitive position (e.g. Morris et al., n.d.) have often been proclaimed as outcomes of cooperation between competitors. Thirdly, research has been conducted in regards to relational outcomes such as trust (e.g. Peng et al., 2012) and longevity of the coopetitive relationship (e.g. S. H. Park & Russo, 1996; Peng et al., 2012). Lastly, innovation, being one of the most frequently studied outcomes of coopetition strategies (e.g. Gnyawali &

Park, 2009; Mitchell, Dussauge, & Garrette, 2002; Quintana-Garcia & Benavides-Velasco, 2004; Ritala, 2012) has to be considered in order to complete the classification of desired outcomes of coopetition and respectively the indicators of its success.

A thorough presentation and categorisation, together with examples of key performance indicators to measure the success of coopetition will be presented in a later section of this paper (3.1.3).

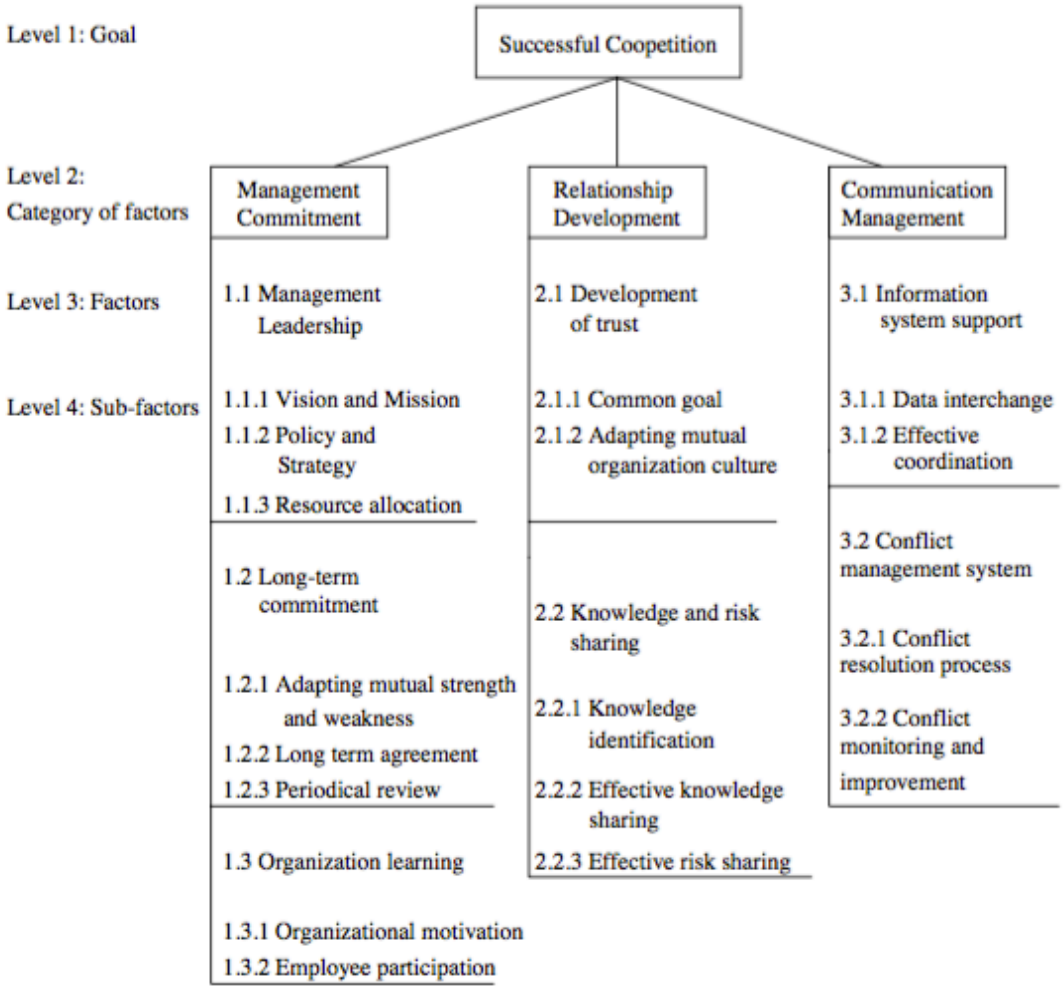
2.3.5 The Chin-Model

Chin et al. (2008) propose a coopetition model consisting of various critical success factors. In their study, they identify and prioritize seven CSFs and 17 sub-factors. Moreover, they organize the identified success factors into a hierarchical model and argue that through the help of their model, practitioners could understand the importance of success factors and accordingly develop improvement plans if necessary. Although Chin et al. (2008) claim to have identified generic success factors, their model is primarily designed for contender firms (cf. p. 23). Without depriving Chin et al. (2008) of their valuable contribution to the body of coopetition research, their model is not fully equipped for the diagnostic use. Therefore, the following two sections will present the composition of the model before critically assessing the shortcomings of the model.

Composition of the model

The model groups the factors into three broad categories, namely *management commitment*, *relational development* and *communication management*. Moreover, the authors apply a hierarchical order to the identified CSFs, including the sub-factors, classifying them into four levels. Each success factor consists of several sub-factors. The complete model can be seen in figure 5.

Figure 6: The coopetition strategy model after Chin et al. (2008)



Source: from Chin et al. (2008), p. 442

Three CSFs are subsumed under the category management commitment: *Management leadership*, *long-term commitment* and *organizational learning*. Management commitment refers to the ability of senior executives to communicate vision and values, guiding the organization's activities and strategy. Long-term commitment corresponds with the dedication of the firm to sustain and maintain a partnership for a longer period of time. Lastly, organizational learning relates to the organization's capability to detect errors and make corrections (Chin et al., 2008). The category relationship development refers to the importance of establishing a trusty relationship with the coopetition partner. It comprises the CSFs *development of trust* and *knowledge and risk sharing*. The former relates to trust as an essential building block of coopetition and moreover suggest that firms have to align in regards to their individual goals as well as their corporate culture in order to be successful.

Knowledge and risk sharing recognizes knowledge as an important source of competitive advantage while risk sharing can minimizes potential costs (Chin et al., 2008). Finally, *communication management* refers to the planning and execution of communication between partners as well as within the firm. It consists of the two CSFs *information system support,* the interchange of relevant business data, and *conflict management system, which* calls for a system that efficiently handles potential conflicts between the partners (Chin et al., 2008).

In order to identify the CSFs and sub-factors relevant to the success of coopetition, Chin et al. (2008) first conducted a literature review. Subsequently, the authors used the analytic process hierarchy (AHP) method[9] to prioritize the success factors. This prioritization of success factors is necessary because the authors –in line with the literature about success factors (e.g. Bullen & Rockart, 1981; Parmenter, 2010; Rockart, 1979)- assume organizations cannot devote their efforts equally to all CSFs due to limited resource availability.

Prior to the development of the model, the authors conducted an exploratory survey to investigate the practices of coopetition strategy. The survey was performed with participants from the manufacturing industry in Hong Kong. Results showed that the majority of surveyed firms exhibit a high degree of competition and a lower level of cooperation. Therefore, the identification and prioritization of CSFs and sub-factors focused on success factors relevant for contender firms.

Due to the outcome of the AHP analysis, the authors suggest that management commitment is the most important category of success factors, followed by relationship development and communication management.

Critical assessment

When examining the coopetition strategy model by Chin et al. (2008), one realizes that the CSFs and sub-factors proposed by the authors are kept highly generic. While intended by the authors (Chin et al., 2008), this leaves room for misinterpretation. The success sub-factor "vision and mission" (cf. Figure 6), e.g. is difficult to implement into an improvement proposal for a coopetition strategy. Albeit Chin et al. (2008) provide descriptive passages to each CSF and sub-factor, it is not always clear how the success factors should be understood or used.

[9] (cf. Forman & Gass, 2001)

Moreover, it should be stated that some scholars (e.g. Combs & Ketchen, 1999) consider certain of the by Chin et al. (2008) identified CSFs (e.g. “Development of trust”) to be an outcome of coopetition than a success factor.

Besides, Chin et al. (2008) claim to offer a model that helps practitioners in their strategy management efforts (Chin et al., 2008) and in return improve their coopetition results. However, neither they do deliver any explanation toward what exactly successful coopetition constitutes, nor how it could potentially be measured. Other scholars (e.g. Ritala, 2012; Thomason, Simendinger, & Kiernan, 2013), when analysing successful coopetition, aim to itemize the success in order to allow assessment of the success. Hence, the lack of a definition or explanation of successful coopetition in the model makes it challenging to apply the model in practice.

Further criticism is raised by the fact that Chin et al. (2008) do not consider environmental aspect as success factors for the success of coopetition. The contingency approach, well established in business strategy literature (e.g. Venkatraman, 1989), states that the outcome of any situation is not only defined by actions related to that situation but also depends on the prevailing circumstances. For instance, Ritala (2009, 2012) shows that coopetition strategy and its performance are dependent on, or moderated by market circumstances like uncertainty or competitive intensity. Others have found that geographical distance can play a moderating role on the success of coopetition (Le Roy & Czakon, 2016).

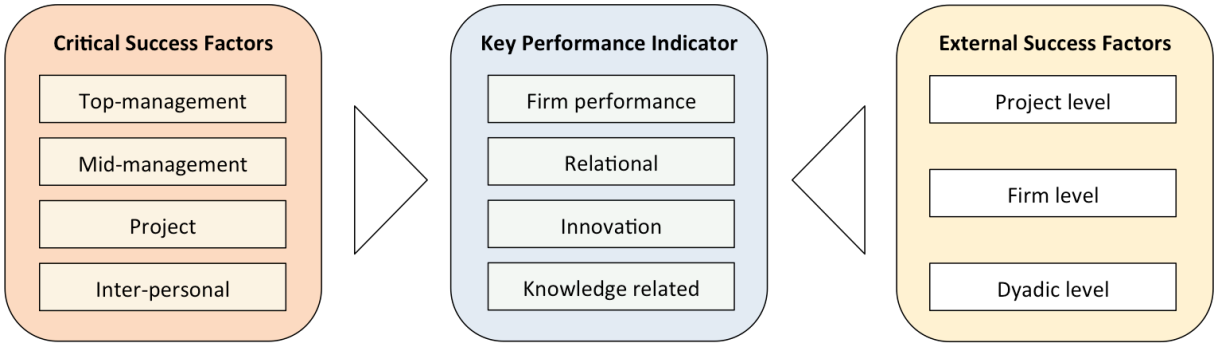
3 Revision of the model

The following chapter aims to revise the previously presented coopetition strategy model by Chin et al. (2008) (2.3.5) based on the stated theory and definitions in order to conclude by establishing a new coopetition strategy model.

Firstly, the components of the revised model will, one after another, be discussed (3.1). Secondly, the final model in its new format and concept will be presented (3.2).

3.1 Components of the DOSC-model

Figure 7: The three modules of the DOSC-model



Source: Own figure

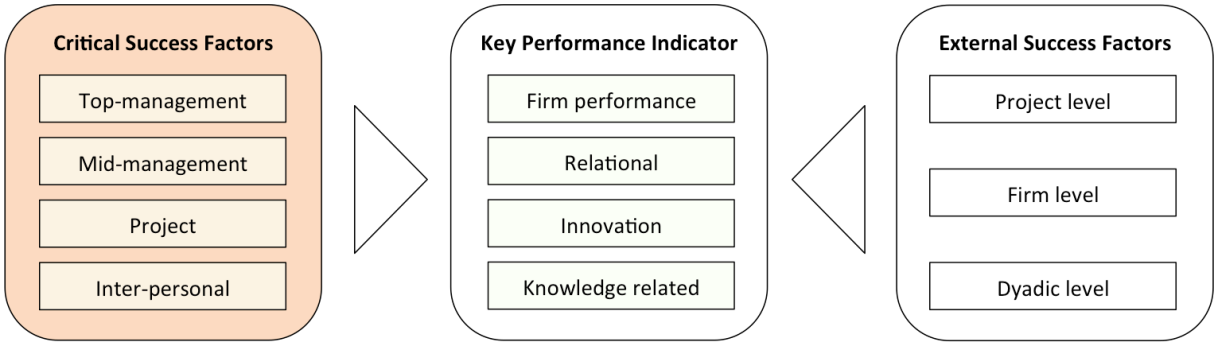
Overall it can be said that the findings from the research and study resulted in a conceptual model that takes the ideas from Chin et al. (2008) but then offers a more comprehensive and comprehensible view on coopetition strategy. Although originally not intended, it appeared advisable to not merely extend the existing model by Chin et al. (2008) but rather develop a completely new model. Not only does the new model propose several critical success factors like the model by Chin et al. (2008) also did. It furthermore also takes external influence factors of the successful outcome of coopetition into account provides means to evaluate the success of coopetition by proposing KPIs of successful coopetition. Hereby the model offers novel contribution to coopetition research. Given its three components, the new model will hereinafter be referred to as *Determinants and Outcomes of Successful Coopetition-model*, or DOSC-model.

By categorizing the CSFs as well as the external influence factors into different levels, practitioners using the model can better determine the area within a firm where changes have to be implemented in order to improve the outcome of the coopetition. The critical success

factors incorporated into the DOSC-model will initially be described in the following (3.1.1). Then, section 3.1.2 will give information on contingency aspects of successful coopetition. Finally, the key performance indicators of successful coopetition will be specified (3.1.3). Each of the following sections ends by presenting a figure of the CSFs and their sub-factors discussed in that specific section. Figure 7 illustrates how the three components (CSFs, external success factors and KPIs) of the DOSC-model are connected to another.

3.1.1 Critical success factors

Figure 8: Focus illustration - Critical success factors



Source: Own figure

The adjacent chapter presents the results from first reviewing the literature (2.2.1) and then subsequently categorizing and abstracting the findings. The presented CSFs reflect the condensed and abstracted success factors previously identified in the literature.

The model presents nine CSFs for coopetition. In this context, the DOSC-model distinguishes between four levels of analysis for the CSFs: Top-management-, middle-management-, project- and inter-personal level. External success factors will be categorized into project-, firm- and dyadic level. Organizing the CSFs and external success factors into levels enables the model to not only add theoretical value to coopetition research but also to permit practical deductions from the model for the execution of a coopetition strategy. Practitioners can use the model to determine which areas or respectively levels need to be addressed in order to communicate or implement changes into their coopetition strategy.

The following paragraphs consecutively discuss one specific level of analysis and address the specific CSFs of that level. Each paragraph will show the relevance of a CSF and present sub-factors.

Top-management level

CSFs at the top-management level of analysis refer to all CSFs related to issues that only senior management is able to address. CSFs in this category are primarily of importance prior to the start of the collaboration because they require approval and commitment by high-level executives. Without adequate management commitment, a coopetition project cannot succeed (Chin et al., 2008). Moreover, achievement of critical success factors (or the failure thereof) at top-management-level establishes the conditions for lower-level CSFs. The first critical success factor within this category to be mentioned is *effective project setup:* Effective project setup includes different organisational aspects regarding hierarchical structure and decision-making processes within the firm. McComb, Kennedy, Green, & Compton (2008) were able to show that project outcome is positively related to a well organized and efficient project setup. The critical success factor efficient project setup persists of sub-factors such as formalization, decentralization and flat project structure. Formal coordination mechanisms or, in other words, formalization delineates to which extent processes, rules and roles are recorded in writing and play a crucial role for the success of a coopetition project (Dahl et al., 2016; Mariani, 2016; Strese, Meuer, Flatten, & Brettel, 2016). Formalization helps to create a successful outcome by providing guidance to employees and moreover also decreases the risk of opportunistic behaviour by any of the partners (Dahl et al., 2016). To enforce this positive effect, it is recommended to establish a contractual basis between the coopetitive partners, in order to minimize the risk of opportunistic behaviour (Dorn, Schweiger, & Albers, 2016). Although contracts are part of formalization, they refer here to contracts at firm level whereas formal coordination mechanism can also only be agreed upon at lower level among the firms. While the formal record of regulations increases the likelihood of successful coopetition, too much centralization in hierarchy and decision-making competencies impairs coopetition (Baruch & Lin, 2012). Decentralization signals commitment (Strese et al., 2016) and ensures close interaction among the coopetitive partners (Pellegrin-Boucher et al., 2013). Lastly, a flat project structure is more suitable for knowledge sharing (Mohamed, Stankosky, & Murray, 2004) and hence positively effects the KPIs of successful coopetition related to knowledge.

Next to an effective project setup, *adequate resource investments* count as critical success factors. A firm, or respectively the management needs to make financial as well as non-financial commitments to the coopetition project. McComb et al. (2008) prove the necessity of resource investments for team performance in general, while Morris et al. (2007)

even argue for the necessity of resource investments for coopetition in particular. Morris et al. (2007) consider the willingness to make financial and non-financial investments as managerial commitment required in order to maintain and promote a coopetitive relationship.

Summing up, the top-management is required to guarantee an effective setup of the coopetition project by formally recording rules, obligations and best practices and committing to provide the required resources for the coopetition.

Table 2: CSFs with corresponding sub-factors at the top-management level

1) Effective project setup
• Formalization • Decentralization • Flat project structure
2) Adequate resource investments

Mid-management level

CSFs in the category of mid-management-level are most likely not being planned too far ahead in time of the project unlike top-management-level CSFs. Instead, they start being relevant to the project on an everyday basis. However, they still require managerial decision-making competencies in order to be implemented. At first, the CSF *operative alignment* will be introduced: Operative alignment relates to a variance of adjustments that need to be performed in different areas of the firm and the project in order for the coopetition to be successful. Management must consider to adjust the firm's practices in order to harvest productivity and innovative benefits from the coopetition most effectively (Tsai, 2002). On this matter, Morris et al. (2007) note that the management, again, needs to be committed in order for changes regarding the operative alignment to be implemented, while Sherer (2003) argues for the importance of top-management support for such changes, stressing the significance of operative alignment as a CSF.

Several sub-factors constitute the size of operative alignment and need to be fulfilled comprehensively to achieve the CSF. Among these sub-factors is the necessity for the focal firm to adjust its expectations (Jap, 2001). This especially refers to mutual expectations of the companies on how the benefits of the coopetitive relationship are shared. Moreover, firms need to align their communication approaches to avoid misunderstanding and conflicts, and adjust their operative and internal processes so that potentially incompatible practices can be

merged (Morris et al., 2007). In addition, resource allocation has to be adjusted by both partners to guarantee an efficient use of resources across the partnership (Morris et al., 2007). Furthermore, a high level of operative alignment also entails a clear definition of task responsibilities for each department or firm (Faems, Janssens, & Van Looy, 2010). Hereby, again, process efficiency is increased because ideally no resources are used to generate output that already has been produced by the partner. Also, defining task responsibility can prevent knowledge spillover since confidential information does not need to be shared across the firms (Faems et al., 2010).

Next to operative alignment, another critical success factor is *close involvement*: Close involvement partly builds on the previously mentioned necessary adjustments in operative alignment and highlights the fact that not only efficiency benefits play a role in successful coopetition but also opportunistic incentives (from the focal firm's perspective) such as the opportunity to tap into the partner's knowledge. Without close involvement in planning –to gain strategic insights- but especially in the evaluation of knowledge created by the partner, the focal firm is not able to appropriate the knowledge resident in the partner (Saxton, 2016). Being closely involved in such processes raises the opportunity for the focal firm to maximise its learning form the coopetition, positively affecting the KPIs related to knowledge and thereby the success of coopetition.

The last CSF belonging to the mid-management category is *tension management*: Tensions naturally arise in business relationships that simultaneously include cooperation and competition (Tidstrom, 2014). The notion tension refers to conflicts between partners of the alliance but moreover also includes an additional aspect unique to coopetition: Tensions include the contradictory forces of competition and coopetition with their conflicting goals (Tidstrom, 2014). At a macro-level or respectively management level, tensions, on the one hand, can arise between the goals of the firm and the goals of the partnership. On the other hand, tensions can arise at an individual level when people perceive role conflicts regarding their interaction with internal and external colleagues (Tidstrom, 2014)[10]. In order to prevent problems related to tensions, tension management becomes critical. Successful tension management includes several sub-factors. Most effectively, tensions can be managed by

[10] More types of tensions can be found in the literature. However, for the scope of this paper a detailed differentiation is not supportive. The interested reader can find further information on types of tensions in e.g. Bengtsson & Kock (2003).

implementing the principle of separation regarding the departmental structure and overall work tasks (Bengtsson & Raza-Ullah, 2016; Fernandez, Le Roy, & Gnyawali, 2014). This means example pooling employees from both organizations, creating dedicated project teams, and separating them form the rest of the company to create one coopetition team. Tensions due to conflicting goals could thereby be minimized. On the downside, however, too much separation can also have negative effects on knowledge sharing and might demand higher initial resource investments (Stadtler & Van Wassenhove, 2016). Entrusting a third party actor to manage and mediate the coopetition could also be a method of achieving adequate tension management, as the issue of conflicting goals between the coopetition partnership and the firm would be prevented if an external actor who's goal is solely the success of the coopetition managed the collaboration (Fernandez et al., 2014). Moreover, by implementing a division of work in form of specialized departments according to the task responsibility of each firm, efficiency of the coopetition is increased. Lastly, Faems et al. (2010) were able to show that companies that defined partner-specific knowledge domains were more likely to maintain a coopetition over time because fewer conflicts arose. These partner-specific knowledge domains should directly be related to the partner's area of expertise and intellectual property generated should be owned by the specific partner (Faems et al., 2010). Thereby, the risk of conflicts can be mitigated and furthermore prevent competition becoming the dominant aspect of the partnership, supporting effective tension management.

Additionally, internal tensions that develop between top-management and lower level executives as the result of opposing opinions about the value of cooperating with a competitor can be reduced by implementing an effective system and culture of top-down communication (Bengtsson et al., 2015).

In summary, CSFs at the mid-management level are relevant for the daily coopetition routine but still require the commitment of mid to top management levels in order to be implemented. Management can minimize the natural risk of conflicts between the companies and within each company by separating coopetition from other parts of the company. Lastly, the management needs to set up the coopetitive relationship in a manner so that the focal firm is included into strategic decision-making and hence gets the opportunity to acquire novel information.

Table 3: CSFs with corresponding sub-factors at the mid-management level

1) Operative alignment
• Adjustment of processes, expectations & resource allocation • Definition of task responsibilities
2) Close involvement
3) Tension management
• Principle of separation • Third party mediation • Effective top-down communication

Project level

The project level of the DOSC-model consists of two critical success factors; Both CSFs at the project level have in common that they are related to information sharing. Although information is transferred from one organization to the other also at management levels, the project level marks the domain where employees actually work together and exchange their know-how and skills (J.-G. Park & Lee, 2014). This, combined with the specific relevance of both CSFs on a frequent, practical basis of the daily execution of the coopetition gave reason to grasp them at the project level.

The first being *information control*: Since coopetitive partnerships occur between competitors, firms should not only aspire to share information and knowledge to generate value but also to take protection of their core capabilities into account (Bengtsson & Raza-Ullah, 2016; Ritala & Hurmelinna-Laukkanen, 2013). The competitive position, and the firm performance strongly depend on the control of information during the coopetition (Quintana-Garcia & Benavides-Velasco, 2004). Moreover, information control also affects the relational outcome of a coopetition as studies (e.g. Ritala & Hurmelinna-Laukkanen, 2013) show: Members of a coopetitive project are more likely to engage in the relationship if knowledge protection is ensured. The control of information and its flow across teams is naturally also dependent on CSFs at higher levels of the coopetition. E.g. contractual mechanisms, as part of an effective project setup, for instance influences how information sharing is implemented during the collaboration because they establish rules that decide to which extent knowledge is shared. However, in the last instance, it is the project level where information control needs to be translated into action.

The second critical success factor at the project level is *supportive information technology (IT)*. Supportive IT is a prerequisite for information and knowledge exchange as well as organizational learning in modern business environments (Mohamed et al., 2004) and increasingly considered critical to a company's performance (Broadbent, Weill, Brien, & Neo, 1996). Information technology has to match the requirements of the coopetition and should not pose a constraint on the productivity of the employees. Due to its relevance in regards to information sharing, the CSF supportive information technology is closely tied to the KPIs of the DOSC-model related to knowledge and innovation.

In summary, CSFs at the project level advise to consider information protection and the implementation of an adequate IT-infrastructure as being essential to coopetition. Information control is best ensured at the project level and needs to be consistently realized by each individual employee. On the one hand, supportive information technology has to enable convenient and secure data transfer. On the other hand, it also has to facilitate easy communication and understanding between teams. Modern voice-over-IP technology for example enables members of a team to communicate and exchange information regardless of geographic distance and therefore shows the benefits and importance of adequate information technology.

Table 4: CSFs with corresponding sub-factors at the project level

1) Information control
2) Supportive information technology (IT)

Inter-personal level

The last category of CSFs concludes the proposed hierarchy with CSFs at the inter-personal level. The inter-personal level gives credit to the thought that certain critical success factors are rooted in the way people associate and interact with each other. For a successful relationship at an inter-personal level two critical success factors have been identified. In the first instance, inter-personal *trust* is critical for the success of coopetition (Soekijad & Andriessen, 2003). High levels of trust enhance engagement in the partnership (Doney & Cannon, 1997) and reduce the likelihood as well as the intensity of conflicts (Anderson & Narus, 1990). In the original coopetition strategy model upon which the DOSC-model is based, Chin et al. (2008) also argue for the importance of trust as critical success factor. The

present paper agrees with the Chin et al. (2008), yet the present paper suggest partly different sub-factors to support trust: While Chin et al. (2008) suggests the mutual adaptation of organizational culture as a sub-factor of trust, this paper argues that cohesion needs to occur at an inter-personal level. Employees first need to bond at a personal level because without inter-personal cohesion, it is not be possible to establish trust at an organizational level (Soekijad & Andriessen, 2003). For cohesion to take place it is important that social interaction and boundary spanning activities are included into the coopetition (Faems et al., 2010; Tsai, 2002) because such social activities facilitates the bonding and befriending among employees. Furthermore, Sherer (2003) found honesty and reliability to be especially important in the development of inter-personal trust.

Next to trust, *knowledge absorption* is the second critical success factor within the current category. Several scientific papers have already dealt with the process of inter-personal knowledge sharing in coopetitive projects (e.g. Soekijad & Andriessen, 2003; Tsai, 2002). Some articles proposed knowledge sharing as an outcome of coopetition (e.g. Ho & Ganesan, 2013). Others declared knowledge sharing to be crucial for the success of coopetition (e.g. Baruch & Lin, 2012; Zineldin & Mosad, 2004).

Due to its paradoxical nature of coopetition, the DOSC-model suggests *knowledge absorption* in order to account for the competitive characteristics of coopetition, instead of mere knowledge sharing as a critical success factor. In this context, knowledge absorption includes the concept of knowledge sharing but additionally incorporates the competitive aspect of absorbing knowledge to the success factor. The DOSC-model aims to assess successful coopetition comprehensively and therefore also both characteristics have to be considers when determining the CSFs.

While Estrada, Faems, & de Faria (2016) show the positive effect of knowledge sharing on innovation, other authors (Quintana-Garcia & Benavides-Velasco, 2004) were able to prove that knowledge absorption generates competitive advantages for the innovation efforts of a firm. Several sub-factors have been identified as being important to be considered in order to effectively share and absorb knowledge: Constructive conflicts are positively related to knowledge absorption (Bengtsson & Raza-Ullah, 2016). Conflicts are inevitable when opposing interests meet. However, conflicts can lead to effective problem solving as long as such conflicts are managed accordingly (Assael, 1969). Furthermore, diversity in personal

skills benefits knowledge absorption. While similar interests make it easier for a person to bond with others, a heterogeneous set of skills among a team has proven to be essential for team-learning and knowledge absorption because the variety in available skills supports information exchange and fosters creativity at the same time (Soekijad & Andriessen, 2003).

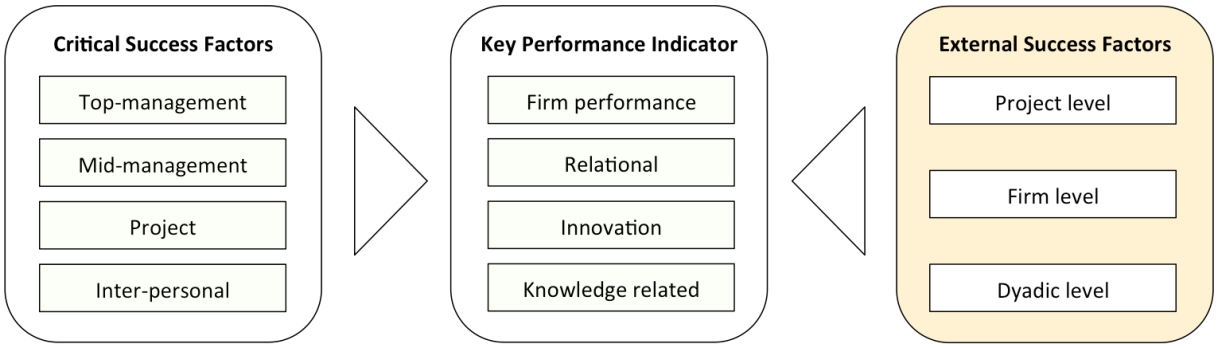
Concluding, the two CSFs at the inter-personal level of the DOSC-model are highly important for the success of coopetition because the employees need to support and realize the coopetition. In order to engage employees, social activities as well as an honest and reliable communicational approach can serve as a catalyst for the development of trust. By encouraging constructive conflicts and a diverse set of skills among the employees knowledge absorption can be promoted.

Table 5: CSFs with corresponding sub-factors at the inter-personal level

1) Trust
• Cohesion • Social interaction • Honesty & reliability
2) Knowledge absorption
• Constructive conflicts • Diversity in personal skills

3.1.2 External success factors

Figure 9: Focus illustration - External success factors



Source: Own figure

One novel contribution of the DOSC-model to coopetition theory is the incorporation of success factors that cannot be influenced by the firm. As mentioned earlier in this paper, the contingency approach is a well-established concept in organizational theory. In recent years,

several authors (e.g. Le Roy & Czakon, 2016; Ritala, 2012) have argued for the importance of contingency factors to the success of coopetition. Since Chin et al. (2008) do not elaborate on this matter, the following sections will seize the topic and present several factors relevant to the success of coopetition that are not directly controllable by the focal firm. In this context, the present paper will refer to such success factors as *external success factors*, as they cannot, unlike the CSFs presented in the previous part, immediately and/or easily be influenced but still affect the outcome of the coopetition. All external s presented in the adjacent chapter were identified through the literature review and, similar to the CSFs, abstracted in order to condense the findings into concepts transformable into the DOSC-model.

In the following, the external success factors are categorized in three levels; each level representing the object of analysis connected to the external success factor. Similar to the classification of CSFs in the previous section, this serves the purpose of providing practitioners with indication on how to address issues of the coopetition. The succeeding paragraphs will aim to follow the same structure as in the chapter about the CSFs: To begin with, the external success factors will be illustrated and their relevance pointed out. Subsequently, sub-factors supporting the external success factors will be presented and at the end of each section a table will summarize the findings.

Project level

The first level that will be elaborated on is the project level. Identical to the project level within the CSFs, this level contains success factors that are relevant on a frequent basis and directly involve or concern the employees working on the coopetition project.

To begin with, *staff competence* has been identified through the literature research as an external success factors: Staff competence is understood as the extent to which employees achieve their goals or satisfactorily implement the coopetition strategy. For example, Dulewicz & Higgs (2000) argue for the relevance of general team competence in order to achieve successful project outcomes. In particular, the external success factors subdivides into two factors: Emotional intelligence, the ability to interact at a social level with other employees, and technical intelligence, the ability to execute subject-specific tasks, are both strongly influential on the project outcome (Baruch & Lin, 2012). Although both intelligence and competence among the employees are vague concepts, their effect on the outcome of the project cannot be neglected. Moreover, the fact that a manager cannot influence both

characteristics immediately makes staff competence applicable to be an external success factors. One could however argue that employees as (human) resources are exchangeable and adjustable. In a real-life environment laws protecting the employees to some extent prevent instant changes to a company's workforce.

Next to staff competence, *recognition* has been identified as an external success factors at the project level. Information exchange and knowledge transfer often occur not in a formal, predefined process but rather at an informal level between team members (Tsai, 2002). Studies show that recognition, the feeling of being perceived as a peer, increases the engagement in information exchange (Soekijad & Andriessen, 2003) and thereby the opportunity for the team and organization respectively to exchange and absorb information. Managers in charge of the coopetition can try to influence recognition by creating a supportive culture in regards to that factor. However, establishing such a culture takes time and demands constants realignment and therefore is not an aspect management can easily manipulate in order to increase the success of coopetition project.

Table 6: External success factors with corresponding sub-factors at the project level

1) Staff competence
• Emotional intelligence • Technical intelligence
2) Recognition

Firm level

External success factors at the firm level apply more general concepts of coopetition than items at the project level. The firm level contains three external success factors whereof *leadership & cultural mind-set* will be delineated first. Leadership & cultural mind-set on the one hand includes the organizational culture, meaning the set of values, beliefs, perceptions and assumptions shared by the employees of the company (Klimas, 2016). On the other hand, leadership & cultural mind-set refers to the competence of the management. Similar to staff competence at the project level, the management capabilities also strongly affect the outcome of a coopetition. The significance of organisational culture stems from its ability to explain a range of outcomes such as innovativeness (e.g. Kamaruddeen, Yusof, & Said, 2009; Valencia, Valle, & Jiménez, 2010) and performance (Zheng, Yang, & McLean, 2010). Furthermore, a cultural mind-set that facilitates and promotes collaboration is important for the development

and maintenance of long-term inter-firm partnerships (Klimas, 2016). The most positive effects on the success of coopetition are achieved when both partners display a supportive organizational culture and moreover also exhibit similar corporate values and beliefs (Klimas, 2016). In regards to leadership or managerial competence respectively, Bengtsson et al. (2015) argue that certain managerial capabilities are necessary in order for a manager to be able to lead a coopetition successfully. For example, the leadership has to demonstrate a general open-mindedness (Gnyawali, Madhavan, He, & Bengtsson, 2016) toward collaboration with a competitor. Furthermore, a manager has to have the capability to deal with coopetitive tensions (Bengtsson et al., 2015) while demonstrating strong consistency in leadership and identity (Bengtsson & Raza-Ullah, 2016) in order to provide guidance and reliability for the members of the coopetition. While one can argue that good leadership always affects the outcome of a project, a competent manager seems particularly critical for coopetition due to the challenges unique to coopetition (cf. 2.3.3).

The second external success factor at the firm level is *firm magnitude*. In this context, firm magnitude consists of three sub-factors that constitute its moderating effect on the success of coopetition. Firstly, firm magnitude relates to a firm's size in terms of number of employees, the availability of resources, and the relevance of the firm on the market. Research (e.g. Gnyawali & Park, 2009; Quintana-Garcia & Benavides-Velasco, 2004) shows that firm size can both positively and negatively affect coopetition. While an increase in size usually is attended by an increase in resource availability and therefore positively affects coopetition, it can also be of negative effect due to a reduction in strategic dynamism of the company (Gnyawali & Park, 2009).

Secondly, a firm's reputation is part of firm magnitude. Having a positive reputation signals to the partner that the focal company is trustworthy, thereby increasing the likelihood of longevity of the coopetition and engagement of the partner (Saxton, 2016).

Lastly, the previous coopetition experience of a firm is part of firm magnitude. Previous coopetition experience can improve the handling of inter-firm conflicts and tensions within the firm due to superior managerial reactions based on the experiences of previous situations. Furthermore previous experience can provide best practices on how to most effectively appropriate insights from the coopetition (Gnyawali & Park, 2009)

Concluding, *project importance* has been identified as an external success factors at the firm level. Project importance refers to the importance of the coopetition project to the focal firm. Depending on the significance of the coopetition to the focal firm, it is likely to invest more in terms of resources and engagement, both positively affecting the outcome of the project (Bouncken & Fredrich, 2012). Several sub-factors compound project importance: Financial value of the project (J.-G. Park & Lee, 2014) for one thing, project complexity (J.-G. Park & Lee, 2014; Soekijad & Andriessen, 2003) for another thing. The financial value of the project influences the project importance due to its connection to the potential profits and losses for the company. Project complexity is part of project importance because it influences the necessity for cooperation. Increasing complexity of the issue can cause a greater dependence on the partner as only a combined effort might promise success (J.-G. Park & Lee, 2014).

Table 7: External success factors with corresponding sub-factors at the firm level

1) Leadership & Cultural mind-set
• Managerial competence
2) Firm magnitude
• Company size • Reputation • Coopetition experience
3) Project importance
• Project value • Project complexity

Dyadic level

The third category of external success factors is the dyadic level. This level includes success factors that are based on the relationship of the two partners engaged in coopetition. Since two different entities are involved in a coopetition, factors that specifically arise due to the relational character of the project need to be included into strategy considerations.

On this matter, *geographic proximity* has been identified as an external success factors. Capaldo & Messeni Petruzzelli (2015), for example, argue that information exchange between organizations is influenced by their geographical distance. The authors indicate that geographic distance hinders direct and frequent communication between alliance partners resulting in poor information exchange. This observation highlights the relevance of the

previously proposed CSF "supportive technology" since the latter can counteract the effects of geographic distance to some extent.

The second external success factor that has been identified is *fit*. Fit takes into account that companies can vary from another in numerous ways and depending on how well the individual differences match, the outcome of the coopetitive engagement is affected. In general, similarities between companies are positively affecting alliance performance because of facilitated communication and more cooperation (Saxton, 2016). Cultural similarity in particular is mentioned in coopetition literature (e.g. Bengtsson et al., 2015; Capaldo & Petruzzelli, 2015) as being influential to the alliance outcome because differences in the organizational culture can complicate communication between the alliance partners. Further, the strategic fit, meaning the complementarity as well as the similarity of strategic interests of the partners influences the success of the coopetition (Saxton, 2016; Soekijad & Andriessen, 2003) and therefore is a sub-factor of fit. Moreover, resource-based fit is part of the external success factor fit. On the one hand, resource similarities can positively affect coopetition (Bleeke & Ernst, 1991; Gnyawali & Park, 2009) because the similarity can facilitate the utilisation of economies of scale and by pooling resources together synergy effects arise which then allow for complex, costly investments. Thereby, resource similarity also creates mutual resource dependency among the partners, which prompts the companies to engage in long-term coopetition (Gnyawali & Park, 2011). On the other hand, resource-base homogeneity can reduce a firm's desire to collaborate as the opportunity to activate new resources for the value creation is reduced with increasing similarity (Y. Luo, 2004).

The last external success factor is *intensity of competition*. Intensity of competition is the extent to which firms are competing on the market (Morris et al., n.d.). This in determined by the market overlap, i.e. the amount of markets the firms directly compete in (Peng et al., 2012). While firms can decide to which extent they want to collaborate, the intensity of competition is not entirely under their control and therefore intensity of competition is categorized as external success factor. A highly competitive market environment e.g. results in more internal tensions and inter-firm conflicts (Bengtsson et al., 2015; Peng et al., 2012). Moreover, partnerships that exhibit high rivalry are more likely to fail, resulting in lower success rates for coopetition (Y. Luo, 2007). Overall, balanced levels of competition are most effective for coopetition because while too little competition reduces constructive conflicts,

too much competition hinders the overall partnership (B.-J. Park, Srivastava, & Gnyawali, 2014).

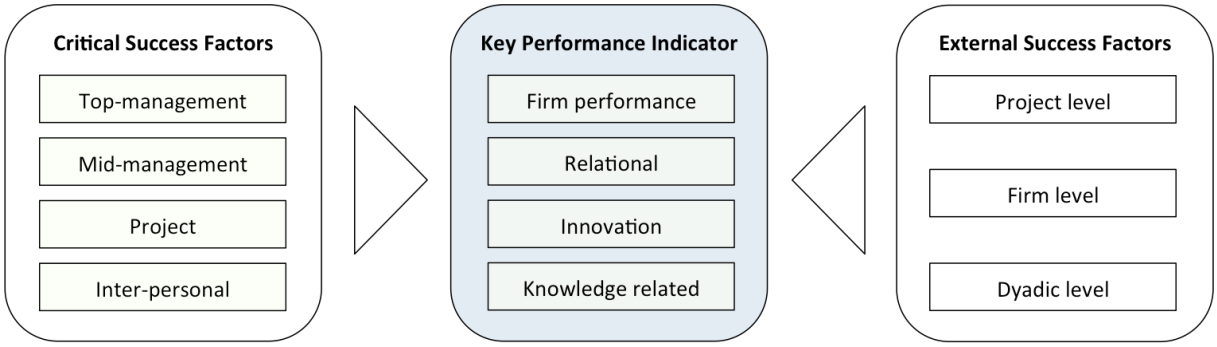
Concluding, one can note that the success of coopetition is influenced by the geographic as well as cultural and resource-based proximity of the partners. In addition, the market environment and the strategic approach in terms of competition and rivalry have an effect on the outcome of a coopetitive alliance.

Table 8: External success factors with corresponding sub-factors at the firm level

1) Geographic proximity
2) Fit • Cultural similarity • Strategic fit • Resource fit
3) Intensity of competition

3.1.3 Key Performance Indicators

Figure 10: Focus illustration - Key Performance Indicators



Source: Own figure

The next sections will present KPIs that have been identified through the literature research as being able to inform about the success of a coopetition and are used in the DOSC-model. It generally has to be noted that KPIs need to be compared to a benchmark such as a competitor or previous business periods in order to carry interpretational value (Peng et al., 2012).

In the model as well as the following sections, the KPIs are arranged in four different categories. The selection of categories is adapted from Bengtsson & Raza-Ullah (2016, p. 10) and the rationale behind this choice of classification is confirmed through the inter-rater

agreement test (2.2.3). In their paper, the authors classify the outcomes of coopetition into four categories, namely *firm performance, relational, innovation,* and *knowledge related*. Since KPIs, within the scope of this paper's definition, measure the success of coopetition and the latter depends on the achievement of the desired outcomes of the coopetition, it seems reasonable to adapt the classification by Bengtsson & Raza-Ullah (2016) for the DOSC-model.

The succeeding paragraphs will aim to follow the same structure as the explanations of the CSFs and external success factors: First the KPI itself and subsequently, supporting sub-indicators will be presented. Each section will end with a table summarizing the findings.

Firm Performance

The first category of KPIs to be discussed is *firm performance*. A number of studies (e.g. Combs & Ketchen, 1999; Y. Liu, Luo, Yang, & Maksimov, 2014) have suggested economic performance measures as necessary when evaluating the success of coopetition. Through the literature review, several economic performance indicators were identified: Market share (Morris et al., 2007), relative market share (Gnyawali & Park, 2011), sales growth and return on investment (X. Luo, Rindfleisch, & Tse, 2007) as well as revenue and profit (Bengtsson & Raza-Ullah, 2016). For the DOSC-model, the identified performance indicators were condensed, resulting in two key performance indicators, namely *competitive position* and *profit.* The former takes into account that the coopetition can be considered successful if it improved the competitive position of the focal firm compared to its main competitors. Competitive position as KPI can be evaluated by comparing the market share of the focal firm. The KPI profit can be obtained by evaluating the financial figures of the focal firm. Various financial ratios such as e.g. return on investment, return on equity or simply the revenue of a company could be used as performance indicator. However, the DOSC-model suggests profit as KPI because the profit development of a company allows direct and important evaluation.

Table 9: KPIs within the category Firm performance

1) Competitive position
2) Profit

Relational

Next to financial aspects, the success of a coopetition can also be measured in regards to its relational performance. This category therefore takes aspects of the partnership into account in order to evaluate the successful outcome of coopetition. Through literature review, duration of the collaboration (Peng et al., 2012), premature termination of the partnership (S. H. Park & Russo, 1996), continuation of coopetition after the initial contractual ending (Dussauge, Garrette, & Mitchell, 2000) and individual evaluation of the partnership (Ketchen et al., 2004) have been identified as performance indicators in regards to the relationship. The DOSC-model combines these performance indicators and proposes the two key performance indicators *longevity* and *perceived success*. Longevity refers to the duration of the coopetition. Although the duration of a competitive engagement depends on the magnitude and complexity of the partnership, the DOSC-model considers longer coopetitive engagements as more successful because they would otherwise be terminated prematurely. Moreover, the KPI perceived success directly takes the evaluation of the management into account. A successful collaboration will result in higher levels of satisfaction with the coopetition among the management of the focal firm and thereby translate into higher values for the KPI perceived success.

Table 10: KPIs within the category Relational

1) Longevity
2) Perceived success

Innovation

Scholars tend to emphasize the importance of coopetition for the innovation capabilities of a company (Garcia & Velasco, 2002; Gnyawali & Park, 2009). Hence, it is reasonable to measure the success of coopetition in terms of its innovation-performance. Through the process of reviewing the literature, several indicators for innovation-performance were identified: Percentage of sales generated with newly developed products (Garcia & Velasco, 2002), overall amount of developed products (Estrada et al., 2016; Quintana-Garcia & Benavides-Velasco, 2004), lead times (Dowling et al., 1996) and the speed with which companies are able to transform information/invention into innovation and innovation into the launch of a product (Giovanni B. Dagnino & Rocco, 2009), and R&D- or product development costs (Simoni & Schiavone, 2011). Considering the findings of the literature

review and in adaption to Stojanovic (2015), the DOSC-model suggests *innovation intensity, innovation quantity, innovation speed, and innovation costs* as KPIs for coopetition. The KPI innovation intensity refers to the percentage of revenue generated from new products within the product portfolio of a firm (cf. Cooper, Edgett, & Kleinschmidt, 2004). Innovation quantity measures the amount of developed products related to the coopetition. The KPI innovation speed focuses on the time an innovation needs until it is introduced the market. Lastly, innovation costs takes the necessary budget into account and measures the amount spent during the innovation process.

Table 11: KPIs within the category Innovation

1) Innovation intensity
2) Innovation quantity
3) Innovation speed
4) Innovation costs

Knowledge related

The outcome of coopetition can be measured in relation to the knowledge created through the coopetition. Knowledge related outcomes partially serve as prerequisite for successful innovation (Bengtsson & Raza-Ullah, 2016) but moreover include a second dimension. The following performance indicators were identified through the review of existing literature and relate to the two dimensions of knowledge related outcomes.

The first performance indicator to consider when measuring the success of coopetition in regards to the created knowledge is the usefulness of the created knowledge (Ghobadi & D'Ambra, 2013). Only knowledge and information that can be used to create value and generate financial benefits serves a purpose for a business and therefore the knowledge created through coopetition has to be evaluated in this regard. Another performance indicator found in the literature is the satisfaction with the created knowledge (Ghobadi & D'Ambra, 2013). The subjective satisfaction with knowledge is of importance because only knowledge that receives appreciation from the management of the focal firm can be used for further application in the company. The last performance indicator that has been identified is the amount of copied products by the coopetition partner during and after the coopetition (Faems et al., 2010). This performance indicator accounts for the second dimension of knowledge related performance indicators mentioned above. While the first two indicators evaluate the

created knowledge itself, the latter measures the successfulness of the focal firm in its prevention of knowledge spillover. Depending on the competitive intensity between the partners of the coopetition, knowledge protection can become an essential aspect of the overall success of the coopetition (Andersen, 2008). Within the DOSC-model, the presented performance indicators are combined into two key performance indicators. The first being *knowledge value.* It includes the measurement of the usefulness as well as the satisfaction of the created knowledge. The second KPI is knowledge protection.

Table 12: KPIs within the category Innovation

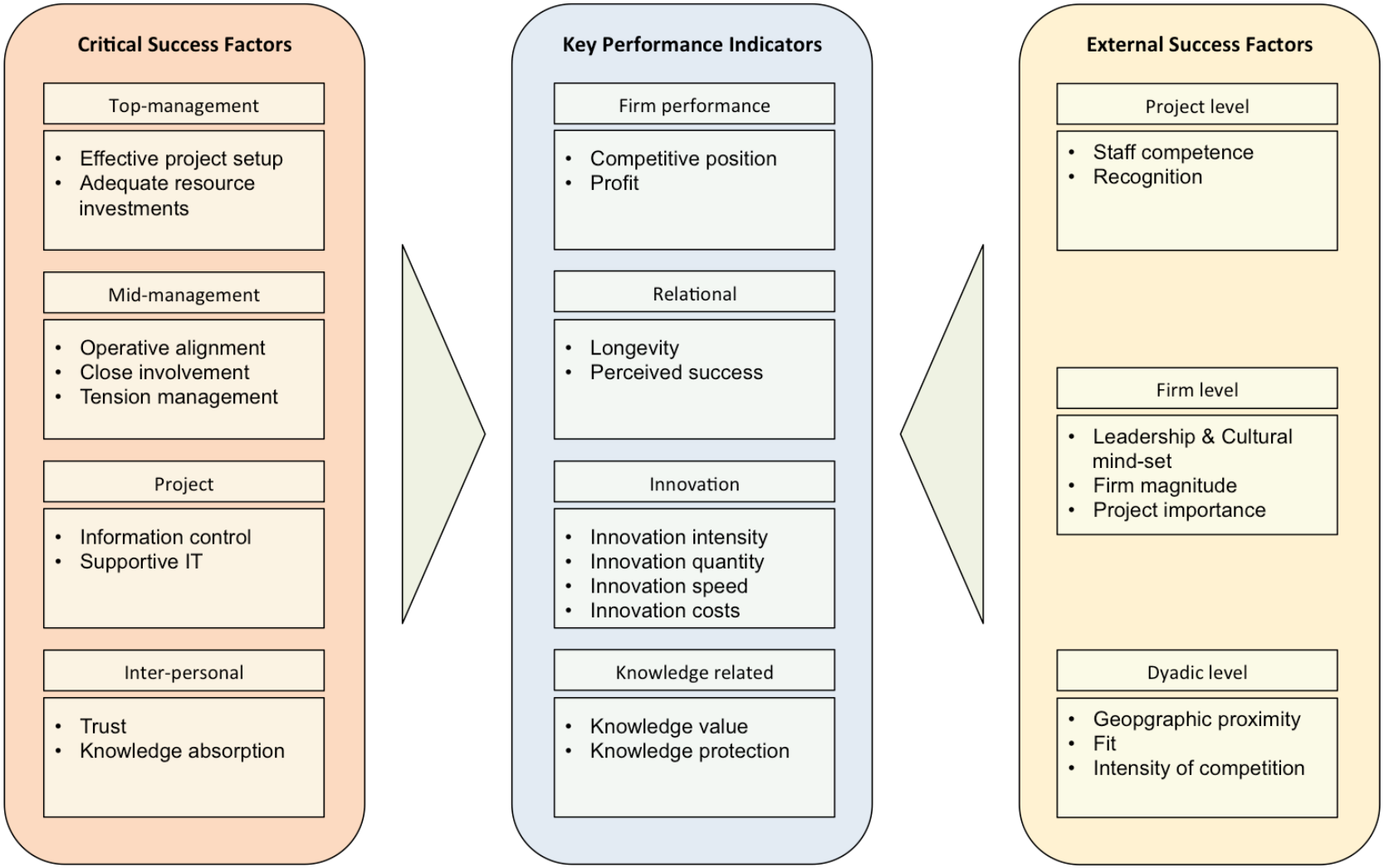
1) Knowledge value
2) Knowledge protection

3.2 The final model

The previous sections introduced the numerous components, that combined compose the DOSC-model and explained the reasoning behind the design of the model. The present section will present the final model in its illustrated form (Figure 11).

The presented DOSC- model visually summarizes the findings from this thesis. It constitutes of three main columns, comprising the elements of the model: The CSFs, the KPIs, and the external success factors. It is important to take notice of the arrangement of those columns. The CSFs on the left side, and the external success factors on the right side of the model frame the KPIs in the middle. This illustrates the influence the CSFs and the external moderatos have on the outcome of the KPIs. Further, each column consists of the categories and their corresponding items described in (3.1). While the KPIs give information on the success of the coopetition, the external success factors and the CSFs help assessing the likelihood of overall success. Higher achievement-levels of CSFs and external success factors result in an improvement of the relevant KPIs.

Figure 11: The DOSC-model



Source: Own figure

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4 Discussion

In the introduction, this paper identified the need for action in regards to the understanding of coopetition strategy. Although coopetition as a theoretic concept has already been topic in numerous scientific studies (e.g. Brandenburger & Nalebuff, 1996; Gnyawali & Madhavan, 2001; Lado et al., 1997) only the model by Chin et al. (2008) tries to offer a framework for a successful coopetition strategy. Hence, the aim of this study was to explore which factors determine successful coopetition and also how success of coopetition can be measured. Through literature review this study was able to determine that 17 success factors (sub-factors) and 18 contingency aspects are considered important to the outcome of coopetition. Moreover, the 17 success factors can be consolidated into 9 CSFs, and the 18 contingency aspects can be subsumed into 8 external success factors. Together, the CSFs and the external success factors determine the success of a coopetitive relationship. The success of a coopetition can be assessed through evaluation of nine key performance indicators. From these findings, the study sought to develop a new coopetition strategy model, connecting critical success factors and external success factors to the key performance indicators of successful coopetition. The resultant model is the DOSC-model, which can be used as a tool to evaluate a coopetitive relationship.

It is interesting to note that the coopetition strategy model by Chin et al. (2008), which initially was used as inspiration and example for the DOSC-model partially suggests similar CSFs as the DOSC-model, although its research approach in regards to the identification of success factors was different from the one used in this study. Commonalities are for example the naming of trust and leadership in both models as critical success factors. Although the importance of both CSFs for a coopetitive relationship has already been discussed in this paper, the reason for the appearance of CSFs in both models could be a general significance of certain CSFs for any business relationship. Further, the Chin-model suggests a hierarchical order for the CSFs and differs in this regard from the DOSC-model. The DOSC-model does not differentiate the importance of CSFs because, by definition, all factors included to the model are considered critical to the outcome of a coopetitive relationship

Most importantly however, the novel contribution to coopetition research of this study and particularly the DOSC-model is not only the mere identification of determinants of coopetition, since they, at least in their primary form, were extracted from existing literature.

Rather, the remarkable contribution of the DOSC-model is that it also takes into account that not all determinants are immediately susceptible to manipulation by the focal firm. Moreover, the DOSC-model offers less generic concepts as determinants of coopetitive success compared to the Chin-model, which makes the model more applicable for coopetition strategy assessments. Thus, the range for possible applications of the DOSC-model is not limited to theoretical examination of coopetition success, particularly also because it offers KPIs to measure the performance of the coopetitive engagement and therefore exceeds the range of the Chin-model. When measured in the proposed manner, the incentive to pursue coopetition is associated with enhanced firm performance. This might suggest coopetition primarily a strategy for leveraging resources. Although in line with the presented drivers of coopetition previously in this thesis, it seems that coopetition as a strategy also entails aspects of i.e. risk mitigation especially for smaller firms.

This leads to limitations the present thesis is confronted with. One limitation of the study stems from its conceptual nature. Since a research review was chosen as study approach for this thesis, the findings of the study were a priori limited to already existing knowledge on coopetition strategy. Moreover, some of the suggested determinants could be placed in several of the proposed categories and even potentially overlap. For example affects the adequate resource investment of a company also other CSFs such as the availability of supportive IT or the overall set up of the coopetition since resource investments are crucial for any major change within a company. Further, a possible connection between KPIs within the category of firm performance and the category of innovation cannot be denied. Indisputable, successful innovation plays a crucial role in improving e.g. a firm's profit and competitive position.

Another avenue for research, which was beyond the scope of this study, is to clarify how exactly the KPIs should be used to evaluate the success of coopetition. Peng et al. (2012) for example argue that the success of coopetition can only be measured if the overall market performance is taken into account and more than one business period after a competitive engagement is compared to periods before the alliance. This way, the performance of a coopetition could be evaluated adjusted to other external influence factors not considered in the DOSC-model.

Since the DOSC-model aims to provide practical value in regards to coopetition strategy assessment to companies, an interesting avenue for future research could be to further

explore to which extent the DOSC-model is applicable to realistic, modern company structures and challenges. Moreover, the KPIs measuring the success of coopetition suggested by this study could be topic of further research. Performance measurement is difficult to generalise and therefore an investigation, further exploring the practicability of the suggested KPIs for companies, would add interesting value to the DOSC-model.

5 Conclusion

For a firm, pursuing coopetition as a business strategy means to simultaneously compete and cooperate with competitors. A successful outcome of coopetitive partnerships is difficult to achieve. In fact, studies suggest that more than 50% of coopetitive alliances fail to achieve the desired outcomes (e.g. S. H. Park & Ungson, 2001) and scientific research yet only offers deficient models for successful coopetition strategies. Coopetition is a paradoxical and complex concept because it combines conflicting business interests. While a coopetitive strategy is demanding and can pose risks to a firm, the numerous drivers of coopetition at the same time promise high rewards. In order for a firm to avoid the risks and successfully engage in coopetition, several determinants are crucial to consider. These determinants can be defined as either critical success factors, or external success factors. Moreover, it is recommendable to use key performance indicators as a tool to measure the performance or respectively success of a coopetitive partnership. The DOSC-model combines these insights.

This study has set out to improve the understanding of factors affecting a firm's likelihood of achieving its desired outcomes of a coopetitive engagement and furthermore provide aid in form of a model for coopetition strategy management. While the literature review conducted in this paper has shed light on determinants of successful coopetition, the developed DOSC-model is a valuable tool for coopetition strategy management.

As quoted in the introduction of this paper, modern management theory recognized that a company is less likely to strive if it considers its business as a war. Coopetition is a modern, alternative strategy approach to ensure a company's growth and profit. By utilizing the DOSC-model, the outcome of coopetition can be better evaluated and the likelihood of a successful coopetitive engagement increased.

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Appendix

Inter-rater agreement questionnaire p. 1/3

Categorization of success factors

The following is a list of possible success factors of coopetition.

1. **Please choose one category for each item listed**
   Mark only one oval per row.

	Top-management	Mid-management	Project	Inter-personal
Effective project setup	◯	◯	◯	◯
Adequate resource investments	◯	◯	◯	◯
Operative alignment	◯	◯	◯	◯
Close involvement	◯	◯	◯	◯
Tension management	◯	◯	◯	◯
Information control	◯	◯	◯	◯
Supportive IT	◯	◯	◯	◯
Trust	◯	◯	◯	◯
Knowledge absorption	◯	◯	◯	◯

Inter-rater agreement questionnaire p. 2/3

Categorization of external success factors

The following is a list of possible external success factors

3. **Please choose one category for each item listed**
   Mark only one oval per row.

	Project level	Firm level	Dyadic level
Staff competence	◯	◯	◯
Recognition	◯	◯	◯
Leadership & Cultural mindset	◯	◯	◯
Firm magnitude	◯	◯	◯
Project importance	◯	◯	◯
Geopgraphic proximity	◯	◯	◯
Fit	◯	◯	◯
Intensity of competition	◯	◯	◯

Inter-rater agreement questionnaire p. 3/3

Categorization of external moderators

The following is a list of possible external moderator

3. **Please choose one category for each item listed**

Mark only one oval per row.

	Project level	Firm level	Dyadic level
Staff competence	◯	◯	◯
Recognition	◯	◯	◯
Leadership & Cultural mindset	◯	◯	◯
Firm magnitude	◯	◯	◯
Project importance	◯	◯	◯
Geopgraphic proximity	◯	◯	◯
Fit	◯	◯	◯
Intensity of competition	◯	◯	◯