Creating value through alliance experience: An empirical investigation of R&D alliances in the biopharmaceutical industry

A thesis

by

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AMM	Alliance management mechanisms
CAR	Cumulative abnormal return
CBV	Capability-based view
CEO	Chief executive officer
CRSP	Centre for Research in Security Prices
e.g.	for example, for instance (Latin*: exempli gratia*)
et al.	and others (Latin: *et alii/alia*)
FLU	Firm-level uncertainty
GAE	General alliance experience
GAR	General alliance rhythm
IBES	Institutional Brokers' Estimate System
i.e.	that is to say; in other words (Latin: *id est*)
JV	Joint venture
M&A	Mergers and acquisitions
OL	Organizational learning
OLS	Ordinary least squares
PAR	Partner-specific alliance rhythm
R&D	Research and development
RECAP	Recombinant Capital database
S.D.	Standard deviation
SEC	Securities Exchange Commission
SIC	Standard Industrial Classification
SNT	Social network theory
TCE	Transaction cost economics
TMT	Top management team
WRDS	Wharton Research Data Services

Abstract

This thesis investigates the effect of alliance experience onto stock-market value creation. Building on existing research, this thesis centres on the distinction between general alliance experience (i.e. the overall experience of managing alliances) and relational experience (i.e. the experience of managing alliances with the same partner). As existing research has identified significant heterogeneity in value creation from these types of alliance experience, the purpose of this thesis is to investigate conditions under which alliance experience is more valued by investors. This thesis therefore disentangles alliance experience into three further dimensions, namely the *quality* of previous relational experiences, the *interrelationship* among the two experience types and a *temporal* dimension of how the two experience types are accumulated in different rhythms over time.

Firstly, by using signalling theory, I hypothesize that the quality of the previous partnerships emphasized at announcement positively influences value creation and this effect is moderated by signaller, receiver, and intermediary characteristics. Secondly, in order to investigate the interrelated effect of both types of experience, resource-based, learning and trust-based arguments are used to build an interrelated alliance experience theory. I argue that high levels of general alliance experience create overconfidence in alliance management processes and this negatively affects the value creation of relational experiences. This effect is hypothesized to vary based on firm characteristics. Thirdly, building on organizational learning, resource-based and trust-based perspectives, I propose that both general alliance and relational experiences are negatively affected by irregularity in the rhythm in which they are accumulated.

This thesis investigates the effect of these *quality*, *interrelationship* and *temporal* dimensions onto value creation through multiple event studies in the global biopharmaceutical industry in a sample of R&D alliances between 2003 and 2012. Results indicate general support for the arguments and provide evidence that experience-related contingencies affect firms' ability to create value from alliance experiences.

Key words: *Strategic alliance, alliance experience, general alliance experience, relational experience, event study, experience quality, experience spill-over, rhythm*

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CHAPTER 1: INTRODUCTION

Strategic alliances are important means for organizations to enter new markets, access knowledge, develop capabilities or improve current market position (e.g. Das & Teng, 2000b; Eisenhardt & Schoonhoven, 1996; Grant & Baden-Fuller, 2004; Hamel, Doz, & Prahalad, 1989; Hitt, Dacin, Levitas, Arregle, & Borza, 2000; Mowery, Oxley, & Silverman, 1996; Parkhe, 1991). Particularly, in competitive environments where flexibility is key to success (D'Aveni, 1994), the temporary nature of alliances enables organizations to expand their firm boundaries while at the same time limit their resource commitments. As a result, the number of strategic alliances worldwide has been growing exponentially (e.g. Hagedoorn, 2002). One industry in which alliances are particularly important is the biopharmaceutical industry, where the complexity of innovation, efficiency pressures and the uncertainty associated with the R&D process drive organizations to engage in multiple strategic alliances (e.g. Hess & Rothaermel, 2011). While growth rates in alliance formations have slowed down over the years, organizations perception of the importance of alliances has increased. For instance, the 'IBM CEO Survey 2012' has indicated that the importance of alliances to CEOs has grown by around 25% compared to 2008. This actually means that nowadays around 70% of CEOs regard strategic alliances as essential to their organizations future competitiveness.

Despite such increased emphasis to engage in strategic alliances, difficulties in managing them remain on high levels. Around 30 to 70% of all alliances are classified as failures (Kogut, 1989; Lunnan & Haugland, 2008; Park & Russo, 1996). When managing strategic alliances organizations are essentially faced with a dilemma. On the one hand, the fast-paced nature of the business environment makes alliances essential. Yet, on the other, the temporary nature makes them particularly difficult to manage. More specifically, alliances are subject to severe complexity arising from tensions between collaboration and competition among the partners (Hamel et al., 1989). As organizations choose to ally in a distinct product area, each partner remains independent and thus faces the danger of strengthening a competitor in the same or other areas. Consequently, organizations may not effectively trust each other or if they do, trust may get exploited (e.g. Das & Rahman, 2002). Therefore, organizations face an important trade-off: Either to control the alliance partner and thus, limit flexibility and possibly knowledge exchange or to trust the partner, thereby improving flexibility

while risking exploitation by the partner (e.g. Gulati & Singh, 1998). As each alliance is 'unique' towards either control or trust requirements, understanding the respective dangers and benefits of each alliance is challenging (De Man, 2014).

Firms differ in their effectiveness to manage such trade-offs and effectively their alliance management. Hewlett Packard or Eli Lilly, for instance, are well-known for their alliance management practices (Dyer, Kale, & Singh, 2001; Sims, Harrison, & Gueth, 2001). One key component to improve alliance management identified in existing literature is to accumulate alliance experiences. Such experiences enable firms to 'learn by doing' (Epple, Argote, & Devadas, 1991). As firms increase their experience with alliances, they move further down the learning curve and thereby increase their effectiveness (Epple et al., 1991; Huber, 1991). In the alliance context, such firm-level alliance experiences are value creating (Anand & Khanna, 2000a; Hoang & Rothaermel, 2005). More specifically, such experiences provide important learning opportunities (Sampson, 2005), while also improving legitimacy among potential future partners (Stuart, Hoang, & Hybels, 1999). Essentially, experience is a unique component of developing replicable firm-level 'alliance capabilities' as it may improve alliance value creation (Kale, Dyer, & Singh, 2002).

The main problem the literature identifies is that the simple accumulation of alliance experience is insufficient for explaining organizations superior alliance management (e.g. Sampson, 2005; Simonin, 1997). For instance, while accumulating experience may provide expertise to individuals in organizations, it does not necessarily address how this expertise is utilized and shared. Building on the capability-based view of the firm, experience by itself may only provide means to generate routines necessary to apply lessons learnt from experiences (e.g. Helfat & Peteraf, 2003; Nelson & Winter, 1982; Zollo & Winter, 2002). However, in order to generate effective alliance capabilities, more than the accumulation of experience is needed. Consequently, researchers have called for studies to "go beyond semi-automatic stimulus-response processes and tacit accumulation of experience" (Zollo & Winter, 2002: 341) as studies investigating these provide only "crude approximations" (Kale et al., 2002: 750) of the capability-building process.

Research has therefore branched out into two different directions to explain how firms can generate value from gaining alliance experience. One branch of

research focuses on investigating mechanisms other than experience which can facilitate the further utilization of experiences. Such alliance management mechanisms have the objective to capture, store and disseminate experiences throughout the organization (Heimeriks, Duysters, & Vanhaverbeke, 2007; Kale et al., 2002; Kale & Singh, 2007) in order to complement experience in capability development (Zollo & Winter, 2002). In the context of alliances, research finds that the institutionalization and integration of knowledge, alliance functions and knowledge management processes facilitate alliance value creation (Dyer & Singh, 1998; Heimeriks & Duysters, 2007; Heimeriks et al., 2007; Kale et al., 2002; Kale & Singh, 2007).

Another stream of alliance research, however, continues to focus on how experience by itself can generate value (e.g. Gulati, Lavie, & Singh, 2009; Hoang & Rothaermel, 2005; Zollo, Reuer, & Singh, 2002). This stream of research has recognised that experiences "lie at the foundation of building alliance capability" (Kale et al., 2002: 750). As they are essentially inputs to the learning mechanisms described above, understanding the impact of alliance experience on developing alliance capabilities is essential. As of now, studies have focused on the identification of various alliance experience *types* and how these impact value creation differently. More specifically, previous studies have identified differences in the importance of alliance experience in general (General alliance experience) and the experience with the same partner over multiple alliances (Relational experience) (Gulati et al., 2009; Hoang & Rothaermel, 2005; Reuer & Zollo, 2005; Zollo et al., 2002). More importantly, research has actually found that these experience types affect entirely different levels of capabilities. Whereas general alliance experience (GAE) impacts firm-level processes, so-called alliance capabilities, relational experience impacts dyad-level processes, thus very specific processes with the same partner, so-called relational capabilities (Dyer & Singh, 1998; Kale, Singh, & Perlmutter, 2000; Wang & Rajagopalan, 2015). The value creation ability of experiences differs as well, with relational experience having more positive influences onto value creation than general alliance experience (Gulati et al., 2009; Zollo et al., 2002).

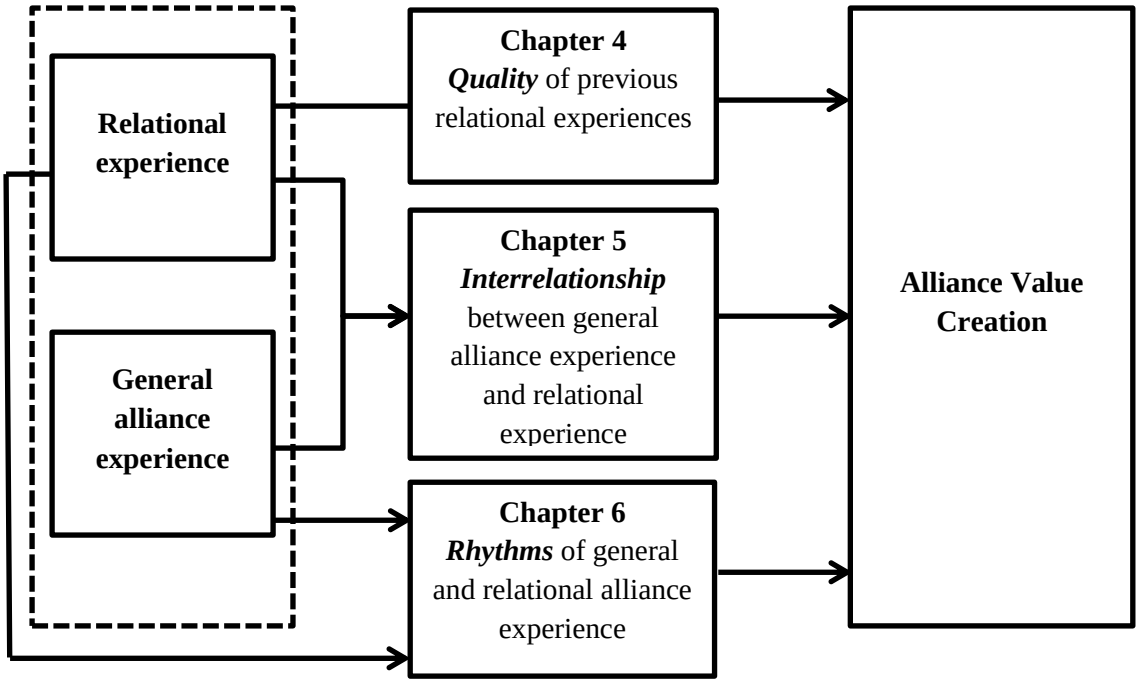
This thesis builds on this second stream of research, focusing on alliance experience itself and the distinction between firm-level alliance experiences and dyad-level relational experiences. While prior studies have improved our understanding that such alliance experience types have different value creation impacts, significant

unexplained heterogeneity remains in the literature with several studies finding both positive (Anand & Khanna, 2000a; Gulati et al., 2009; Kale et al., 2002; Zaheer, Hernandez, & Banerjee, 2010) and no or even negative value creation effects (Hoang & Rothaermel, 2005; Sleptsov, Anand, & Vasudeva, 2013; Swaminathan & Moorman, 2009; Wassmer & Dussauge, 2012; Yang, Zheng, & Zaheer, 2015).

While this heterogeneity has been recognized in prior studies (Gulati et al., 2009; Wang & Rajagopalan, 2015), existing research has so far considered factors influencing the value creation ability of alliance experiences only to some extent. Existing studies have differentiated among different alliance experience *types* and investigating various firm, environment and partnership characteristics which facilitate the value creation of these experience types (Gulati et al., 2009; Reuer & Zollo, 2005; Zollo et al., 2002). However, these existing studies have only provided a starting point to further investigate "the importance of differentiating alliance experience trajectories" (Zollo et al., 2002: 711). Surprisingly, the way experiences, thus the 'trajectories', are accumulated has not received a lot of attention in existing literature. In order to fill this research gap, this thesis explores which other experience *dimensions* may contribute to explaining how alliance experience can facilitate the development of alliance value creation (please see **Figure 1.1** on the next page). This leads to the following overarching research question:

How do different dimensions of both firm-level alliance experience and dyad-level relational experience contribute to alliance value creation?

FIGURE 1.1: Overview of empirical chapters



In order to answer this overarching research question, the first empirical chapter (Chapter 4) investigates a ***quality dimension*** of experience in the context of repeated partnerships, thus relational experiences. This is in contrast to existing literature which has primarily focused on the *quantity* of prior experiences. While organizations may have accumulated a large number of such experiences over time, these may or may not have been value creating for firms (Goerzen, 2007; Gulati et al., 2009; Zollo et al., 2002). Investigating the quality of previous alliance experiences provides further clarity as to whether prior experiences have actually been valuable for firms and thereby contribute to the development of dyad-level relational or firm-level alliance capabilities, respectively. In line with this, previous studies such as Hoang and Rothaermel (2005: 343) have called for more research in this area by stating that "alliance experience variables should also reflect the *quality* (…), not only their *quantity*." As the first study using signalling theory in the context of repeated partnerships, I therefore investigate whether firm executives' sending signals to investors about the quality of prior experiences with the same alliance partner may reflect the development of a relational capability and thus is reflected in a positive value creation for the announcing firm. Signalling theory predicts that executives will only send such signals about the quality of prior partnerships if the partnership is

indeed effective and thus a relational capability may have been developed. Otherwise, executives may face reputation costs. Thus, not signalling these prior experiences may therefore indicate that capabilities have not been developed and firms' relational experience means that they may have entered repeated partnerships for inertial reasons. Understanding that identifying the actual quality of a previous experience is challenging, this chapter investigates the *perceived* quality from an external investor perspective. More specifically, it aims to investigate whether such quality signals sent by executives positively impact the alliance value creation. Moreover, this chapter aims to investigate factors which mitigate or exacerbate the effect of these signals. The research questions of Chapter 4 are therefore:

How does the signalling of relational experiences impact the valuation of a subsequent alliance? What impact do signaller, intermediary and receiver characteristics have on the effect of the signal?

The second empirical chapter (Chapter 5) investigates an ***interrelationship dimension*** between both firm-level general alliance experience and dyad-level relational experience and their impact on value creation. While existing research has differentiated between experience types of dyad-level relational and firm-level alliance experience (e.g. Gulati et al., 2009; Hoang & Rothaermel, 2005; Zollo et al., 2002), such experience types have largely been considered in isolation. Existing research in other corporate development fields has found, however, that different experience types can be interrelated as experience in one type may positively or negatively spill-over onto another (e.g. Bertrand & Capron, 2015; Mulotte, Dussauge, & Mitchell, 2013; Zollo & Reuer, 2010). Drawing on organizational learning and resource-based literature, this chapter develops theory for a spill-over effect between firm-level general alliance experience and dyad-level relational experience. More specifically, I argue that high levels of general alliance experience may not only have declining effects on value creation due to overconfidence, but this may also decrease the effect of relational experiences onto alliance value creation, thus leading to a spill-over effect. Moreover, I investigate whether such a spill-over effect is moderated by firm-level uncertainty and the alliance management mechanisms. The research questions of Chapter 5 are therefore:

How does the extent of firm-level general alliance experience (GAE) influence the value creation effects of dyad-level relational experiences? How do firm-level uncertainty and alliance management mechanisms influence the interrelationship between the two levels of experience?

The third empirical chapter (Chapter 6) investigates a ***temporal dimension*** of both general alliance experiences and relational experiences and their effect on value creation. While experience is a temporal dimension by itself, the accumulation of it over time may vary significantly causing different demands for organizations to utilize lessons learnt from experience. More specifically, I investigate how the accumulation of both alliance and relational experiences in different temporal rhythms over time affects value creation. Recent research has indicated that such rhythms are important for explaining performance heterogeneities in the context of alliances (e.g. Shi & Prescott, 2012). While this has helped our understanding of rhythms, we do not know whether this relates to the rhythm of general alliance experience only or also to repeated partnerships. Moreover, it is unclear how firm-specific factors influence the ability to mitigate or exacerbate the impact of such rhythms on value creation. This chapter therefore draws on the organizational learning, resource-based and inter-organizational trust literature to argue that irregularity in accumulating alliance and relational experiences has negative value creation effects. The chapter also identifies firm-specific factors that may mitigate or exacerbate the negative effects of irregularity in accumulating alliance or relational experiences, respectively. The research questions of Chapter 6 are therefore:

What effect do irregular General Alliance Rhythms (GAR) and Partner-specific Alliance Rhythms (PAR) have on alliance value creation? How can slack resources, absorptive capacity, and GAE mitigate or exacerbate the potentially negative effect of irregular GARs and PARs on alliance value creation, respectively?

In order to investigate the effect of these three experience dimensions onto alliance value creation, I study the formation of non-equity strategic alliances in the global biopharmaceutical industry over a ten-year period between 2003 and 2012. The biopharmaceutical industry is in this regard a frequently used context in studies for strategic alliances due to their high alliance activity and the importance of non-equity alliances to competitiveness in the industry (Hagedoorn, 2002; Hagedoorn & Narula, 1996). In order to investigate the effect of the various experience dimensions onto

alliance value creation, I use a stock-market based measure of alliance value creation generated from an event study. Frequently used in the strategic alliance field, such a methodology has been shown to provide valuable insights into the role of experience in alliances from an investor perspective (e.g. Anand & Khanna, 2000a; Das, Sen, & Sengupta, 1998; Gulati et al., 2009; Kale et al., 2002; Koh & Venkatraman, 1991; Merchant & Schendel, 2000).

This thesis addresses various issues which persist in the literature on strategic alliances. Most importantly, this thesis finds that alliance experience is critical to creating value from alliances. This contributes to previous studies which identify the importance of alliance experience in predicting the value created from each alliance (e.g. Anand & Khanna, 2000a; Gulati et al., 2009). However, findings of this thesis provide evidence that more fine grained approaches to alliance experience are needed as research has shown that the interpretability of experience depends on numerous aspects of experience itself (e.g. Levitt & March, 1988). By developing a quality, interrelationship, and temporal dimension, this thesis provides a potential starting point for deviating from count-based measures of experience to more fine-grained measures investigating the actual effectiveness of experience accumulation. This thesis therefore also contributes to studies investigating the importance of experience in capability development. While previous studies have oftentimes emphasized how important institutionalized mechanisms are in the way firms can benefit from experience (e.g. Crossan, Lane, & White, 1999; Helfat & Peteraf, 2003), this thesis takes a step back and finds that the importance of how experiences are actually accumulated may even be more critical than institutionalized mechanisms. In particular, investors who cannot observe such mechanisms directly through publicly available information may rely more heavily on such publicly available information of experience. Moreover, by investigating experience dimensions, this thesis contributes to studies which have investigated contingency effects in the strategic management field (e.g. Contractor, 2012). More specifically, this thesis finds that the quality, interrelationship, and the temporal dimension of alliance experience represent contingencies for creating value from alliance experience. This thesis also has managerial implications. Most importantly, findings indicate that investors react significantly to experience-specific information. As the announcement of alliances in the form of press releases triggers investment reactions by investors, findings of this

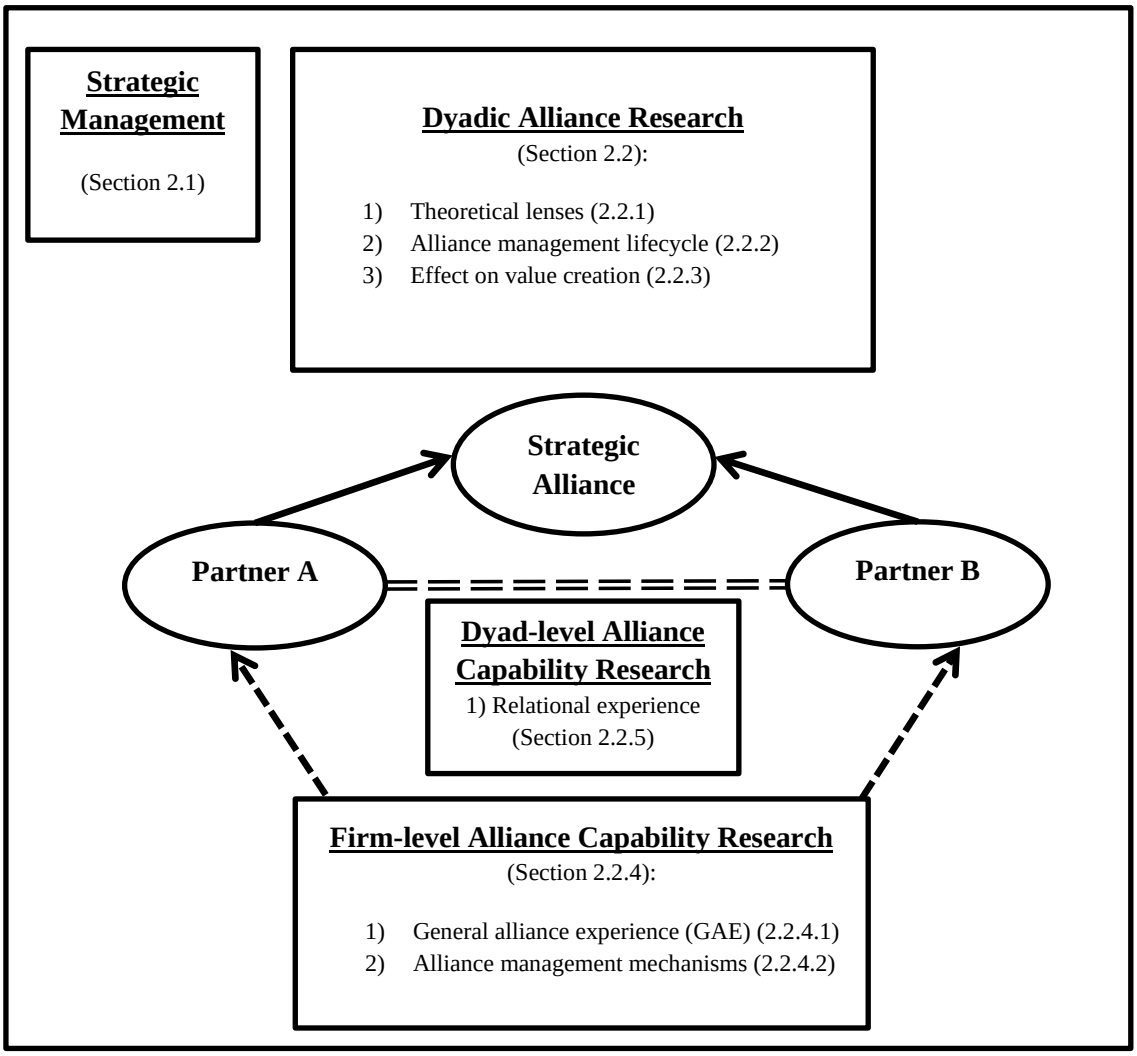
thesis indicate that managers of announcing firms may actively influence how investors perceive these experience dimensions through, for instance, impression management in alliance press releases.

This thesis is structured as follows. Firstly, the Chapter 2 provides an overview of the broader strategic alliance literature. Secondly, Chapter 3 describes the methodological underpinning for the three empirical chapters. This methodology chapter aims to delineate the overarching research philosophy, methods and the key dependent, independent and control variables used throughout all three empirical chapters. Thirdly, the abovementioned empirical chapters then follow in Chapters 4, 5, and 6. All three empirical chapters consist of a brief introduction, theory and hypotheses, methodology, results and discussion sections. Fourthly, a general discussion and conclusion section in Chapter 7 provides an overview how the various results from the empirical chapters link together in answering the abovementioned research question. Moreover, general contributions of this thesis are provided.

CHAPTER 2: RESEARCH ON STRATEGIC ALLIANCES WITHIN THE FIELD OF STRATEGIC MANAGEMENT

This literature review provides an overview of the strategic alliance literature with a particular emphasis on how firms can generate value from strategic alliance experiences. Research on strategic alliances is embedded in the field of strategic management. In order to move from the general to the more specific, this review firstly provides a short overview of the strategic management field in Section 2.1 before considering alliance research more specifically. As a first step, dyadic alliance literature is introduced in Section 2.2. This stream of literature is primarily concerned with the formation and management of individual alliances between two alliance partners. As firms engage in dyadic strategic alliances, researchers have used a multitude of different theoretical perspectives investigating how, when, and with which objectives firms engage in alliances. I introduce these in Section 2.2.1, before I review literature on the differences in governance mechanisms for such alliances and the management of the alliance lifecycle from formation to post-formation in Section 2.2.2. The ways in which strategic alliances impact value creation has also been of particular interest to researchers and literature is reviewed in Section 2.2.3. As existing literature finds that a significant amount of alliances do not meet the performance expectations (e.g. Park & Ungson, 2001), the remaining part of the literature review focuses on research which investigates how firms improve their alliance management by gaining so-called alliance capabilities (e.g. Heimeriks et al., 2007). In this line of reasoning, existing research has distinguished between firm- and dyad-level alliance capabilities (e.g. Wang & Rajagopalan, 2015). I first review literature on firm-level alliance capabilities in Section 2.2.4. This subsection is further divided into two primary components as identified by existing literature: General alliance experience and alliance management mechanisms (Anand & Khanna, 2000a; Heimeriks et al., 2007). Existing research finds that beyond firms' ability to more successfully manage alliances, alliance partners can among themselves develop such capabilities. These capabilities rest on the partnership level between the two partnering companies, so-called dyad-level relational capabilities (Dyer & Singh, 1998). These are reviewed in more detail in Section 2.2.5. A graphical overview of the various literature review sections is provided in **Figure 2.1** on the next page.

FIGURE 2.1: Literature review overview



2.1 Strategic management

The field of strategic management has started to develop in the 1960's with the works of Chandler (1962) on structure and Ansoff (1965) on corporate planning. Due to its long history, strategic management has various definitions. One of the earliest definitions by Alfred Chandler (1962) emphasizes that the objectives of strategic management are "the determination of the *long-run goals* and *objectives* of an enterprise" and how organizations tend to achieve these objectives through "the allocation of resources" (Chandler, 1962: 16). Essentially, strategic management therefore "consists of the *analysis*, *decisions*, and *actions* an organization undertakes in order to *create* and *sustain competitive advantages*" (Dess, Lumpkin, Eisner, & McNamara, 2014: 7). This relates to the planning of deliberate strategies and the

implementation of these within the organization. These strategic choices may happen on the business unit level, or at the level of the corporation.

Grant (2002: 72) defined strategic management by asking two key questions: "*where* does the firm compete and *how* does it compete?" The latter ('How?') refers to business-level strategy and is concerned with issues of market positioning and how firms can achieve competitive advantage in the markets they operate in. Most fields of strategic management are based on the business-level of a firm. An overview over the strategic interest groups of the Strategic Management Society nowadays shows twelve different groups of which corporate strategy is one. For instance, other fields refer to competitive strategy, behavioural strategy, strategy practice, and stakeholder strategy. The former question ('Where?') refers to corporate-level strategy and deals with issues of firm scope or 'domain selection' and where and by which means firms select businesses to operate in (Grant, 2002).

2.2 Strategic alliances

Strategic alliances are one key option for scope expansion. They are defined by Gulati (1999) as: "(...) any voluntarily initiated cooperative agreement between firms that involve exchange, sharing or codevelopment, and it can include contributions by partners of capital, technology or firm-specific assets" (Gulati, 1999: 397). Such partnerships can consist of two partners in dyadic alliances or more than two partners in multi-partner alliances (Lavie, Lechner, & Singh, 2007). In contrast to M&A, the two partnering firms continue to act as independent entities (Yoshino & Rangan, 1995). In essence, the organizations share the benefits of joint operations as they both contribute elements in agreed-upon key functional or strategic areas but retain the benefit of control in other parts of their operations (Yoshino & Rangan, 1995). Therefore, firms may collaborate in one area, whilst being competitors in another (Hamel et al., 1989). Partnerships between organizations and the exchange, sharing or co-development of resources, products or capabilities are not a new phenomenon as alliances have been used for many decades (Hagedoorn, 2002). The importance of collaborations, however, has increased in recent decades due to amongst other reasons simultaneous cost and innovation pressures leading to a

growing demand for more flexible, lower commitment modes of expansion (De Man & Duysters, 2005; Hagedoorn, 2002).

Strategic alliances have attracted significant interest from researchers investigating various contexts, stages, types, or even levels. This literature review firstly concentrates on the theoretical perspectives used in strategic alliance research. Following this, I focus on reviewing the different stages of the alliance process, the so-called 'alliance management lifecycle' of strategic alliances before the various, oftentimes contradictory performance effects of strategic alliances are discussed. After identifying that alliance performance does not always meet the stated objectives, this review then centres on development in the literature on alliance capabilities which have been shown to facilitate firms' ability to manage alliances more effectively.

2.2.1 Overview of theoretical lenses in strategic alliance research

In order to understand why strategic alliances are formed and what implications they might have on value creation, this literature review focuses on four of the most frequently used theories (e.g. Ireland, Hitt, & Vaidyanath, 2002): the resource-based view (RBV), organizational learning (OL), social network theory (SNT) and signalling theory (e.g. Eisenhardt & Schoonhoven, 1996; Hamel, 1991; Kogut, 1988). In the early stages of the alliance literature development, most research had followed a transaction cost perspective (TCE) and argued that alliances may help to lower the transaction costs associated with spot-market transactions such as the enforcement costs (e.g. Stuckey, 1983). TCE has first been applied as a means to analyse why firms enter strategic alliances over other means such as spot-market transactions or M&A (Hennart, 1988; Kogut, 1988; Kogut & Singh, 1988). This has been extended to discussions how firms enter alliances through different types of alliance governance modes (Oxley, 1997; Sampson, 2004). However, as the literature has gradually recognized the limitations of TCE's focus on only cost and efficiency (Khanna, 1998), this perspective has been complemented with strategic, learning, and social objectives (Das & Teng, 2000a; Khanna, 1998; Teng, 2007). In the following, these theoretical perspectives are first introduced and then their relevance to the alliance literature is provided.

2.2.1.1 Resource-based view (RBV)

The resource-based view (RBV) of the firm has frequently been applied in the context of strategic alliances (e.g. Das & Teng, 2000b; Dyer & Singh, 1998; Eisenhardt & Schoonhoven, 1996; Harrison, Hitt, Hoskisson, & Ireland, 2001; Lavie, 2006; Mowery et al., 1996; Mowery, Oxley, & Silverman, 1998). The RBV argues that organizations can gain a competitive advantage when they possess bundles of resources which are valuable, rare, non-substitutable and non-imitable (Barney, 1991; Dierickx & Cool, 1989; Wernerfelt, 1984). While the TCE perspective has been a major focus in past research on alliances, RBV scholars believe that organizations mainly form alliances not because of cost reductions but because alliances enable them to gain access to such valuable, rare, non-substitutable and non-imitable resources in order to gain a competitive advantage (Das & Teng, 2000b). More specifically, according to the RBV, strategic alliances enable organizations to exchange, share or co-develop resources, products or capabilities (Das & Teng, 2000b; Eisenhardt & Schoonhoven, 1996; Yoshino & Rangan, 1995). In this regard, organizations are most likely to form alliances when they are in need of specific resources or have a strong bargaining position and want to exchange their valuable resources for other resources (Eisenhardt & Schoonhoven, 1996).

Even though M&A may be the default option to 'acquire' resources, particularly exchanges in which not all resources are valuable enough to justify an acquisition, or when resources are based on tacit knowledge, alliances provide a more effective resource-accessing form of organizing (Das & Teng, 2000b). By essentially only 'accessing' resources (Grant & Baden-Fuller, 2004), firms can close the gaps between desired and actual resources without engaging in a lengthy acquisition process (Das & Teng, 2000a). In particular, firms with a broad range of technological knowledge are therefore more likely to engage in a strategic alliance (Zhang & Baden-Fuller, 2010). Specific resources to be accessed in strategic alliances can be related to certain locations which facilitate the entry into a new market (García-Canal, Duarte, Criado, & Llaneza, 2002), or the long-term goal of accessing specific knowledge resources so that a specific capability can be transferred (Hamel, 1991; Kogut, 1991). Especially in competitive environments (D'Aveni, 1994), organizations may not possess all the necessary resources and alliances allow for the access of these resources (Ariño & de la Torre, 1998). Organizations may therefore engage in

alliances for both input and output activities or alternatively use it for marketing or R&D activities (Sampson, 2007).

One drawback of the traditional RBV's applicability to strategic alliances is that it assumes that resources are owned and controlled by one firm (Barney, 1991; Wernerfelt, 1984). In strategic alliances, however, resources are essentially shared across firm boundaries. Therefore, more recent research has provided RBV extensions to an alliance level (Dyer & Singh, 1998; Lavie, 2006). In a first attempt to extend the RBV to strategic alliances, Dyer and Singh (1998) find that firms' enter strategic alliances because of the potential to generate relational rents. Such rents are derived from the partnership itself and are the direct result of the combination, exchange or co-development of each partner's firm-specific resources (Dyer & Singh, 1998). What makes these relational rents so unique is that firms would not be able to generate these by themselves or even through M&A as the partnership enables firms to also access the alliance partners' portfolio of alliances. Through such network resources, firms can also access further resources (Gulati, 1999). Also, on a dyadic level, firms benefit from resources which are actually owned and controlled by the direct partner such as the partner firms reputational or legitimacy resources (Saxton, 1997; Stuart et al., 1999). This indicates that firms' existing linkages and the position in their alliance portfolio make them an attractive partner beyond firms' own resource endowments (Goerzen, 2007; Koka & Prescott, 2008). Therefore, Lavie (2006) proposed that the incentive for firms to enter alliances is not merely due to the re-configuration of shared resources. Instead, non-shared, unintended resource transfers among partners dyadic or network resources may also occur. Such spill-over of resources may essentially be a key motivation for firms to enter strategic alliances (Lavie, 2006).

Overall, the RBV has been one of the most frequently used theories underpinning why firms enter into alliances for strategic objectives. It has been extended to the alliance level and research has indicated that the connectedness of resources and re-configurations with internal resources create incentives for firms to engage in strategic alliances (Dyer & Singh, 1998; Lavie, 2006).

2.2.1.2 Organizational learning (OL)

Similar to the RBV, alliance researchers embracing an organizational learning (OL) perspective assume that organizations can enhance value by transferring organizational resources from the partner firm. OL is distinct from the resource-based view, however, as it is primarily concerned with the knowledge transfer of processes or products from the partner firm (Argote, 2012; Huber, 1991). Research in the knowledge-based tradition emphasizes that knowledge derived from learning is a unique resource (Grant, 1996). Alliance literature has used OL in two distinct ways. Firstly, firms may learn *through alliances* to improve their knowledge of a certain geographical market for instance. Secondly, research has drawn on OL literature to explain how firms learn *from previous alliances* in order to improve their alliance management. This section is structured around these two distinct research areas.

- *Learning through alliances*

With efficiency, pace and knowledge accumulation critical to an organization's success, learning becomes an important component to achieving competitive advantage (Hamel, 1991). Strategic alliances help organizations to learn from their partners and enhance their own knowledge resources with the partner's knowledge (Dyer & Nobeoka, 2000; Hamel, 1991; Inkpen, 2008; Inkpen & Crossan, 1995; Kale et al., 2000; Khanna, Gulati, & Nohria, 1998; Kogut, 1988; Lyles, 1988; Simonin, 1997, 2004). Research finds that knowledge transfer through learning is one of the key objectives for organizations to enter strategic alliances and that the strength of learning opportunities determines how knowledge is transferred effectively (Simonin, 2004).

While organizations may increase their knowledge base through alliances (Hamel, 1991), several factors such as the knowledge ambiguity (Simonin, 2004), or inert managerial beliefs may hinder knowledge transfer across alliance partners (Inkpen & Crossan, 1995). On the contrary, organizations may engage in so-called 'learning races' which means that both partners try to internalize the other partner's knowledge faster, consequently destabilizing the collaboration process altogether (Hamel, 1991; Inkpen & Beamish, 1997; Khanna et al., 1998). More recent research has indicated that organizations actually may not intend to acquire the knowledge

indefinitely but instead only access it for the purpose of one alliance (Grant & Baden-Fuller, 2004).

- *Learning from alliances*

Another approach frequently investigated in existing alliance research relates to learning from alliances to improve the alliance management. As the name suggests, alliance management relates to the process of managing strategic alliances (Ireland et al., 2002). This process involves several distinct stages from alliance formation to termination which are described in more detail in Section 2.2.2 ('Alliance Management Lifecycle'). By building on learning curve arguments that organizations can improve the productivity in their respective strategic actions by continuously engaging in them (Argote, Beckman, & Epple, 1990; Darr, Argote, & Epple, 1995), researchers have investigated whether firms can improve their alliance management through gaining experience in managing them. While research finds that organizations can benefit from such experience (Anand & Khanna, 2000a), these positive benefits are shown to be limited to the first few experiences (Sampson, 2005). Building on this, research finds that firms with significant experience may even have negative performance effects (Zollo et al., 2002). Research proposes that learning curves are not applicable for alliances (Deeds & Hill, 1996; Hoang & Rothaermel, 2005). Others have argued that such negative performance effects can instead be attributed to the difficulty of the learning context for alliances themselves (Zollo, 2009). One such learning mechanism which makes it difficult to effectively integrate knowledge is superstitious learning (Heimeriks, 2010; Levitt & March, 1988). Essentially, this refers to the misattribution of cause and effect in learning. When causal relationships between inputs and outputs are particularly ambiguous and performance is difficult to assess, firms tend to ascribe their performance to routines they feel comfortable about, thus, learning superstitiously (Levitt & March, 1988). If these routines are formed at times when firms have received positive performance feedback, then such routines are likely to be reinforced and only adapted if organizations are unsuccessful for long periods of time, thus resulting in overconfidence (Levitt & March, 1988). The context and dynamism surrounding strategic alliances makes it particularly likely that firms learn superstitiously (Zollo, 2009). Moreover, similarly to M&A, the relatively rare occasion of alliance announcements makes the performance assessment more challenging, therefore making misattribution in cause and effect even more likely

(Zollo, 2009). Therefore, it is not surprising that firms are more overconfident in their alliance management leading to inferior alliance performance (Heimeriks, 2010). In summary, OL theory provides valuable insights into why firms form strategic alliances and how firms' performance heterogeneity from alliances can be explained.

2.2.1.3 Social network theory (SNT)

The RBV and the OL perspective have contributed significantly to alliance research by focusing primarily on the level of the dyadic alliance. Whilst this has contributed to our improved understanding into the alliance formation reasons, governance structures and performance heterogeneity, these perspectives have largely considered firms on a dyadic level. However, organizations quite often manage multiple interrelated alliances in so-called alliance portfolios or networks (Goerzen, 2007; Greve, Baum, Mitsuhashi, & Rowley, 2010; Hoffmann, 2005; Rowley, Behrens, & Krackhardt, 2000; Shipilov, 2006). Research has shown that organizations have incentives to enter alliances beyond the dyadic alliance itself, but instead with the perspective of the entire network or portfolio of alliances (Inkpen & Tsang, 2005). For instance, an alliance with a certain partner who has a large densely connected network of partners may provide the organization with more lucrative future alliance partnerships or contacts. Through the formation of alliances, organizations therefore enter social networks of inter-connected alliances which further enable organizations to benefit from social capital. In turn, this may enhance the innovation level (Ahuja, 2000), or facilitate the transfer of knowledge (Inkpen & Tsang, 2005).

The theory on which most of the existing works on alliance portfolios rests is social network theory (SNT) (e.g. Wassmer, Dussauge, & Planellas, 2010). SNT has originated from sociology and regards networks as consisting of multiple dyadic relationships. Due to a sociological underpinning, research in this tradition has primarily looked at networks of acquaintances or friends (Granovetter, 1973). Nevertheless, SNT has contributed significantly to alliance portfolio research. Its exponential increase (Borgatti & Foster, 2003) may have contributed to research on alliances which has only recently become a distinct theoretical field. In particular, the social capital and the embeddedness streams of literature have contributed to work on alliance portfolios (Wassmer, 2010). From a SNT perspective, portfolios consist of an egocentric network with a multitude of direct ties (Rowley et al., 2000). Network

theory has contributed to the development of the configuration of alliance portfolios as many studies have focussed on the topic of structural and relationship-specific aspects (tie strength and depth) of networks (e.g. Rowley et al., 2000).

2.2.1.4 Signalling theory

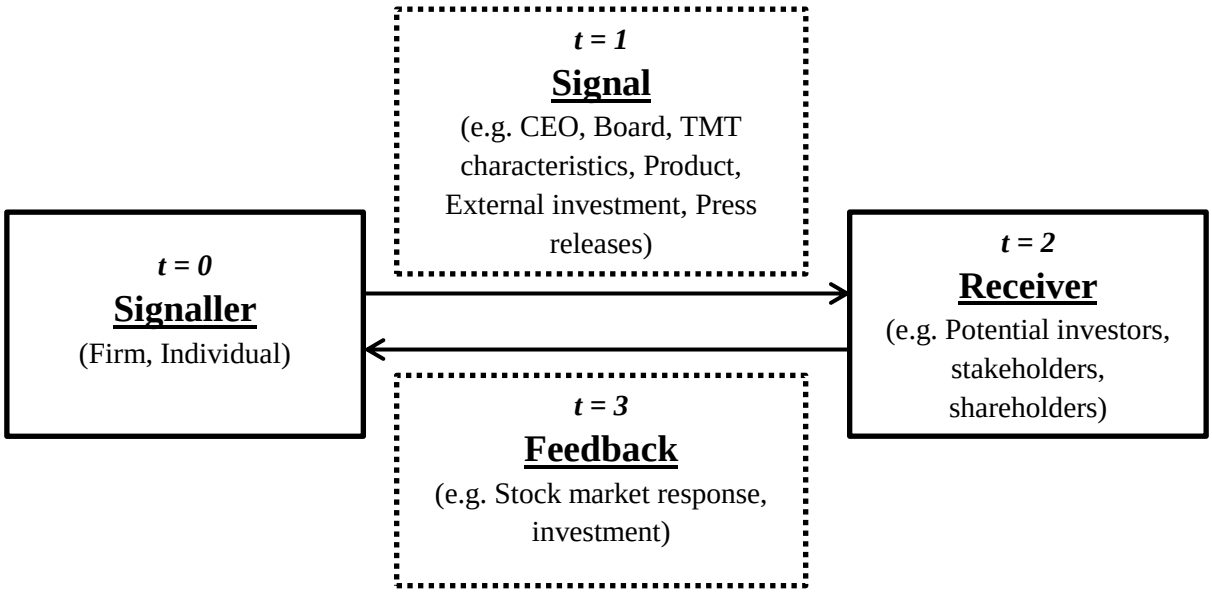
While the above theories primarily focus on firm-, dyad-, or network-related aspects for alliance formation and the ability to create value from alliances, these theories fall short in establishing a direct relation to how the formation of alliances is received by external stakeholders. In this respect, alliances function as signals to investors to either indicate increased future profitability or to signal a capability to more successfully manage strategic alliances. The theory on which this is built is called signalling theory which is essentially concerned with reducing the differences in information possessed between two transaction parties (Spence, 2002), in the case of alliances between the firm engaging in an alliance and (potential) investors into the firm. Signalling theory is built on the ideas developed by Akerlof (1970) in his famous 'lemon' example in the second-hand car market in which he shows that in situations where one party cannot draw any inferences about the quality of an asset, markets are likely to collapse because of the reluctance of one party to engage in a transaction. Stiglitz (2000) has emphasized that such information asymmetry exists on two different levels. Firstly, the quality of the information causing the asymmetry is difficult to assess in many instances. Secondly, there might be information asymmetry concerning the intent of one subject towards the other. Winning the Nobel Prize in 2001 for their contribution to Information Economics, George A. Akerlof and Joseph E. Stiglitz have emphasized adverse selection as a consequence of information asymmetry while Michael Spence has stressed ways to reduce information asymmetry through signalling – the eventual birth of signalling theory.

Spence (1973) in his work on labour markets identifies that a high level of information asymmetry between employers and job applicants regarding the 'true qualities' of the latter exist. He finds that signals can be used to differentiate high quality from low quality applicants. Furthermore, he defines such signals as "activities or attributes of individuals in a market which by design or accident, alter the beliefs of, or convey information to, other individuals in the market" (Spence, 1974:1). In the context of the labour market, Spence (1973) finds that high quality job applicants use

their level of education as a signal to differentiate themselves from lower quality applicants in order to gain employment. In order for signals to credibly convey quality to the other party however, the signal, for instance education, must be too costly for other parties with low quality activities or attributes to imitate. As applicants with inferior qualities bear significant costs to replicate such education levels, according to Spence (1973), education reflects an effective signal to differentiate between low and high quality applicants.

While the development of signalling theory has started in the field of economics (Spence, 1973) as a response to research indicating the problems associated with information asymmetry (Akerlof, 1970), it has since been frequently applied in the contexts of finance (Downes & Heinkel, 1982; Easley & O'Hara, 2004; Flannery, 1986; Myers & Majluf, 1984) and also management (Certo, 2003; Ndofor & Levitas, 2004). More specifically, management research has applied the idea of signalling qualities in multiple contexts, such as amongst others in initial public offerings (Pollock, Chen, Jackson, & Hambrick, 2010) or product awards (Soh, Mahmood, & Mitchell, 2004). While the above may seem complex, the actual process of signalling is illustrated in **Figure 2.2** below.

FIGURE 2.2: Graphical illustration of signalling theory



Signalling theory recognizes two primary actors which are firstly the sender of the signal ('signaller') and secondly the 'receiver' of the signal. Signallers can be firms (e.g. Montiel, Husted, & Christmann, 2012), or individuals within the firm (e.g. Zhang & Wiersema, 2009). These may then deliberately or by accident send signals to

the receiver. Signals can refer to any corporate action or simply the announcement of them, such as certain executive member appointments (Certo, 2003), product certifications (Montiel et al., 2012), or press releases (Carter, 2006) of corporate development activities, such as strategic alliances (Park & Mezias, 2005). Receivers can refer to either individuals or firms concerned with a financial or societal interest in the signaller, such as stakeholders. Research oftentimes identifies potential investors or shareholders who may lack certain information about the signaller's organization as receivers of signals (Connelly, Certo, Ireland, & Reutzel, 2011). These receivers then interpret the signal and feed their evaluation back to signallers through investment-related responses. Signalling theory also recognizes that the transmission of signals from the signaller to the receiver may occur through the use of intermediaries such as media outlets or financial analysts. For instance, media outlets may distort the effect of signals by not reporting on them (Carter, 2006). Additionally, expert opinions such as financial analysts may exacerbate or mitigate the effect of signals (Ozcan & Overby, 2008).

In the context of strategic alliances, signalling theory has also frequently been applied (e.g. Ozmel, Reuer, & Gulati, 2013; Stuart et al., 1999). Almost exclusively, the alliance formation itself represents the signal to receivers which are most often investors. One critical distinction is that two different types of alliance signals in particular exist. Firstly, the alliance partnership itself may send a signal to investors (e.g. Ozmel et al., 2013; Park & Mezias, 2005; Stuart et al., 1999). In this case, forming the alliance helps to reduce information asymmetry regarding the firm's future profitability. For instance, forming alliances with prominent alliance partners in contrast to less prominent alliance partners may send a signal of legitimacy to investors and create a positive value creation (Ozmel et al., 2013; Stuart et al., 1999). This is because the alliance formation sends a signal of higher future profitability to investors.

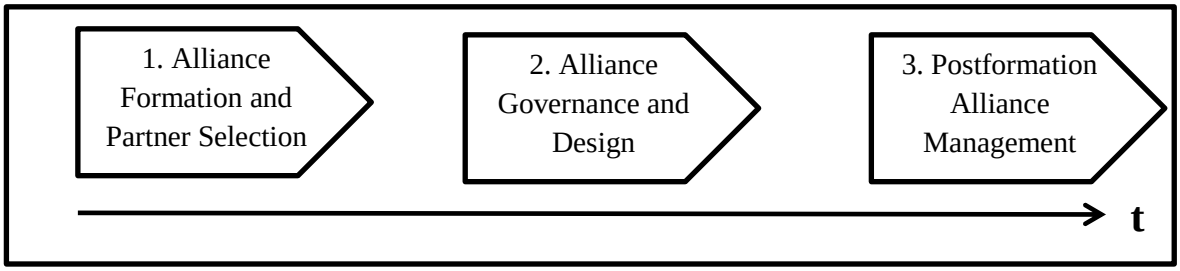
Secondly, the underlying firm-specific characteristics of the announcing firm also send a signal to investors (e.g. Anand & Khanna, 2000a; Gulati et al., 2009). In contrast to the abovementioned alliance formation signals, these signals reflect the ability to manage strategic alliances more successfully. For instance, firms' experience in managing strategic alliances signals a firm-level alliance or dyad-level relational capability to more successfully manage (repeated) alliances to investors (Anand &

Khanna, 2000a; Gulati et al., 2009). In order to further discuss the difficulty of managing strategic alliances, the following subsection introduces research on the various stages of alliance management.

2.2.2 Alliance management lifecycle

Despite clear alliance objectives such as the reduction of transaction costs, resource accession, learning from alliance partners or benefiting from the entire network of alliances, as described above, the process of managing strategic alliances is inherently difficult. While each alliance differs in terms of the management requirements (De Man, 2014), research has, however, identified common, repeatable stages of each alliance. Therefore, firms can potentially learn about the process of managing the alliance lifecycle as described in the OL literature above. The alliance management lifecycle consists of three identifiable areas: alliance formation, alliance governance and design and post-formation alliance management (Kale & Singh, 2009). Other researchers have noted that the alliance lifecycle may consist of up to seven distinct stages, such as choosing an alliance strategy, selecting partners, negotiation, setting up the alliance, operation, evaluation, and modification (Das & Teng, 1997). For matters of simplicity, and due to significant overlap between the different views on the components of the alliance management lifecycle, this literature review uses the three stage alliance development process based on Kale & Singh's (2009) identification. For an overview of the different stages, please see **Figure 2.3** below.

FIGURE 2.3: Alliance management lifecycle overview



Adapted from Kale & Singh (2009)

2.2.2.1 Alliance formation and partner selection

All alliances begin with a formation decision. After the objectives of the strategic alliance have been agreed upon within the organization, due diligence for alliance partners may begin (Schreiner, Kale, & Corsten, 2009). A large stream of literature has argued for the importance of partner selection criteria and has emphasized the importance of certain elements such as trust (Anand & Khanna, 2000a; Gulati, 1995b), commitment (Das & Rahman, 2001), complementarity (Bucklin & Sengupta, 1993; Harrison et al., 2001) and financial payoff (Dyer & Chu, 2000) when selecting an alliance partner. A misfit in any of these characteristics may lead to the failure of an alliance (Bucklin & Sengupta, 1993). While these characteristics are critical to alliance success, Shah and Swaminathan (2008) develop a framework to identify the relative importance of them. Using a managerial control and contingency approach, they find that the alliance project type and the resulting process manageability and outcome interpretability determines which partner characteristics are most critical (Shah & Swaminathan, 2008). Trust among the alliance partners may be essential in alliances which are difficult to manage in terms of processes and when the outcomes are uncertain, calling for an extended period of due diligence (Shah & Swaminathan, 2008). On the contrary, due diligence may be reduced and the potential financial payoff prioritized in alliance projects in which processes are easy to manage and the outcomes are more certain (Shah & Swaminathan, 2008). R&D alliances have a high level of uncertainty, the processes are difficult to manage and, hence, from a control perspective, trust is the most important criteria in this alliance context (Shah & Swaminathan, 2008). Partner selection essentially depends on a trade-off between the potential to reach alliance objectives weighed against the risk of opportunism. Li, Eden, Hitt, and Ireland (2008) find that in important alliances, firms are likely to select partners based on the amount of previous alliance partnerships with them. In such instances, firms are likely to select ‘friends’, thus firms with a significant amount of previous partnerships with the firm or partners with whom they have not partnered before. However, ‘acquaintances’, thus partners with whom firms have little partnering experience, are least preferred because these firms are more familiar with the weaknesses of the partner company and thus may more easily engage in opportunistic behaviour (Li et al., 2008).

The criticality of due diligence in the partner selection stage can be further reduced through the investment of irreversible assets in the partnership, which by itself indicates a high level of commitment and trust (Parkhe, 1993). Following TCE logic, this makes the assets for the alliance relationship-specific, thereby limiting the chance for opportunism by the alliance partner (Dyer & Singh, 1998). Even though this may make the partnership more stable, it may essentially also harm the effectiveness of an alliance from a benefits or strategic perspective as it limits an organizations flexibility (Das, 2005).

Shah and Swaminathan (2008) consider the partner choice explicitly based on an integrated framework of minimizing risks while still meeting strategic objectives. Other studies have focused more explicitly on the goal of enhancing strategic competitiveness and have used a RBV perspective (Eisenhardt & Schoonhoven, 1996). According to these studies, firms may form alliances when they are in a position of weakness, such as in need of specific resources or in a position of strength, such as well-connected top management in order to improve their bargaining position (Baum, Calabrese, & Silverman, 2000; Eisenhardt & Schoonhoven, 1996). Therefore, firms partner decision will likely reflect how well the partner either meets the resource requirements or whether the partner is also in need of critical resources (Baum et al., 2000; Eisenhardt & Schoonhoven, 1996). Intangible benefits, such as legitimacy in the industry, are also critical when deciding on an appropriate alliance partner (Baum & Oliver, 1991; Stuart et al., 1999). In general, the alliance formation process is political and dependent upon the effective negotiation of the contract and conditions, thus, the better connected, large enterprise with a stronger social position usually has a bargaining power advantage over the smaller partner (Eisenhardt & Schoonhoven, 1996). However, previous experiences between the partners may also have an influence as they help to increase trust and facilitate the mutual achievement of alliance goals (Bucklin & Sengupta, 1993; Gulati, 1995a) and hence organizations are also likely to select a trustful previous partner (Li et al., 2008).

2.2.2.2 Alliance governance and design

After a firm has engaged in due diligence and chosen an alliance partner, firms need to decide on governance and design choices (Kale & Singh, 2009). Alliances in general can be seen as a hybrid organizational form as they combine both elements of hierarchy and markets (Powell, 1987; Williamson, 1991) for which there are important governance and design decisions to be made in order to increase the effectiveness of alliances (Kale & Singh, 2009). These essentially relate to decisions of trust and control (De Man, 2014). While strategic alliances can be distinguished along various different dimensions, the most frequently used distinction is the equity versus contractual (non-equity) dimension. While non-equity arrangements are similar to market exchanges and allow for significant flexibility, they come at the expense of losing control. The effect for equity arrangements which are similar to a hierarchical structure is the opposite as they allow for control while being limited in terms of flexibility (Yoshino & Rangan, 1995). Several factors influence the decision whether equity is recommendable in an alliance: Transaction costs (Pisano, Russo, & Teece, 1988), the perceived risk level (Das & Teng, 1999) and learning reasons (Mowery et al., 1996) have been identified as decision criteria for organizations in evaluating the choice between equity and non-equity partnerships.

- *Equity Joint Ventures*

Joint venture (JV) research has been particularly prevalent in strategic alliance research (Anand & Khanna, 2000a; Hennart, 1988; Hennart & Reddy, 1997; Inkpen, 2008; Inkpen & Crossan, 1995; Klijn, Reuer, Buckley, & Glaister, 2010; Lyles, 1988). Through shared equity ownership in a new venture, firms can effectively learn from one another while reducing risk for opportunism through ‘shared hostages’ in the form of equity (Hennart, 1988). JVs can distinguished among majority equity joint ventures and minority equity joint ventures (Yoshino & Rangan, 1995). Majority equity JVs refer to the creation of a separate new entity in which two or more partners hold ownership stakes. Research has found that firms are likely to push towards the formation of JVs when the partner has tacit knowledge-based resources while the focal firm has property-based resources in order to improve access to partners’ knowledge resources while at the same minimizing opportunism (Das & Teng, 2000b). Minority equity JVs refer to one or both companies taking a minority equity position in the partner firm without gaining full control. The equity stake thereby

serves as a means to tie the destiny of both companies together (Das & Teng, 1996). This may reduce the risk of opportunism for firms which primarily contribute tacit, knowledge-based resources against partners which primarily contribute explicit, property-based resources to the alliance (Das & Teng, 2000b). JVs can also be distinguished among multiple objectives. JVs may either be scale or link ventures. Scale JVs have the objective of maximizing economies of scale (Hennart, 1988), such as the well-known Nissan-Renault JV in manufacturing and procurement (Yoshino & Fagan, 2003). Link JVs on the contrary involve collaborations between organizations with complementary skills or markets (Hennart, 1988). This means that firms may collaborate in areas which may not be their primary focus.

- *Non-Equity Contractual Alliances*

Non-equity alliances can take the form of bilateral contractual partnerships, such as joint R&D operations, complementary asset or skills partnerships or R&D consortia as well as unilateral contractual partnerships, such as licensing agreements (Das & Teng, 2000b; Yoshino & Rangan, 1995). In contrast to equity alliances, they are based on contracts instead of equity to bind the companies together. While equity arrangements provide firms with the perceived reduction in potential partner opportunism, this may essentially only be a perceived feeling of certainty. Essentially, partner firms can still exploit a firm's resources as the boundaries to the JV may be blurry (De Man, 2014). Moreover, the cost of setting up a JV can be substantial as discussions may revolve not only about the areas of collaboration but also about the financial and organizational aspects of setting the venture up (De Man, 2014). This process can be resource- and time-consuming. Das and Teng (2000b) argue that if both firms have knowledge-based resources, this will likely result in learning races with both firms aiming to learn and terminate the alliance as soon as objectives are achieved. Therefore, as a result of this and the above mentioned cost and resource demands of JVs, firms may form bilateral contract alliances. These offer the flexibility of rapid formation and termination. Consequently, it is not surprising that non-equity contractual arrangements are most prevalent in the field of R&D in general and in knowledge-intensive sectors such as the pharmaceuticals or the information technology industries, in particular (Hagedoorn, 2002).

Unilateral contract arrangements are usually structured in the form of licensing agreements (Anand & Khanna, 2000b). Such arrangements may include a more limited amount of interaction between partners than in bilateral agreements. In addition, such arrangements require detailed specifications of the licensing resources. Due to the difficulty of providing explicit specifications of tacit knowledge, such licensing arrangements usually involve the transfer of property-based resources such as patents or specific molecules in the pharmaceutical sector, for instance (Das & Teng, 2000b).

2.2.2.3 Post-formation alliance management

Once an alliance is formed and design choices have been made, the actual management of the alliance begins. Whereas the partner selection, and the alliance governance and design have received significant attention throughout the evolution of alliance research, post-formation alliance management has not received as much attention in the literature (Reuer, Zollo, & Singh, 2002). Being able to manage this stage of the alliance lifecycle can be termed an alliance management capability and encompasses all the key elements needed for managing an alliance after it has been formed (Schreiner et al., 2009).

The process of managing the alliance relationship is the actual key to an effective alliance (Doz & Hamel, 1998; Reuer et al., 2002). This is because there is the danger of a constant tension between cooperation and competition among the alliance partners (Hamel et al., 1989; Khanna et al., 1998). While trust is an essential element for the stability of an alliance (Ireland et al., 2002), recognizing and managing potentially deceitful, opportunistic behaviour by an alliance partner at this stage is essential (Das, 2005). Negative experiences in terms of cooperation with a specific partner due to low veracity and commitment (Ariño, 1997) may make it necessary for organizations to have mechanisms in place to limit the potential for opportunistic uncooperative behaviour (Das, 2005). More specifically, Das (2005) identifies six mechanisms to prevent deceitful behaviour which should be selected according to the potential likelihood for such behaviours by alliance partners at different stages. The mechanisms are "contracts, governance structure, mutual hostages, monitoring, participatory decision making, and staffing and training" (Das, 2005: 708). While contracts and governance structure are more important in the early stages of an

alliance formation as described in earlier sections, the most effective mechanisms in the post-formation stage are rather the monitoring and participatory decision-making (Das, 2005). Such mechanisms can effectively be introduced into alliances by means of inter-organizational routines such as steering committees which facilitate monitoring and communication among the alliance partners (Zollo et al., 2002). As emphasized by Schreiner et al. (2009), coordination, communication and bonding with the alliance partner are essential at this stage (Schreiner et al., 2009).

Before an alliance is eventually terminated, either planned or unplanned, roughly 40% of all alliances experience changes in their governance structure through contractual changes, board changes or possibly changes in the supervision of the alliance partner (Reuer et al., 2002). Thus, being prepared for instability is essential for firms. Previous alliance experiences influence the post-formation changes but, most importantly, alliance specific characteristics such as a low division of labour, or a high relative importance of the alliance, may make post-formation governance changes more likely (Reuer et al., 2002).

Due to inter-organizational conflict (Mohr & Spekman, 1994), or when one or more organizations have reached their alliance objectives (Hamel et al., 1989; Inkpen & Beamish, 1997; Yan & Zeng, 1999), an alliance may be terminated. Alliances due to their temporary nature have been described as “mere transitional devices” which, in addition to their complexity, makes them “destined to fail” (Porter, 1990: 612-613). Alliance partners’ access to complementary resources and a high strategic importance of the partnership may however decrease the termination likelihood (Lunnan & Haugland, 2008). The unstable nature of alliances is supported by high termination rates which indicate that roughly 50% of all alliances fail and end up being terminated prematurely (Bleeke & Ernst, 1993; Kogut, 1989). Terminations have therefore frequently been used as an indicator for the failure of an alliance (Park & Ungson, 2001). It is not surprising that failure rates are highest after the initial ‘honeymoon phase’ of the alliance has passed (Levinthal & Fichman, 1988; Lunnan & Haugland, 2008). Reasons for the termination of alliances in general can include dysfunctional conflict among alliance partners (Bucklin & Sengupta, 1993; Doz & Hamel, 1998) which may develop when controlling an alliance partner to reduce information asymmetry and opportunistic behaviour (Hamel, 1991). Additionally, the incorrect management of conflict can lead to the termination of alliances (Kale et al., 2000).

Nevertheless, terminations are not necessarily failures but may instead be the result of partnering organizations reaching their alliance objectives (Inkpen & Beamish, 1997; Yan & Zeng, 1999).

2.2.3 Alliance effect on value creation

As indicated above, the management of strategic alliances is inherently difficult. While some firms are more effective in managing alliances, others have difficulties to manage them. One key means to evaluate performance of strategic alliances refers to the value created by alliances. The concept of value creation is central to the field of theory and particularly to the RBV (e.g. Amit & Schoemaker, 1993; Barney, 1991). In essence, existing research finds that competitive advantage is created through *valuable* resources. Value creation in that sense is the primary focus of any corporation, albeit different types of value creation exist. These may refer to stock market, accounting book value or other factors which ultimately may impact a firm's economic profits such as innovation. Previous studies have therefore used a multitude of different measures for value creation which can be distinguished based on ex ante and ex post value creation. *Ex ante* value creation refers to the value created before an alliance is even undertaken and refers to stock market based measures upon the announcement of an alliance, while *ex post* value creation refers to the value created after the alliance has been formed. Examples of this include the innovative value created (e.g. De Man & Duysters, 2005), the operational performance (e.g. Pangarkar, 2003), and the managerial assessments of the alliance (e.g. Zollo et al., 2002). The ultimate processes which impact the value created are based on economic rents. The next subsection therefore focuses on the rents created by strategic alliances before a more thorough introduction of alliance value creation is presented.

2.2.3.1 Rent generation of strategic alliances

Value is created through earning economic rents. Alliances have the potential to create various economic rents beyond the most common types of ricardian and quasi-rents which are derived from purely internal efforts (e.g. Amit & Schoemaker, 1993; Peteraf, 1993). While ricardian rents refer to scarce resources a firm may

possess, quasi-rents refer to the added value a firm can contribute to a specific resource which another firm may not be able to do. These types of rents are based on the traditional RBV. Dyer and Singh (1998) and Lavie (2006) extend this to the alliance context and argue that firms can benefit from alliances through additional types of rent. More specifically (1) internal rents, (2) relational rents, (3) inbound spill-over rents, and (4) outbound spill-over rents may be generated. As these form the basis for the empirical results of alliance value creation, which follow in the section below, these will be discussed here.

Firstly, firms can extract *internal rents* from the resources not shared with the partner. For instance, while the reputation of the partner is not a resource shared by the partner, it can still either positively or negatively affect a firm's resource base (Stuart et al., 1999).

Secondly, *relational rents* are the primary means by which firms gain advantages from strategic alliances. The relational view, as developed by Dyer and Singh (1998), argues that firms generate rents which neither firm could generate by itself. As the resources of the firm are shared, such relational rents are generated. These rents stem from complementarity between the resources, knowledge-sharing routines and relation-specific assets (Dyer & Singh, 1998). This leads to common benefits for both alliance partners (Khanna et al., 1998).

Thirdly and fourthly, firms can also gain private benefits through accessing related but non-shared resources of the partner firm. Such rents are termed *inbound* and *outbound spill-over rents* (Lavie, 2006). They derive from opportunistic behaviour of either alliance partner. Such behaviour is not unusual in alliances and oftentimes both partners do the same by engaging in so-called 'learning races' (Hamel, 1991). Both partnering firms have mechanisms in place to prevent such opportunistic behaviour through patents or specialized assets, for instance. Additionally, causal ambiguity of key resources can protect against opportunism (Lippman & Rumelt, 1982). However, through mechanisms, such as partner firms' absorptive capacity and bargaining position advantages, such spill-overs are still likely to occur in favour of one alliance partner (Lavie, 2006).

2.2.3.2 Ex ante alliance value creation

As mentioned above, value can be created either *ex ante* or *ex post* of the alliance formation. *Ex ante* refers to the expectation that organizations can turn the potential economic rents into value during the alliance. The *ex ante* reaction of investors thus represents the expectation that economic rents as described above are going to be earned. This is in contrast to *ex post* value creation which refers to the value created essentially during or after the alliance, such as the achievement of strategic objectives such as, for example, innovation. This thesis focuses on the value creation *ex ante* of the alliance formation through abnormal stock market returns which has been the focus of many studies investigating the effect of alliances onto value creation (Anand & Khanna, 2000a; Gulati et al., 2009; Merchant & Schendel, 2000). Reasons for the use of ex ante value creation are due to the temporal nature of alliances and the multitude of alliances managed by firms which makes ex post alliance value creation particularly difficult. Therefore, this thesis relies on abovementioned previous research using abnormal stock market performance as a means to investigate how different alliance experience dimensions impact value creation.

The most frequently used *ex ante* value creation measure is the value generated by strategic alliances upon their announcement through so-called cumulative abnormal returns (CAR). By using an event study methodology as introduced in the seminal paper by Fama, Fisher, Jensen, and Roll (1969), several studies have identified positive CARs to strategic alliance announcements by stock market investors (e.g. Anand & Khanna, 2000a; Chan, Kensinger, Keown, & Martin, 1997; Gulati et al., 2009; Kale et al., 2002; Koh & Venkatraman, 1991; McConnell & Nantell, 1985). The CAR directly reflects investors' opinion on the ability of each alliance to increase value for the firm (Kale et al., 2002). This presents an advantage over *ex post* value creation as the direct value creation effect of strategic alliances can be more easily extracted (Koh & Venkatraman, 1991). Moreover, *ex post* measurement of value creation is subject to further difficulties. While other studies have investigated the effect onto managerial assessments (e.g. Zollo et al., 2002)This includes biases in managerial assessments and the difficulty of extracting the effect of single alliances due to the multitude of other confounding events.

Under the assumption that investors are effectively able to predict the value of an alliance, the *ex ante* value creation provides a *long-term view* of the firm to generate economic rents and essentially superior value creation through alliances. This builds on the stock market efficiency hypothesis, which has been created by Fama (1970) who argued that weak, semi-strong and strong forms of market efficiency exist[1]. While the stock market seems to at best be semi-strong efficient as the recent financial crisis has indicated, in the context of strategic alliances, the stock market has been found to be efficient as market movements around the alliance announcement indicate (Gulati et al., 2009). While the reaction of markets to alliance announcements may indicate (semi-strong) efficiency of the markets, studies have also tested whether short-term CAR for alliance announcements reflects the long-term or other levels of analysis in alliance performance in order to support the efficient market hypothesis. Empirical evidence indeed finds support for the efficient market hypothesis in different strategic alliance contexts (e.g. Kale et al., 2002; Koh & Venkatraman, 1991). The use of *ex ante* value creation measures in this thesis and other previous studies (e.g. Anand & Khanna, 2000a; Gulati et al., 2009; Merchant & Schendel, 2000) therefore includes the investor *expectation* for *ex post* value creation measures. This thesis essentially focuses on three aspects of alliance experience (Signalling, Learning dynamics and temporal aspects) and their effect on value creation. Existing research has indicated that in all three aspects, investors are well capable to estimate the value created due to signalling (e.g. Park & Mezias, 2005) learning effects (e.g. Anand & Khanna, 2000a) and temporal dynamics (Rindova, Ferrier, & Wiltbank, 2010). Combined with the stock market efficiency this makes the *ex ante* value creation particularly attractive in this context.

[1] (1) Weak form efficiency predicts that the stock market price reflects all past publicly available information, (2) semi-strong form of market efficiency includes all publicly available information which adjust to new information, (3) while the strong form efficiency predicts that stock prices upon an announcement reflect not only publicly available information but also private and insider information (Fama, 1970)

2.2.4 Firm-level alliance capability

The effect of alliances on the various value creation measures, as described above, has been shown to vary by firm (Anand & Khanna, 2000a). Hence, there is evidence which shows that some firms have developed superior capabilities to manage strategic alliances effectively. Therefore, this section shifts from the dyadic alliance level to the firm-level (please refer to a graphical overview of this in **Figure 2.1** above). In line with this, both anecdotal evidence and empirical research shows that certain firms are more capable of managing strategic alliances than others. For instance, the pharmaceutical company Eli Lilly (Sims et al., 2001) and the electronics company Hewlett Packard (Draulans, De Man, & Volberda, 2003) have been particularly successful at managing strategic alliances by developing specific alliance processes. Such processes facilitate the management of alliances by modifying and improving the various operating routines important for the day-to-day management of the alliance lifecycle, as explained earlier in this chapter. These skills as described above essentially become a capability within the firm through "(…) a learned and stable pattern of collective activity through which the organization systematically generates and modifies its operating routines in pursuit of improved effectiveness" (Zollo & Winter, 2002: 340). An alliance capability is therefore regarded as a dynamic capability (Eisenhardt & Martin, 2000; Kale & Singh, 2007) as it enables firms to "extend, modify or create ordinary capabilities" (Winter, 2003: 991). Moreover, several researchers argue that alliance capabilities need to be considered as dynamic because "it enables firms to achieve greater alliance success by helping them develop or improve their lower-order partnering skills to manage different phases or aspects in alliances more successfully." (Kale & Singh, 2007: 982)

While there is coherence on the fact that alliance capabilities exist and can be classified as dynamic capabilities, ambiguity exists regarding the composition of alliance capabilities and how exactly they may improve performance. In order to provide a clearer overview of the various components of an alliance capability identified in existing literature, I provide several definitions identified in existing literature before suggesting an alternative definition. An alliance capability has previously been defined as firms' "mechanisms and routines that are purposefully designed to *accumulate, store, integrate, and diffuse* relevant organisational knowledge through individual and *organizational experience*" (Kale et al., 2002: 749),

the "*ability to create successful alliances*, based on *learning* about alliance management and *leveraging* alliance knowledge inside the company" (Draulans et al., 2003: 152), which results in a "*higher order resource* that is difficult to obtain or imitate and has the *potential to enhance the performance of the firm's alliance portfolio*" (Heimeriks et al., 2007: 374). These definitions complement each other as each one targets a specific underlying process and objective. The first one by Kale et al. (2002) focuses on the various processes related to experience, institutionalization and integration. Draulans et al. (2003) focus on the objectives of improving dyadic alliances through specific processes, whereas Heimeriks et al. (2007) focus on the dynamic capability itself while also emphasizing the overall objective of making alliances successful on a firm-level.

More specifically, existing research identifies that firms can develop such an alliance capability by the underlying processes of (1) gaining alliance experience (e.g. Anand & Khanna, 2000a) and (2) by developing alliance management mechanisms consisting of alliance management institutionalization (e.g. Kale et al., 2002) and integrating processes throughout alliance organizations (e.g. Dyer et al., 2001; Kale et al., 2002). This section is structured around these two underlying components of an alliance capability[2], beginning with general alliance experience.

2.2.4.1 General alliance experience (GAE)

As a general requirement for firms to successfully replicate alliance success, firms need to have managed alliances in the past. In particular, the alliance management lifecycle requires specific knowledge and essentially experience in order to avoid mistakes. The stream of literature on strategic alliance capability has built on literature of learning curves within the OL literature (e.g. Epple et al., 1991; Huber, 1991; Levitt & March, 1988) which has argued that as firms accumulate experience they can improve their performance (Argote et al., 1990). More specifically, they become more effective and efficient the more they engage in a certain activity.

General alliance experience (GAE) refers to all previous alliances a firm has managed in the past (Anand & Khanna, 2000a; Gulati et al., 2009; Hoang &

[2] An overview of empirical research for the identified components of firm-level alliance capability is provided in Appendices 2.1-2.3

Rothaermel, 2005). Some research slightly adapted this to include only previous alliances of a specific type (Kale et al., 2002) or only those formed in more recent years as knowledge may decay (Sampson, 2005). By means of prior experience, firms can improve their alliance performance through the accumulation of experience as it allows for the generation of specific knowledge about how to manage all stages of the alliance management lifecycle (Child & Yan, 2003; Lyles, 1994; Simonin, 1997). In particular, it allows for "(…) develop[ing] realistic expectations and avoid[ing] gross mistakes" (Child & Yan, 2003: 288) with the processes involved (e.g. alliance management lifecycle). More specifically, it may lead to improved communication between partners (Mohr & Spekman, 1994), may lead to an effective goal setting, effective management of alliances and can therefore lead to higher levels of alliance success (Child & Yan, 2003; Lyles, 1988). Besides learning benefits, accumulating alliance experience also improves the centrality of the firm within the network. Therefore, firms are better positioned to enter subsequent strategic alliances when they have gained experience (Powell, Koput, & Smith-Doerr, 1996).

The empirical results, however, show that the effect is more ambiguous than the learning curve literature has predicted. Some research has found that alliance experience can have a positive effect on performance (Anand & Khanna, 2000a; Heimeriks & Duysters, 2007; Pangarkar, 2003; Sampson, 2005). However, other research has found evidence for a non-linear relationship between alliance experience and performance (Deeds & Hill, 1996; Draulans et al., 2003; Hoang & Rothaermel, 2005; Zollo & Reuer, 2010). In particular, small firms tend to benefit more significantly from alliance experience. In a similar line of reasoning, Sampson (2005) finds that only the most recent experiences are valuable for an organization. Other research finds that the benefits drawn from alliance experience depend on the specific *type of alliance* (Anand & Khanna, 2000a; Rothaermel & Deeds, 2006) and *type of experience* (Hoang & Rothaermel, 2010). Some research even identifies negative effects of alliance experience. More specially, GAE may not necessarily avoid early terminations (Barkema, Shenkar, Vermeulen, & Bell, 1997), while also the managerial assessment towards alliance performance may be non-positive (Reuer & Zollo, 2005; Zollo et al., 2002)

These results built on research which finds that experience itself can be "confusing" (Levinthal & March, 1993: 97). The following quote by Levinthal and

March (1993) further elaborates on the difficulty of benefiting from simply accumulating experience: "Experience is often a poor teacher, being typically quite meager relative to the complex and changing nature of the world in which learning is taking place. Many of the same cognitive limits that constrain rationality also constrain learning. Learning from experience involves inferences from information. It involves memory. It involves pooling personal experience with knowledge gained from the experiences of others. The difficulties in learning effectively in the face of confusing experience are legendary. Even highly capable individuals and organizations are confused by the difficulties of using small samples of ambiguous experience to interpret complex worlds" (Levinthal & March, 1993: 96-97).

Empirical results therefore indicate that the quantity of GAE is insufficient on its own, however, is an important contributor to explaining how firms can consistently improve alliance performance. This is in line with literature on capabilities which finds evidence that having experience by itself is not necessarily a predictor for higher levels of capabilities (Helfat & Peteraf, 2003; Teece, Pisano, & Shuen, 1997; Zollo & Winter, 2002). As such, it is a necessary but not sufficient condition for developing superior alliance capability (Simonin, 1997). Instead, the literature finds that supplementary processes around how alliance experiences are institutionalized (Kale et al., 2002) and integrated into alliance management processes (Heimeriks & Duysters, 2007) have a large impact on the alliance capability development. The following section elaborates on the impact of these.

2.2.4.2 Alliance management mechanisms

Existing research indicates that firms may benefit from processes which essentially integrate the knowledge from experience and disseminate it throughout the organization (Heimeriks et al., 2007; Kale et al., 2002; Kale & Singh, 2007). Such processes are based on the '4I model' developed by Crossan et al. (1999). Essentially, they develop a learning model which proposes that experience goes through a process of intuition among organizational members that make sense of the experience. Subsequently, lessons learnt may become integrated and institutionalized within the organization. Existing literature has primarily emphasized the processes of integration and institutionalization of knowledge generated from alliance experience in order to develop a firm-level alliance capability.

- *Institutionalized alliance management mechanisms*

According to CBV and OL literature, organizations can benefit from experience through routinisation of behaviour in order to ensure replicability (Winter, 2003). In order to generate such routines in the alliance context, existing literature identifies functions and other structural processes. As such, alliance functions may store experiences learned, and enable organizations to effectively draw lessons from the formal structures in alliances (Kale, Dyer, & Singh, 2001; Simonin, 1997). Organizations such as Eli Lilly have been shown to institutionalize alliance management practices in an alliance function (Sims et al., 2001). Most generally, these functions allow organizations to capture and codify alliance experiences (Kale et al., 2002). These can be either from own experience or best practices transferred from other organizations through vicarious learning (Harbison & Pekar, 1998). Subsequently, an alliance function can provide a platform that allows for the sharing of best practices at all stages of the alliance management lifecycle (Kale et al., 2002). The communication and dissemination of such best practices throughout the organization can occur via databases, websites, seminars, workshops in order to further coach management in such alliance practices (Harbison & Pekar, 1998; Kale et al., 2001).

However, the effects are wider-ranging. As emphasized by Dyer et al. (2001: 38), an alliance function also "increases external visibility, provides internal coordination, and eliminates both accountability problems and intervention problems". Through the dissemination of alliance knowledge throughout the organization, alliance functions can also improve legitimacy within the organization. A frequent problem with alliances among employees is the 'not-invented-here-syndrome' and the oftentimes widespread belief among managers that alliances with partners are not necessary (Harbison & Pekar, 1998). Through alliance functions becoming 'centres of excellence' and emphasizing the benefits of alliances, the institutionalization may therefore improve legitimacy within the organization (Heimeriks, Klijn, & Reuer, 2009; Kale et al., 2002). Additionally, it may improve external visibility towards stakeholders (Heimeriks et al., 2009; Kale et al., 2002). For instance, it may signal commitment to potential strategic alliance partners, thereby attract potentially new alliance partners and signal a firms' ability to successfully manage strategic alliances to shareholders (Kale et al., 2002). Such institutionalization not only has an impact on

current or potential individual alliances but also directs the companies' overall partnering strategy (Hoffmann, 2005). In particular, it may improve the coordination of alliances in large portfolios and managing them simultaneously (Goerzen, 2005; Reuer & Zollo, 2005; Wassmer et al., 2010).

Significant heterogeneity in institutionalization can be observed across organizations. Essentially, alliance institutionalization can occur on a continuum from 'ad-hoc management' (no institutionalizing) over 'lone ranger' (very small number of in-house alliance experts but no knowledge sharing) to 'institutional' (formalization of processes, dedicated staff and knowledge repositories) (Harbison & Pekar, 1998). The level of institutionalization has been found to vary according to various dimensions. Firstly, the level of GAE influences a firm's institutionalization (Heimeriks et al., 2009). As the level of GAE increases, the institutionalization has been shown to increase as well in order to manage the increasing amount of experience to store and disseminate (Heimeriks et al., 2009). Secondly, the extent of alliance institutionalization appears to differ by country with more institutionalized alliance processes in the USA than in European companies (De Man, 2005)

Similar to alliance experience, empirical evidence indicates that the effect of such institutionalized alliance functions on alliance performance in general is mixed (Heimeriks et al., 2009; Kale et al., 2002). A dedicated alliance function seems to be valued by investors as organizations receive higher positive abnormal returns upon announcements of alliances. However, the reasons may be even more fundamental by allowing organizations to manage alliances more successfully and more therefore to be more likely to meet the alliance objectives in the long-term (Kale et al., 2002). However, institutionalized processes have also been shown to have negative effects on performance at high levels of experience due to inertia, overconfidence and superstitious learning (Heimeriks, 2010; Heimeriks et al., 2007). This indicates that there are limits to institutionalization of alliance experience and that the level needs to be appropriate in relation to the level of alliance experience.

- *Integrated alliance management mechanisms*

Effectively, the integration of learning processes takes the institutionalization one step further. They serve the purpose of creating interactive systems within the organization in order to improve understanding of the experiences. Such integration

alliance management processes are comprised of three underlying components. Firstly, tool-based processes such as intranet and databases provide firms with the ability to articulate and capture lessons of previous alliances and best practices (Harbison & Pekar, 1998; Heimeriks et al., 2009). Additionally, the introduction of performance reporting practices such as scorecards can improve alliance performance (Bamford & Ernst, 2002). Secondly, alliance management training such as communities of practice enables firms to share alliance knowledge throughout the organization (Draulans et al., 2003; Heimeriks et al., 2009). Thirdly, third-party relationships to consultants help firms to further improve their best practices and also provide ad-hoc help to manage alliance-related problems for which the firm does not possess the necessary capabilities (yet) (Draulans et al., 2003; Heimeriks et al., 2009). In summary, the alliance management process is to a large extent based upon the knowledge-based view as accumulating alliance knowledge is the main priority in order to improve alliance performance (Grant, 1996). Additionally, the alliance management processes consist of articulation, codification, sharing and the internalization of alliance knowledge (Kale & Singh, 2007).

Based on the learning framework by Crossan et al. (1999), the literature has referred to such processes as integrating alliance management which occurs at the group level (Crossan et al., 1999). Empirical evidence indicates that the effect of such alliance management processes on alliance performance in general is also mixed (Heimeriks et al., 2009; Kale et al., 2001). Their impact on alliance performance is more positive for firms with high levels of alliance experience (Heimeriks et al., 2007). Essentially, such experiences provide more variation and may therefore help in the selection of the value creating processes. Both mechanisms are complementary for organizations to effectively convert alliance experience into alliance knowledge (Heimeriks et al., 2007). As the CBV has emphasized, the development of capabilities is evolutionary (Nelson & Winter, 1982; Zollo & Winter, 2002). The sequential process for an alliance capability is to first gain experience, and then institutionalize it in order to capture this experience. Lastly, the use of integrating processes to spread the alliance experience throughout the organization is suggested (Heimeriks et al., 2007; Kale & Singh, 2007). While such mechanisms may have positive effects on alliance performance (Kale et al., 2001), recent research has found that the effect of codified alliance processes can be negative for alliance performance. Essentially, this

is dependent on the alliance lifecycle stages with alliance management processes for some stages being more beneficial than for others. More specifically, Heimeriks, Bingham, and Laamanen (2015) find alliance management processes are more valuable for early stage partner selection and late stage alliance termination phases, whereas, for the post-formation management stages it may even have negative effects (Heimeriks et al., 2015). This is because flexibility is more important when actually managing the alliance than in standardized early and late stages of the alliance lifecycle (Heimeriks et al., 2015). This indicates that alliance management mechanisms may also have detrimental effects on alliance value creation and may not be the key to achieving superior alliance performance.

2.2.5 Dyad-level alliance capability

2.2.5.1 Relational experience

While firm-level alliance experience and alliance management mechanisms may facilitate the management of alliances through an explicit focus on the alliance lifecycle, the ability to transfer these across other alliances is limited as each alliance is 'unique' due to differences in alliance partners. These may require different management approaches (De Man, 2014). Firms may however reduce the uniqueness of an alliance by partnering with a familiar partner in multiple repeated partnerships[3] (Gulati, 1995a; Gulati & Sytch, 2008). As this may translate into higher alliance performance, research has shown alliance capabilities may also exist on the dyad-level between two partners (Dyer & Singh, 1998; Wang & Rajagopalan, 2015). Building on the relational view as introduced above, the literature has referred to these as dyad-level relational capabilities (Dyer & Singh, 1998; Kale et al., 2000). Firms have been found to develop relational capabilities by managing repeated partnerships, thereby gaining relational experience (Dekker & Abbeele, 2010; Gulati & Gargiulo, 1999; Gulati et al., 2009; Kale et al., 2000; Li & Rowley, 2002), or partner-specific absorptive capacity (Zaheer et al., 2010). Existing literature identifies two reasons why relational experiences may lead to relational capabilities: These are the

[3] Repeated partnerships refer to new or extended partnership agreements between two firms which have collaborated in a previous partnership before. In this context the term "Repeated partnership/ties" (e.g. Goerzen, 2007; Hagedoorn, 2006; Xia, 2011) has primarily been used. Also the term "repeated exchanges" has been used in prior literature. As it has predominantly been in the context of supplier-buyer partnerships (e.g. Elfenbein and Zenger (2014) and not strategic alliances in general, I rely on repeated partnerships in this thesis.

development of trust and the generation of partner-specific routines. However, other research has doubts whether relational experiences are beneficial as they may be entered due to network inertia. This section therefore endeavours to present both the positive and negative outcomes of repeated partnerships.

- *Trust as a result of relational experience*

Trust has frequently been investigated in the field of strategic alliances (Dyer & Chu, 2000; Fang, Palmatier, Scheer, & Li, 2008; Gulati & Nickerson, 2008; Zaheer, McEvily, & Perrone, 1998). Partnering firms may develop trust among each other as they partner repetitively (Gulati, 1995a; Muthusamy & White, 2005). This may in turn reduce transaction costs (Granovetter, 1985; Ring & Van de Ven, 1992) and eventually lead to more successful alliances (Mohr & Spekman, 1994). This is because the familiarity between alliance partners may provide firms with the ability to (1) reduce efforts for accumulating information about the partner in due diligence (Dyer & Chu, 2003), which then (2) improve the control process (Dekker & Abbeele, 2010). This has led several researchers to propose that trust essentially *reduces the need for control* of the alliances partner (Gulati, 1995a; Zollo et al., 2002). Thus, trust and control of the alliance partner can be regarded as *substitutes* (Corts & Singh, 2004). Other research however indicates that trust *facilitates the ability to control* (Argyres, Bercovitz, & Mayer, 2007; Mayer & Argyres, 2004; Ryall & Sampson, 2009). This research considers firms as learning from previous partnerships in order to improve subsequent contracts with the partner (Mayer & Argyres, 2004; Vanneste & Puranam, 2010), thus leading to trust and control being considered as *complements*. While this debate is still ongoing in existing literature, the effect of repeated interactions on trust is positive (Gulati, 1995a; Gulati & Sytch, 2008). Increased trust among partners leads to increased knowledge sharing and reduces the number of conflicts (e.g. Abrams, Cross, Lesser, & Levin, 2003) and therefore facilitates the interaction quality between organizations (Arrow, 1974).

- *Partner-specific routines as a result of relational experience*

Derived from a dynamic capability perspective (Zollo & Winter, 2002) and the relational view (Dyer & Singh, 1998), both partnering firms may establish shared partnering routines and capabilities (Zollo et al., 2002). These can include an improved understanding for the other partners' culture and management processes but

can also lead to explicit mechanisms for improving coordination among partners or problem-solving (Zollo et al., 2002). For instance, partner-specific knowledge exchange routines can include frequent steering committee meetings (e.g. De Man & Roijakkers, 2009; Hoetker & Mellewigt, 2009; Kaplan, Norton, & Rugelsjoen, 2010; Pangarkar, 2003). Such processes are difficult to manage as they involve the coordination and communication among partnering companies (Pangarkar, 2003). Introducing such processes eliminates several key problems with strategic alliance management such as the risk for opportunism (Das, 2006).

A key aspect for introducing such routines is that they are relation-specific, thus, they may not be applicable in other partnerships. Such relation-specific asset investments are key aspects for the relational view as introduced by Dyer and Singh (1998). Based on Williamson (1985), such investments can either be related to *sites* (e.g. headquarter or factory location), *physical* (e.g. specific machines or equipment), or *human* (e.g. specific know-how held by partnering firm employees). An example for relation-specific asset investments is the relocation of facilities close to the partner in order to facilitate knowledge exchange. For instance, Toyota's alliance partners have moved their development and production facilities close to Toyota's facilities indicating substantial commitment to the partnership (Dyer & Nobeoka, 2000).

- *Network inertia as a result of relational experience*

Other research in the alliance field argues that repeated partnerships may lead to a negative effect on performance (Goerzen, 2007; Kim, Oh, & Swaminathan, 2006). Drawing on Burt (1992) and Granovetter (1973), Goerzen (2007) argues that partnerships with the same partner offer redundant information and resources. As such, they may be more cost effective to maintain but offer less benefits than partnerships with new partners. Relying on familiar partners may therefore reduce the long-term effectiveness of the partnership itself (Goerzen, 2007). Kim et al. (2006) contribute a network inertia perspective to this. They argue that as partnering organizations have repeatedly engaged in alliances, they become inert and do not look for alternative partners. Thus, they continuously enter repeated partnership for inertial reasons (Kim et al., 2006) and alliances with relational experiences therefore lead to negative effects on performance (Goerzen, 2007).

- *Ambiguous effects of relational experience*

The abovementioned mixed results of repeated partnerships therefore indicate that there might be issues with using relational experience as a proxy for relational capabilities. Due to both positive (trust and partner-specific routines) and negative (network inertia) reasons to enter repeated partnerships, it is not surprising that empirical evidence is mixed. Several studies in existing research have found positive alliance performance effects when relational experiences existed. For instance, research has found that they positively impact managerial assessments (Zollo et al., 2002), termination outcomes (Reuer & Zollo, 2005), and value-creation measures, such as stock market response (Gulati et al., 2009), indicating that these partnerships have effectively developed relational capabilities through trust and/or partner-specific routines. However, other studies have found negative effects on alliance performance, such as financial or project performance, thus, indicating that network inertia among partners may have been generated (e.g. Goerzen, 2007; Hoang & Rothaermel, 2005; Pangarkar, 2003).

In order to provide clarity to this theoretical and empirical issue, it is not surprising that recent literature has used more fine-grained approaches to identify conditions under which firms can benefit from relational experiences. Several studies have focused on governance and firm-level aspects in relation to relational experiences. These studies find, for instance, that firms in non-equity alliances benefit more from relational experience than those in equity alliances (Reuer & Zollo, 2005; Zollo et al., 2002). This is because equity is an alternative supplementary governance mode to trust-based capability mechanisms to reduce opportunism by one alliance partner (De Man, 2014). Thus, relational experience has a stronger effect when managing non-equity alliances (Zollo et al., 2002). Other research identifies that firms benefit more from relational experience when there is a high level of uncertainty surrounding the firm as the familiar partner provides more certainty under these circumstances (Gulati et al., 2009). Additionally, firm's with more technological and financial resources benefit more from relational experiences as the trust generated through these resources acts as a safeguard to protect these resources (Gulati et al., 2009). Moreover, research indicates that large firms tend to benefit less from relational experience than smaller firms (Park & Kim, 1997). Results have been attributed to the small firm in a repeated partnership being more effective to

appropriate the knowledge from the larger partner (Park & Kim, 1997). Even other research focuses on the trust developed itself and finds that it may take longer than expected (Gulati & Sytch, 2008). This is because organizations and its boundary spanners need time to set up routines in order to start trusting each other (Mayer & Argyres, 2004). While such contingencies have improved our understanding of the effect between relational experience and performance, a recent meta study has provided some evidence that the effect of trust-based processes on performance still depends on many unobserved moderators (Vanneste, Puranam, & Kretschmer, 2014).

2.2.6 Summary

This literature review on strategic alliances has set out by providing an overview why strategic alliances are formed and how they fit into the corporate strategy literature. After that, it has gone through the dyadic alliance research and has analysed the reasons for and stages of strategic alliances. Moreover, the review has indicated that performance results are ambiguous and that firms rely on superior alliance management practices. However, as also shown finding the right mix of experiences and alliance-related processes is critical but immensely difficult. In order to contribute and improve our understanding how firms can more successfully manage alliances, this thesis investigates various dimensions of both general alliance and relational experience.

CHAPTER 3: METHODOLOGY

In this thesis on different dimensions of alliance experiences and their effect on alliance value creation, a deductive, hypothesis-testing approach is adopted. This chapter firstly provides an overview of the research philosophy adopted in Section 3.1, before the research design is introduced in Section 3.2. Following this, the data collection and analysis is described in Section 3.3. The chapter then provides an overview of the variables and measures used in the following empirical chapters in Section 3.4.

3.1 Research philosophy

In this section I describe the research philosophy, the key onto[4]-epistemological[5] assumptions underpinning this thesis. These assumptions help to refine how I, as a researcher, position myself within the field and how this fits within the existing paradigm in research on strategic alliances.

This thesis is based on a critical rationalist perspective. Critical rationalism agrees with the logical positivist stance that knowledge is objective, yet it also maintains that it can never be absolute. As argued by Popper (1962), a key proponent of critical rationalism, "the way in which knowledge progresses, and especially our scientific knowledge, is by unjustified (and unjustifiable) anticipations, by guesses, by tentative solutions to our problems, by *conjectures*. These conjectures are controlled by criticism; that is, by attempted *refutations*, which include severely critical tests. They may survive these tests; but they can never be positively justified" (Popper, 1962: vii). Thus, as a researcher it is difficult to claim that there is no other alternative theory which can possibly describe an empirical finding more accurately than the specific one used. Consequently, while a particular theory may hold for decades, subsequent evidence may result in the revision, extension or refutation of existing theory (e.g. the famous black swan example). Therefore, truth can only be approached, however, never be entirely reached. Popper summarized this in his moral

[4] Ontology refers to the "philosophical assumptions about the nature of reality" (Easterby-Smith, Thorpe , & Jackson, 2008: 61).
[5] Epistemologies refer to the "general set of assumptions about the best ways of inquiring into the nature of world" (Easterby-Smith et al., 2008: 61).

credo: “I may be wrong and you may be right, and by an effort, we may get nearer to the truth” (Popper, 1994: xii).

The development of scientific knowledge according to critical rationalism therefore depends on a constant process of conjectures and refutations. In other words, the key basic assumption of critical rationalism is that knowledge is refutable. This has important implications for the generation of scientific knowledge. For science to effectively develop new knowledge, it is necessary to develop *testable* hypotheses which allow for the falsification of existing knowledge in a so-called “falsifying hypothesis” (Popper, 2009: 66).

Kuhn (1962) and Lakatos (1970) have further elaborated this approach by showing that falsification of hypotheses occurs within ‘paradigms’ (Kuhn) or ‘research programs’ (Lakatos). Paradigms are defined by Kuhn as “universally recognized scientific achievements that, for a time, provide model problems and solutions for a community of researchers” (Kuhn, 1962: viii). Similarly, Lakatos’ concept of research programs refers to the acceptable standards within the community of scientific researchers. Through these two concepts both have advanced the idea of falsification by further specifying the theoretical context in which research occurs. Kuhn has propagated that within a paradigm of a research area, so called ‘normal research’ is carried out. This means that within the research area, fundamental beliefs and theoretical assumptions are not challenged. Essentially, the paradigm enables researchers to ‘solve puzzles’ with the goal to improve the fit towards reality. Thus, in order to explain empirical phenomena the researcher makes use of recognized heuristics within the ‘research program’ (Lakatos, 1970). Yet the inability to solve a particular puzzle does not immediately result in the falsification of the paradigm. Instead, such ‘anomalies’ initially question the ability of the researcher and the methodological process before the ‘hard core’ (Lakatos, 1970), the key set of theoretical assumptions of a research area are scrutinized.

As a researcher I rely on the ‘hard core’ (Lakatos, 1970) within the paradigm of alliance research. One core assumption is that investors are capable to rationally evaluate the impact of an alliance announcement onto the stock market value of a focal firm. This assumption is largely accepted within the scientific community as evidence from scientific publications indicates (e.g. Gulati et al., 2009) and thus forms

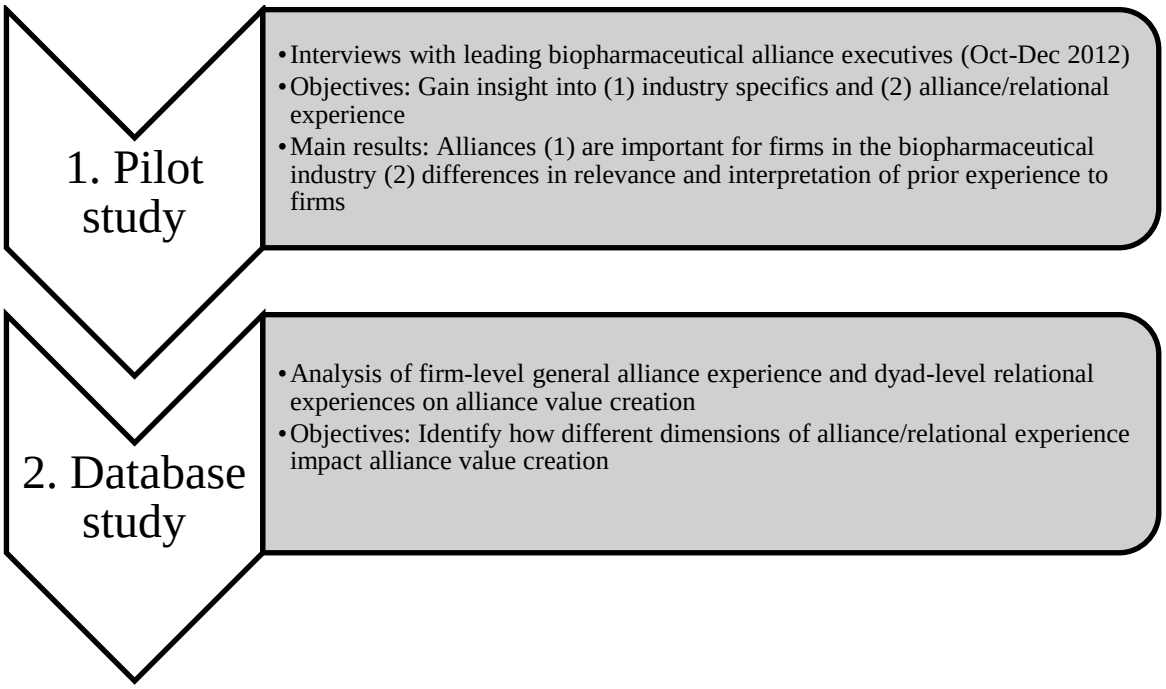
part of the paradigm of alliance research. Whereas Popper believes those assumptions may be falsified, Kuhn in turn argues that falsification is not sufficient. It would require a scientific revolution. A scientific revolution in turn would require the community of researchers to abandon such core assumptions regarding alliances in order to adapt a new paradigm or research program. Kuhn believes that in a scientific revolution the key assumptions may be replaced, or the recognition of the actual research problem may differ and thus scientific may be non-cumulative. Within the paradigm, however, my contribution as a researcher is that I try to falsify hypotheses regarding what Lakatos (1970) calls the 'protective belt' of the 'research program' but not the 'hard core'. This helps to further develop research within the accepted scientific community.

In essence, both Kuhn and Lakatos further modify Popper's falsification by providing a necessary context for the process of hypotheses falsification. This process is influenced by political factors within the scientific area. Under consideration of such influences and in line with critical rationalism and logical positivism, I follow a deductive, hypothesis-testing approach. In particular, I aim to falsify existing theory of alliance experience. It is the refutation of those hypotheses through which I aim to advance knowledge in the alliance literature.

3.2 Research design

The research design of this study, firstly, builds on a pilot study in order to gain better insights into the industry and secondly an empirical database study. The pilot study consisted of interviews with industry and strategic alliance experts.

FIGURE 3.1: Research design overview



3.2.1 Pilot study with alliance executives (interviews)

Interviews with alliance executives had been conducted as a pilot study in order to provide further clarity into strategic alliances, specifically in the biopharmaceutical industry. Therefore, in October 2012, the largest global 100 biopharmaceutical companies by revenue in 2011 were identified from the Recombinant Capital (RECAP) database and other industry reports. Subsequently, leading alliance management executives, such as (senior) vice-presidents of alliances, or R&D executives who had managed alliances at these companies in the past were initially identified through the RECAP database, which has an extensive list of alliance executives in the biopharmaceutical industry. Additionally, annual reports, company websites, were consulted for alliance executive names. From these sources, the highest ranked executive in the company with an alliance management

background or position was identified and contact details obtained. Executives were then sent a letter by post introducing the research project asking for their availability to participate in either a personal or telephone interview to discuss the role of strategic alliances in the biopharmaceutical industry and their organization specifically. If no response had been obtained after three weeks, a follow-up phone call was made. Several contacted firms replied but were unable to participate in an interview due to confidentiality agreements regarding their alliances, resulting in initial interviews with 10 firms. Interviews were then scheduled via telephone for the period between October and December 2012. Additionally, interviews with smaller biotech firms were scheduled during the 'CPhI' in Madrid (October 2012) and the 'Biofit' trade-fair in Lille, France, (December 2012), two of the leading European biopharmaceutical trade-fairs for R&D and alliance executives. In combination with the phone interviews, this resulted in 20 interviews. The interviewed companies consist of both large pharmaceutical and small biotechnology organizations. Their headquarters are primarily in Europe, with a smaller proportion of interviewed companies based in the US and Japan. All of the interviewed executives had been directly involved with the management of strategic alliances in the past. The interviews were semi-structured and provided the opportunity to discuss role of alliances in the biopharmaceutical industry with a special on the role of alliances for the respective organization. Based on this, the importance of alliance experience in the management of strategic alliances for the firm was discussed.

The key insights from the interviews were: Firstly, executives stressed the importance of strategic alliances in the biopharmaceutical industry. Alliance executives emphasized that both R&D collaborations and licensing deals are important in the industry, whereas manufacturing and marketing alliances are deemed not as critical to success. Moreover, some executives indicated that alliance performance depends on various factors. While some alliances have measurable outputs associated with them, others involve intangible outputs such as learning. Additionally, most executives indicated that the termination of alliances is not necessarily a signal for failure. Despite having their own alliance performance assessment criteria, most executives seemed to agree that stock market indicators are an important measure for their alliance management as well, particularly for smaller firms which are more reliant on early-stage financing.

Secondly, interviews allowed me to specify the research questions more precisely. A few executives emphasized that experience is important for managing strategic alliances. During the interviews it was noted, however, that firms leverage on their alliance experiences differently. Several executives for instance were more capable of recalling both positive and negative experiences with previous alliances. Additionally, some alliance executives' seemed to imply that contingencies are important to derive benefits from alliance experience. For instance, some executives mentioned that it is easier to learn from an alliance when performance is extreme, thus, either very successful or unsuccessful.

Overall, the main insights from these interviews were that firstly, R&D alliances are critical in the biopharmaceutical industry. Secondly, alliance performance is difficult to measure, while the stock market does provide a reasonable measure. Thirdly, differences in how executives were able to recall previous alliance experiences and the contingencies for benefiting from previous experiences raised important questions I intended to explain further in a more generalizable database study.

3.2.2 Three deductive empirical chapters

Based on insights from these interviews, the second step of the research design is to test whether alliance experience is relevant and whether there might be contingencies which influence how firms benefit from alliance experience. Prior research in the field of strategic alliance experience has been conducted using a wide range of different methodologies by using either inductive, theory generating or deductive, hypothesis-testing approaches (e.g. Gulati et al., 2009; Hoang & Rothaermel, 2005). Additionally, some research has identified data on alliance experience from interviews and surveys (e.g. Heimeriks, 2010; Zollo et al., 2002), while other studies have relied on using databases (e.g. Anand & Khanna, 2000a; Gulati et al., 2009). In this thesis, I decided to test the effect of contingencies of alliance experience on value creation in a deductive, database study as this provided a direct extension to existing studies which have investigated alliance experience.

The empirical chapters consist of a series of event studies in each one of them. For each event study, independently pooled cross-sectional data is used. More

specifically, as the level of analysis in an event study is the alliance itself, this means that cross-sectional data is sampled over the duration of the sample period. This is in sharp contrast to panel data which tracks a cross-section of firms' alliances over time. However, here cross-sectional data is 'pooled' over multiple years. Using pooled cross-section data is standard practice in event study research (e.g. Balakrishnan & Koza, 1993).

3.3 Data collection and analysis

3.3.1 Data sources

The MEDTRACK database is used to identify strategic alliance. This database offered by Life Science Analytics, offers a very comprehensive account of biopharmaceutical drug development activity on both public and private companies. A particular emphasis in the database is on strategic alliances. MEDTRACK accumulates data on alliances from press releases, annual reports, newspapers, and company sources. It has frequently been used in previous alliance studies (e.g. Diestre & Rajagopalan, 2012; Diestre, Rajagopalan, & Dutta, 2015; Fernald, Pennings, & Claassen, 2014). For each announcement, MEDTRACK provides in many cases the original press release as well as other relevant information regarding the alliance such as an event history. For this thesis, the alliance announcement press releases are of particular interest. Due to the importance of the precise announcement date for event studies, particular emphasis is placed on the press release date. Therefore, press releases and confounding announcement dates are also checked in Lexis-Nexis.

Besides the critical data on strategic alliances, other data sources are consulted for other variables. Stock market data for the dependent variable in the work is derived from the University of Chicago's Centre for Research in Securities Prices (CRSP). This data is then used in the Wharton Research Data Services (WRDS) Eventus tool to calculate the alliance value creation effect. Data for control and moderating variables are extracted from the WRDS Compustat tool, the WRDS I/B/E/S database, from annual reports (10-K and 20-F) and proxy statements (DEF14A) filed on the Securities and Exchange Commission (SEC) Edgar website.

3.3.2 Sample

This study uses a sample of non-equity strategic R&D alliances in the global biopharmaceutical industry [SIC codes: 2834 (Pharmaceutical preparations) and 2836 (Biological products)] from 2003 to 2012. This ten-year sampling window is selected to account for recent alliances, while still permitting the collection of firm-level data for control variables. The recency of the data is particularly desired as the importance of strategic alliances has been increasing over time, as mentioned in the CEO survey above. Joint ventures are excluded from the analysis as they differ significantly in terms of ownership and control of assets, making them difficult to compare to contractual strategic alliances (e.g. Das et al., 1998). Furthermore, this sample relates to all the non-equity strategic alliance and licensing agreements entered by firms in the R&D stage or the commercialization stages of development. Such alliances are common in the biopharmaceutical industry as firms increasingly share the rising development costs (Hagedoorn, 2002) and have been emphasized by alliance executives as the key alliance type in the biopharmaceutical industry.

As explained above, the level of analysis in event studies is usually the announcement itself, not the announcing firm. MEDTRACK identifies 8872 strategic alliance announcements for this time period. These deals are then matched to the CRSP files in order to identify whether one of the firms involved in the strategic alliance is listed on either one of the following stock exchanges at the announcement date: NYSE, NYSE Amex, NASDAQ, and Arca exchanges. This results in 1294 alliance deals. Following that, further alliances are excluded if confounding events occurred around the announcement date which might influence the analysis. More specifically, Lexis Nexis and MEDTRACK are checked whether announcing firms also announce earnings, dividends, M&As, strategic alliances and annual general meeting announcements surrounding the alliance announcement (+/- 5 days). This results in a further exclusion of 425 cases, resulting in a sample size of 869 alliance announcements. As Medtrack provides alliance information on other related industries all non-biopharmaceutical firms are excluded from the analysis. This results in 741 alliance announcements.

Final sample sizes differ across the empirical chapters 4, 5 and 6 however. In Chapter 4, this thesis uses a subsample of alliances where the two partners had collaborated in a previous alliance before, thus have relational experience. This results

in the identification of 184 strategic alliance announcements. Due to missing values in control variables, the final sample consists of 161 announcements. Chapter 5 consists of the full sample of 741 alliance announcements. Excluding cases with missing values results in a final sample of 611 strategic alliances. For Chapter 6, the focus is on general alliance rhythms (GAR) but also on the partner-specific alliance rhythms (PAR). Therefore, both the full sample and the subsample are used.

External validity is ensured by comparing key measures of general alliance experience, total assets and employees. Due to data limitations, this comparison is conducted between the population of all listed firms engaging in strategic alliances and the final sample sizes for Chapters 4, 5, and 6. Resulting from this, no statistical difference can be identified for these key measures.

3.3.3 The Biopharmaceutical industry

Existing research on strategic alliances has extensively focused on the biopharmaceutical industry (e.g. Deeds & Hill, 1996; Diestre & Rajagopalan, 2012; Hess & Rothaermel, 2011; Hoang & Rothaermel, 2005; Hoang & Rothaermel, 2010; Lane & Lubatkin, 1998; Pangarkar, 2003; Powell et al., 1996; Reuer & Zollo, 2005; Rothaermel, 2001; Rothaermel & Boeker, 2008; Rothaermel & Deeds, 2006; Yang et al., 2015). This is because of the importance of strategic alliances to the industry's total revenues (Rothaermel, 2001), and the resulting high number of alliance announcements (Hagedoorn, 2002; Hoang & Rothaermel, 2005). Before I provide more details on the importance of strategic alliances to the industry, I provide a general overview of the biopharmaceutical industry.

3.3.3.1 General overview of the industry

The biopharmaceutical industry is comprised of pharmaceutical and biotechnology firms which develop new medicines and vaccines to prevent and treat diseases and improve lives of patients, according to the International Federation of Pharmaceutical Manufacturers and Associations (IFPMA) (IFPMA, 2014). The industry itself is global with multiple companies dispersed around the world. Global market size in terms of revenues in the industry have reached over US$800 billion in 2013 which represents growth rates of around 4% over the period 2009-2013 and forecasts until

2018 predict that the CAGR will reach around 5% (Marketline, 2014). The key market still remains North America with over 40% of all revenues generated there. Nevertheless, reports indicate that the Asia-Pacific region is the fastest growing market with growth rates of around 7% (Marketline, 2014). As a result of the rapid growth, the Asian-Pacific market has already surpassed the European market size during the last decade.

One of the key features of the biopharmaceutical industry is the high research intensity. Evidence from the National Science Foundation in the US indicates that 20% of all R&D expenses in the US are funded by biopharmaceutical companies, making it the most research-intensive industry in the US and also globally (IFPMA, 2014). Globally, around US$137 billion annually are spent on R&D by biopharmaceutical companies (IFPMA, 2014). The output of these efforts has led to more than 500 new drug approvals by the Food and Drug Administration in the US since 2000, according to the trade association Pharmaceutical Research and Manufacturers of America (PhRMA) (PhRMA, 2013).

This has substantial socio-economic impacts. According to data for the US, PhRMA estimates that more than 810,000 people are employed in the US pharmaceutical industry with around 3.4 million jobs across the economy being created due to efforts by biopharmaceutical organizations. Based on data by the Office of National Statistics in the UK, the Association of the British Pharmaceutical Industry (ABPI) finds that the economic value created (as measured by the Gross Value Added) is the highest among all manufacturing industries per employee in the UK (ABPI, 2015)

One key measure for the impact onto society is the life expectancy. According to the ABPI, the life expectancy of new born babies in the UK is now almost doubled in comparison to figures in 1900. Also, numbers from the British Heart Foundation indicate that deaths from cardiovascular diseases have declined by about 40% over the period 1998 to 2008. Additionally, deaths arising due to HIV/Aids have dropped by 85% from 1995 to 2011 due to introductions of new antiretroviral therapies. Furthermore, data by the World Health Organization and the IFPMA indicate that since the 20th century 19 classes of Antibiotics have been developed which have led to cures of multiple thousand types of infections and saving potentially over 200 million

lives since then. In developing countries, the impact of the biopharmaceutical industry is also substantial. For instance, it is estimated that over 1 million African children's life has been prevented due to medicines being developed against malaria.

3.3.3.2 Importance of strategic alliances in the biopharmaceutical industry

The contribution of strategic alliances to the growth in the biopharmaceutical industry is substantial. According to Medtrack data on R&D alliance[6], the number of newly formed strategic alliances has continuously increased [CAGR: +18% (1995-2005)]. A recent trend over the last decade, however, finds a decrease in the number of newly formed strategic alliances [CAGR: -6% (2005-2012)]. More interestingly, this trend has been counteracted by a substantial increase in the median deal value over the same time period [CAGR: +10% (2005-2012)]. This indicates that the relevance of the (smaller number of) newly formed alliances to the industry has actually grown over time.

One of the key reasons for such dramatic increases in the significance of strategic alliance to the biopharmaceutical industry has been due to the dramatic changes to the industry structure since the 1980's. The industry has traditionally been focused on the chemical development of drugs. Traditionally, the industry consisted of large pharmaceutical corporations which experimented with the drug development primarily by themselves. This process was oftentimes based on serendipity and resulted in one-off successes. However, the industry was shaken up when the principle of DNA recombination was first developed by scientists at the University of California San Francisco who would later go on to found the now-publicly listed company Genentech. This discovery has enabled researchers to investigate living cells and test whether so-called 'lead compounds' can affect the target molecule in such cells. As a result, a new form of companies has challenged the way traditional pharmaceutical companies have developed drugs. Nowadays, the industry is comprised of two types of organization: On the one hand, the large pharmaceutical companies, leveraging on their expertise of large-scale chemical development and on the other, the small biotechnology firms, in turn leveraging on the more innovative biologic compounds for their drug development. While these seem distinct, their

[6] This includes all R&D alliances following Medtrack's definition.

capabilities such as the management and the resources needed for the later stage are similar.

The unique composition of financially strong pharmaceutical firms and the small innovative biotechnology firms in combination with the expensive drug development has led to intense pressures for both types of firms to engage in strategic alliances (Rothaermel, 2001). Firstly, the risks associated with the development of drugs are high given the immense development costs. Most importantly, the outcome is uncertain as the success rate for drug compounds taken into human clinical trials is only 20% (DiMasi, Hansen, & Grabowski, 2003). It is an inherently uncertain industry as a quote of the former Novartis CEO, Dr Daniel Vasella indicates: "We can never read the future. You can put in place all the elements that you believe are essential: The people, the money, the technical resources, the skills, the continuous training, alliances with academia and with other partners…but there is no guarantee for success. You are constantly dealing with uncertainty. But having said that, you need to have people who are willing to bet their life that what they are doing is right. That's when you have programs that move forward and succeed, but then you also have more programs that move forward and don't succeed. It's a business with more failures than successes. It's just the fact and we have to accept it" (Vasella, 2004).

Secondly, costs for the development of drugs are high. Capitalized costs for developing a drug from research through clinical trials to approval have grown from US$100 Million in the 1970's to over US$800 million in the 2000's (Grabowski, 2011).

Thirdly, the benefits for incurring such high costs are often marginal as sales levels for individual drugs have declined over the years. While drugs in the 1980's and 1990's have often delivered a major breakthrough to a medical indication and became blockbuster drugs (sales over US$ one billion), improvements to existing drugs are often only marginal nowadays (Grabowski, 2011). Therefore, it is not surprising that only 30% of all product approvals break-even, with the rest incurring loses (Grabowski, 2011).

Fourthly, regulatory pressures intended to enhance competition have led to the shortening of market exclusivity for drugs and the increased legislative power to generics and biosimilar producers. Moreover, increased value-based pricing systems

do not make any reference to the actual development costs but only to the added patient benefits of a specific new drug. This has led to increased substitute and buyer power in the industry, respectively (Marketline, 2014).

As mentioned above, the industry has nevertheless continued to grow and despite the abovementioned challenges, outlooks are also positive. The reason behind this is that firms have reacted to these pressures. Firstly, companies have consolidated by engaging in horizontal M&As, as evidenced by recent examples of large pharmaceutical M&As this decade. While these have helped to reduce costs and minimize risks, M&As have not addressed the underlying issues of the pharmaceutical industry which is a lack of innovation at a cost-efficient price (Gassmann, Reepmeyer, & Zedtwitz, 2008). Therefore, several companies have focused on their core markets, vertically disintegrated and instead partnered with multiple alliance partners. Such strategic alliances have enabled biopharmaceutical firms to focus on their key capabilities in core markets while complementing these with capabilities of external partners. Most often the small biopharmaceutical company provides the innovative capabilities, while the large pharmaceutical company provides the commercial abilities.

In summary, due to the abovementioned pressures of uncertainty, dynamism and the various capabilities needed in order to stay competitive, companies oftentimes engage in strategic alliances. In order to diversify their risk over multiple alliances (Grabowski, 2011), companies manage large portfolios of strategic alliances at the same time (Hoffmann, 2005). These alliances can range from non-equity to equity alliances and can improve firm performance while at the same time maintaining strategic flexibility (Yoshino & Rangan, 1995).

3.3.4 Statistical analysis and OLS regression

The statistical analysis is conducted using the STATA software package. An ordinary least squares (OLS) regression is used throughout all three empirical chapters. In order to use OLS regression and for results to be robust, several assumptions concerning the dependent variable need to be fulfilled. The assumptions refer to the linearity between independent and dependent variables, independence of errors, normality of error distributions and homoscedasticity of the error terms. These

are tested and no violations for the assumptions could be identified. Furthermore, robust standard errors (Huber-White Sandwich Estimators) are used in OLS regressions throughout the thesis with the clustering option by firm (e.g. Wang & Zajac, 2007) in order to reduce any potential biases and more specifically to reduce any potentially disturbing issues concerning with interdependence of announcements by the same firm. Multi-collinearity is checked through mean-centring as proposed by (Aiken & West, 1991) and tested through variance inflation factors. Additionally, as suggested by Echambadi and Hess (2007), subsamples as used for robustness checks are also used to check for changes of coefficients and standard errors.

3.4 Variables and measures

3.4.1 Dependent variable

An event study methodology is used to calculate the dependent variable *Cumulative Abnormal Return (CAR).* Event study methodology is frequently used to assess investor reactions to announcements which were previously unanticipated (MacKinlay, 1997). Investors constantly re-evaluate the firm value of companies due to changes in the firm's projected discounted cash flows. Therefore, investors primarily react to announcements which can range from macroeconomic, political, competitor to focal firm announcements. Under the assumption that the stock market is at least semi-efficient (Fama, 1970), investors react to publicly available announcements to adjust their projected discounted cash flow and, hence, the value of the company (Fama et al., 1969). If carefully conducted and confounding events are excluded, these abnormal changes can then directly be attributed to the announcement being made. Event studies are therefore a frequently used method in the field of strategic management (Anand & Khanna, 2000a; Laamanen, Brauer, & Junna, 2014; Liu, Arthurs, Nam, & Mousa, 2014; Liu & Ravichandran, 2015; Sears & Hoetker, 2013). They have also frequently been used as a stock-market based measure for alliance performance or value creation (e.g. Anand & Khanna, 2000a; Balakrishnan & Koza, 1993; Das et al., 1998; Gulati et al., 2009; Kale et al., 2002; Koh & Venkatraman, 1991; Liu & Ravichandran, 2015; Merchant & Schendel, 2000; Yang et al., 2015).

Based on the assumption that the stock market is at least semi-efficient and is able to predict the value of an alliance upon the announcement, it offers a measure with high validity. By comparing the derived market-based measure to subjective managerial assessments of long-term alliance performance, studies have found a high correlation between such measures; hence, concluding that the stock market based measure is efficient (Heimeriks et al., 2015; Kale et al., 2002; Koh & Venkatraman, 1991).

In order to estimate the incremental value creation of each alliance for the respective announcing firm in the sample, the 'normal' stock market behaviour for the stock (the estimation period) needs to be estimated. The estimation period is subject to influence from confounding events surrounding the alliance announcement. Thus, the end date of the estimation period should not be too close to the announcement itself, however, also not too long before it as it should pick up the 'normal' returns for the focal firm in order to be able to calculate the 'abnormal returns'. It is common practice to have an estimation period of over 200 days, with the start date around 250 days ahead of the focal alliance and the end date between 50 to 10 days before the alliance (MacKinlay, 1997). In this study an estimation period of 250 days up to 10 days before the alliance is used which is comparable to other alliance studies (Gulati et al., 2009).

In order to calculate the abnormal return, the individual return of the focal firm $\boldsymbol{i}$ needs to be regressed on the market returns in the estimation period. The CRSP equally-weighted index is chosen which is common in existing research (e.g. Moeller, Schlingemann, & Stulz, 2005; Park, 2004)[7]. From both the firm and market returns in the estimation period, the parameter estimates $\boldsymbol{\alpha_i}$ and $\boldsymbol{\beta_i}$ are calculated to measure the relationship between the firm's stock and the market return in the actual event window.

$$r_{it} = \alpha_i + \beta_i r_{mt} + \varepsilon_{it} \quad \textbf{(1)}$$

In this, $\boldsymbol{r_{it}}$ represents the returns for firm $\boldsymbol{i}$ on day $\boldsymbol{t}$, $\boldsymbol{r_{mt}}$ is the daily return on the CSRP equally weighted index, $\boldsymbol{\alpha_i}$ and $\boldsymbol{\beta_i}$ are firm-specific measures for the model and

[7] All models are also run with the CRSP value-weighted index and results do not change.

ε_{it} is distributed normally. As it is standard practice in the field, the returns generated from the above model are then used in multiple event windows surrounding the alliance announcement (MacKinlay, 1997). Both short and long event windows are used in alliance research. For this thesis the main event window of -1 days before the announcement to the event, day 0, is used. This event window takes into account that the alliance announcement may be leaked to the market the day before the official announcement and sophisticated investors and analysts may already be informed. Hence, the announcement may already be reflected in the firm's stock price one day before, while still having the main effect on the announcement day itself. The event window (-1,0) is therefore one of the most frequently used event windows in strategic alliance research (e.g. Gulati et al., 2009; Koh & Venkatraman, 1991; McConnell & Nantell, 1985; Reuer & Koza, 2000; Yang et al., 2015).

The main advantage of the stock-market based measure CAR is that it may pick up the effect of an announcement without being influenced by confounding events. This is particularly advantageous over other measures of value creation or performance in the field of strategic alliances such as innovation (De Man & Duysters, 2005), managerial assessments (Zollo et al., 2002). Such measures are heavily influenced by such factors and their empirical effect onto value creation may be biased. However, there is the danger of misinterpreting short event windows as investors may require more time to understand such rare announcements (Oler, Harrison, & Allen, 2008). Therefore, various event windows[8] which are still short but longer than the (-1,0) window are chosen to increase the robustness of results. While choosing long event windows would decrease the issue of investor understanding, they are also not without disadvantages. Essentially long-event windows are subject to be negatively influenced by various confounding events such as other firm announcements (McWilliams & Siegel, 1997). Due to the dynamism and the frequency of announcements in the pharmaceutical industry, this might seriously influence the results. In the pharmaceutical industry in particular alliances are one of the most common forms of announcement and multiple such events may be made in short succession (Hagedoorn, 2002). Hence, investors are likely not to require extensive time to value an alliance announcement and be expected to be

[8] I use multiple different event windows ranging from -10 to +10 days as robustness checks which is standard practice in existing literature

knowledgeable of alliance announcements. Additionally, the multitude of different announcements in the industry makes short event windows even more appropriate. After selecting the event window, the parameter estimates for the calculation of the expected return for the focal firm in the event window can be used:

$$\widehat{R}_{it}=\hat{\alpha}_i+\hat{\beta}_i r_{mt} \quad (2)$$

, where $\widehat{\boldsymbol{R}}_{\boldsymbol{it}}$ represents the expected returns for firm $\boldsymbol{i}$ in the respective event window, and $\widehat{\boldsymbol{\alpha}}_{\boldsymbol{i}}$ $\widehat{\boldsymbol{\beta}}_{\boldsymbol{i}}$ represent the model estimates. The next step is then to calculate the abnormal return for the firm on a specific day. The expected return on that specific day for the firm $\widehat{\boldsymbol{R}}_{\boldsymbol{it}}$ is then subtracted from the actually realized return $\boldsymbol{r}_{\boldsymbol{it}}$.The error term $\hat{\boldsymbol{\varepsilon}}_{\boldsymbol{it}}$ is used as a measure for the abnormal returns:

$$\hat{\varepsilon}_{it}= r_{it}-\widehat{R}_{it} \quad (3)$$

The abnormal return reflects the increase or decrease in a firm's stock which is unanticipated in comparison to those witnessed during the estimation period; i.e. the so-called 'normal' returns. The abnormal returns for each trading day are then summed and form the 'Cumulative Abnormal Return' over the specified event window below.

$$CAR_i= \sum_t \hat{\varepsilon}_{it} \quad (4)$$

$\boldsymbol{t}$ reflect the event window for which the cumulative abnormal returns are generated. As described above, in this thesis $\boldsymbol{t}$ ranges from -1 to 0. The CAR is multiplied by 100 and therefore presented in percentages in order to improve readability.

3.4.2 Control variables

This section provides an overview of the control variables which are used throughout all three empirical chapters of this thesis. To facilitate readability of the later chapters and to avoid repetition, control variables used throughout are only introduced here, whereas the independent variables used for the respective hypothesis testing are introduced in the respective chapter's methodology sections. **Table 3.1** provides an overview of the measures for each independent and control variables and the empirical chapters in which each variable occurs. The control variables are:

Alliance year. A dummy variable for the year in which the announcement is made is created. Year 2003 represents the base year and is not included in the OLS regression. Creating dummy variables for announcement years is common practice in event studies for strategic alliance. (e.g. Gulati et al., 2009).

Non-listed alliance partner. The diversity of the organizational governance of the alliance partners in the focal alliance is included as another control (e.g. Deeds & Hill, 1996). This is a dummy variable with '0' indicating an alliance between the public focal firm with another stock-listed public partner and '1' indicating an alliance between the public focal firm and a non-listed private firm, research institute or university. The ownership and the diversity of alliance partners has been shown to significantly impact alliance performance (e.g. Jiang, Tao, & Santoro, 2010). As non-listed partners are smaller than listed partners, this measure also takes into account the relative size between alliance partners which has been found to be relevant in explaining alliance value creation (e.g. Koh & Venkatraman, 1991; Lavie, 2007). In general, small partners tend to appropriate more value than the larger partner.

Slack Resources. A measure for the slack resources is also included as a control variable. Multiple, highly correlated measures of slack resources exist (Daniel, Lohrke, Fornaciari, & Turner Jr, 2004). This study follows multiple studies in the field of strategic management which have measured organizational slack as the solvency of firms (Bourgeois, 1981; Greve, 2003; Lavie & Rosenkopf, 2006). Gulati et al. (2009) have found that it is a particularly important variable in predicting the impact of relational experience on alliance value creation. The *slack resources* of the focal firm are measured as the cash divided by the long-term debt, both enumerated in

the year preceding the alliance announcement. Due to the skewness in the variable, the natural logarithm is taken.

Firm Uncertainty. Additionally, literature has identified *Firm uncertainty* to be relevant in terms of alliance formation decisions. Beckman, Haunschild, and Phillips (2004) in their measurement of uncertainty as a function of the focal firm's standardized monthly volatility are followed:

$$\text{Firm uncertainty} = \frac{\text{SD (Firm's monthly closing price, Year}_i\text{Firm}_j)}{\text{Mean (Firm's monthly closing price, Year}_i\text{Firm}_j)} \qquad \textbf{(5)}$$

The volatility of firm j in year i, the announcement year, is firstly standardized. By dividing the standard deviation of the stock by the average firm's monthly stock market closing price, this method enables the interpretation of the standard deviation across firms with different stock prices.

Absorptive capacity. I follow existing literature and measure absorptive capacity by using the R&D intensity of the focal firm (Cohen & Levinthal, 1990). The R&D intensity measure captures the *potential* capacity of the firm to absorb knowledge. It is the most frequently used measure for absorptive capacity in strategic management (e.g. Ben-Menahem, Kwee, Volberda, & Van Den Bosch, 2013; Bertrand & Mol, 2013; Cohen & Levinthal, 1990; Lane, Koka, & Pathak, 2006) and is also particularly prone to be used in the context of strategic alliances (Mowery et al., 1996; Schildt, Keil, & Maula, 2012). It is a particularly important measure in the biopharmaceutical industry as firms rely on research and development (Hagedoorn, 2002). This does, however, vary across firms as some firms focus on less R&D intensive areas, such as generic products. Additionally, R&D intensity has been found to be important in explaining the impact of alliances on alliance performance (e.g. Gulati et al., 2009). The R&D intensity is measured as the R&D expenses divided by the net sales of the focal company in the year preceding the alliance announcement.

R&D alliance type. Some R&D alliances may also consist of licensing in addition to the collaboration in the R&D field. Experience effects however are significantly different for R&D collaborations and licensing deals (Anand & Khanna, 2000a; Rothaermel & Deeds, 2006). In order to account for such differences, I follow Medtrack's coding to control whether R&D alliances are only based on collaboration

and do not have a licensing component of a biopharmaceutical compound or product. Therefore, a dummy variable is created with the value of '0' if the firms have a licensing component in their alliance agreement and '1' if the alliance is solely based on R&D collaboration.

International alliance. Research has frequently distinguished between domestic and international alliances. International alliance have higher failure rates because they are more difficult to manage (Dacin, Hitt, & Levitas, 1997). Geographical and cultural distance may make it more challenging to generate trust, for instance (Parkhe, 1998). Geographical distance also decreases the likelihood of forming alliances, which may however be influenced when collaborating with partners (Reuer & Lahiri, 2014). Following Sampson (2005), I therefore created a dummy variable to control for this impact. The dummy variable receives a '0' if both alliance partners headquarter is located in the same country, or a '1' if the headquarters are located in different countries, hence making it an *international alliance*.

Relational experience. *Relational experience* is measured as a continuous variable as it is standard in existing literature (e.g.Gulati et al., 2009; Hoang & Rothaermel, 2005; Zollo et al., 2002). It is based on the number of previous alliances with the same alliance partner prior to the announcement of the focal alliance. This measure is updated for each focal alliance in the sample. Studies have found that previous alliances with the same partner as a measure for *relational experience* may either positively or negatively influence alliance performance (e.g. Gulati, 1995a; Gulati et al., 2009; Hoang & Rothaermel, 2005; Zollo et al., 2002).

General alliance experience (log). *General alliance experience* (GAE) refers to all previous alliances managed by a firm. Some studies have used all prior strategic alliances irrespective of alliance type (Sampson, 2005). However, other studies have found that there are significant differences in management requirements between alliance types (e.g. Das & Teng, 2000a; Rothaermel & Deeds, 2006). In this study, I follow Anand and Khanna (2000a) who measured GAE by all previous alliances of a specific type an organization has accumulated up to the focal alliance. For example, for a focal alliance classed as a contractual R&D alliance, all previous contractual R&D alliances are measured. Sampson (2005), however, has found that both measures provide similar results. The number of *relational experiences* is deleted from GAE in

order to ensure the independence of the two variables. Due to the high level of skewness in the variable, I take the natural logarithm of GAE. Also other studies have used the natural logarithm as a measure for GAE (e.g. Al-Laham, Amburgey, & Bates, 2008; Reuer & Zollo, 2005).

Even though several studies have used firm size to investigate the effect of alliance announcements on CAR, these size effects have largely been insignificant (Anand & Khanna, 2000a; Gulati et al., 2009; Merchant & Schendel, 2000). Moreover, I find that the correlation between GAE and Firm size (as measured by total assets or employees in the year of the alliance announcement) exceeds 0.85 which might lead to spurious results. Therefore, these are not included as control variables in the models presented in the empirical chapters. However, key effects are also tested using firm size and effects hold. **Table 3.1** provides an overview of the various measures and the data sources for the variables.

TABLE 3.1: Measures table (Thesis)

Variable name	Measures	Data source	Chapter 4	Chapter 5	Chapter 6
Alliance year(s)	0/1 Binary variable for each year in which the alliance was announced	Medtrack	Control	Control	Control
Non-listed alliance partner	0/1 Binary variable. 1, if partner firm is a non-public partner (private firm, research institute or university), 0 if partner firm is a listed public firm	Compustat	Control	Control	Control
Slack resources	Natural logarithm cash divided by long-term debt in the year preceding the alliance announcement	Compustat	Control	Control	Independent /Moderating
Firm uncertainty	Volatility in monthly stock prices in the alliance announcement year	Compustat	Control	Independent /Moderating	Control
Absorptive capacity	R&D expenses divided by net sales in the year preceding the alliance announcement	Compustat	Control	Control	Independent /Moderating
R&D Alliance Type	0/1 Binary variable. 1, if alliance is classified as a contractual R&D alliance, 0 if it is classified as comprising a licensing agreement	Medtrack	Control	Control	Control
International alliance	0/1 Binary variable. 1, if alliance is between two partners which have their HQs in different countries. 0, if HQs are in the same country	Compustat	Control	Control	Control
Relational experience	Number of previous partnerships between focal firm and alliance partner.	Medtrack	Control	Independent /Moderating	Control
General alliance experience (log)	Natural logarithm of total number of alliances of either R&D alliance or licensing agreements the focal firm has managed since its inception	Medtrack	Control	Independent /Moderating	Independent /Moderating
Relational experience signal	0/1 Binary variable. 1, if focal firm executive mentions previous relational experience quality, 0, if otherwise.	Medtrack	Independent	Independent /Moderating	
Analyst coverage	Number of financial analysts making earnings forecasts for focal firm in year of alliance announcement	I/B/E/S	Independent /Moderating		
Executive reputation	0/1 Binary variable. 1 if focal firm's announcing executive is a CEO, 0 if otherwise	Medtrack	Independent /Moderating		
Institutional investors	Percentage of focal firm's total equity held by firms which have more than 5% of total equity	Def 14A/ 10-K/ 20-F	Independent /Moderating		
Alliance management mechanisms	0/1 Binary variable. 1, if focal firm has an executive level board with alliance responsibility. 0, if otherwise.	Def 14A/ Annual reports (10-K/ 20-F)		Independent /Moderating	
General alliance rhythm (GAR)	Kurtosis of all alliances 10 years prior to the focal alliance	Medtrack			Independent /Moderating
Partner-specific alliance rhythm (PAR)	Kurtosis of all alliances with the same alliance partner 10 years prior to the focal alliance	Medtrack			Independent /Moderating

CHAPTER 4: THE QUALITY DIMENSION OF RELATIONAL EXPERIENCES: A SIGNALLING APPROACH

4.1 Introduction

One key issue for alliance researchers has been the performance and value creation impact of repeated partnerships with the same alliance partner (e.g. Dyer & Singh, 1998; Goerzen, 2007; Gulati et al., 2009; Hoang & Rothaermel, 2005; Zollo et al., 2002). Most studies identify that repeated partnerships result in positive performance and value creating effects, and attribute these to trust and inter-organizational routine generation, which ultimately facilitate the knowledge exchange between alliance partners (Gulati, 1995a; Gulati et al., 2009; Zollo et al., 2002). Results of those studies have further led researchers to associate repeated partnerships as proxies for the development of relational capabilities between alliance partners (Wang & Rajagopalan, 2015; Zollo et al., 2002). However, other evidence indicates that repeatedly partnering with the same alliance partner may generate negative performance effects (Goerzen, 2007; Hoang & Rothaermel, 2005). Reasons for this have primarily been attributed to network inertia, a process caused by inter-personal, inter-organizational and network linkages which incentivize firms to continuously enter into repeated partnerships with the same partner despite potentially more appropriate new alliance partners (Goerzen, 2007; Kim et al., 2006). Based on these two opposing objectives for entering repeated partnerships, research has investigated the conditions under which repeated partnerships may actually generate positive value and thus lead to development of relational capabilities. Specifically, alliance, firm, partner, or environmental characteristics influence whether a repeated partnership is actually value-creating (e.g. Gulati et al., 2009; Reuer & Zollo, 2005; Zollo et al., 2002). So far, to the best of my knowledge, most studies, however, focus on the *quantity* of previous partnerships while not recognizing that there are heterogeneities in the previous alliance experiences themselves. OL literature, however, identifies that significant heterogeneities in the value of various experiences themselves exist (Cyert & March, 1963; Levinthal & March, 1993; Sitkin, 1992). For instance, both more positive and negative experiences, thus extreme experiences, may more effectively contribute to the value of experiences (e.g. Kim, Kim, & Miner, 2009; March, Sproull, & Tamuz, 1991). Thus, the context of in which experiences are accumulated matters to generating value from them (e.g. Argote & Miron-Spektor, 2011). In the context of alliances, the variety of different value creation outcomes and the fact that benefits

derived from relational experiences are largely intangible (Gulati, 1995a) indicates that the development of relational capabilities is not necessarily subject to the *quantity* of previous partnerships, but instead the "*quality* of collaborations" (Hoang & Rothaermel, 2005: 343).

Investigating the quality of repeated partnership experiences may provide further insights to distinguish between repeated partnerships formed due to the development of on the one hand 'high quality' relational capabilities or on the other hand 'inferior quality' network inertia. Knowing the objective for entering such repeated partnerships is especially critical for investors. While alliance partners themselves may be aware whether their repeated partnership represents an effective, high quality partnership, outside investors may be unaware of the underlying quality of them due to intangibility of the previous alliance outcome. In order to adjust their firm valuation based on the alliance announcement, knowing whether relational capabilities between partners have actually developed is essential for investors as these facilitate the knowledge exchange between partners and thereby also likely alliance performance (Schilke & Goerzen, 2010).

Therefore, the announcement of repeated partnerships is likely to be a situation in which asymmetry in information about the quality of the partnership relationship exists. Information asymmetry and quality heterogeneity has been referred to as the adverse selection problem in the economics literature[9]. In the context of repeated partnerships, investors are therefore likely to discount the value of each repeated alliance because they risk that the alliance may be subject to network inertia or inferior quality in general. As the stock market reaction to an alliance announcement can be critical to alliance partners, such asymmetry is not favourable to either partner. Based on the information asymmetry, signalling theory has developed and proposes that firms which have effectively developed relational capabilities are in turn likely to signal this to investors, while firms which have not, are likely not to emphasize this to investors. As signalling theory regards firm executives as important signallers in firm

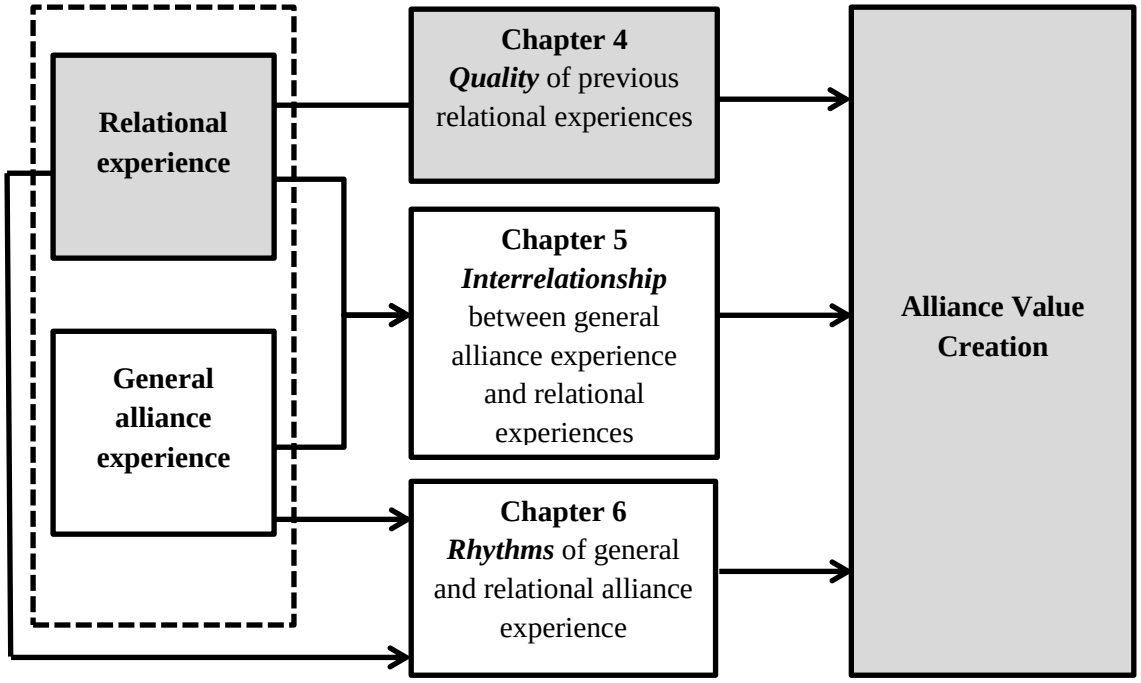
[9] Developed by Akerlof (1970), the adverse selection problem refers to a situation in which information asymmetry between two parties concerning the quality of a product exists. Also known as the 'market for lemons' in the second-hand car market, Akerlof (1970) finds evidence that buyers who cannot effectively evaluate the quality of cars are discounting the value they attribute to those. Therefore, sellers of high quality cars are unlikely to offer their cars unless they can make buyers believe that their product is of 'high quality'. In absence of such credible guarantees or signals, this is therefore considered a situation of market failure.

announcements (Westphal & Zajac, 1998), I therefore argue that firms, whose executives send a credible signal of having developed relational capabilities between alliance partners to investors, receive higher positive alliance value creation effects. As such signals have significant effects on investors (Bergh, Connelly, Ketchen, & Shannon, 2014; Connelly et al., 2011; Spence, 1973), more positive alliance value from a new collaboration with that same partner can be expected.

Signalling literature also finds that the strength of signals varies significantly across signaller and receivers as they are largely subject to influence from contingency factors (Bergh et al., 2014). Building on this, three moderating relationships mitigating or exacerbating the effect of signals are proposed in this chapter. Firstly, I expect that executive signaller reputation exacerbates the strength of the signal as these are more 'credible signallers'. Secondly, I expect that the sophistication of investors is likely to mitigate the effects of the signal as such investors are already aware of the signal. Similarly, I expect that financial analysts as intermediaries between announcing firms and investors are likely to mitigate the strength of the signal on investor valuations as they are likely to be better informed, not requiring the signal and therefore most likely pass the information on to investors by the time the signal is sent. This chapter therefore endeavours to answer the following research question:

How does the signalling of relational experiences impact the valuation of a subsequent alliance? What impact do signaller, intermediary and receiver characteristics have on the effect of the signal?

FIGURE 4.1: Empirical chapter overview (Chapter 4)



In order to answer these research questions, this chapter draws on signalling theory as introduced by the economics literature (Spence, 1973). I intend to use signalling theory as a means to investigate the *quality* of repeated partnerships based on firms' signals to draw inferences regarding the relational capability development as only firms which have managed high quality partnerships with the same partner are likely to signal this to investors. This takes into account the difficulty of *externally* evaluating the *quality* of repeated alliances as these require insights into various intangible alliance outputs, such as organizational learning and therefore assessing alliance performance is difficult for external stakeholders (Lunnan & Haugland, 2008). As credible signals, this chapter draws on the use of executive quotes in alliance press release announcements which emphasize the quality of the previous partnership with the same partner. This follows existing research in the fields of management and accounting which regard executives commenting on the quality of earnings announcements as effective signals as they represent knowledgeable and at the same time credible authorities (e.g. Francis, Schipper, & Vincent, 2002; Westphal & Zajac, 1998; Zajac & Westphal, 2004).

This chapter thereby contributes to existing literature in various ways. Most importantly, it introduces a *quality* dimension of relational experiences to the alliance

literature. This is particularly relevant as prior studies investigating the *quantity* of relational experiences have indicated significant heterogeneity in value creation effects. Also, this chapter contributes by combining literature of alliance formation reasons for either relational capabilities or network inertial reasons. It thereby provides a means to differentiate between the two concepts arising from repeated partnerships. Both areas have been investigated separately with almost all studies exclusively focusing on either relational capabilities (Gulati, 1995a; Gulati et al., 2009; Zollo et al., 2002) or network inertia outcomes of repeated partnerships (Goerzen, 2007; Kim et al., 2006). Only few studies have tried to distinguish between positive and negative reasons for firms to enter repeated partnerships (Beckman et al., 2004; Gulati & Westphal, 1999). This study contributes to the existing ones by providing a signalling perspective from alliance firms to investors.

The theoretical development of this chapter has two main components. Firstly, existing literature on the formation objectives for repeated relationships as either resulting from relational capabilities or network inertia is discussed. This builds the foundation for outlining the relevance of a signalling approach in this context. Secondly, signalling theory is specifically applied to the context of repeated partnerships. This results in hypotheses development how the signalling of relational capabilities positively impacts alliance value creation. Afterwards, relevant signaller (executive reputation), financial intermediaries- (financial analysts), and receiver-specific (institutional investors) moderating factors, which influence the signal-value creation relationship, are developed. The hypotheses are tested in the subsample of repeated partnerships between two alliance partners. General support for the main hypothesis is found, whereas only mixed results for the moderating variables can be identified. Subsequently, the implications of the results and the limitations are presented before concluding.

4.2 Theory and Hypotheses

4.2.1 The ambiguous effect of repeated partnerships on alliance value creation

Partner selection is a critical issue for organizations entering strategic alliances (Beckman et al., 2004; Gulati & Gargiulo, 1999; Hitt et al., 2000; Rothaermel & Boeker, 2008; Shah & Swaminathan, 2008). The paramount decision for organizations to make is whether to partner with a known partner (Gulati, 1995a), or to engage with a new partner (Goerzen, 2007). Essentially, this reflects a dilemma between exploitation (repeated partnership) and exploration (new partner) that managers face in many other contexts of strategy as well (March, 1991). Existing literature identifies that the perceived uncertainty in the environment influences firms' decision to enter new alliances (Beckman et al., 2004). Additionally, the inter-personal or inter-organizational network may influence the decision to repeatedly partner with the same firm (Gulati & Westphal, 1999; Kim et al., 2006).

While studies regarding the objectives to enter a repeated partnership are rare, a large number of studies have investigated the effect of such relational experiences, partner-specific alliance experiences, repeated partnerships or repeated ties on performance or value creation (e.g. Goerzen, 2007; Gulati et al., 2009; Hoang & Rothaermel, 2005; Reuer & Zollo, 2005; Zollo et al., 2002). The majority of these studies have argued for a positive effect and derived this effect from three primary reasons (Gulati, 1995a; Gulati et al., 2009; Reuer & Zollo, 2005; Zollo et al., 2002). Firstly, based on transaction cost theories, repeated partnerships reduce monitoring of and negotiation costs with the alliance partner (Zaheer et al., 1998). Secondly, repeatedly partnering develops trust among partners which further facilitates knowledge exchange, leading to more favourable alliance outcomes (Gulati, 1995a). Thirdly, it produces inter-organizational routines, such as steering committees and other structural coordination mechanisms which make the partnership more effective (Zollo et al., 2002).

However, an increasing number of studies identifies negative effects of repeated partnerships (Goerzen, 2007; Hoang & Rothaermel, 2005). Such results are primarily attributed to reasons unrelated to the respective alliance itself but instead related to inter-personal, inter-organizational or network connections between partner organizations and/or their managers (Kim et al., 2006). As such, alliance partners may become used to partner with one another, which in turn may prohibit their ability to

engage in alliances with potentially new and valuable partners (Goerzen, 2007; Kim et al., 2006). In the next two subsections, these differing reasons are discussed in more detail. Reasons why repeated partnerships may result in positive value creation, thus relational capabilities, are provided first before discussing reasons why they may also result in negative value creation, thus network inertia.

4.2.1.1 Relational capability as a result of repeated partnerships

Relational capabilities refer to a dyad-level capability for more effectively managing an alliance with a specific partner (e.g. Dyer & Singh, 1998). They facilitate the ability to trust the partner, thereby avoiding opportunism, while also facilitating the ability to exchange knowledge among partners. Empirical evidence indicates that the outcomes of repeated partnerships are oftentimes positive (e.g. Gulati et al., 2009). More specifically, partners have been shown to increase the level of trust after repeatedly partnering (Gulati, 1995a) or improve their knowledge exchange through development of partnering routines (Zollo et al., 2002). As a consequence, partners tend to be more likely to form additional repeated alliances in the future (Gulati, 1995b; Gulati & Gargiulo, 1999) and significantly benefit from these (e.g. Gulati et al., 2009; Reuer & Zollo, 2005; Zollo et al., 2002). Therefore, repeated partnerships are regarded as a proxy for relational capabilities (Wang & Rajagopalan, 2015). The underlying reasons why repeated partnerships lead to favourable outcomes are explained in detail in Chapter 2 but are summarized here again.

When organizations partner with one another in any business relationship, transaction costs may arise (Williamson, 1975). In the alliance context, these costs emerge from preparing the contract and engaging in negotiations and monitoring to prevent the opportunistic behaviour of the alliance partner (e.g. Das, 2006; Zaheer et al., 1998). The familiarity with the partner may, however, reduce such transaction costs due to various reasons. For instance, search costs for partners, arising from due diligence efforts, are reduced as the firm already knows about the partner's suitability (Dyer & Chu, 2003). Through repeated alliances, partners can more easily trust that the other partner will not act opportunistically (Gulati, 1995a). Existing literature also finds that such mutual trust through repeated collaborations may result in partners sharing information more openly (Gulati, 1995a; Ring & Van de Ven, 1992), while

also decreasing the likelihood for conflicts (Simonin, 1997). Furthermore, such inter-organizational trust may lead to a development of interpersonal trust among the managers of the partnering organizations which has been shown to further improve the effectiveness of strategic alliances (Abrams et al., 2003; Zaheer et al., 1998).

The development of trust, however, takes significant effort by the partnering organizations (Das & Teng, 2001). Therefore, firms may need to invest further resources into developing repeated partnerships into relational capabilities. Consequently, alliance partners may emphasize their commitment to the alliance by investing in so-called relation-specific assets (Dyer & Singh, 1998). Such assets can, for instance, be related to production relocation closer to the alliance partner (e.g. Dyer & Nobeoka, 2000). This may indicate a significant commitment to the partnership, as even when the alliance is terminated, these assets may not be useful in alliances with other partners. Therefore, the trust may be further enhanced through such investments (Gulati, 1995a). Moreover, such assets may also include the development of inter-organizational routines, such as steering committees, to engage in a continuous information exchange between alliance partners (Zollo et al., 2002). The improved interaction may make the knowledge exchange more efficient and effective (Schilke & Goerzen, 2010; Zollo et al., 2002). As a result of increased trust and the generation of relation-specific assets or routines, it is not surprising that many studies have found positive performance effects of repeated partnerships (e.g. Gulati et al., 2009; Reuer & Zollo, 2005; Zollo et al., 2002).

4.2.1.2 Network inertia as a result of repeated partnerships

In contrast to the abovementioned literature, which finds that repeated partnerships are an indication of relational capabilities due to the trust and routines generated, there is also evidence against this. Some evidence indicates that firms are simply more likely to form additional alliances with the same partner when they have partnered before (Gulati, 1995b; Gulati & Gargiulo, 1999). Consequently, this does not mean that the underlying processes of relational capabilities, such as trust or effective inter-organizational routines have actually been developed. Despite efforts by organizations to make a rational cost-benefit analysis whether to engage in another repeated partnership, many organizations enter into such partnerships for non-performance-enhancing reasons (Kim et al., 2006; Li & Rowley, 2002). Kim et al.

(2006) summarize these by terming them: 'Network inertia', which is a similar concept to 'structural inertia' (Hannan & Freeman, 1984). Network inertia refers to a constraint for organizations to change their alliance partners as they continuously engage with them. Due to such inertial pressures, firms avoid choosing or even looking for a new partner because of simplicity or other inter-organizational or network reasons (Kim et al., 2006). The following two subsections look more specifically at the reasons why such network inertia may develop.

- *Inter-personal/organizational dyadic ties as reasons for network inertia*

Inter-organizational or inter-personal factors may incentivize firms to enter repeated alliances (Kim et al., 2006). As such, the same reasons developed for firms to benefit from repeated partnerships, namely trust and routines may actually also incentivize firms to enter repeated partnerships for non-positive reasons. Inter-personal ties between alliance executives are often the key to success for an alliance as they enable effective knowledge exchange (Abrams et al., 2003; Zaheer et al., 1998). However, if the alliance is dysfunctional, such inter-personal ties may mitigate the ability to change the alliance partner. As a classic agency problem, this may be because executives value their inter-personal relationships higher than the inter-organizational relationship and effectively the firm. Zollo et al. (2002), for instance, find that executives are personally more satisfied with repeated partnerships. However, this personal satisfaction does not necessarily translate into higher financial performance as evidenced by other studies (Goerzen, 2007). However, as identified by Gulati and Westphal (1999), such inter-personal linkages increase alliance formation. Consequently, this may provide an indication that the inter-personal relationship of executives may be the underlying incentive for many firms to engage in repeated partnerships.

Additionally, inter-organizational routines may represent constraints why firms repeatedly engage in strategic alliances with the same partner. Such routines, for instance, the bureaucratic and technological alliance structures are oftentimes created through repeated partnerships (Dyer & Singh, 1998; Zollo et al., 2002). While these generate important benefits by reducing transaction and coordination costs, these routines also create significant commitment to the specific alliance partner as they involve relation-specific assets. As the name suggests, these assets are relation-

specific, consequently become less useful in a partnership with a new alliance partner (Dyer & Singh, 1998). As firms are oftentimes not following the principle of 'sunk costs', they are likely to let such earlier investments into routines influence their strategic decisions for the future (Hannan & Freeman, 1984). Firms may therefore internally limit the choice for new partners apart from existing ones (Gulati, 1999). In summary, the inter-personal and inter-organizational trust in addition to the extent to which organizations regard their alliance-specific investments as non-sunk costs may impact the decision to engage in repeated partnerships (Kim et al., 2006).

- *Inter-organizational network position reasons for network inertia*

While the above has focused on factors involving the *dyadic* relationship between the alliance partners that may prevent alliance partners from choosing new partners, the position of the firm within its *alliance network* may also influence the decision to engage in repeated partnerships. Among those reasons are dependence between the focal firm and the alliance partner and the status of the alliance partner in the network.

Alliance partner dependency can refer to different resources. Firstly, firms may be dependent on their alliance partner when the partner offers contacts across the entire network which may provide benefits to the focal firm in various ways (Kim et al., 2006). In such circumstances, firms may be more likely to continuously engage in repeated partnerships (Gulati, 1998; Shan, Walker, & Kogut, 1994). Dependence may also relate to other resources accessed in the partnership. In case partner resources fill a firm's 'structural holes' by connecting them to other potential partners in the network, they are more valuable to keep and therefore companies more likely to engage in repeated partnerships (Burt, 1992; Kim et al., 2006). Additionally, status may be a reason for firms to engage in strategic alliances (Gulati, 1998). Partnering with a high-status firm can be an endorsement of its capabilities and has been shown to increase firms' ability to attract further funding (Stuart, 2000). If one of the partnering firms has a reputation or status which is lower than the other partnering firm, then one firm has a strong incentive to continuously engage in alliances with the other firm (Kim et al., 2006). Essentially, all the above factors may in combination affect firm's decision to engage in repeated alliances with the same partner (Hagedoorn, 2006).

4.2.1.3 Comparison of alliance formation based on relational capabilities versus network inertia

In essence, as can be seen from **Table 4.1**, the similarity between processes reflecting either relational capabilities or network inertia is striking. Inter-personal, inter-organizational connections or status of the alliance partner may be either positive or negative. Objectively assessing whether such connections or processes exist is therefore unlikely to facilitate our understanding whether a partnership can be considered of consisting of positive relational capability processes, as they may in turn also reflect negative network inertial processes. This indicates that investigating *whether* such processes actually exist within partnerships or between alliance partners is not as helpful. Instead, investigating the *quality* of such processes is key for evaluating whether relational capabilities or network inertia exist between alliance partners.

TABLE 4.1: Formation objectives for repeated partnerships

Relational Capabilities	***References***	**Network Inertia**	***References***
Inter-organizational/ Inter-personal *trust*	(e.g. Gulati, 1995a; Gulati & Sytch, 2008)	Inter-organizational/ Inter-personal *ties*	(e.g. Goerzen, 2007; Kim et al., 2006)
Facilitation of for knowledge exchange through relation-specific assets or routines	(e.g. Dyer & Singh, 1998; Zollo et al., 2002)	Disregard for relation-specific assets to be considered as *'sunk costs'*	(e.g. Dyer & Singh, 1998; Hannan & Freeman, 1984)
Status of alliance partner as *endorsement*	(e.g. Saxton, 1997; Stuart et al., 1999)	*Status* of alliance partner as *dependency* on its resources	(e.g. Gulati, 1995b; Pfeffer & Salancik, 1978)

4.2.2 Investor uncertainty regarding repeated alliance objectives

From the above, it seems apparent that investigating whether repeated partnerships may be formed due to the development of either relational capabilities or network inertia is challenging for external stakeholders. Making matters even more difficult is that outcomes of previous alliances are largely intangible and the success depends on alliance managers' evaluations themselves (Zollo et al., 2002). Objective indicators such as the length of the partnership are not helpful either as they may indicate the creation of either relational capabilities or network inertia (Gulati, 1995a; Gulati & Sytch, 2008; Kim et al., 2006). Such uncertainty for evaluations is common if resources or outcomes are largely intangible (Ndofor & Levitas, 2004). Therefore, investors evaluating whether a repeated partnership indicates a relational capability or network inertia face uncertainty and information asymmetry. Despite these uncertainties, investors have a strong incentive for identifying the reasons for alliance formations as varying value creation impacts indicate.

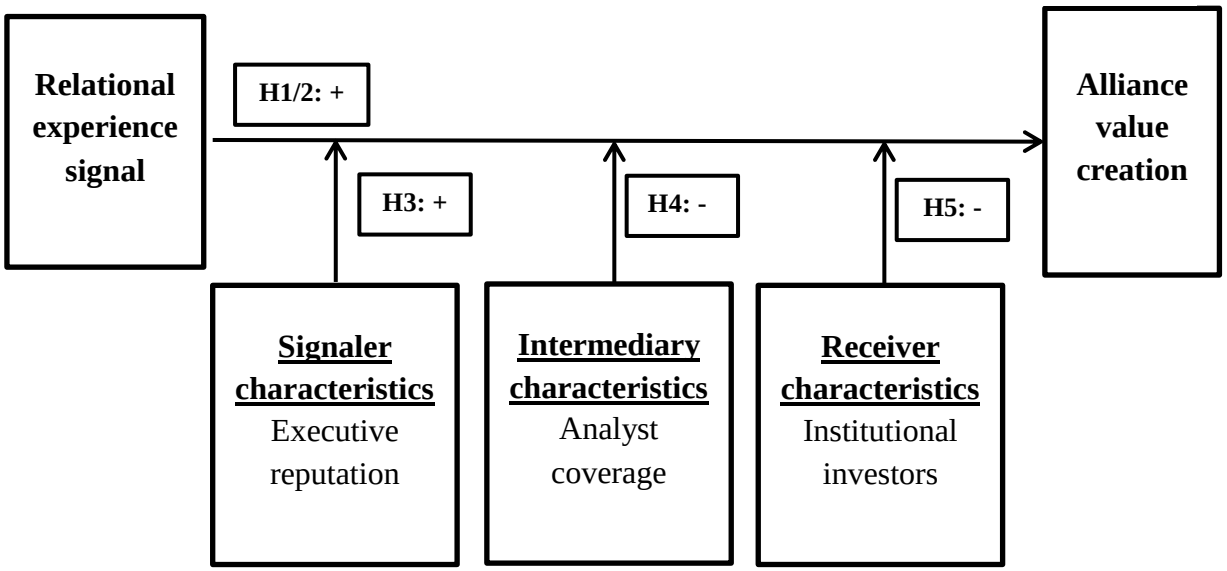
Ultimately, it is the executives of the partnering organizations who are aware of the underlying formation reasons and the effectiveness of the existing partnership so far, while investors have difficulty to identify those. This leads to information asymmetry between the partnering firms and investors. Such information asymmetry not only creates problems for investors aiming to invest in firms due to the uncertainty but also to firms themselves as investors are likely to discount all security prices for the risk they incur that the repeated alliance may possibly be formed due to network inertia (Easley & O'Hara, 2004; Wang, 1993). Alternatively, investors may decide to forego any investments in such assets which they perceive as too risky (Domowitz, Glen, & Madhavan, 1997). As this may negatively influence stock prices, announcing firms have incentives to decrease the asymmetry in information. Firms that can credibly indicate that their repeated alliance is not subject to such network inertia but relational capabilities are likely to signal this in order to positively influence investors. This chapter therefore uses signalling theory in order to provide an improved understanding which repeated alliances investors regard as valuable, thus consisting of relational capabilities, and which ones are regarded as negative, thus possibly being subject to network inertia instead. The following subsection applies signalling theory to the context of repeated partnerships.

4.2.3 Signalling theory applied to the context of repeated partnerships and their effect on alliance value creation

As introduced in Chapter 2, signalling theory is primarily concerned with firms aiming to reduce information asymmetry between themselves and investors. The literature has identified that the signalling process consists of five stages as they occur in a sequential process: The information problem, observation of signal, signal costs, Pareto optimization, and signal confirmation (Bergh et al., 2014; Spence, 1973). The following is structured around these key dimensions of signalling theory and applies them to the context of how firms can signal that their respective repeated partnership consists of a relational capability and not network inertia.

This chapter identifies executive quotes in alliance announcement press releases as a means for signalling superior partnership quality to investors. I propose that such quotes decrease the information asymmetry between on the one hand firms announcing an alliance and on the other hand, investors valuing the alliance announcement. As such, these quotes may signal the superior *quality* of the previous partnership with the same partner. Such signals are credible because executives have a cost involved with sending such signals as their reputation is at stake. Consequently, according to signalling theory, only firms that have developed relational capabilities and intend to build on those in the subsequent partnership will signal the quality of repeated partnerships to investors whereas firms that have developed network inertia or are not utilizing relational capabilities previously are more likely not to emphasize this to investors. The following subsections develop the theoretical argument using the distinct stages identified by signalling theory (Bergh et al., 2014). The theoretical framework for Chapter 4 can be found in **Figure 4.2** on the next page.

FIGURE 4.2: Theoretical framework (Chapter 4)



4.2.3.1 Information problem between alliance partners announcing repeated partnerships and investors

In order for signals to have any relevance, there needs to be an 'information problem', a situation where the signaller and the receiver have different levels of information, also called information asymmetry (Akerlof, 1970). Signallers in this case believe a signal will have an effect on how the receiver reacts to it and thereby reduce the information problem (Spence, 1973). In the context of repeated partnerships, there is an information problem for investors at the announcement of a repeated alliance regarding the formation reasons. As explained in detail above, whether firms form repeated partnerships for positive or negative reasons is unclear. Evaluating the ultimate reason, however, is critical for investors to estimate the incremental value the repeated alliance generates for the firm. More specifically, investors need to evaluate whether a repeated alliance is entered because firms have developed processes such as trust or inter-organizational routines in their previous partnership (Gulati, 1995a; Schilke & Goerzen, 2010; Zollo et al., 2002). The alternative for the repeated alliance formation may be that firms have developed tendencies to repeatedly collaborate due to network inertia (Kim et al., 2006). Investors may search for insights from previous partnerships. However, due to the complexity of alliance partnerships and the intangible performance outcomes of previous partnerships, there is significant ambiguity whether a previous partnership has been successful (Kogut & Zander, 1992; Ndofor & Levitas, 2004). Research has

found that, for instance, the length of the alliance or premature termination does not indicate the performance level of the alliance as firms may have reached their alliance objectives prematurely (Sadowski & Duysters, 2008).

Consequently, there is significant heterogeneity in the value investors ascribe to repeated partnerships. While several studies (e.g. Gulati et al., 2009; Sleptsov et al., 2013; Zaheer et al., 2010) find that investors react positively to repeated partnership announcements, others find that investors value repeated partnerships negatively (Lee, 2013; Wassmer & Dussauge, 2012; Yang et al., 2015). Research finds that in such high ambiguity contexts, investors look for signals which help them to more fully understand why firms might be entering repeated partnerships as they cannot be aware of all private and public information that is available to the executives involved (Hirshleifer & Teoh, 2003). Therefore, the various empirical effects upon announcement might indicate that investors' reaction is triggered by underlying experience-related signals from the announcing firm to value such repeated alliance announcements (e.g. Koh & Venkatraman, 1991; Merchant & Schendel, 2000).

4.2.3.2 Signal observability

- *Press releases as signals*

Signalling in the context of alliances is based on two types of signals in particular. Firstly, the alliance partnership itself may send a signal to investors (e.g. Ozmel et al., 2013; Park & Mezias, 2005; Stuart et al., 1999). For instance, forming alliances with prominent alliance partners may send a signal of legitimacy to investors (Ozmel et al., 2013; Stuart et al., 1999). Secondly, the underlying firm-specific characteristics of the announcing firm also send a signal to investors (e.g. Anand & Khanna, 2000a; Gulati et al., 2009). For instance, firms' experience in managing strategic alliances signals a firm-level alliance or dyad-level relational capability to more successfully manage (repeated) alliances to investors (Anand & Khanna, 2000a; Gulati et al., 2009).

Both types of alliance signals can be observed by investors as they involve the public disclosure of alliances through press releases (e.g. Gulati et al., 2009). Such press releases are distributed through publicly available databases such as 'Business Wire' or 'PR Newswire', which have a high reach in the investor community (Henry,

2008; Perkins & Hendry, 2005). They may also effectively influence how the media reports on the announcement, thereby increasing the effect of press releases (Carter, 2006; Paul, 2001). Therefore, press releases have been used in prior literature as effective signals to the market (e.g. Carter, 2006; Francis et al., 2002; Westphal & Zajac, 1998). Investors essentially use such real-time development press releases to adapt their firm valuation. Thus, signals are not only observable but investors even actively observe those signals to adapt their investment strategy (Henry, 2008).

Stock-listed firms in the USA have a 'duty to disclose' any 'material'[10] event for their organization (Palmiter, 2008). A frequent test for such materiality is whether such actions would have significant effects on the stock price. As indicated by previous empirical studies, most strategic alliance announcements actually have a significant impact on share prices with averages between 1 and 3% around the announcement date (e.g. Koh & Venkatraman, 1991; Merchant & Schendel, 2000). According to SEC regulations, companies need to announce any such alliances in a press release and file an 8-K statement with the SEC subsequently. Additionally, also the press release is regulated to some extent by the SEC. The main press release requirement is writing in an 'unambiguous', 'timely' way, with a 'duty of honesty' for announcing firms and executives (Palmiter, 2008; Wasserman, 2003). This prevents companies from making false or misleading statements; however, it leaves companies free to voluntarily disclose as much information about strategic alliances as they feel appropriate as long as all investors receive the official press release at the same time. Consequently, there is significant heterogeneity in the length and information provided in press releases (Kimbrough & Louis, 2011).

As investors actively seek the detection of signals, some firms deliberately signal certain information to investors who spend considerable effort to interpret such press releases (Kimbrough & Louis, 2011; Kimbrough & Wang, 2013). Research indicates that investors are influenced by the way press releases are written (Henry, 2006, 2008), whether they contain certain keywords (Hussainey, Schleicher, & Walker, 2003; Smith & Taffler, 2000) or the structure of press release (Guillamon-Saorin, Osma, & Jones, 2012). One key illustration is the US Federal Reserve Bank

[10] Material has been defined as "a fact is material if there is a substantial likelihood a reasonable investor would consider it important in making a securities-related decision" unless "investors already know or can infer the omitted information from other disclosure" (Palmiter, 2008: 85)

and its announcements concerning monetary policy. Investors in these announcements actively observe statements by the Central Bank and look for any hints concerning monetary policy such as sentences which contain 'patience' etc. (Gurkaynak, Sack, & Swanson, 2004).

In line with this, research has identified that firms put significant efforts into properly communicating corporate agreements to investors (Sirower & Lipin, 2003). Wayne Moore, a former partner and managing director at one of the world's leading deal advisors Goldman Sachs, has argued: "It is critical that the announcement of a transaction be well received […]. As a result, the time, effort, and care that goes into announcing a deal has increased significantly. And the content—the description of the strategic rationale and the quantification of the synergies and future earnings effects—has as well." (Moore, Rimland, Ritch, & Rouner, 1998: 12).

- *Executives as signallers*

As investor/external relations departments oftentimes write press releases themselves, press releases can at times be generic. Moreover, as press releases may be part of the disclosure requirements, the release itself may not differentiate the announcing company. Research finds, however, that a means for companies to differentiate themselves in press releases is through the use of executive quotes (Blankespoor & de Haan, 2014; Sleurs, Jacobs, & Van Waes, 2003). Executives represent key signallers of the organization (e.g. Higgins & Gulati, 2006; Zhang & Wiersema, 2009) and in the context of alliance formation (Eisenhardt & Schoonhoven, 1996; Gulati & Westphal, 1999). They have been found to signal effectively to investors through their quotes in statements, as introduced in the subsection above (Malmendier & Tate, 2008; Sleurs et al., 2003). In line with this, accounting research finds that investors may be influenced by executives' qualitative comments in earning press releases (Francis et al., 2002; Hoskin, Hughes, & Ricks, 1986). More specifically, research identifies that the amount of press releases detailing executives' opinions about earnings has significantly increased over time and can explain why investors value such announcements more significantly (Francis et al., 2002). Such comments about earnings may further explain the importance and acceptance of such announcements among investors (Davis, Piger, & Sedor, 2012;

Francis et al., 2002). As such, executive statements may be critical to delivering a key message of an announcement (Sleurs et al., 2003).

4.2.3.3 Signalling costs

In order for the receiver to evaluate the signal as credible, the signal itself must be costly for the signaller to make or alternatively sending a false signal must be leading to penalty costs (Bergh et al., 2014; Kang, 2008). Most importantly, according to SEC guidelines misleading or wrong information in press releases incur substantial *direct* penalty costs (e.g. Francis, Philbrick, & Schipper, 1994) as firms and announcing executives have a 'duty of honesty' (Palmiter, 2008). Signalling costs are not necessarily incurred by the firm but may also be indirectly incurred by the executive who sends the signal (Connelly et al., 2011). One of the key reasons, why above studies have found that executives are effective signallers for investors, is because executives have high signalling costs due to their *indirect* costs associated with their reputation.

Executive reputation as such can be conceptualized as the subjective judgment of overall executives performance by stakeholders (Bednar, Love, & Kraatz, 2014) and therefore may serve as a proxy for executive ability (Milbourn, 2003; Weigelt & Camerer, 1988). Therefore, if executives perform below expectations, they are likely to pay reputational costs (Milbourn, 2003). Such costs matter to executives because they also act in their own self-interest (Jensen & Meckling, 1976) and incurring such costs may essentially harm their career development as their reputation serves as a means for further career enhancement (Gibbons & Murphy, 1992). Consequently, executives' reputational costs can include job losses (Desai, Hogan, & Wilkins, 2006), and long-term career difficulty of finding a subsequent job (Cannella Jr, Fraser, & Lee, 1995). As they are interested in improving their bargaining position and their career prospects, they have a strong incentive to maintain such a positive reputation (Hirshleifer, 1993).

Therefore, research indicates that executives tend to act fairly honest towards stakeholders as a negative reputation would spread to existing/potential alliance partners as well as to existing/potential investors. Kang (2008), for instance, finds that reputational costs may even spill-over to companies. Therefore, firms and their boards

have strong incentives to keep executives statements under control. In the context of strategic alliances, executives have a key role due to their personal relationship with the alliance partner's executives (Eisenhardt & Schoonhoven, 1996), thus emphasizing the scrutiny they are under regarding any alliance decision or statements. As investors evaluate executives actions and statements on a continuous basis (Bednar et al., 2014), executives tend to be rather conservative in the statements they make (Hirshleifer & Thakor, 1992).

4.2.3.4 Separating equilibrium

The combination of the signal and the signalling costs leads to a 'Pareto optimizing solution' in which the receiver is able to effectively estimate the signalling costs to the signaller and hence, is able to put a value on the signal (Bergh et al., 2014). In the case of executives signalling the quality of a repeated alliance, a separating equilibrium is created whereby only executives managing an effective alliance partnership with relational capabilities are likely to provide a positive statement regarding the quality of the previous partnerships with the same alliance partner. Executives, which manage an ineffective partnership, subject to network inertia, or have managed an unsuccessful alliance with the same alliance partner in the past, will regard their reputational costs as too high and therefore not make such statements. Investors subsequently ascribe a value to the statement considering the signalling costs of each firm which will then lead to a separating 'Pareto optimal solution'. This means that given the respective signalling costs, there is no other more optimal feasible solution for either party. Hence, I hypothesize that investors view executive statements on the experience of previous alliance relationships with the same alliance partner as effective signals for determining whether a repeated partnership is an effective, high quality partnership.

Hypothesis 1: Press releases comprising an evaluation of the quality of the previous strategic alliance have a more positive impact on investor valuation of repeated strategic alliances than press releases not comprising a quality evaluation.

4.2.3.5 Comparison of relational experiences signal and repeated partnerships

Existing studies have almost exclusively focused on quantity-based experience measures as an indication that relational capabilities have been generated. These, however, have found both positive (Gulati et al., 2009; Zaheer et al., 2010) and non-positive or even negative (Lee, 2013; Wassmer & Dussauge, 2012; Yang et al., 2015) value creation effects with significant unexplained heterogeneity. Therefore, it can be expected that the quantity-based measure reflects both repeated alliances which entail relational capabilities or network inertia. I therefore propose that not only does a *quality-based* relational experience signal as introduced in Hypothesis 1 have positive value creation effects but also that it is likely to provide a more positive value creation effect than *quantity-based* measures of relational experiences. In order to confirm the value of the signal, I therefore hypothesize that the signal is more effective in predicting value generated from repeated alliances than non-signalled measures. Thus,

Hypothesis 2: Press releases comprising an evaluation of the quality of the previous strategic alliance on alliance value creation have a more positive value creation effect than quantity-based relational experience measures.

While the above provides a foundation for why executives' signals impact the perception of receivers (investors), existing research finds that the strength of signals is dependent on various other factors related to signaller, receiver or environmental characteristics (Connelly et al., 2011). Therefore, the following subsections investigate how the abovementioned relationship is moderated by the reputation of the signaller (Executive reputation), the sophistication of the receiver (Institutional investors) and an intermediary between signallers and receivers (Financial analysts).

4.2.4 Moderating impact of executive reputation

As argued above, the costs and credibility of a signal are important components which influence the Pareto optimal solution between signaller and receiver (Bergh et al., 2014; Connelly et al., 2011; Weigelt & Camerer, 1988). As also described above, executives' reputational costs are an important reason why executives signals can be perceived as credible (Bednar et al., 2014). However, not all

executives face the same costs as their reputations are inherently different. Executives who have a higher reputation essentially also "have more to lose" (Balvers, McDonald, & Miller, 1988: 613). Reputation can be distinguished along various dimensions. One key dimension is the structural dimensions. CEOs are the 'face' of the company and their decisions clearly influence market value (e.g. Quigley & Hambrick, 2015). A recent survey by Weber Shandwick and KRC Research (2011) of more than 1,700 executives worldwide indicates that almost half the company reputation is attributed to the CEO's reputation, essentially making the CEO's reputation a significant factor in the firm's market value. This so-called 'CEO effect' means that CEOs have the power to dramatically impact firm's value. Thus, CEOs with high reputation levels in turn also face higher reputational costs thus increasing the signal strength. Therefore,

Hypothesis 3: The impact of previous partnership executive signals on alliance value creation is positively moderated by executive reputation.

4.2.5 Moderating impact of financial analysts

Financial analysts are individuals usually hired by large investment companies. Such analysts cover firms for which they expect trading commission in the security or alternatively financing and consulting revenue from the covered firm (Hong, Lim, & Stein, 2000; Irvine, 2003). Financial analysts tend to be knowledgeable about the companies they cover and they usually have a team of junior analysts that follow the company even more closely. Their task is to provide forecasts on future earnings and issue recommendations on buy, hold, or sell to investors. As analysts are also in direct contact with the firm's managers, their expertise about the firm tends to exceed the knowledge of other investors. As they pass their knowledge and judgement on to investors, they essentially become information intermediaries with a high degree of legitimacy, both from investors as well as from company managers (Zhang & Wiersema, 2009; Zuckerman, 1999). Therefore, their buying recommendations have a significant impact on investment decisions.

In their role as intermediaries, analysts can reduce the information problem between buyers and sellers as they pay particular attention to strategic actions in so-called analyst calls which help in the interpretation of firms' actions. Analysts may

then effectively communicate this to their clients (Brennan & Subrahmanyam, 1995), essentially improving the effectiveness of markets by making them more liquid and reducing the information problem (Roulstone, 2003). Ruling out preferential treatment of analysts over other investors, firms are still likely to keep analysts well-informed over the course of the alliances. In line with this, research has shown that signalling by companies is usually less effective for firms which are covered by a large number of financial analysts (e.g. Ozcan & Overby, 2008). Due to analysts being well-informed, they may also more effectively evaluate the potential outcome of previous strategic actions and know the underlying reasons for firm's actions (Bednar et al., 2014). Their knowledge of the firms they cover, and their often informal connections with the executives involved with the alliance makes financial analysts more likely to be aware of the underlying reasons for any alliance formation.

In the context of repeated partnerships, financial analysts may therefore have two key advantages over individual investors. Firstly, they may be more knowledgeable of outcomes of previous partnerships between the same alliance partners and may have informed investors of these over the course of the partnership. This may help analysts to evaluate whether the repeated partnership is likely formed due to relational capabilities or network inertia. Secondly, their informal conversations and the knowledge of the firms may provide analysts with the underlying reasons for the repeated alliance formation and, hence, may know the likelihood of it being due to relational capabilities or network inertia.

Hence, investors of companies which are extensively covered by financial analysts have a higher chance of receiving earlier cues as to whether previous partnerships have been a success or not, and whether the repeated partnership is entered due to either relational capabilities or network inertia. Thus, such information may have already reached investors by the time of the repeated alliance announcement (or even before). Hence, the value of the signal is therefore less valuable to such investors. Thus, I expect that as more analysts follow the firm, the impact of the signal will have a lower impact on the stock price.

Hypothesis 4: The impact of previous partnership executive signals on alliance value creation is negatively moderated by financial analyst coverage.

4.2.6 Moderating impact of institutional investors

Receiver characteristics may also impact the strength of a signal (Connelly et al., 2011). As explained above, the basic assumption of signalling theory is that there is an information problem between signallers and receivers. In turn, the extent to which there is an actual information problem can influence the strengths of the signal (Connelly et al., 2011). Therefore, more informed investors are likely not to be influenced by signals as much. As one of the largest groups of receivers among firm investors, institutional investors are large organizations such as pension or mutual funds which usually hold substantial amounts of shares (Bartov, Radhakrishnan, & Krinsky, 2000). Due to their significant investments, such investors are professional and sophisticated in their investment strategy, thus, well-informed of current developments at firms they have invested in (e.g. Bushee, 1998). Similar to analysts, institutional investors are oftentimes better informed than smaller private investors as organizations may take extra efforts to keep them informed such as special conference calls (Bushee, Matsumoto, & Miller, 2003). Therefore, institutional investors are likely to be more capable to interpret the quality of the previous partnership with the same alliance partner than private investors. Hence, the information problem is not as significant between firms announcing repeated partnerships and institutional investors. In turn, the magnitude of the signal sent by the executive is likely to be less valuable for institutional investors. Thus,

Hypothesis 5: The impact of previous partnership executive signals on alliance value creation is negatively moderated by the level of institutional investors.

4.3 Variables and measures

4.3.1 Independent variables first introduced in Chapter 4

Relational experience signal. To determine whether firms send a relational experience signal to investors, a content analysis of alliance announcement press releases is conducted (e.g. Francis et al., 2002; Westphal & Zajac, 1998). Alliance press releases are first gathered from Medtrack and then coded by the researcher and subsequently by another coder. The coding scheme involved two key steps. Firstly, press releases are studied whether the statement contains a reference to previous partnerships between the two announcing firms either in the main body of the text or in a quote. An example is the following: "This collaboration is **the second** between the companies. **In December 2002**, Sunesis and Biogen Idec entered into a separate collaboration to discover therapeutics for the treatment of inflammatory and autoimmune diseases".

Secondly, press releases are scanned and coded whether executives of the focal firm make a statement directly referencing to the quality of the previous partnership and the experience with the partner in collaborating or the outcomes of the previous partnership. A binary variable is used and receives a '1' if the executive makes a statement regarding the quality and '0' otherwise. Please see two examples below for the quality assessment. There was inter-coder agreement rate on over 95% of all cases. The remaining cases were discussed and an opinion found. Such a coding procedure has been used in the management field in the context of executive explanations and justifications for corporate governance mechanisms such as long-term incentive plans in proxy statements (Westphal & Zajac, 1998; Zajac & Westphal, 1995) or in the accounting field in the context of earnings comments by executive (Francis et al., 2002). For this chapter, 31% of all statements included a reference to a previous partnership and a direct statement from a firm executive about the quality of a repeated partnership.

"The importance of this agreement to our company is at least twofold: it manifests the **excellent collaboration already in place with Solvay, as evidenced by the current Phase II clinical trials with Cetrotelix**. In addition, it is yet another proof of the research competence and commitment of our internal drug discovery unit (Dr. Juergen Vogel, Executive Vice President Global R&D and COO at Aeterna).

"For the first time in any pharmaceutical company's history, we have the ability to capture and evaluate atherosclerotic plaque from thousands of patients. **Our first year of collaboration with FoxHollow has given us novel insights into cardiovascular disease, and we're very pleased to enlarge our relationship today to continue this focus on cardiovascular disease while including other important disease areas as well.** The expanded collaboration will also enable FoxHollow to use human plaque analysis to enhance the capabilities of its NightHawk intravascular plaque imaging system, and accelerate its anti-restenosis drug therapy program" (Peter S. Kim, Ph.D., president of Merck Research Laboratories).

Executive reputation. Executive reputation is challenging to measure as it reflects a perception of different stakeholder groups. Therefore, I rely on two measures for this. Firstly, I draw on research which indicates that higher positioned executives might be more reputable. Structural power gives more senior executives a higher reputation as they are the head of the company and 'have more to lose' (Chatterjee & Hambrick, 2011). Recent research indicates that CEOs have substantial power over organizations and can therefore influence performance significantly (Quigley & Hambrick, 2015). Therefore, I measure executive reputation through a binary variable which receives the value '1' if the signal is sent by the CEO or '0' if it had been sent by another executive-level officer. Additionally, I measure executive reputation through an analysis of the newspaper coverage the announcing executive had received 3 years prior to the announcement and since 1990. Similar to Francis, Huang, Rajgopal, and Zang (2008), I use Lexis Nexis to check The Wall Street Journal, Financial Times, the New York Times, the Washington Post, USA Today, as well as the PR Newswire and the Business Wire for the number of articles in which executives are mentioned.

Analyst coverage. Previous studies (e.g. Brennan & Subrahmanyam, 1995; Ozcan & Overby, 2008) are followed by measuring the impact of analyst coverage by the count measure of all analysts explicitly following the focal firm. The I/B/E/S database is used to identify the unique number of analysts making earnings forecasts in the year of the alliance announcement in order to indicate the number of intermediaries between executives as signallers and investors as receivers of the signal.

***Institutional investors*.** The sophistication of institutional investors is measured as the percentage of investors which own more than 5% of the outstanding shares. Under SEC regulations, any investment manager, fund or other person must file a schedule 13D form if they own more than 5% of a US-based equity. Information regarding the percentage of the stocks outstanding held by such investors is directly gathered from the announcing firm's DEF 14A proxy statement filed for the financial year of the announcement.

4.3.2 Measures

Measures for control variables are described in detail in Chapter 3. In order to improve readability, an overview of all the measures used in this chapter is provided in the **Table 4.2** below.

TABLE 4.2: Measures table (Chapter 4)

Variable name	Measures	Data source	Chapter 4
Alliance year(s)	0/1 Binary variable for each year in which the alliance was announced	Medtrack	Control
Non-listed alliance partner	0/1 Binary variable. 1, if partner firm is a non-public partner (private firm, research institute or university), 0 if partner firm is a listed public firm	Compustat	Control
Slack resources	Natural logarithm of cash divided by long-term debt in the year preceding the alliance announcement	Compustat	Control
Firm uncertainty	Volatility in monthly stock prices in the year of the alliance announcement	Compustat	Control
Absorptive capacity	R&D expenses divided by net sales in the year preceding the alliance announcement	Compustat	Control
R&D Alliance Type	0/1 Binary variable. 1, if alliance is classified as a contractual R&D alliance, 0 if it is classified as comprising a licensing agreement	Medtrack	Control
International alliance	0/1 Binary variable. 1, if alliance is between two partners which have their HQs in different countries. 0, if HQs are in the same country	Compustat	Control
Relational experience	Number of previous partnerships between focal firm and alliance partner.	Medtrack	Control
General alliance experience (log)	Natural logarithm of total number of alliances of either R&D alliance or licensing agreements the focal firm has managed since its inception	Medtrack	Control
Relational experience signal	0/1 Binary variable. 1, if focal firm executive mentions previous relational experience quality, 0, if otherwise.	Medtrack	Independent
Analyst coverage	Number of financial analysts making earnings forecasts for focal firm in year of alliance announcement	I/B/E/S	Independent /Moderating
Executive reputation	0/1 Binary variable. 1 if focal firm's announcing executive is the CEO, 0 if otherwise	Medtrack	Independent /Moderating
Institutional investors	Percentage of focal firm's total equity held by firms which have more than 5% of total equity	Def 14A/ 10-K/ 20-F	Independent /Moderating

TABLE 4.3: Descriptive statistics and bivariate correlations (Chapter 4)

	Mean	Std.	1	2	3	4	5	6	7	8	9	10	11	12	13
1 CAR	3.06	9.81	1												
2 Absorptive capacity	1.18	2.10	0.29 ***	1											
3 Firm uncertainty	0.16	0.13	0.27 ***	0.35 ***	1										
4 Slack resources	0.14	1.96	0.01	0.06	0.14 *	1									
5 Non-listed alliance partner	0.30	0.46	-0.04	0.02	0.17 **	-0.01	1								
6 R&D alliance	0.52	0.50	0.11	0.17 **	-0.07	-0.12	0.09	1							
7 International alliance	0.54	0.50	-0.06	-0.17 **	-0.10	0.17 **	-0.12	-0.13 *	1						
8 Relational experience	1.83	1.42	0.02	-0.05	-0.06	-0.03	-0.14 *	-0.05	-0.02	1					
9 GAE (log)	4.00	1.27	-0.33 ***	-0.34 ***	-0.47 ***	-0.29 ***	0.03	-0.01	0.07	0.16 **	1				
10 Relational experience signal	0.31	0.46	0.23 ***	0.20 **	0.09	-0.02	0.14 *	0.13 *	0.05	-0.06	-0.22 ***	1			
11 Executive reputation	0.23	0.42	0.16 **	0.15 **	0.03	0.09	-0.04	-0.04	0.09	-0.08	-0.25 ***	0.27 ***	1		
12 Financial analysts	11.45	10.79	-0.11	-0.08	-0.13 *	0.11 *	-0.07	0.02	0.09	0.04	0.08	0.11	0.00	1	
13 Institutional investors	21.81	19.37	0.18 **	0.19 **	0.25 ***	0.04	-0.14 *	-0.14 *	0.03	0.11	-0.53 ***	0.11	0.24 ***	-0.02	1

N=161

*p<0.1; **p<0.05; ***p<0.01

4.4 Analyses and results

4.4.1 Analyses

Descriptive statistics of the mean and the standard deviation (S.D.) are detailed in **Table 4.3**. This sample consists of partnerships comprising of at least one previous alliance before the focal alliance announcement. This results in 161 alliances. For *CAR*, the mean abnormal return of 3.06% is somewhat higher than for previous studies, which primarily investigated equity joint venture announcements (Gulati et al., 2009; Merchant & Schendel, 2000). There are various explanations for this. Firstly, as Anand and Khanna (2000a) indicate the mean abnormal return for contractual alliances is higher than for equity alliances. Secondly, Zollo et al. (2002) find that the value of repeated experiences is higher in non-equity alliances as trust (generated through repeated experiences) and control (generated through equity) are substitutes. Thirdly, Gulati et al. (2009) find that relational experiences in general are more valuable than general experiences. As this sample only consists of partnerships comprising at least one previous repeated experience between the two partners, it can therefore be expected that the mean CAR is higher than in previous studies. For a detailed overview of event study results including CAR tables please refer to **Appendices 4.1-4.2**.

Table 4.3 also shows the bivariate correlation results. Notable is the negative correlation between *GAE(log)* and *Institutional investors* (-0.53, $p<0.001$), indicating that as the number of GAE increases, the proportion of institutional investors decreases. This can be explained by the fact that small firms in the biopharmaceutical industry tend to require substantial financing and therefore have a large proportion of institutional investors with significant shareholdings. *Executive reputation* is highly correlated with the *Relational experience signal* (0.27, $p<0.001$). This indicates and may provide some support that more reputable executives send signals to investors in order to increase the strength of the signal. Additionally, it is notable that *Firm uncertainty* is negatively correlated with *GAE(log)* (-0.47, $p<0.001$). This can largely be explained by industry factors as well. Firms inexperienced in alliances are likely to have significant uncertainty surrounding their product development success as partnering with firms in the industry is associated with reputation and status (Stuart et al., 1999). In turn, this means that firms with more alliance experience are likely to have less uncertainty surrounding product development.

Besides the bivariate correlations and due to the inclusion of interaction variables in the empirical models, multi-collinearity is also checked by investigating the variance inflation factors (VIFs). Both mean and individual values are below the critical threshold value of 10 (e.g. Kleinbaum, Kupper, Muller, & Nizam, 1998).

In **Table 4.4**, the OLS regression results for estimating alliance performance based on CAR are presented. Model 1 is the baseline model that includes all the control variables. Model 2 introduces the *Relational experience signal* sent by focal firms' executives in order to test Hypothesis 1. Hypothesis 2 comparing the effect of the quality-based *Relational experience signal* with the quantity-based *Relational experience* measure is also tested using this model. The moderating effect of *Executive reputation* as proposed in Hypothesis 3 is tested in Model 3. Model 4 then tests the moderating effect of *Financial analysts* (Hypothesis 4), while Model 5 tests the moderating impact of *Institutional investors* on the signal effects (Hypothesis 5).

TABLE 4.4: OLS regression results (Chapter 4)

CAR (in percentage) as dependent variable	**MODEL 1**	**MODEL 2**	**MODEL 3**	**MODEL 4**	**MODEL 5**
	Controls	**Relational Experience Signal**	**Executive Reputation**	**Financial Analysts**	**Institutional Investors**
Control variables					
Alliance years (dummies)	n.s.	n.s.	n.s.	n.s.	n.s.
Absorptive capacity	0.884	0.801	0.778	0.804	0.828
	(.86)	(.79)	(.78)	(.77)	(.8)
Firm uncertainty	10.051	11.873 *	12.519 *	12.091 *	11.759
	(7.15)	(6.91)	(7.06)	(6.83)	(7.14)
Slack resources	-0.462	-0.381	-0.426	-0.474	-0.430
	(.4)	(.38)	(.43)	(.4)	(.38)
Non-listed alliance partner	-1.596	-2.391	-2.146	-2.033	-2.457
	(1.48)	(1.54)	(1.45)	(1.4)	(1.53)
R&D alliance	1.758	1.470	1.487	1.350	1.276
	(1.45)	(1.34)	(1.3)	(1.28)	(1.53)
International alliance	0.136	-0.294	-0.333	-0.121	-0.254
	(1.49)	(1.36)	(1.39)	(1.36)	(1.36)
Relational experience	0.087	0.030	0.060	-0.066	0.107
	(.68)	(.68)	(.66)	(.7)	(.7)
GAE (log)	-1.990 **	-1.556 **	-1.432 **	-1.487 **	-1.821 **
	(.79)	(.72)	(.67)	(.7)	(.72)
Explanatory variables					
Relational experience signal		4.139 **	3.434	4.495 **	4.171 **
		(1.79)	(2.16)	(1.85)	(1.76)
Executive reputation			1.058		
			(1.43)		
Relational experience signal x Exec. Reputation			1.168		
			(3.72)		
Financial analysts				0.030	
				(.04)	
Relational experience signal x Financial analysts				-0.309 *	
				(.17)	
Institutional investors					-0.027
					(.05)
Relational experience signal x Instititutional investors					0.002
					(.08)
Constant	9.872 *	7.632	7.151	8.356	8.798 *
	(5.62)	(5.8)	(5.74)	(5.78)	(5.19)
N	161	161	161	161	161
F-Statistic	1.66 *	2.19 **	2.28 ***	2.54 ***	2.2 ***
R-Square	0.21	0.24	0.25	0.27	0.24
Root MSE	9.21	9.07	9.11	8.97	9.12

*p<0.1; **p<0.05; ***p<0.01

Robust Standard Errors calculated through Huber-White sandwich estimators and firm clustering are in parentheses

4.4.2 Results

In this section, results of the hypothesis testing are presented. In terms of overall fit of the empirical models, the r-squares of the models are compared to existing literature and are found to be higher than in previous studies using stock market measures for alliance value creation (e.g. Gulati et al., 2009; Kale et al., 2002). R-squares tend to be rather low due to the amount of other factors influencing stock market performance. As stated by Gulati et al. (2009: 1226): "the objective of the analysis in these cases is to evaluate the contribution of partnering experience to value creation rather than to explain the overall variance in abnormal market returns following alliance announcements".

Due to the robust OLS option (Huber-White sandwich estimator with firm clustering), adjusted r-square values are not identifiable for comparing the explanatory power of the models. Alternatively, Root Mean Squared Error (Root MSE) provides an accuracy measure for model comparisons. The lower the Root MSE, the more accurate the model is. Model 1 as the controls model provides the least explanation to CAR, whereas the explanatory power of the other models increases. The most accurate Model 4 is model including the *Financial analysts* interaction term. While the other two interactions provide more explanatory power than the base model, Models 2 and 4 seem to be best fitting. However, the difference to the moderating models fit is marginal.

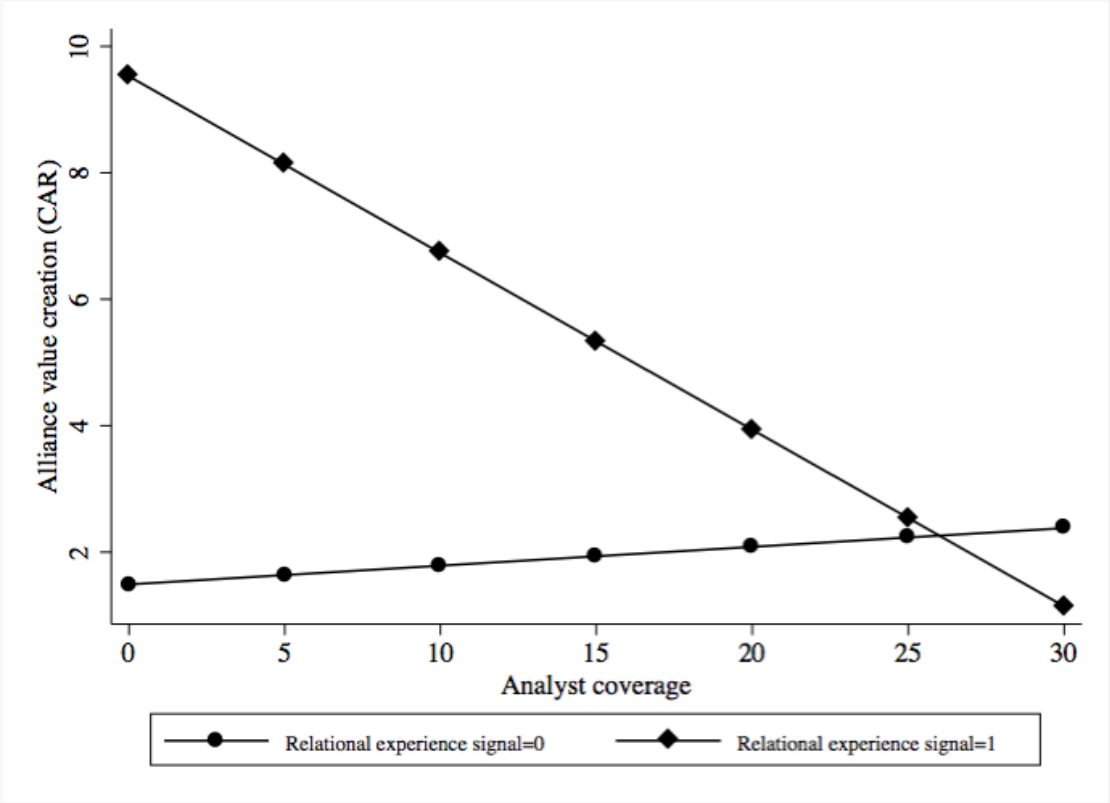
In order to test Hypothesis 1 that the signal of previous repeated alliance quality is positively related to investor reaction, it is tested in Model 2 ("*Relational experience signal*"). The results reported in Model 2 provide support for Hypothesis 1 with the coefficient estimate on the *Relational experience signal* variable being positive and significant ($\beta_{Relational\ experience\ signal}$: 4.13, p-value: 0.02). All other things being equal, this means that a firm with an executive sending a signal about the previous partnerships quality receives around a 4% higher stock market return than firms which do not. This is in line with prior research that signals sent by executives in corporate disclosures such as press releases are received and valued by investors (Francis et al., 2002; Westphal & Zajac, 1998). Thus, they represent important means to signal quality to the market. Results therefore seem to suggest that a separating equilibrium between on the one side firms with relational capabilities and on the other side firms with non-relational capabilities exists.

Results reported in Model 2 also provide means to test Hypothesis 2 that the effect of the *Relational experience signal* is higher than for the quantity of *Relational experiences.* An F-test provides support for Hypothesis 2 as $\beta_{Relational\ experience\ signal} > \beta_{Relational\ experience}$ ($F_{1,\ 68}$: 3.91, p-value: 0.05). This indicates that there is a significant difference between a *quantity* and *quality* based indicator of relational experiences in predicting alliance value creation.

The moderating effects are tested in Models 3, 4, and 5. Results reported in Model 3 provide no support for Hypothesis 3, that *Executive reputation* as measured by the executive position positively moderate the effect of the *Relational experience signal* onto *CAR*, with the coefficient estimate being positive but insignificant for executive position ($\beta_{Relational\ experience\ signal\ x\ Exec.\ reputation}$: 1.16, p-value:0.7). Hypothesis 3 is therefore rejected. A supplementary analysis whether other reputational factors impact the signal strength is subsequently conducted. The news coverage for executives is also a frequently used measure for reputation (e.g. Francis et al., 2008). However, due to smaller sample size as they cover only the 'signalled' announcements, these suffer from multi-collinearity issues and are therefore not reported.

The results reported in Model 4 provide support for Hypothesis 4, that the number of *Financial analysts* negatively moderate the effect of the *Relational experience signal* onto *CAR*, with the coefficient estimate being negative and significant ($\beta_{Relational\ experience\ signal\ x\ Financial\ analysts}$: -0.30, p-value: 0.06). Please see an interaction graph in **Figure 4.3**. As expected, results indicate that as the number of analysts following the firm making the alliance announcement increases, the effect of sending a *Relational experience signal* decreases.

FIGURE 4.3: Two-way interaction graph relational experience signal and analyst coverage



The results reported in Model 5 provide no support for Hypothesis 5, that the proportion of *Institutional investors* negatively moderates the effect of the *Relational experience signal* onto *CAR*, with the coefficient estimate being positive but insignificant ($\beta_{Relational\ experience\ signal\ x\ Institutional\ investors}$: 0.001, p-value: 0.9). The control variables are tested in Model 1. In line with existing research which has frequently found a large amount of insignificant control variables (e.g. Anand & Khanna, 2000a; Gulati et al., 2009), this chapter also finds that several control variables are insignificant. Only two control variables are significant across most models, however. Firstly, this chapter finds that *Firm uncertainty* has positive effects on CAR. This result on first sight may seem surprising given that investors do not like uncertainty as it is more difficult to value a company's strategic actions. However, uncertainty by itself is not an unfavourable condition. In particular, investors may positively react to announcements, particularly in conditions of uncertainty (Zhang, 2006). As alliances in general are positive news for investors, the positive effect of firm uncertainty on such announcements is therefore not surprising (Chan et al., 1997). Secondly, this chapter also finds that *General Alliance Experience (GAE)* has a negative impact on

alliance value creation. This is also in line with existing literature which finds declining effects on alliance performance (Hoang & Rothaermel, 2005; Sampson, 2005). The underlying reasons for this are discussed more extensively in Chapter 5.

4.4.3 Robustness checks

Four different robustness checks are conducted. Firstly, robustness is ensured by testing whether any underlying partnership characteristics influence whether a signal is actually sent. In essence, there might be a sample selection problem in that other characteristics beyond the ones tested above may influence whether firms actually send a relational experience signal. As this may result in endogeneity issues, a two-step procedure as suggested by Heckman (1979) is followed to take this into account. As a first step, this meant that a probit model is run with *Relational experience signal* as the dependent variable and partnership characteristics as independent variables. Several characteristics were identified from existing literature, namely (1) *Relationship length* (Continuous variable: number of years since the *first* announced partnership between the two organizations), (2) *Last relationship* (Continuous variable: Number of years since the *last* announced partnership between the two organizations), (3) *Alliance type* (Binary variable: 1 if focal announcement refers to a R&D collaboration, 0 if the focal announcement refers to a licensing deal), and (4) *Different alliance type* (Binary variable: 1 if previous announced alliance between the two partners was a different alliance type to the focal alliance, 0 if it was the same alliance type). Existing literature suggests that the length between partnerships over time may be either beneficial or not as long gaps decrease the strength of a new partnerships between the partnering organizations (Gulati, 1995b) but may also indicate increased trust (Dyer & Chu, 2000; Gulati & Sytch, 2008). Additionally, the alliance type is a critical determinant of alliance success (Rothaermel & Deeds, 2006) and for benefiting from alliance or relational experience more specifically (Zollo et al., 2002). Relational experience may be more relevant in contexts in which partner teams more actively collaborate in this case R&D alliances over licensing agreements. Changes in the type of alliance may also indicate important changes in the alliance objectives and thus the possibility to take utilize on the development of previously generated relational experiences. Therefore, I decide to include these four variables as explanatory variables for executives sending a quote or

message to the market with the objective to generate the inverse Mills ratio from this model. Results suggest that two of these factors are indeed significant in influencing whether a relational experience signal is sent. Firstly, the relationship length negatively impacts whether such a signal is sent (-0.054, p-value: 0.09). This suggests that firms may possibly be more likely to be subject to network inertia at this stage. Secondly, the alliance type also influences whether a quality signal of relational experiences is sent to the market. More specifically, when announcing more collaborative deal types, these are more likely to be signalled to the market (0.416, p-value: 0.05).

Overall, this robustness check suggests that also partnership-specific aspects influence whether a signal to investors concerning the quality of the previous partnerships is sent. As a second step, the generated inverted Mills ratio is then added as another control variable in the above models (please see **Table 4.5**). Important findings from this additional robustness check are that, firstly, the inverse Mills ratio control variable is insignificant, which implies that endogeneity may not be a concern. Secondly, the sign of *Relational experience signal* is still positive ($\beta_{Relational\ experience\ signal}$: 3.87, p-value: 0.03) and significant, thus supporting the main argument for a quality-based measure of relational experience. Moreover, the effect of the *Financial analyst* coverage also holds when controlling for the inverse Mills ratio.

TABLE 4.5: OLS regression with inverted Mills ratio

CAR (in percentage) as dependent variable	MODEL 1 Relational Experience Signal	MODEL 2 Financial Analysts
Control variables		
Alliance years (dummies)	n.s.	n.s.
Absorptive capacity	0.796	0.803
	(.79)	(.77)
Firm uncertainty	11.970 *	12.202 *
	(6.99)	(6.93)
Slack resources	-0.379	-0.475
	(.39)	(.41)
Non-listed alliance partner	-2.555	-2.177
	(1.63)	(1.48)
R&D alliance	0.952	0.883
	(1.23)	(1.18)
International alliance	-0.436	-0.248
	(1.39)	(1.39)
Relational experience	0.098	-0.007
	(.65)	(.67)
GAE (log)	-1.532 **	-1.467 **
	(.71)	(.7)
Inverted Mills ratio (λ)	-1.948	-1.728
	(2.34)	(2.37)
Explanatory variables		
Relational experience signal	3.872 **	4.249 **
	(1.8)	(1.9)
Financial analysts		0.035
		(.04)
Relational experience signal x Financial analysts		-0.309 *
		-(.31)
Constant	10.090	9.934
	(7.57)	(7.58)
N	161	161
F-Statistic	2.17 **	2.42 ***
R-Square	0.25	0.27
Root MSE	9.08	8.99

*p<0.1; **p<0.05; ***p<0.01

Robust Standard Errors calculated through Huber-White sandwich estimators and firm clustering are in parentheses

Secondly, I check if despite collinearity issues (>0.85) including firm size as a control variable changes the significance of the main results identified in this chapter. I find that the effect of the *Relational experience signal* and the moderating effect of *Analyst coverage* are both significant also when including firm size. Thirdly, I check if a subset of the data drives the effect. Therefore, I randomly delete 10% of the observations and check if the results hold (Lee, 2013). Confirmation for this is found. Fourthly, I use a different event window as suggested by existing literature to improve robustness of the results (MacKinlay, 1997; McWilliams & Siegel, 1997). I choose event window (-1, +1) in order to leave more time for investors to interpret the alliance announcement. This event window provides support to the main hypothesis of a quality-based measure of relational experience (see **Appendix 4.3**). The effects of the analyst coverage interaction become insignificant in this window, however, as their main effect is likely to be strongest when the news of the repeated alliance announcement triggers through to the market and not after the announcement day itself. Additionally, results of the CAR tables (**Appendices 4.1** and **4.2**) indicate that investors react positively on the announcement day itself with average CARs of +2.47% and also albeit smaller on the pre-announcement day (+0.59%). This provides support to both the argument of a quality-based relational experience measure and the importance of analysts to investors in immediately communicating to investors. On the contrary, as expected, results do not hold for an event windows *not* comprising the event day (e.g. -10,-2 or +2, +10).

4.5 Discussion

This chapter aims to answer the research questions how the signalling of relational experiences affects alliance value creation. In addition, it endeavours to find whether the effect of such signals is influenced by signaller, intermediary or receiver characteristics. This chapter thereby advances research on repeated partnerships and their effect on value creation (Anand & Khanna, 2000a; Goerzen, 2007; Gulati et al., 2009; Kale et al., 2002; Zollo et al., 2002). Existing research has used performance or value creation implications of repeated partnerships as an indication or proxy whether relational capabilities had been generated. Research has, however, found significant unexplained heterogeneity in effects of relational experiences implying that the use of the quantity of previous relational experiences may actually not reflect the quality of

the partnership, thus the development of relational capabilities. This chapter therefore distinguishes alliances with the same partner between *signalled* and *non-signalled* repeated partnerships to identify whether these may significantly explain the value creation heterogeneity. By using signalling theory, this chapter reveals that the distinction between signalled and non-signalled alliances is a critical one and can explain parts of the heterogeneity observed in previous studies. Findings also reveal that the strength of the signal is contingent upon intermediaries transmitting the signal to receivers, while signaller or receiver characteristics do not influence the strength of the signal. More specifically, the effect of relational experience signals depends on financial analysts who mitigate the direct effects of the signal as they are likely to keep their clients informed about the quality of the partnership before a signal by the announcing firm has been sent.

Findings indicate that the signalling of relational experiences has a positive impact on value creation. This confirms expectations that firms which signal their repeated partnerships may indicate superior quality of the previous one. While some firms provide a short press release focusing on the newly announced repeated alliance, other firms provide additional information about the previous partnership. When executives provide such information, this may signal confidence and quality in the partnership to investors. Accordingly, organizations which do not signal their repeated alliances may not be able to credibly covey their alliance objective is for relational capabilities. On the contrary, companies may have developed network inertia with no positive results from previous partnerships reported by executives.

Moreover, this chapter finds evidence that a *quality*-based measure of relational experiences provides a better indication for the value created from alliances than only the *quantity* of previous relational experiences. This finding explicitly builds on existing studies that the number of previous partnerships may be a weak indicator of relational experiences. Therefore, previous studies have challenged the use of repeated partnerships as a measure for relational capabilities (e.g. Gulati et al., 2009; Hoang & Rothaermel, 2005). Gulati et al. (2009: 1228), for instance, propose that such measures should "(…) allow researchers to assess realized experience rather than limit investigation to potential experience or learning opportunities." In line with this, Hoang and Rothaermel (2005: 343) propose that "(…) alliance experience variables should also reflect the *quality* of collaborations (…)." This finding builds on the above

and finds an indication that the signalled and perceived quality of collaborations may influence the value creation thereof.

The chapter's hypotheses regarding the moderating effects of signaller characteristics, signaller-receiver intermediaries and receiver characteristics receive only some support. Findings concerning executive reputation in moderating the signalling effect are not supported. Insignificant findings for executive reputation may indicate that signalling costs for executives are already at a significant level for all executives and there are no significant differences whether executives have a low or high executive position. While such executives have technically more to lose in terms of reputation, executives with a lower position also have more to gain in terms of their career advancements, thus making them also inclined to prevent reputation losses. The insignificance of the findings for executive reputation, therefore may also be part of a the difficulty in measuring of executive reputation as has been indicated by previous literature (Milbourn, 2003).

Findings for signal-receiver intermediaries confirm expectations that financial analysts decrease the impact of such signals to the market. According to expectations, such analysts have significant power in informing their investor clients (e.g. Brennan & Subrahmanyam, 1995). Thus, analysts may mitigate the effect of signals to the market effectively. It seems surprising that the receiver characteristics, in this case, the sophistication of the institutional investors are found to be insignificant. Two possible reasons for this can be identified. Firstly, institutional investors react differently to news announcements. Their trading activity is less frequent than private investors and they essentially use different trading strategies. As such, they may be subject to various clauses in their fund offering, potentially requiring fund managers to divest for non-market related factors (e.g. Lakonishok, Shleifer, & Vishny, 1992). This implies that they may not react significantly around the announcement date itself. Secondly, the insignificance might be a methodological issue. This chapter uses the percentage of shares held by institutional investors above the outstanding disclosure threshold. However, many institutional investors might own less than this reporting threshold. Therefore, a measure using all institutional investors might provide significant results as hypothesized.

This chapter provides contributions to existing literature both theoretically and empirically. Firstly, this chapter provides a means to distinguish between repeated partnerships formed for different reasons. It therefore explicitly builds on studies which have identified significant performance heterogeneity in repeated partnerships. While some studies find that firms benefit from repeated partnerships (Gulati et al., 2009; Sleptsov et al., 2013; Zaheer et al., 2010; Zollo et al., 2002), others find negative effects (Goerzen, 2007; Hoang & Rothaermel, 2005; Lee, 2013; Wassmer & Dussauge, 2012; Yang et al., 2015). This chapter may clarify some of the differences among these for repeated partnerships from an external investor perspective.

Secondly, this chapter combines an investigation into the reasons for repeated alliance formation with an examination of the outcome of repeated partnerships. Previous studies have mentioned and theorized based on these alliance formation reasons (e.g. Goerzen, 2007; Gulati, 1995a). However, the explicit reasons for alliance formation and their impact on alliance performance has hardly been investigated before, with the exceptions of Beckman et al. (2004) and Gulati and Westphal (1999). This study thereby answers calls for more research investigating the *quality* of previous partnerships instead of only the *quantity* (Hoang & Rothaermel, 2005; Zollo et al., 2002).

Thirdly, this chapter is one of the first studies to investigate repeated partnerships with the same alliance partner which uses signalling theory. It is a valuable theory which can help to uncover circumstances when significant information asymmetry between parties exists and its use in many areas of strategic management has been increasing (Bergh et al., 2014; Connelly et al., 2011). In the context of strategic alliances, signalling theory has been applied before (e.g. Ozmel et al., 2013; Park & Mezias, 2005; Stuart et al., 1999), however, not in the context of repeated partnerships. As signalling theory is particularly imperative when information asymmetry is present, the context of repeated partnerships provides a relevant addition to signalling theory and signalling theory to the context of repeated partnerships.

Fourthly, the investigation of the moderating variables has implications on the understanding of prior studies which have investigated the alliance value creation through CAR (Anand & Khanna, 2000a; Gulati et al., 2009). While previous studies

have primarily investigated firm- and partnership-specific moderating factors which impact the alliance announcement effect on CAR (Anand & Khanna, 2000a; Koh & Venkatraman, 1991; Merchant & Schendel, 2000), this study finds that financial intermediaries also have an important effect in moderating the impact. Such financial analysts have the power to significantly reduce the information asymmetry between announcing firms and financial investors.

4.6 Limitations and directions for future research

While this chapter provides contributions to the strategic alliance literature, it has also has limitations which may provide directions for future research. Firstly, it needs to be emphasized that this chapter is only one first step to investigate the impact of previous partnership *quality* over the *quantity*. By using the signal of the previous partnership, it essentially refers to a quality measure as *perceived* by investors. Thus, drawing conclusions regarding the actual development of relational capabilities or network inertia may essentially be an investor evaluation. Whilst this study has attempted to identify factors which encourage firms to send such signals and finds that the alliance type and the relationship length may have an impact on the decision to send such signals, future studies may wish to investigate further factors that may impact firm's signal. While signalling theory predicts that if signals are costly and the signal itself represents a quality assessment, future studies may also investigate the quality of previous partnerships with respect to the development of relational capabilities or network inertia in more detail.

This chapter investigates the quality of repeated partnerships through signalling theory only in one industry. In order to improve generalizability and to rule out industry-specific differences, future studies may wish to investigate whether results also hold in other industry settings. Moreover, this chapter uses a stock-market measure for alliance value creation. While evidence indicates that it may be correlated with other more subjective measures of alliance performance (e.g. Heimeriks et al., 2015; Kale et al., 2002), this study does not explicitly test for such long-term effects. As mentioned above, however, assessing the performance of a repeated partnership is challenging due to varying and oftentimes irrational alliance formation reasons. Nevertheless, future studies may still wish to examine whether the results identified in

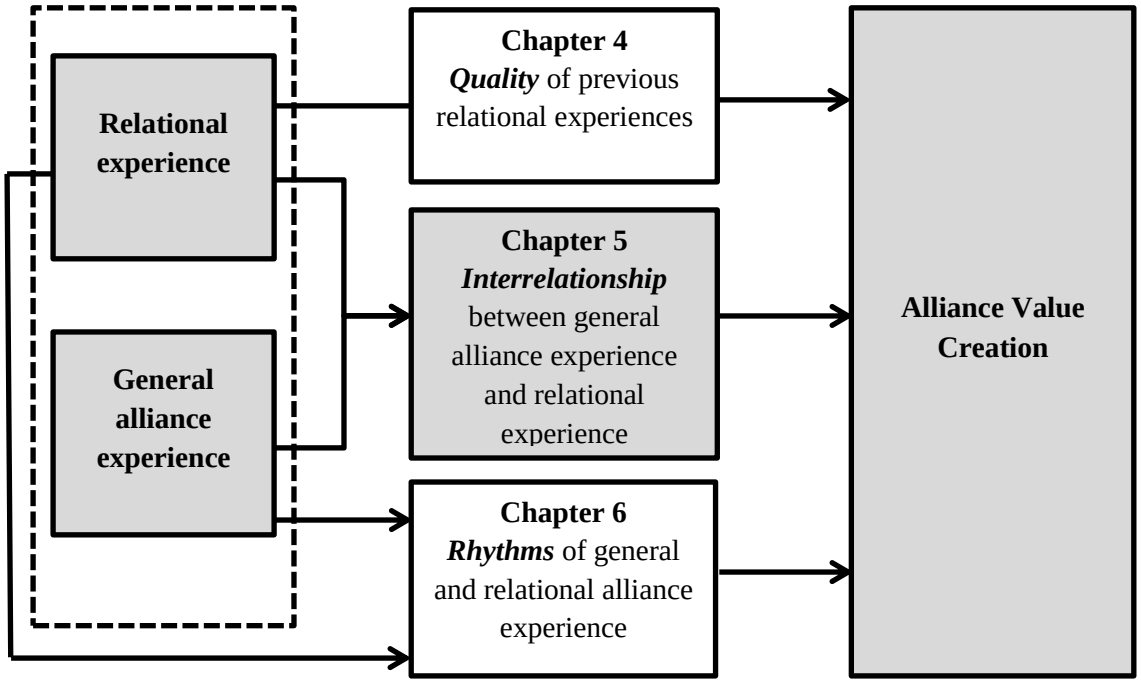
this chapter also lead to better long-term alliance performance. While this may be very difficult in large-scale empirical studies, a possibility may be a number of longitudinal case studies which investigate specific partnerships and the formation reasons in order to further uncover the value creation heterogeneity of repeated alliances.

CHAPTER 5: THE INTERRELATIONSHIP BETWEEN GENERAL AND RELATIONAL EXPERIENCE AND THE IMPACT ON ALLIANCE VALUE CREATION

5.1 Introduction

In order to further contribute to existing empirical literature which has identified heterogeneity in the effect of relational experiences on value creation measures, Chapter 4 has investigated whether the signalling of relational experiences increases value creation. Some support has been found that investors' value signalled previous relational experiences, indicating that the signalled *quality* of relational experiences may reflect the investor-perceived relational capability of the repeated partnership. While this may have helped the understanding of relational experiences, there is still significant heterogeneity in the effect of relational experience onto value creation. In order to build on these findings, this chapter shifts from the sole consideration of *dyad-level* repeated partnerships to an investigation of the interrelationship with *firm-level* general alliance experience (please see **Figure 5.1** below).

FIGURE 5.1: Empirical chapter overview (Chapter 5)



Described in Chapters 2 and 4, repeated partnerships as an antecedent to relational capabilities are situated on the *dyad-level* (e.g. Dyer & Singh, 1998). This is in contrast to the general ability of the firm to manage strategic alliances, irrespective of the partner (Kale & Singh, 2007). There are significant differences in the way firms manage alliances and their respective performance outcomes. Some firms, such as Eli Lilly for instance, are renowned for their ability to manage strategic alliances effectively (Sims et al., 2001). Due to the generation of processes which are introduced firm-wide, alliance capabilities seem to also exist on the *firm-level*. A key antecedent to developing such firm-level alliance capabilities is through accumulating experiences with strategic alliances: General Alliance Experience (GAE). Primarily based on OL literature, existing research finds that firms can improve their alliance performance over time through 'learning by doing' (Argote et al., 1990). In the alliance context, research has investigated the effect of GAE on various performance measures and has shown that accumulating GAE may improve alliance performance (Anand & Khanna, 2000a; Kale et al., 2002), particularly for inexperienced firms (Hoang & Rothaermel, 2005; Park & Kim, 1997; Sampson, 2005). However, as firms accumulate more alliance experience, empirical evidence indicates that firms may become overconfident in managing those (Heimeriks, 2010) and performance declines at high levels of GAE (Deeds & Hill, 1996; Hoang & Rothaermel, 2005). Such a process of overconfidence is triggered by heuristics and superstitious learning which means that firms are likely to misattribute the cause and effect relationship between their alliance management and performance (Heimeriks, 2010; Zollo, 2009). Initial alliance successes may cause firms to over-ascribe their ability to manage alliances based on firm-level alliance processes leading to performance declines at high extents of firm-level alliance capabilities (Heimeriks, 2010). Empirical results provide strong support for this theory of overconfidence at high levels of GAE (Heimeriks, 2010; Hoang & Rothaermel, 2005).

While research suggests that GAE may lead to overconfidence, it is still unexplored whether this may elucidate why such significant heterogeneity in the effect of dyad-level relational experiences on alliance value creation exists. Surprisingly, existing literature has so far considered *firm-level* GAE and *dyad-level* relational experience only independently. While they are situated on different levels, existing research has found that both types of experiences are still highly interrelated

as they both aim to improve the traditionally low alliance performance and affect the same alliance managers (Dyer & Singh, 1998; Kale et al., 2002; Kale & Singh, 2009; Zollo et al., 2002). Furthermore, theory on overconfidence suggests that in conjunction with any overconfidence in an organizational activity goes a simultaneous neglect or decline in other related processes, a so-called "competency trap" (Levitt & March, 1988: 322) or "core rigidity" (Leonard-Barton, 1992: 118). More specifically, resources may be allocated to the overconfident processes, in this case firm-level alliance processes, while insufficient resources may be allocated to other processes, in this *case dyad-level* relational processes, leading to an underdevelopment of the latter. Existing conceptual research indicates that both types of alliance experience may in fact be interrelated (Schreiner & Heimeriks, 2010; Wang & Rajagopalan, 2015). However, empirical evidence investigating whether overconfidence in firm-level GAE leads to a decreased value creation of dyad-level relational experience is to the best of my knowledge missing.

In support of the proposed interrelationship between firm-level alliance experience and dyad-level relational experience, recent literature in related corporate development fields such as M&A or licensing finds that experiences which are interrelated may 'spill-over' from one activity level to another and thus may either positively or negatively impact one another (Bertrand & Capron, 2015; Eggers, 2012; Mulotte et al., 2013; Zollo & Reuer, 2010). For instance, developing strong in-licensing experience may negatively impact a firm's internal research and development efforts as firms resource allocations to own activities decreases (e.g. Mulotte et al., 2013). Alternatively, a firm's international M&A activity may impact its internal activities in the domestic markets (e.g. Bertrand & Capron, 2015).

While existing research finds that overconfidence may occur under such conditions, a general understanding of the factors which may mitigate or exacerbate is still lacking. As overconfidence by itself is a process which is triggered by uncertainty as managers and firms rely on using heuristics under such circumstances (e.g. Busenitz & Barney, 1997), I propose that the spill-over effect between relational experiences and GAE is exacerbated under conditions of firm uncertainty.

Moreover, existing research on alliances identifies that the effect of GAE on alliance performance is influenced by the underlying alliance management mechanisms, comprising of both integrating and institutionalizing mechanisms as first introduced in Chapter 2 (Heimeriks & Duysters, 2007; Kale et al., 2002). Such processes which advance alliance management consist of storing, codifying and disseminating alliance knowledge (Kale & Singh, 2007). While there is some evidence that such processes directly improve the management of GAE (Heimeriks & Duysters, 2007; Heimeriks et al., 2007), they also tend to lead to increased overconfidence when used in conjunction with high levels of GAE (Heimeriks, 2010). Therefore, it remains puzzling whether such alliance management mechanisms can mitigate or potentially exacerbate the negative effects of GAE at high levels and consequently how this may affect the relational experiences alliance value creation impact. Therefore, this chapter also investigates how such alliance management mechanisms may affect the interrelationship between GAE and relational experiences. Consequently, the research questions for this chapter are:

How does the extent of firm-level general alliance experience (GAE) influence the value creation effects of dyad-level relational experiences? How do firm-level uncertainty and alliance management mechanisms influence the interrelationship between the two levels of experience?

In order to answer these questions, this chapter builds on previous research which has investigated the interrelationship of experiences across corporate development activities (e.g. Mulotte et al., 2013; Zollo & Reuer, 2010). This chapter thereby draws on two different levels of theories. Firstly, firm-level theories of OL and the RBV are used to argue that firms become overconfident in their firm-level alliance practices at high levels of GAE. Secondly, alliance partner-level theories such as inter-organizational trust are used to argue that such overconfidence affects the ability of dyad-level relational experience to positively impact alliance value creation as firms resource commitments to the partnership are likely to decrease.

The theoretical framework is in comparison to Chapter 4 tested on the full sample and not only the subsample of repeated partnerships. Before testing the interdependent effects of GAE and relational experiences, the independent effect of them on alliance value creation is tested in two baseline hypotheses. Results for the latter confirm results derived in Chapter 4 that the signalling of repeated partnerships has positive effects on alliance value creation. This also confirms parts of existing research which finds that the independent effect of relational experiences on alliance value creation is positive (e.g. Gulati et al., 2009; Zollo et al., 2002). Secondly, results suggest that the effect of GAE on alliance value creation declines rapidly, confirming the expectation that organizations become overconfident in applying past alliance management lessons (Heimeriks, 2010; Hoang & Rothaermel, 2005). Thirdly, the interrelationship is tested and strong support is found that the effect of dyad-level relational experiences on value creation is significantly reduced at high extents of firm-level GAE. Moreover, this chapter finds evidence that the interrelationship is moderated by firm characteristics. More specifically, according to expectations, firms' idiosyncratic levels of uncertainty enhance the negative spill-over effect of high levels of GAE onto relational experiences. This follows expectations that uncertainty may further lead organizations to rely on heuristics, such as overconfidence (Tversky & Kahneman, 1974). Additionally, I find some evidence that alliance management mechanisms influence the proposed interrelationship between GAE and relational experiences. In line with expectations, such mechanisms may exacerbate the spill-over effect. However, results further indicate that such management mechanisms influence the effect onto the effect of relational experiences on value creation *independent* of GAE.

This chapter is a logical next step to studies which have identified overconfidence at high levels of firm-level alliance experiences (e.g. Heimeriks, 2010). Therefore, it also answers calls for more empirical insights into the relationship between firm-level alliance and dyad-level relational capabilities (Wang & Rajagopalan, 2015). To the best of my knowledge, this represents the first empirical study linking the independent fields of *firm-level* alliance experience and *dyad-level* relational experience. By doing so, it also contributes to studies primarily investigating the inter-relationship between the processes directly affected by accumulating either GAE, such as organizational learning, and dyad-level relational

experiences, such as trust development. In light of this, Dekker and Abbeele (2010: 1247), for instance, have called for studies to "examine how organizational learning processes are associated with the development of trust between exchange partners".

The findings of this chapter also explicitly contribute to existing alliance literature investigating the reasons for heterogeneity in value creation effects of relational experiences. These studies have already investigated firm- (Gulati et al., 2009), relationship- (Zollo et al., 2002), and environmental-level moderators (Goerzen, 2007). Low explanatory power and other recent studies have found that the effect of relational experiences still depends on many unobserved factors (Vanneste et al., 2014). As a result, this chapter contributes by finding evidence that the extent of firm-level GAE is an additional moderating factor which impacts the effect of relational experience on alliance value creation. This might further explain why there is such heterogeneity in studies finding both positive (e.g. Gulati et al., 2009; Reuer & Zollo, 2005; Sleptsov et al., 2013; Zaheer et al., 2010; Zollo et al., 2002), non-positive or even negative (e.g. Goerzen, 2007; Hoang & Rothaermel, 2005; Lee, 2013; Swaminathan & Moorman, 2009; Yang et al., 2015) value creation effects of relational experience.

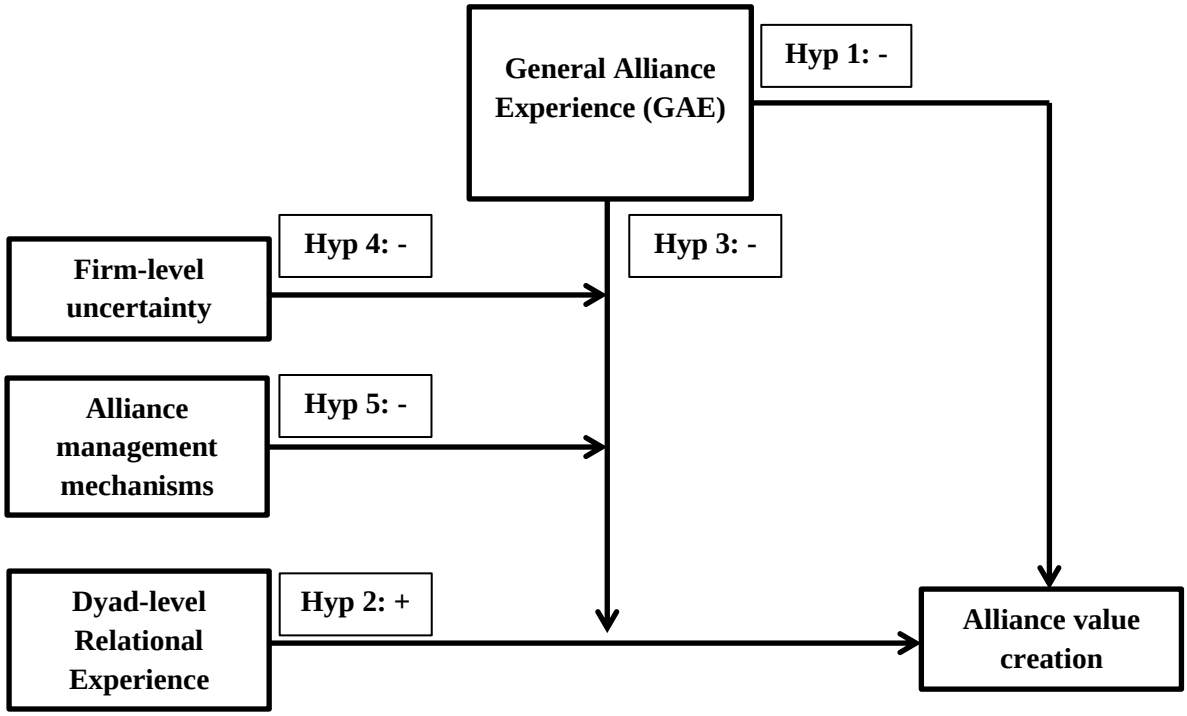
Supportive results for such an interrelated effect further extend research on corporate development capability spill-over effects (Mulotte et al., 2013; Zollo & Reuer, 2010). While existing studies have tested such spill-over effects *across* corporate development activities such as amongst others from M&A to alliance (Zollo & Reuer, 2010) or licensing to firms' internal efforts (Mulotte et al., 2013), this chapter on strategic alliance experiences finds evidence that there might be spill-overs even *within* one activity. Additionally, results of this chapter provide evidence for new moderating factors which may influence spill-over effects. While Zollo and Reuer (2010) and Mulotte et al. (2013) have found that the relatedness of the respective spill-over activities themselves influence the effect of it, this study finds that firm-specific factors, such as structural management processes or the level of uncertainty may influence the extent of such spill-over effects.

This chapter is structured as follows. Firstly a review of the literature on firm-level alliance experiences before hypothesizing effects on alliance value creation is conducted. Secondly, the independent effect of relational experiences on alliance value creation is tested. Thirdly, the interrelated effect of GAE onto relational experiences is hypothesized. Fourthly, the moderating effects of firm-level uncertainty and alliance management mechanisms onto the spill-over effect are hypothesized. Afterwards, the methodology for this chapter is introduced before the results are presented. The chapter then provides a discussion of these results before presenting the contributions and limitations.

5.2 Theory and Hypotheses

This subsection is structured as follows. In order to test for the interdependency of firm-level GAE onto the value creation impact of dyad-level relational experiences, the independent effects are introduced and tested independently. **Figure 5.2** below provides an overview of the theoretical framework and the hypotheses tested. Firstly, I theorize that GAE has negative non-linear value creation effects, indicating overconfidence and inertia in firm-level alliance management processes. Secondly, based on the results of Chapter 4, a hypothesis is developed that relational experiences improve alliance value creation. After hypothesizing for the independent effects, the main hypotheses on the spill-over between high extents of firm-level GAE onto the effect of dyad-level relational experience on value creation are developed. Subsequently, the moderating effects of firm-level uncertainty and alliance management mechanisms onto the interrelationship are hypothesized.

FIGURE 5.2: Theoretical framework (Chapter 5)



5.2.1 Firm-level general alliance experience (GAE) and the effect on alliance value creation

This section theorizes how firms can improve their alliance value creation from managing strategic alliances, irrespective of a repeated partnership with the same partner. This section is structured to stress the positive value creation effects of GAE first before discussing why high levels may not be value-creating for organizations.

General alliance experience (GAE) (e.g. Gulati et al., 2009; Hoang & Rothaermel, 2005) refers to all previous alliances or to alliances of a specific alliance type a firm has managed in its lifetime (Anand & Khanna, 2000a) or over a specific period (Sampson, 2005). It is important to emphasize that the benefits of GAE refer to how organizations *learn about* the management of strategic alliances in general (Anand & Khanna, 2000a). GAE is therefore clearly distinct from the *learning from* strategic alliances in fields such as internalizing specific product development processes other organizational activities from an alliance partner (e.g. Hamel, 1991; Khanna et al., 1998).

The theoretical arguments for an effect of GAE on alliance value creation are generally drawn from the OL literature. The empirical evidence on the effect of GAE onto value creation indicates that alliance experiences are important for learning how to manage the alliance management lifecycle as firm's move down the learning curve and become more effective (Anand & Khanna, 2000a). GAE also provides an input to codify experiences into alliance management routines (Heimeriks et al., 2015; Kale & Singh, 2007). Additional theories have also included signalling theory which has indicated that GAE sends a signal of improved status or reputation to external stakeholders (Stuart et al., 1999; Stuart, 2000). However, as the amount of GAE increases, the overconfidence in these processes increases as well (Heimeriks, 2010; Hoang & Rothaermel, 2005). Therefore, research finds that GAE leads to non-linear effects on alliance performance (Hoang & Rothaermel, 2005; Rothaermel & Deeds, 2006; Sampson, 2005; Zollo & Reuer, 2010).

5.2.1.1 Positive effects of firm-level general alliance experience (GAE) onto alliance value creation

The underlying reasons why low levels of GAE improve alliance value creation can primarily be derived from OL literature. GAE provides organizations with knowledge on how to improve the alliance lifecycle management (Argote, 2012; Cyert & March, 1963; Levitt & March, 1988). The alliance lifecycle consists of multiple processes related to the pre-formation (for example, partner search and contract negotiation) and post-formation phase (for example, the alliance itself and the termination). Within each stage of the alliance lifecycle, organizations run the risk of being exploited by the partner (Das, 2006). Hence, learning how to recognize and prevent partner organizations to act opportunistically is key to alliance success (Schreiner et al., 2009).

Each stage in the alliance lifecycle can be managed independently and firms are able to draw inferences from previous alliances and learn lessons about the management of each stage. On an organizational level, such lessons may then be encoded into alliance management routines (Heimeriks, 2010; Heimeriks et al., 2015; Levitt & March, 1988). Organizations with such well-known alliance management frameworks, for instance Eli Lilly and Hewlett Packard, are often recognised as 'alliance champions' due to their superior ability to manage alliances (e.g. De Man, 2001; Schreiner et al., 2009). In order to effectively develop capabilities, prior experience matters significantly (Zollo & Winter, 2002). This is because learning curve literature argues that organizations become more effective in the management of the respective capability as their experience increases (e.g. Argote et al., 1990). It also helps firms to choose the right partners and to be proactive in managing conflicts (Mohr & Spekman, 1994). GAE is therefore a crucial firm-level alliance capability development mechanism (Kale & Singh, 2007; Rothaermel & Deeds, 2006; Schreiner et al., 2009). Empirical evidence confirms the existence of such alliance capabilities as firms with GAE have been shown to outperform competitors in terms of their alliance value creation both in the short- (Anand & Khanna, 2000a) and in the long-term (Kale et al., 2002).

Contrary to learning curve theories, other research finds that such positive effects of GAE can only be achieved at low levels. More specifically, research identifies that low levels of GAE already significantly improve alliance value creation

(Sampson, 2005). Therefore, it is the *existence* of experience which is necessary for performance improvements. The importance of simply having partnered before is due to two reasons. Firstly, this is in line with OL literature which proposes that the marginal effect of additional experiences is not necessarily positive (Argote, 2012; Darr et al., 1995; de Holan & Phillips, 2004; Levinthal & March, 1993). Firms are capable to internalize knowledge about alliance management practices quickly and codify their experiences into routines. Empirical evidence supports this argument (Hoang & Rothaermel, 2005; Sampson, 2005). Secondly, according to signalling theory the mere existence of alliance experience can be valuable for improving the reputation of the organization. Due to the opportunism risk in alliances, previous partnerships send a signal of trustworthiness which is in contrast to firms which have no previous alliance experiences (Das & Teng, 2001). Particularly, for small firms, which engage in alliances with large firms, such partnerships therefore often act as 'endorsements' and may improve subsequent alliance performance substantially (Stuart et al., 1999; Stuart, 2000). Hence, investors value firms with low levels of GAE more positively (Das et al., 1998).

5.2.1.2 Negative effects of firm-level general alliance experience (GAE) onto alliance value creation

If it is only the existence of GAE that matters to improving alliance value creation, what happens at *higher extents* of GAE? OL literature provides complementary reasons. Firstly, contrary to classic learning curve examples which predict decreasing unit costs as a result of cumulative output, OL literature finds that experiences may not be cumulative and additive (Argote, 2012). Instead, knowledge may depreciate in its value over time through knowledge decay (de Holan & Phillips, 2004). In the context of alliances, the most recent experiences are most relevant (Gulati, 1995b; Sampson, 2005). However, these findings may only explain why higher extents of GAE are not beneficial. Instead, GAE may even have detrimental effects on alliance value creation. Existing evidence suggests that organizations may erroneously draw the wrong lessons from their past experiences to current issues in so-called superstitious learning (Heimeriks, 2010; Levitt & March, 1988). The initially positive effect of gaining GAE may lead to a positive feedback loop (Hoang & Rothaermel, 2005; Sampson, 2005). More specifically, by entering into alliances,

investors and analysts may provide positive feedback as it sends a signal of legitimacy to the market (Das et al., 1998). Additionally, the success rates of the initial alliance projects derived from exponential learning may indicate to firms that their alliance processes are effective (Hoang & Rothaermel, 2005; Sampson, 2005).

However, this feedback loop may not be positive for alliance value creation. Due to abovementioned reasons, initial gains from alliances can be derived from both intensive learning processes and external factors such as reputation increases. Such initial successes may be due to latter 'arbitrary' factors (Levitt & March, 1988). As described above, for instance, firms value creation from alliances at low levels of GAE may also be due to the increased reputation and the 'endorsement' of the firm (Stuart, 2000), hence, entirely irrespective of a firm's actual ability to manage its alliances. As such, firms' alliance capability may be underdeveloped but firms' believe that their own alliance management has led to these early successes. Hence, a firm's success and the positive feedback loop reinforce alliance management routines which are developed early onwards.

The multitude of different aspects which may have led to performance increases is a prime example of superstitious learning. Superstitious learning is a bias in OL which refers to the misattribution of cause and effect (Levitt & March, 1988). As firms perceive they understand the causes for success, they become overconfident. This is due to the underlying organizational belief that failure is due to chance, whereas firms ascribe successes to their own ability (Miller & Ross, 1975). Essentially, this results in a "competency trap" (Levitt & March, 1988: 322) which is the reinforcement of an initial capability that is not applicable any longer. Understanding the cause and effect relationship of strategic actions is difficult as causal ambiguity is prevalent (Carley & Lin, 1997; King & Zeithaml, 2001; Powell, Lovallo, & Caringal, 2006). Particularly, in "situations in which subjective evaluations of success are insensitive to the actions taken" (Levitt & March, 1988: 326), such superstitious learning is prone to happen (Levitt & March, 1988). It therefore results in overconfidence as the applicability is no longer questioned, the existing capability levels may be relied upon and only slightly adapted (Levitt & March, 1988). This has led Heimeriks (2010) to adapt the name "competency trap" (Levitt & March, 1988: 322) to "overconfidence trap" (Heimeriks, 2010: 59).

Superstitious learning is enhanced in rare strategic decisions as the cause and effect relationship becomes even more ambiguous and the outcome more difficult to objectively assess (Zollo, 2009). Zollo (2009) finds evidence for such superstitious learning and resulting overconfidence by managers in the 'rare' activity of M&A. In the context of firm-level alliance management, empirical evidence also supports the notion of superstitious learning and the resulting overconfidence. Heimeriks (2010) finds that firms with high levels of GAE tend to be overconfident in applying their alliance management lessons learnt from previous experiences. Firms then continuously exploit them while neglecting the exploration of new alternative ways of managing alliances. As organizations become overconfident in managing their strategic alliances based on alliance lifecycle management processes, innovations in the alliance processes may easily be overseen as organizations do not look for alternatives of them (Levinthal & March, 1993). For instance, advances in the alliance management processes may be overlooked as past experience has been accumulated with a different process which the organization wants to exploit now. Levinthal and March (1993) in their seminal article on the 'Myopia of Learning' have termed such learning processes as "self-destructive" (Levinthal & March, 1993: 103).

Tversky and Kahneman (1974) in their seminal article in the field of psychology identify another reason for the process of overconfidence to emerge in complex systems such as alliances. More specifically, they find that overconfidence is due to an anchoring and adjustment problem arising from the uncertainty faced. In comparing the choice for conjunctive events versus disjunctive events, they find that 'conjunctive events' may have a lower overall probability of success than 'disjunctive events'[11]. However, as the probability for each independent event occurring may be higher for conjunctive events (in the Tversky and Kahneman (1974) example: 90% for conjunctive events versus 10% for disjunctive events), there is evidence for an anchoring bias whereby such higher base levels for independent events lead to overconfidence in the attribution of success likelihood. Confirmation for such an anchoring bias has been found in existing literature (Busenitz & Barney, 1997). This has direct applications to alliance management which consists of the sequential

[11] Tversky and Kahneman (1974) use an example of marbles in which subjects can bet on either conjunctive events [drawing red marble seven times in succession with replacement and 90% red and 10% white (overall probability: 48%)] and disjunctive events [drawing red marble at least once in seven tries with replacement and 10% red and 90% white (overall probability: 52%)].

management of the alliance lifecycle, thus a 'conjunctive event'. Each stage of the alliance lifecycle may have a relatively high likelihood of success when considered in isolation. The partner selection and termination stage, for instance, are relatively easy to manage, replicable and can easily be codified whereas the actual partner management stage is difficult to manage and thus codification of that stage in the alliance lifecycle is not beneficial (Heimeriks et al., 2015) Moreover, the process of alliance management is inherently sequential and dependent on the effective management of each stage (Kale & Singh, 2009). While managers may think in terms of the isolated success probability of each management stage, the overall alliance value creation depends on the management of the entire alliance lifecycle. Thus, while the average probability of success depending on the separate stages may still be relatively high, the likelihood of overall alliance success is likely to be lower. Such a bias for the overestimation in managing complex systems may therefore essentially reflect overconfidence in firm's general alliance processes.

In summary, such overconfidence and the persistent exploitation of existing alliance management processes is detrimental to alliance value creation as essentially all alliances are different in their requirements for control and trust (De Man, 2014). Therefore, firms would need to treat alliances differently and avoid overconfident comparisons to previous alliances managed in the past. Empirical research confirms the existence of overconfidence at high levels of GAE (Heimeriks, 2010; Hoang & Rothaermel, 2005). As the level of GAE increases, alliance performance decreases. This relates to project performance (Hoang & Rothaermel, 2005), new product development (Rothaermel & Deeds, 2006), innovative performance (Sampson, 2005), value creation measures (Das et al., 1998; Gulati et al., 2009), as well as financial and accounting measures (Zollo & Reuer, 2010). Hence, I hypothesize that the effect of GAE on alliance value creation are negative at high levels of GAE. Thus,

Hypothesis 1: The relationship between general alliance experience and alliance value creation is negative and non-linear.

5.2.2 Dyad-level relational experiences and the effect on alliance value creation

The theoretical reasoning why *relational experiences* and the *signal* thereof lead to positive effects on alliance value creation is described extensively in Chapter 4. Results support these arguments in favour of a *quality*-based experience measure. However, this chapter comprises not only the subsample of repeated partnerships which is used in Chapter 4. Instead, a sample of both repeated and non-repeated alliances is used in order to include a broader variety of different alliances. Thus, in order to develop the argument for the interrelated effect, the effect of *relational experiences* onto alliance value creation is tested again on the full sample in this chapter. As a summary to the theoretical reasoning of Chapter 4, executive's signalling of relational experiences to the stock market indicates a higher *quality* of the repeated partnership as it is more positively evaluated by investors. Signalling the quality of the previous partnerships may indicate that the relationship between the respective partners has been functional, trustful, and that partner-specific routines between the alliance partners may have been generated. Existing literature finds that these factors effectively contribute to the success of relational experiences (Gulati, 1995a; Gulati et al., 2009; Zollo et al., 2002). In essence, the signal may indicate that relational capabilities may exist between partners. The *Relational experience signal* has therefore provided further clarity into the relationship between relational capabilities and value creation.

Hypothesis 2: The effect of relational experiences on alliance value creation is positive.

5.2.3 The impact of firm-level general alliance experiences on dyad-level relational experiences

As also argued in the latter part of the theory development for Hypothesis 1 and confirmed by empirical evidence, the independent effect of alliance experience on value creation can also be negative. This is in contrast to relational experiences for which the effects may even increase as firms partner more frequently (Gulati, 1995a; Gulati & Sytch, 2008). Thus, despite explanations provided in Chapter 4, negative value creation effects for relational experience effects are still surprising (Goerzen, 2007) and many unobserved moderators still exist which may explain such results (Vanneste et al., 2014). Recent research in the field of firm-level alliance and M&A

capability literature has identified that one type of experience may either positively or negatively influence the other through so-called spill-over effects (e.g. Bertrand & Capron, 2015; Mulotte et al., 2013; Zollo & Reuer, 2010). As experiences need to be related but still distinctly different in order for such spill-overs to occur (Zollo & Reuer, 2010), this section aims to provide further clarity into the interrelatedness of the underlying processes. Moreover, it aims to uncover how the negative effects of firm-level alliance experience may have spill-over effects onto dyad-level relational experience and explain why negative effects of relational experience on alliance value creation have been identified in previous studies.

Essentially, firms' managing strategic alliances are leveraging on the firm-level GAE to further develop their ability to manage strategic alliances, independent of the partner, while also aiming to develop relational capabilities between them and the specific partnering firm (De Man, 2014; Sims et al., 2001). In order to benefit from relational experiences, the creation and maintenance of trust between the partnering organizations by reducing transaction and monitoring costs is essential (Gulati, 1995a; Reuer & Zollo, 2005; Zollo et al., 2002). However, these processes involve significant resource commitments for firms (Butler Jr, 1991; Doz, 1996). Hence, the concept of benefiting from relational experiences is particularly prone to be subject to influence from the resources allocated to its processes (Gulati et al., 2009).

As firms are constrained in their allocation of resources however, the argument for the interrelationship between the two is that the amount of resources allocated to relational experience processes is negatively impacted by the resources allocated to general alliance processes. As argued in Hypothesis 1 above, firms become overconfident in their alliance lifecycle management processes as they accumulate GAE (Heimeriks, 2010; Hoang & Rothaermel, 2005). However, how does this overconfidence at high levels of GAE relate to resources allocated to relational experiences and subsequently its effect on alliance value creation? Can the negative impact of firm-level alliance experience spill over onto the effect of relational experience on value creation?

In order to answer these questions, this chapter uses a two-folded perspective from a (1) firm and (2) alliance partner level. Firstly, I propose that through the

accumulation of GAE superstitious learning and overconfidence are created, which in turn has negative impacts on the resources allocated to processes developed from relational experiences. Secondly, such a reduction in the allocation of resources to relational capabilities subsequently has a detrimental effect on the development and maintenance of relational capabilities as the alliance partner notices the lack of commitment to building relational capabilities due to the partnering organizations' overconfidence. Using these arguments, I hypothesize that the otherwise positive effect of relational experiences on alliance value creation is reduced at high levels of GAE.

5.2.3.1 GAE and relational experience interrelationship explained from a firm-level perspective

Firms nowadays manage substantial portfolios of alliances and experiences from alliances managed in the past (Hoffmann, 2005). As described above, firms develop alliance processes on the firm-level in order to improve the alliance lifecycle. This occurs far more frequently through the accumulation of GAE than the practice of building a trusting relationship and developing relation-specific operating routines through relational experiences. Existing studies indicate that firms manage around forty to fifty alliances before managing any repeated alliance with the same partner (e.g. Gulati et al., 2009; Hoang & Rothaermel, 2005). Managing alliances with a variety of different partners requires firms to develop processes to prevent opportunism. Such processes are developed on the firm-level and may include guidebooks and structures which prescribe alliance managers on details of the alliance partnership – 'How to engage with the alliance partner?' 'Which aspects to share etc.?' This likely creates a focus on firm-level alliance management processes. As emphasized in the literature review, GAE influences a firm-level alliance capability, whereas relational experiences influences a dyad-level relational capability (e.g. Dyer & Singh, 1998). As organizations are limited in their resources, important trade-offs regarding the capability development need to be made. Thus, firms need to decide "which among the many promising but uncertain investments should be undertaken" (Winter, 2003: 993). One key criterion for capability investments is based on the usage of the underlying processes with more resources allocated to more frequently used ones (Winter, 2003), which in the case of high GAE are likely to be firm-level

alliance processes. In order to benefit from relational experiences, however, resource commitments to its processes are necessary as boundary spanners are needed, partner-specific routines need to be implemented and most importantly, trust needs to be developed (Zaheer et al., 1998). Especially, for trust to develop and to be maintained effectively, commitment is essential (Mohr & Spekman, 1994).

In line with this, existing research has termed high levels of firm-level GAE a "core rigidity" (Hoang & Rothaermel, 2005: 334). Developed by Leonard-Barton (1992), the main idea behind the concept is that the overly frequent use of a strategic activity leads to a likewise decline in the usage and effectiveness of another related activity as firms stop experimenting and continuously rely on one process (Leonard-Barton, 1992). Hence, one overly used process essentially 'crowds out' another related one. Leonard-Barton (1992) uses the example of Chaparral Steel's core competence of the 'casting' of steel, which made it difficult to apply other knowledge on electromagnetic fields in a new project which was less frequently used in production. Essentially, this leads to more resources committed to one process while the other one is essentially crowded out in the resource allocation process.

Moreover, as developed in Hypothesis 1**,** firms may become overconfident in their management of firm-level alliance processes arising from high levels of experience due to the anchoring bias and superstitious learning which not only inhibits routine adaptations (Levinthal & March, 1993) and makes firms inert to changes (Hannan & Freeman, 1984) but also leads to a far-reaching "overconfidence trap" (Heimeriks, 2010: 59). Such a trap develops as a result of superstitious learning and the *perceived* ability to manage strategic alliances. Subsequently, organizations "(…) increase the frequency with which those procedures result in successful outcomes and thereby increase their use" (Levitt & March, 1988: 322). This goes in hand with an increase in managers who "commit resources (…) without pausing to consider additional information" (Mahajan, 1992: 329). Hence, such overconfidence in complex systems as derived from anchoring and superstitious learning may result in a vicious circle in the usage of activities which are not beneficial to the firm but are instead increasingly and continuously used. More importantly, this also provides an indication that the increased overconfidence leads to a more frequent use which in turn leads to more resources allocated to firm-level alliance processes (Winter, 2003). In the context of M&A, evidence indicates that overconfident CEOs tend to invest

significantly in ‘value-destroying’ M&A, for instance (Malmendier & Tate, 2005, 2008).

In the alliance context, there is empirical evidence that organizations invest significant amounts of resources into developing and maintaining their firm-level alliance management processes as they use them more frequently (Heimeriks, 2010). This leads to firms becoming overconfident in them (Heimeriks, 2010; Hoang & Rothaermel, 2005). In the similar context of in-licensing, evidence for competency and overconfidence traps and superstitious learning have also been identified. Mulotte et al. (2013) find evidence that firms become overconfident once they have in-licensed products and feel these are continuously applicable also to own activities, hence increasing overconfidence. This translates into lower performance of subsequently managed independent activities indicating a neglect of resource allocations to such processes (Mulotte et al., 2013).

In summary, there are two reasons why firms are likely to focus on firm-level alliance processes while neglecting the dyad-level relational processes. Firstly, processes which are used more frequently (Leonard-Barton, 1992; Winter, 2003) and have a high chance of independent success due to anchoring biases (Tversky & Kahneman, 1974) are likely to receive more resource investments. As previous studies indicate, firms manage significantly more alliances with a variety of different alliance partners than repeated partnerships. As both firm-level alliance capabilities and dyad-level relational capabilities are part of an overarching alliance management capability and are essentially managed by the same group of alliance managers, this likely affects the resource allocation process in favour of firm-level alliance capabilities. Secondly, derived from OL literature, such “frequently used procedures” (Levitt & March, 1988: 322), and the declining effects of firm-level alliance experience indicate that firms become overconfident in their management of firm-level alliance capabilities (Heimeriks, 2010). Through early successes with alliance management and the general ambiguity of cause and effect in assessing alliance performance, firms are likely to fall into the ‘overconfidence trap’ (Heimeriks, 2010). The perceived ability to manage alliances through firm-level alliance capabilities disguises that it essentially ‘crowds out’ necessary resource allocations to value-creating relational processes.

5.2.3.2 GAE and relational experience interrelationship explained from an alliance partner-level perspective

The previous section has argued that the interrelationship between the two types of experience and the underlying processes can be explained from firm-level factors. Existing literature however recognizes that alliance success is also largely dependent on the alliance partner and its commitment to the alliance (Das & Rahman, 2002; Das & Teng, 1998; Mohr & Spekman, 1994; Parkhe, 1993). As argued above, overconfidence in firm-level alliance processes leads to a lack of resources allocated to the underlying dyad-level relational processes. This has a significant influence on alliance partners as they are concerned that their alliance partner may behave opportunistically towards them (Parkhe, 1993). Therefore, alliance partners are aware of the other alliance partners resource commitments (Parkhe, 1993). Thus, if one partner reduces the commitment to the alliance by investing less resources to it, this is likely to be recognized by the alliance partner and reciprocal action in the form of resource reductions on the partners side may be taken (Parkhe, 1993). As emphasized by Thompson (1967: 35), it is the "exchange of commitments" of both alliance partners which is essential to alliance success and important for the stability of such partnerships. Essentially, such lack of commitment is one of the most frequently cited reasons for alliance failure (Mohr & Spekman, 1994; Park & Ungson, 2001) as it is essential for building trust on a dyadic alliance level (Butler Jr, 1991).

There are situations in which the reliance on the alliance partner is disproportionate, for instance, when small entrepreneurial organizations partner with a large organization. This might suggest that the small organization would continue to commit to the partnership because it is reliant on the success. However, research suggests that in order to benefit from alliances, commitment needs to be relatively even from both alliance partners. Thus, even if one alliance partner invests disproportionally into the alliance, this will unlikely have positive effects on alliance performance (Das & Teng, 2000a). Consequently, alliance partners are less likely to invest disproportionally more resources into the partnership and essentially the development and maintenance of relational processes.

In summary, the alliance partner and the reciprocity of commitment to the alliance builds on firm-level arguments as described above that may explain why high extents of firm-level alliance experience may have negative spill-over effects on the

effect of dyad-level relational experiences on alliance value creation. Due to the overconfidence in firm-level alliance experience, this likely leads to organizations putting too much emphasis on benefiting from firm-level alliance processes. This results in favourable resource allocations to firm-level alliance processes while dyad-level relational processes are crowded out. Subsequently, this results in the partnering organization perceiving the focal organization's trustworthiness as inferior due to its lack of commitment (Jones & George, 1998). Thus, when the partnering organization notices that the focal firm does not effectively commit to a partnership, the trust and thereby the benefits of a relational capability among both partnering organizations will likely suffer, leading to lower value creation effects of relational experiences.

5.2.3.3 GAE and relational experience interrelationship and the impact on alliance value creation

The previous two sections have provided arguments for the interrelationship from both a firm- and an alliance partner-level. Dyad-level relational experiences have been found to be valuable, rare, in-imitable, and only substitutable through equity agreements (Das & Teng, 2001). They have even been shown to increase in their importance over time (Gulati & Sytch, 2008). However, negative performance effects can still be identified (Goerzen, 2007; Hoang & Rothaermel, 2005) which cannot be explained by firm-, environmental-, and relationship-level moderating variables (Gulati et al., 2009; Zollo et al., 2002) as many unobserved moderating variables still exist (Vanneste et al., 2014). Therefore, the interrelated effect of firm- and dyad-level relational experiences can possibly provide an improved understanding of their effect on value creation as called for by existing research (e.g. Schreiner & Heimeriks, 2010; Wang & Rajagopalan, 2015).

The theoretical framework hypothesizes that the effect of relational experiences may have lower effects on alliance value creation at high levels of GAE due to overconfidence in firm-level alliance management processes. Consequently, this leads to fewer resources allocated to partner-specific processes needed to benefit from the development and maintenance of relational processes such as trust. The alliance partner perspective therefore complements the firm-level perspective and argues that due to the focus in resources invested in *firm-level* alliance processes, alliance partners are likely to reduce their efforts on developing *dyad-level* relational

capabilities and trust even further. I therefore hypothesize that investors perceive firms with high levels of GAE not to be able to benefit from relational experiences.

Hypothesis 3: The positive effect of relational experiences onto alliance value creation is reduced at high levels of general alliance experience.

5.2.4 Moderating impact of firm-level uncertainty on the interrelationship between GAE and relational experiences

The firm-level uncertainty surrounding the firms engaging in alliances is a critical determinant to alliance value creation (Gulati et al., 2009). Prior relational experiences between the two partners may provide an 'anchor' to both firm managers as well as investors that the partnership is more likely to succeed and are thus higher valued by investors under such circumstances (Gulati et al., 2009). However, research on overconfidence indicates that its appearance is also dependent on various environmental factors. One critical factor identified is the level of uncertainty as the process of overconfidence involves executives to "underestimate the associated uncertainty" (Mahajan, 1992: 329). As introduced above, the anchoring and adjustment bias arises directly from uncertainty (Tversky & Kahneman, 1974). As further evidence by Busenitz and Barney (1997) indicates such heuristics and biases are even more likely to occur under uncertainty itself as "in such settings, more comprehensive and cautious decision-making is not possible and biases and heuristics may provide an effective way to approximate the appropriate decisions" (Busenitz & Barney, 1997: 9-10). Moreover, uncertainty directly exacerbates the overconfidence bias generated (Busenitz & Barney, 1997). As relational experience has positive effects onto value creation for firms exposed to high levels of uncertainty (Gulati et al., 2009), I expect that this effect is significantly decreased when firms are overconfident in their general alliance processes. Under such circumstances, both incentives and resources to dyad-level relational processes are likely to be 'crowded out'. Therefore, I hypothesize that under conditions of firm-level uncertainty, the spill-over effect between GAE and relational experience is exacerbated. Thus,

Hypothesis 4: The interrelationship between high levels of GAE and relational experiences is moderated through firm-level uncertainty such that, the reduction of the relational experience effect onto alliance value creation at high levels of GAE is more negative when firms are faced with high levels of uncertainty.

5.2.5 Moderating impact of alliance management mechanisms on the interrelationship between GAE and relational experiences

GAE has often been regarded as one of the key sources for improving alliance performance (Anand & Khanna, 2000a; Hoang & Rothaermel, 2005). Building on capability development and OL research (e.g. Crossan et al., 1999; Helfat & Peteraf, 2003; Teece et al., 1997; Zollo & Winter, 2002), existing studies find that GAE and alliance management mechanisms are tightly interlinked in influencing alliance performance (e.g. Kale & Singh, 2007). Such integrating or institutionalizing processes effectively develop a shared understanding of the previous experiences among organizational members and disseminate it throughout the organization by means of codification (Zollo & Winter, 2002). In the alliance context such mechanisms can range from knowledge integration, such as alliance training programmes or communities of practice to institutionalizing mechanisms which may include codified practices and structural alliance functions (Heimeriks et al., 2007; Kale et al., 2002). Existing research finds support that firms can improve alliance value creation through such alliance management mechanisms in order to integrate and institutionalize the knowledge generated (Draulans et al., 2003; Kale et al., 2001; Kale et al., 2002; Kale & Singh, 2007).

Other evidence, however, indicates alliance management mechanisms are not always beneficial for firms (Heimeriks et al., 2007). As argued above, firms tend to become overconfident in their alliance management when they accumulate alliance experience as they learn superstitiously. Research suggests that this effect is most severe when firms also institutionalize their alliance practices (Heimeriks, 2010). This is because institutionalization routinizes their alliance practices even further, therefore, likely making firms even more overconfident, inert and consequently less likely to adapt their alliance practices when necessary (Heimeriks, 2010). Similarly, recent research finds that such institutionalizing through codification of alliance practices is particularly detrimental to alliance performance when managing the

alliance itself, whereas it may have positive effects for the selection and termination stage (Heimeriks et al., 2015). This is because flexibility is reduced as a consequence of codification and might therefore be costly to capability development (Heimeriks et al., 2015; Winter, 2003). Das and Teng (1998: 498) argue that one of the key reasons why firms enter into alliances is because of their "contractual flexibility". This indicates that alliance management mechanisms may not be beneficial when managing alliances in general due to the lack of flexibility and ad-hoc management.

Flexibility and ad-hoc management are even more essential components for managing repeated partnerships and effectively developing a relational capability between partners. Building the necessary trust among partners requires commitment (Thompson, 1967). As a lack of flexibility may impact organizations' commitment to alliances (Adler, Goldoftas, & Levine, 1999; Das & Teng, 1998; Young-Ybarra & Wiersema, 1999), institutionalized alliance management mechanisms may in turn impact a firms' ability to benefit from its relational experiences. For instance, alliance executives may not be allowed to make critical decisions with the respective alliance executive at the partnering organization as guidelines may impact the decision-making flexibility due to hierarchies or guidelines. Non-institutionalized processes on the contrary may enable alliance managers to make more flexible decisions. As both inter-organizational and inter-personal trust are important for effective alliances (Gulati, 1995a), such alliance management mechanisms may be even more detrimental to the overconfidence generated through the inflexibility and an even stronger on firm-level processes. Therefore, it can be expected that the overconfidence at high levels of GAE is further exacerbated when firms also have alliance management mechanisms.

Hypothesis 5: The interrelationship between high levels of GAE and relational experiences is moderated through alliance management mechanisms such that, the reduction of the positive effect of relational experiences on alliance value creation at high levels of GAE is more negative when the announcing firm has alliance management mechanisms.

5.3 Variables and measures

5.3.1 Independent variables first introduced in Chapter 5

Relational experience is measured through the same variable ***Relational experience signal*** as in Chapter 4 where it is also described in more detail. For two reasons, this chapter uses an additional continuous measure of *relational experiences*, for the moderating variables, however. Firstly, the investigation of the firm-level uncertainty and alliance management mechanisms moderating effects is conducted using a three-way interaction variable. As for the latter, two out of three variables would include binary variables, thus increasing the difficulty in interpretation. Secondly, a continuous *Relational experience* variable may not only provide an improved means to investigate the moderating effects but also increase robustness. The measurement of *Relational experiences* and *General alliance experience* is explained in Chapter 3.

Alliance management mechanisms are measured through a binary variable identified in a content analysis of proxy statements and annual reports of the focal firm. The objective was to identify a variable which captures the *perceived* alliance management mechanisms by investors. While certain aspects such as the alliance function may facilitate the alliance management, these may not be known to investors necessarily. Based on existing research which has found that structural elements as well as processes are important components of alliance management mechanisms (e.g. Heimeriks et al., 2007; Kale et al., 2002), a measure comprising the focal firm's executives responsible for strategic alliances (*Executive VP Strategic Alliances*) or Business/Corporate Development (*Executive VP Business or Corporate Development*) in the year of the alliance announcement were identified. The use of alliance executives as a measure of structural learning mechanisms is common (Harbison & Pekar, 1998; Heimeriks et al., 2007). The variable receives the value 1 if firm executives are signalled to the market in the alliance announcement year. This measure may also essentially signal the underlying functional aspects such as the alliance function, executive and integrating and institutionalizing processes (Heimeriks et al., 2007; Kale et al., 2002). Previous studies on alliance management mechanisms have primarily drawn data from interviews or surveys. This study however explicitly takes into account that investors may more directly react to publicly available information as part of the efficient market hypothesis (Fama et al.,

1969). This measure therefore represents *perceived* alliance management mechanisms of the firm.

In order to test for the interrelationship between GAE and partner experiences, a two-way interaction model between *Relational experiences* and *GAE (log)* is introduced. For the moderating effect of firm-level uncertainty and alliance management mechanisms onto the relationship between GAE and relational experience, three-way interaction variables are used (Aiken & West, 1991). Such three-way interaction variables have been used or suggested for future use in prior management literature (Barthélemy, 2008; Dess, Lumpkin, & Covin, 1997; Hagedoorn, 2006; Hitt, Bierman, Shimizu, & Kochhar, 2001; Stam & Elfring, 2008). In order to test for the three-way interaction, all potential two-way interactions of the respective variables (i.e. *log GAE*, *Relational experience* and *Firm-level uncertainty/Alliance management mechanisms*) are also included in the respective models. To reduce potentially disturbing multi-collinearity, all two- and three-way interaction variables in this chapter are subject to mean centring of the separate variables comprising the interaction variable (Aiken & West, 1991), while further multi-collinearity tests such as the use of subsamples are also conducted. In order to test Hypotheses 4 and 5 further post-hoc tests of slope difference tests are used (Dawson & Richter, 2006).

5.3.2 Measures

Measures for control variables are described in detail in Chapter 3. In order to improve readability, an overview of all the measures used in this chapter is provided in the **Table 5.1** below.

TABLE 5.1: Measures table (Chapter 5)

Variable name	Measures	Data source	Chapter 5
Alliance year(s)	0/1 Binary variable for each year in which the alliance was announced	Medtrack	Control
Non-listed alliance partner	0/1 Binary variable. 1, if partner firm is a non-public partner (private firm, research institute or university), 0 if partner firm is a listed public firm	Compustat	Control
Slack resources	Natural logarithm of cash divided by long-term debt in the year preceding the alliance announcement	Compustat	Control
Firm uncertainty	Volatility in monthly stock prices in the year of the alliance announcement	Compustat	Independent /Moderating
Absorptive capacity	R&D expenses divided by net sales in the year preceding the alliance announcement	Compustat	Control
R&D Alliance Type	0/1 Binary variable. 1, if alliance is classified as a contractual R&D alliance, 0 if it is classified as comprising a licensing agreement	Medtrack	Control
International alliance	0/1 Binary variable. 1, if alliance is between two partners which have their HQs in different countries. 0, if HQs are in the same country	Compustat	Control
Relational experience	Number of previous partnerships between focal firm and alliance partner.	Medtrack	Independent
General alliance experience (log)	Natural logarithm of total number of alliances of either R&D alliance or licensing agreements the focal firm has managed since its inception	Medtrack	Independent /Moderating
Relational experience signal	0/1 Binary variable. 1, if focal firm executive mentions previous relational experience quality, 0, if otherwise.	Medtrack	Independent /Moderating
Alliance management mechanisms	0/1 Binary variable. 1, if focal firm has an executive level board with alliance responsibility. 0, if otherwise.	Def 14A/ Annual reports (10-K/ 20-F)	Independent /Moderating

5.4 Analyses and results

5.4.1 Analyses

As this chapter is comprised of not only the subsample of repeated partnerships introduced in Chapter 4, descriptive statistics and bivariate correlations are presented again. **Table 5.2** describes the descriptive statistics consisting of the mean, standard deviation (Std.) and the bivariate correlations. The sample size for this chapter is based on 611 alliance announcements. Similar to Chapter 4, the mean CAR is positive. It is less positive than Chapter 4's but in range with existing studies (e.g. Anand & Khanna, 2000a). It is lower because this sample not only consists of repeated partnerships but also of alliances with no repeated partnerships, which have been found to have less positive effects on alliance value creation (e.g. Gulati et al., 2009). An overview of the CAR on the various event days and event windows can be found in **Appendices 5.1** and **5.2**. Notable is the correlation between *GAE(log)* and *Firm uncertainty* (-0.43, $p<0.001$). Small firms tend to be exposed to more volatility while having accumulated less GAE. On the contrary firms with substantially high levels of GAE tend to be exposed to less uncertainty due to their maturity. Therefore, the relatively high negative correlation can be explained. Additionally, the high positive correlation (0.47, $p<0.001$) between *GAE(log)* and *Alliance management mechanisms* can be explained that such mechanisms are often the result of high levels of GAE. Therefore, with rising levels of GAE, firms tend to have both (Heimeriks et al., 2007). Consequently, the explanation for the high negative correlation between *Alliance management mechanisms* and *Firm uncertainty* (-0.26, $p<0.001$) follows the explanation above for the high negative correlation between *GAE (log)* and *Firm uncertainty*. Besides the bivariate correlations and due to the inclusion of interaction variables in the empirical models, multi-collinearity is also checked by investigating the variance inflation factors (VIFs). Both mean and individual values are below the critical threshold value of 10 (Kleinbaum et al., 1998). An alternative test as suggested by Echambadi and Hess (2007) is also carried out to rule out issues of multi-collinearity. Therefore, a subset of the data is tested and coefficients remain stable. As a result of this, multi-collinearity does not appear to affect results.

In **Table 5.3**, the OLS regression results for estimating alliance value creation based on CAR are presented. Model 1 is the baseline model which tests Hypothesis 1 and the effect of *GAE (log)* on *CAR*. Model 2 introduces the *Relational experience signal* variable and thereby tests the effect on *CAR* in Hypothesis 2. While this is comparable to Chapter 4, this chapter tests the entire sample. The main hypothesis on the interrelationship between GAE and relational experience is then tested in Model 3 and 4 (Hypothesis 3). Models 5 and 6 then test how the interrelationship between GAE and Relational experiences is influenced by Firm-level uncertainty (Hypothesis 4) and the Alliance management mechanisms (Hypothesis 5).

TABLE 5.2: Descriptive statistics and bivariate correlations (Chapter 5)

	Mean	Std.	1	2	3	4	5	6	7	8	9	10	11
1 CAR	1.65	7.05	1										
2 Absorptive capacity	2.60	12.92	0.06	1									
3 Firm uncertainty	0.17	0.14	0.09 **	0.08 **	1								
4 Slack resources	0.29	1.96	0.11 ***	0.09 **	0.10 ***	1							
5 Non-listed alliance partner	0.51	0.50	-0.14 ***	-0.02	-0.03	-0.03	1						
6 R&D alliance	0.53	0.50	0.01	0.06	-0.02	-0.05	0.07	1					
7 International alliance	0.56	0.50	0.03	0.01	-0.06	0.00	-0.10 **	-0.08 *	1				
8 Relational experience	0.48	1.09	0.10 **	-0.05	-0.06	-0.05	-0.22 ***	-0.02	-0.02	1			
9 GAE (log)	3.81	1.38	-0.18 ***	-0.21 ***	-0.43 ***	-0.37 ***	0.09 **	-0.05	0.10 **	0.11 ***	1		
10 Relational experience signal	0.08	0.27	0.20 ***	-0.02	0.01	-0.03	-0.06	0.06	0.01	0.34 ***	-0.05	1	
11 Alliance management mechanisms	0.48	0.50	-0.08 *	-0.10 ***	-0.26 ***	-0.13 ***	0.04	0.04	0.07 *	0.05	0.47 ***	0.00	1

N=611

*p<0.1; **p<0.05; ***p<0.01

TABLE 5.3: OLS regression results (Chapter 5)

CAR (in percentage) as dependent variable	MODEL 1 GAE	MODEL 2 Relational Experience Signal	MODEL 3 GAE x Relational experience signal	MODEL 4 GAE x Relational experience	MODEL 5 GAE x Relational x FLU	MODEL 6 GAE x Relational experience x AMM
Control variables						
Alliance year 2004	-0.533	-1.083	-1.060	-0.629	-0.985	-0.914
	(1.26)	(1.31)	(1.36)	(1.27)	(1.3)	(1.31)
Alliance year 2005	-0.335	-0.709	-0.727	-0.585	-0.881	-0.868
	(1.46)	(1.45)	(1.43)	(1.46)	(1.48)	(1.43)
Alliance year 2006	-1.668	-1.892 *	-1.792 *	-1.494	-1.868 *	-1.671
	(1.04)	(1.04)	(1.06)	(1.03)	(1.11)	(1.06)
Alliance year 2007	0.074	0.173	-0.033	0.065	-0.451	-0.240
	(1.22)	(1.22)	(1.21)	(1.23)	(1.31)	(1.16)
Alliance year 2008	0.475	0.587	0.338	0.601	0.179	0.638
	(1.85)	(1.82)	(1.61)	(1.85)	(1.76)	(1.79)
Alliance year 2009	-1.609	-1.752	-1.916	-1.617	-2.203 **	-1.903 *
	(1.24)	(1.2)	(1.17)	(1.19)	(1.17)	(1.18)
Alliance year 2010	-0.163	-0.190	-0.598	-0.355	-0.614	-0.830
	(1.26)	(1.21)	(1.25)	(1.24)	(1.26)	(1.33)
Alliance year 2011	-0.357	-0.690	-0.630	-0.404	-0.978	-0.594
	(1.03)	(.99)	(.99)	(1.02)	(1.11)	(1.02)
Alliance year 2012	-0.972	-0.852	-1.063	-0.926	-1.374	-0.938
	(1.11)	(1.11)	(1.04)	(1.07)	(1.1)	(1.05)
Absorptive capacity	0.012	0.014	0.017	0.018 *	0.017 *	0.018 *
	(.01)	(.01)	(.01)	(.01)	(.01)	(.01)
Firm uncertainty	1.595	1.883	1.503	1.476	1.472	1.122
	(1.99)	(1.97)	(1.84)	(1.92)	(2.33)	(1.8)
Slack resources	0.156	0.180	0.175	0.175	0.140	0.197
	(.18)	(.17)	(.17)	(.17)	(.17)	(.17)
Non-listed alliance partner	-1.370 **	-1.468 **	-1.315 **	-1.281 **	-1.419 **	-1.318 **
	(.62)	(.61)	(.57)	(.6)	(.6)	(.58)
R&D alliance	0.323	0.205	0.197	0.342	0.356	0.242
	(.62)	(.57)	(.54)	(.6)	(.56)	(.55)
International alliance	0.598	0.524	0.486	0.602	0.650	0.651
	(.62)	(.59)	(.58)	(.6)	(.59)	(.58)
Relational experience	0.607 *	0.171	0.206	1.104 ***	0.601	1.369 ***
	(.32)	(.27)	(.27)	(.42)	(.42)	(.44)
GAE (log)	-0.747 **	-0.646 **	-0.471 **	-0.865 ***	-0.943 ***	-1.383 ***
	(.3)	(.26)	(.22)	(.31)	(.35)	(.43)
Explanatory variables						
Relational experience signal		4.900 **	4.205 ***			
		(2.06)	(1.48)			
GAE (log)x Relational experience signal			-2.965			
			(1.93)			
GAE (log) x Relational experience				-0.857 **	-0.686	-1.662 ***
				(.34)	(.47)	(.52)
Relational experience x FLU					7.707 *	
					(4.19)	
GAE (log) x FLU					-4.345	
					(2.88)	
GAE (log) x Relational experience x FLU					-7.960 *	
					(4.58)	
Alliance management mechanisms (AMM)						-0.093
						(.68)
Relational experience x AMM						-1.342
						(.89)
GAE (log) x AMM						0.912 *
						(.46)
GAE (log) x Relational experience x AMM						1.826 ***
						(.67)
Constant	2.251 *	2.125 *	2.157 *	2.328 **	2.453 **	2.375 **
	(1.2)	(1.2)	(1.2)	(1.19)	(1.13)	(1.16)
N	611	611	611	611	611	611
F-Statistic	2.27 ***	2.51 ***	2.68 ***	2.5 ***	2.64 ***	2.34 ***
R-Square	0.07	0.10	0.12	0.09	0.11	0.11
Root MSE	6.90	6.79	6.72	6.84	6.76	6.78

*p<0.1; **p<0.05; ***p<0.01

Robust Standard Errors calculated through Huber-White sandwich estimators and firm clustering are in parentheses

5.4.2 Results

In this section the result of the hypothesis testing are provided. Results of the hypothesis testing are provided in **Table 5.3.** In order to test Hypothesis 1 that GAE is negatively related to alliance value creation, the natural logarithm of GAE is included. The coefficient is negative (β_{GAE}: -0.747, p-value: 0.02) and statistically significant, thus confirming Hypothesis 1. This means that for every 10% increase in GAE, the expected mean CAR will be 0.07% lower [$\beta_{GAE} * \ln(1.1) = -0.747 * \ln(1.1) = -0.071$]. More generally, this indicates that a high initial positive value creation effect for firms with low levels of GAE can be expected and this effect declines non-linearly. The underlying theoretical reasoning for this is due to two reasons as identified in existing literature. Firstly, for inexperienced firms, alliance agreements are reputation-enhancing, as they provide legitimacy in the industry (Stuart et al., 1999). As Sampson (2005: 1022) suggests "it is the *existence* rather than the *extent* of prior experience that affects a firm's ability to benefit from current alliance activity". One previously managed alliance can in some cases already effectively improve alliance value creation due to learning effects (Sampson, 2005). Hence, it is not surprising that the results indicate a high value creation effect at low levels of GAE. Therefore, the first alliance which can include the focal alliance is likely to yield the highest returns. Furthermore, the results indicate that the effect of GAE is then decreasing rapidly and non-linearly. Due to inertia in the development of firm-level alliance capabilities (Hoang & Rothaermel, 2005) and firms becoming over-confident with the underlying processes (Heimeriks, 2010), the effect of GAE on alliance value creation has declining effect as experience increases (Hoang & Rothaermel, 2005; Rothaermel & Deeds, 2006; Sampson, 2005; Zollo & Reuer, 2010).

Hypothesis 2 tests whether the *Relational experience signal* also has a significant positive effect on alliance value creation as tested in Chapter 4. Model 2 provides strong support that *Relational experience signal* has a strong positive impact on alliance value creation ($\beta_{Relational\ experience\ signal}$: 4.90) which is statistically significant (p-value: 0.02). This means that also on the full sample of both repeated and non-repeated partnerships, *Relational experience signal* increases value creation by around 4% when firms send a signal of positive relational experiences. This is also in line with empirical research which has found positive effects of relational experience on value creation (Gulati et al., 2009), termination outcomes of alliances

(Reuer & Zollo, 2005) and managerial assessments of alliance performance (Zollo et al., 2002).

After the independent effects of firm-level *GAE* and dyad-level *Relational experiences* on *CAR* have been tested in Models 1 and 2, the interrelated spill-over effect between the two is tested in Models 3 and 4. Model 3 does not provide support that firms which signal a positive relational experience but also have high extents of GAE, have their effect on the alliance value created by relational experiences significantly reduced ($\beta_{GAE\ x\ Relational\ experience\ signal}$: -2.96, p-value: 0.12). As existing research indicates that experiences may have different value with more recent ones more relevant than older ones (Sampson, 2005), I therefore conduct a supplementary analysis in order to test Hypothesis 3. More specifically, I rely on the GAE of the last 3 years in order to test whether the relational experience signal is negatively affected by the most recent experiences only. Please see **Table 5.4** for OLS regression results and an interaction graph in **Figure 5.3**. Both regression results as well as the graphical illustration indicate that firms with high levels of GAE accumulated over the last 3 years are not able to create as much value from their relational experiences as firms which have low values. This effect is statistically significant ($\beta_{GAE\ last\ 3\ x\ Relational\ experience\ signal}$: -4.03, p-value: 0.08). This firstly provides support that more recent experiences are more relevant for alliance performance (Sampson, 2005) and secondly that the market may forget information over time.

TABLE 5.4: Supplementary analysis GAE last 3 years x Relational experience signal

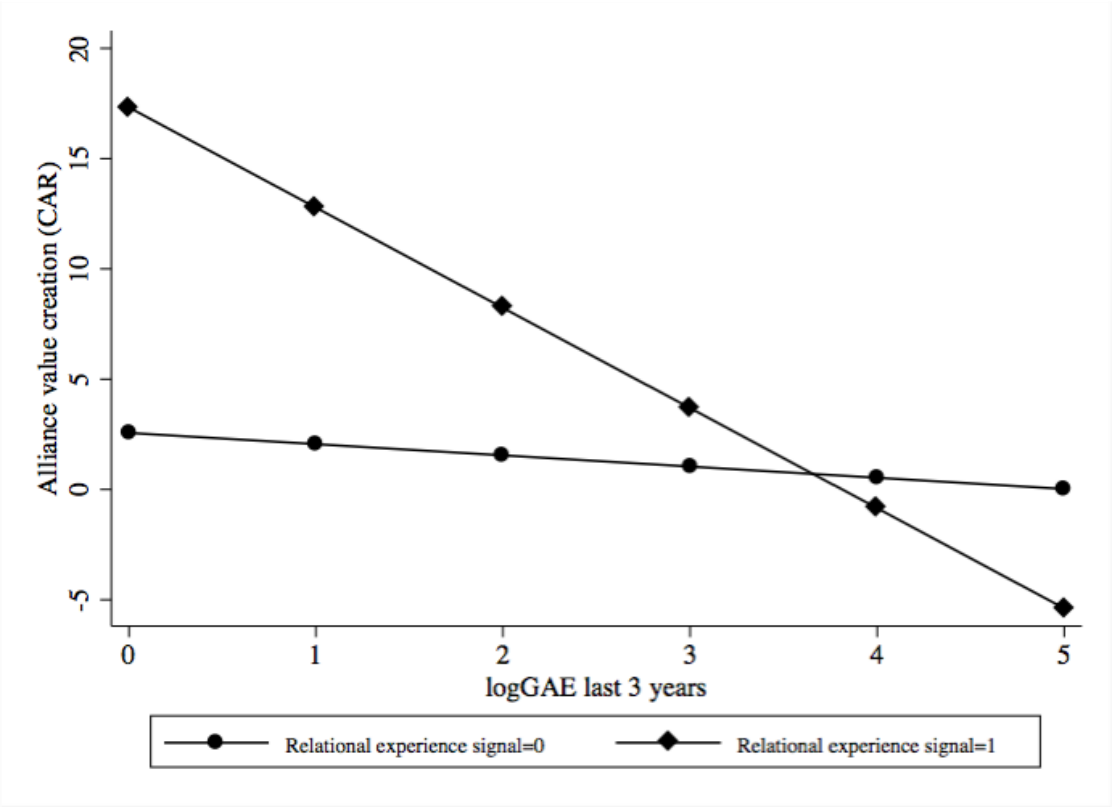
CAR (in percentage) as dependent variable

	GAE last 3 x Relational experience signal
Control variables	
Alliance Year 2004	-0.836
	(1.35)
Alliance Year 2005	-0.982
	(1.51)
Alliance Year 2006	-2.014 *
	(1.1)
Alliance Year 2007	-0.322
	(1.34)
Alliance Year 2008	-0.053
	(1.6)
Alliance Year 2009	-2.438 **
	(1.21)
Alliance Year 2010	-1.069
	(1.28)
Alliance Year 2011	-1.457
	(1.07)
Alliance Year 2012	-1.697
	(1.16)
Absorptive capacity	0.017
	(.01)
Firm uncertainty	1.393
	(1.8)
Slack resources	0.189
	(.17)
Non-listed alliance partner	-1.273 **
	(.57)
R&D alliance	0.156
	(.53)
International alliance	0.519
	(.56)
Relational experience	0.215
	(.27)
GAE (log) last 3 years	-0.508 *
	(.3)
Explanatory variables	
Relational experience signal	4.372 **
	(1.67)
GAE (log) last 3 years x Relational experience signal	-4.034 *
	(2.3)
Constant	2.425
	(1.24)
N	611
F-Statistic	2.68
R-Square	0.13
Root MSE	6.69

*p<0.1; **p<0.05; ***p<0.01

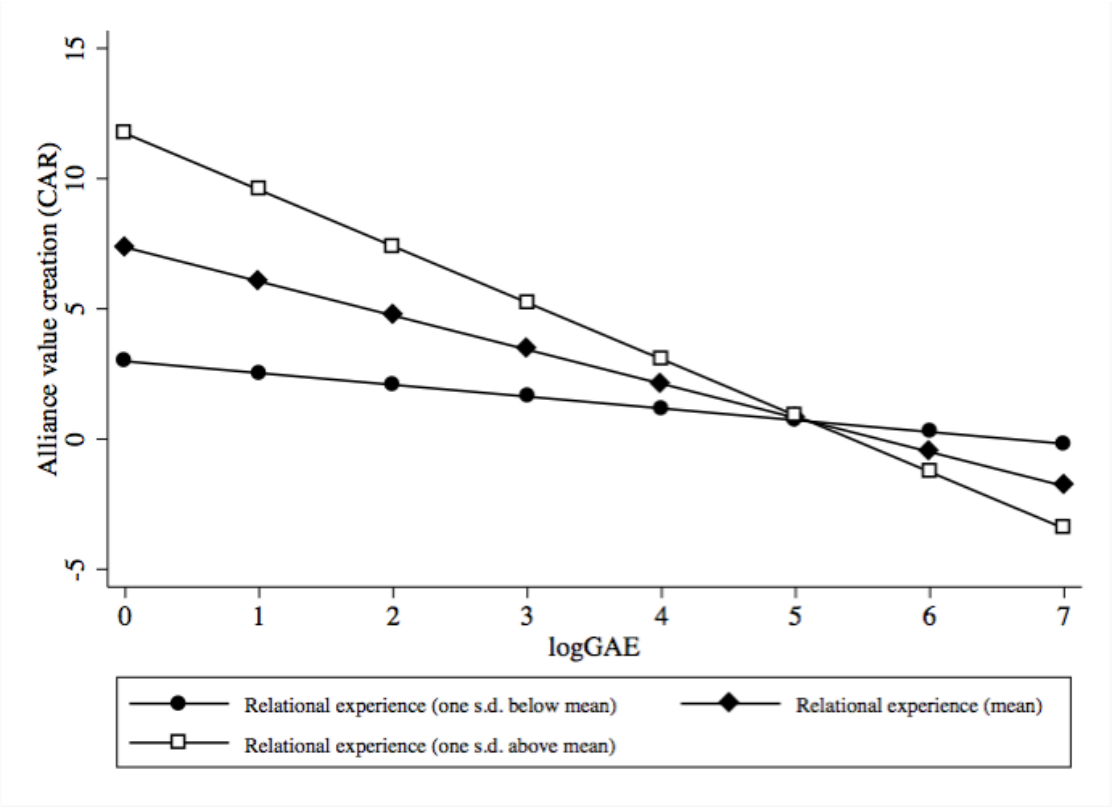
Robust Standard Errors calculated through Huber-White sandwich estimators and firm clustering are in parentheses

FIGURE 5.3: Two-way interaction graph relational experience signal and GAE (last 3 years)



Model 4 tests the interrelated relationship between *GAE* and *Relational experience* using a continuous variable of all previous partnerships, not only the signalled ones. More specifically, results indicate that as the level of GAE increases, the effect of repeated partnerships on alliance value creation decreases significantly ($\beta_{GAE\ x\ Relational\ experience}$ = -0.85, p-value: 0.01). This provides further support for Hypothesis 3 for both measures of relational experience and confirms the theory for an interrelated effect of GAE and relational experiences. Please see an interaction graph in **Figure 5.4** which indicates that relational experience one standard deviation above the mean has a stronger negative effect at high levels of GAE.

FIGURE 5.4: Two-way interaction graph relational experience (continuous) and GAE

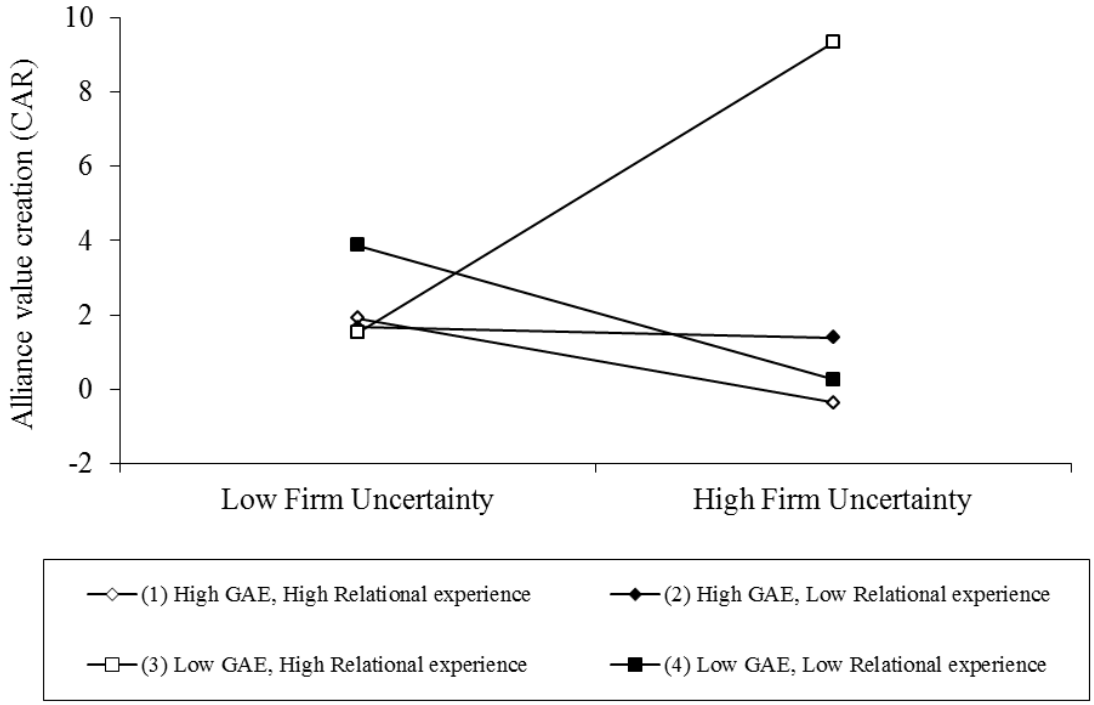


Hypothesis 4 is tested in Model 5 through a three-way interaction variable. As explained above, the three-way interaction effects in Model 5 and also in Model 6 are tested by means of *Relational experience* instead of the *Relational experience signal.* The continuous variable *Relational experience* has a higher variability as it ranges from 0 to 9 instead of the use of the binary *Relational experience signal* variable. In Hypothesis 4, I had proposed that the spill-over effect between high levels of GAE and Relational experience is likely to be stronger when the firm is exposed to high levels of idiosyncratic uncertainty, thus arising directly from a focal firm's operations. The argument is that such uncertainty creates further demands for the organization and increases the overconfidence a firm may have in its general alliance processes.

Using the continuous *Relational experience* variable support can be found that adding this three-way interaction variable improves the fit of the model and supports Hypothesis 4 ($\beta_{GAE\ x\ Relational\ experience\ x\ FLU}$: -7.96, p-value: 0.08). In order to interpret three-way interactions, both a graphical presentation and a Dawson-Richter slope difference test have been suggested and are provided in **Figure 5.5** and **Table 5.5** (Dawson & Richter, 2006). Testing the difference in the slope between various two

way interactions at both low (one s.d. below the mean) and high (one s.d. above mean) levels of uncertainty, this test provides an opportunity to understand the effects of the three-way interaction more clearly. The corresponding lines of interest are firstly the differences between the black lines with the white markers Lines 1 (*High* GAE, High relational experience) and 3 (*Low* GAE, High relational experience). These are of particular interest as they indicate firms which have high levels of relational experience but varying levels of GAE. In order for the spill-over to be confirmed, a significant difference between the two would be expected. Correspondingly, differences between Lines 2 and 4 may also be expected.

FIGURE 5.5: Three-way interaction graph GAE, Relational experience and Firm-level uncertainty



Line 1 in **Figure 5.5** indicates that indeed firms do not seem to create more alliance value from relational experiences in conditions of uncertainty only when they have accumulated high levels of GAE. The corresponding Line 3, however, indicates that firms can benefit from relational experiences with high levels of firm uncertainty only when they have low levels of GAE. The Dawson-Richter slope test in **Table 5.5** however indicates that the difference between these lines is insignificant (t-statistics: -1.29, p-value: 0.2). Additionally, differences between Line 2 and 4 are also

insignificant (t-statistics: 0.92, p-value: 0.36). Significant differences can only be found between the highly positive Line 3 with Lines 2 and 4 which both have low levels of relational experience. This indicates that the positive three-way interaction effect may primarily be driven by the positive impact that relational experiences have under conditions of uncertainty, supporting existing literature (Gulati et al., 2009).

TABLE 5.5: Dawson-Richter slope difference test (GAE, Relational experience and Firm-level uncertainty)

Pair of slopes	t-value for slope difference	p-value for slope difference
(1) and (2)	0.52	0.61
(1) and (3)	-1.29	0.20
(1) and (4)	1.53	0.13
(2) and (3)	-2.18	0.03
(2) and (4)	0.92	0.36
(3) and (4)	2.24	0.03

In order to further investigate this relationship, I created a dummy variable of relational experience. The abovementioned strong positive impact of Relational experience may be driven by cases with high numbers of relational experiences. In order to investigate whether it may simply be the existence of relational experiences, I create a dummy variable of it. Thus, firms which had managed at least one partnership before the announcement of the focal alliance received the value of 1 and firms for which the focal alliance is the first one with that respective partner received the value of 0. As can be seen from the regression results in **Table 5.6**, the three-way interaction is as proposed in Hypothesis 4 negative and significant also for the firms which have only managed at least one prior repeated partnership ($\beta_{GAE\ x\ Dummy\ Relational\ experience\ x\ FLU}$: -16.86, p-value: 0.02).

TABLE 5.6: Three-way interaction relational experience dummy x GAE x FLU

CAR (in percentage) as dependent variable	**MODEL 2**
	GAE x Relational experience (Dummy) x FLU
Control variables	
Alliance years (dummies)	n.s.
Absorptive capacity	0.020 **
	(.01)
Firm uncertainty (FLU)	-0.918
	(2.12)
Slack resources	0.174
	(.16)
Non-listed alliance partner	-1.524 **
	(.58)
R&D alliance	0.350
	(.55)
International alliance	0.607
	(.58)
Relational experience (Dummy)	0.816
	(.82)
GAE (log)	-0.360
	(.22)
Explanatory variables	
GAE (log) x Relational experience (Dummy)	-1.871 *
	(1.01)
Relational experience (Dummy) x FLU	8.406 **
	(6.75)
GAE (log) x FLU	1.471
	(2.02)
GAE(log) x Relational experience (Dummy) x FLU	-16.864 **
	(7.2)
Constant	2.256 **
	(1.14)
N	611
F-Statistic	2.13 ***
R-Square	0.13
Root MSE	6.68

*p<0.1; **p<0.05; ***p<0.01

Robust Standard Errors calculated through Huber-White sandwich estimators and firm clustering are in parentheses

Figure 5.6 and **Table 5.7** illustrate the three-way interaction between GAE, relational experience (dummy) and firm-level uncertainty. The difference in this model is that no distinction between high or low levels of relational experience is made. Instead, through the dummy variable only distinctions between relational experience or no relational experience are made. The corresponding lines of interest for the spill-over

effect are again the differences between the black lines with the white markers Lines 1 (*High* GAE, relational experience) and 3 (*Low* GAE, relational experience). These are of particular interest as they indicate firms which do have at least one relational experience but varying levels of GAE. In order for the spill-over to be confirmed, a significant difference between the two would be expected. Results indeed suggest a significant difference between these two lines (t-statistics: -2.02, p-value: 0.04). This provides support for Hypothesis 4 that firms' overconfidence in general alliance management practices and the spill-over onto the effect of relational experiences on value creation is exacerbated under conditions of firm-level uncertainty. Thus, this indicates that the relevance of the spill-over may be applicable to any level of relational experience, not necessarily the amount. Moreover, it indicates the importance of uncertainty for benefiting from relational experiences and the opposing effect of GAE causing overconfidence under conditions of uncertainty.

FIGURE 5.6: Three-way interaction graph GAE, Relational experience dummy and Firm-level uncertainty

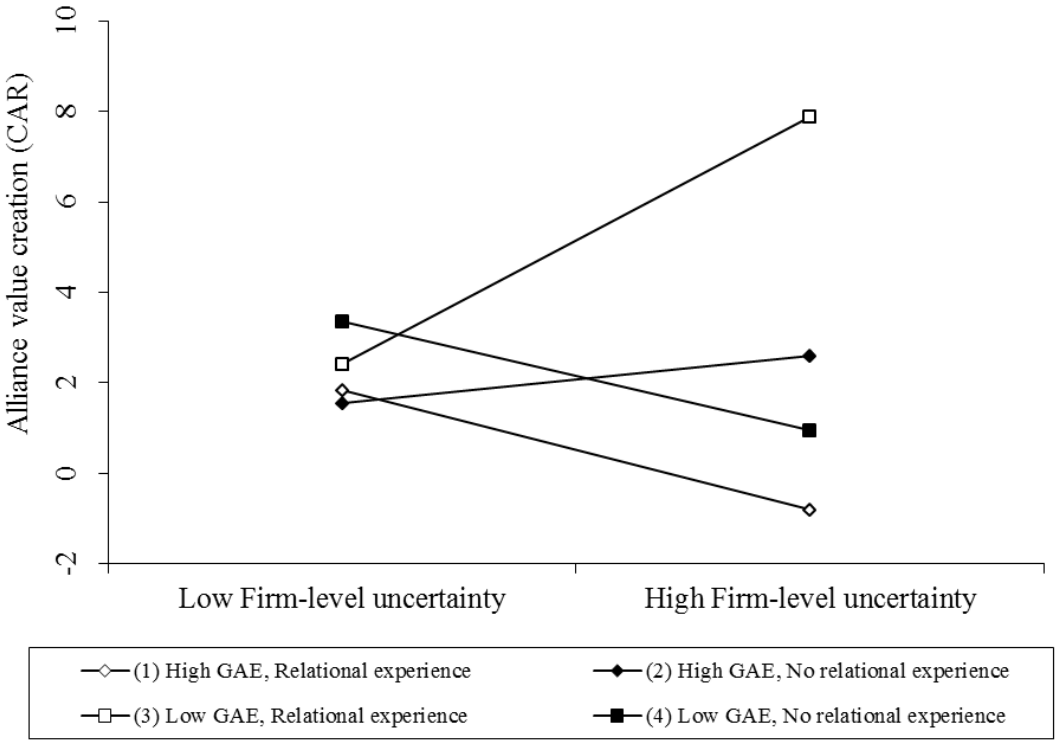


TABLE 5.7: Dawson-Richter slope difference test (GAE, Relational experience dummy and Firm-level uncertainty)

Pair of slopes	t-value for slope difference	p-value for slope difference
(1) and (2)	-1.10	0.27
(1) and (3)	-2.02	0.04
(1) and (4)	-0.08	0.93
(2) and (3)	-1.72	0.09
(2) and (4)	1.75	0.08
(3) and (4)	3.07	0.00

Hypothesis 5 is also tested in a three-way interaction variable in Model 6 in the OLS **Table 5.3**. The three-way interaction term between GAE, relational experience and alliance management mechanisms is positive and significant ($\beta_{GAE\ x\ Relational\ experience\ x\ AMM}$: 1.82, p-value: 0.01). Initially this looks like it is contrary to the hypothesis that alliance management mechanisms exacerbate the spill-over effect as a negative sign would intuitively be expected. However, as above, in order to investigate this further, a graphical investigation and a post-hoc Dawson-Richter slope difference tests are necessary.

The graphical results in **Figure 5.7** indeed indicate a different effect than initially expected. Line 1 with high levels of GAE and high levels of relational experience is positively influenced by alliance management mechanisms. This indicates that such mechanisms may contrary to expectations of an exacerbation moderation effect actually positively moderate the ability to benefit from relational experiences at high levels. However, the slope of Line 3 (low levels of GAE and high levels of relational experience) is negative. This provides some evidence that alliance management mechanisms may have a negative effect onto the relationship between relational experience and value creation at low levels GAE. This suggests that alliance management mechanisms may have a negative effect onto relational experiences *independent* of GAE.

Results from the Dawson-Richter slope difference tests in **Table 5.8** indicate that the difference between Lines 1 and 3 is indeed significant (p-value<0.01). The finding can actually be explained by existing alliance capability development literature which proposes that firms need to first accumulate experience before such mechanisms should be introduced (Heimeriks et al., 2007). Evidence generated from

this analysis provides support to this as firms are less capable to create value from high levels of relational experience when they also have low levels of GAE but also institutionalized alliance management mechanisms. On the contrary, firms can mitigate the negative effects of relational experience at high levels of GAE. Thus, the hypothesis that alliance management mechanisms exacerbate the spill-over effect needs to be rejected. Instead, results suggest that alliance management mechanisms can mitigate the negative effects of high levels of GAE and relational experiences but instead may have negative impacts onto the relationship between relational experience and value creation when firms have low levels of GAE. This suggests that such mechanisms are *both* complementary and substitutable in their effect on alliance experience.

FIGURE 5.7: Three-way interaction GAE, Relational experience, and Alliance management mechanisms

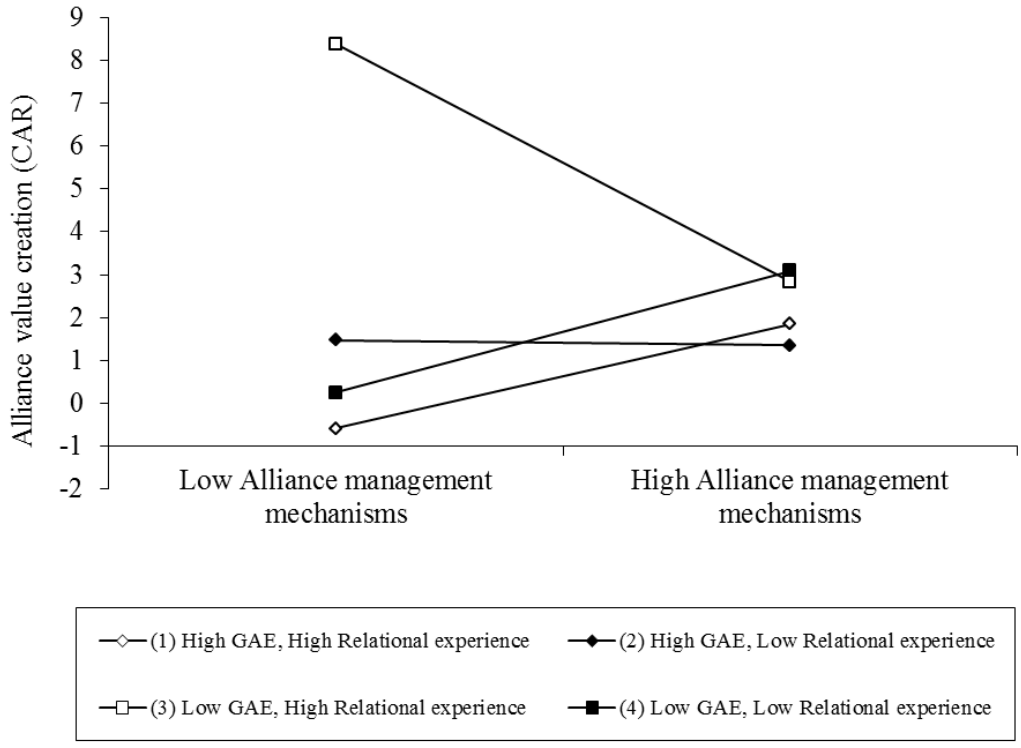


TABLE 5.8: Dawson-Richter slope difference test (GAE, Relational experience and Alliance management mechanisms)

Pair of slopes	t-value for slope difference	p-value for slope difference
(1) and (2)	2.46	0.01
(1) and (3)	2.85	0.00
(1) and (4)	-0.20	0.85
(2) and (3)	2.13	0.03
(2) and (4)	-1.58	0.12
(3) and (4)	-2.21	0.03

The control variables are in line with existing literature. *Non-listed alliance partner* has a negative effect on alliance value creation (p-value: <0.01). Partnering with functionally diverse partners, such as research institutes, private firms or universities may have negative performance implications as it may put demands on organizations due to increased complexity and coordination costs (Jiang et al., 2010). Additionally, it may be because smaller partners may appropriate most of the value created from the alliance itself (Das et al., 1998). *Absorptive capacity* has a positive impact on value creation which is in line with existing literature (Deeds, 2001). *Relational experiences* also have a positive impact on alliance value creation. This is in line with existing literature which has found that they may generate alliance value through their ability to develop trust and inter-organizational routines, both facilitating the relationship among the alliance partners (Gulati, 1995a; Gulati et al., 2009; Zollo et al., 2002).

5.4.3 Robustness checks

Five different types of robustness checks are performed in this chapter. Firstly, building on the above supplementary analysis a different variation of the relational experience measure is used. While this chapter builds on Chapter 4 which has identified that relational experiences are most effectively measured through the signal sent by announcing firms, this is complemented with the continuous variable of relational experiences for Models 4, 5, and 6. However, to improve the robustness of the results, relational experiences are also measured through the use of, a dummy variable of relational experience with a value of '0' if the firms have had no previous relational experience or '1' if the firms have accumulated relational experiences of

one or more. Results indicate that the spill-over effect also holds when using a dummy variable indicating that overconfidence affects the impact of relational experiences regardless of the amount of relational experience. As shown above, the interaction with firm-level uncertainty is also significant for the dummy variable of relational experience. For reference, please see **Appendix 5.3** for OLS results and an interaction graph of relational experience (dummy) and GAE in **Appendix 5.4**.

Secondly, a variation of the GAE variable is used. As suggested by prior research, more recent experience tends to be most relevant for firms in developing their alliance capability (e.g. Sampson, 2005). Therefore, I follow such research by using only experiences accumulated three years prior to the focal alliance. Please see **Appendix 5.5** for the OLS results. Results indicate that the results hold for the two-way interactions with strong indications of overconfidence in GAE-related experiences built up in the three years prior to the focal alliance. The effect for both Relational experience signal hold ($\beta_{GAElast3x\ Relational\ experience\ signal}$: -4.03 , p-value: 0.08) and relational experience ($\beta_{GAElast3x\ Relational\ experience}$: -1.11 , p-value: 0.005) hold, while the effects for the three-way interactions for firm-level uncertainty and alliance management mechanism signals do not.

Thirdly, I use alternative event windows to calculate the CAR in order to check whether results hold. Results for event window (-2, +2) are presented for the supported hypotheses in the **Appendix 5.6**. Fourthly, I check if a subset of the data drives the effect. Therefore, as suggested by existing literature (e.g. Lee, 2013), I randomly delete 10% of the observations and find support that the results hold. Fifthly, I test whether the use of firm size as a control changes the significance of any of the effects. Results indicate that the main hypotheses hold.

5.5 Discussion

Building on the *quality* dimension identified in Chapter 4, this chapter introduces an *interrelationship* dimension between firm-level GAE and dyad-level relational experience. Following recent theoretical work calling for empirical research investigating the interrelated effect between dyad-and firm-level alliance management processes (Dekker & Abbeele, 2010; Wang & Rajagopalan, 2015), this chapter answers the research question if high extents of firm-level GAE negatively impact the effect of dyad-level relational experiences onto alliance value creation. The findings indicate support for the theory of an interrelationship between the two types of alliance experience, while both firm-level uncertainty and alliance management mechanisms have a moderating effect on this relationship. Overall, this chapter provides support for the relevance of alliance experience in predicting value creation from alliances.

The independent effects of both GAE and relational experience support existing literature. Firstly, findings show that value creation declines as firms accumulate higher quantities of GAE indicating that high levels of such experiences are detrimental to alliance value creation. This supports prior literature which has found that at very low levels these experiences are valuable to organizations as they provide endorsements (Stuart et al., 1999) and learning opportunities (Sampson, 2005) but that the effects declines rapidly afterwards. Research attributes such findings to organizations' overconfidence in their general alliance management when having accumulated significant amounts of GAE (e.g. Heimeriks, 2010; Hoang & Rothaermel, 2005). Secondly, this chapter finds evidence that dyad-level relational experiences improve alliance value creation significantly. As this effect is positive when not considering the level of GAE a firm has accumulated, this demonstrates that these are value-creating for the firm. Such positive value creation effects can be attributed to the generation of both inter-organizational and inter-personal trust between executives or alliance managers (Abrams et al., 2003; Gulati, 1995a; Zaheer et al., 1998) and inter-organizational routines (Dyer & Singh, 1998; Zollo et al., 2002). Therefore, this supports existing literature which has found positive effects of dyad-level relational experiences (Gulati et al., 2009; Zollo et al., 2002).

Directly building on the abovementioned findings of the independent effects of both GAE and relational experience (quality), this chapter investigates the interrelationship between these two types of alliance experience. This study finds strong evidence for such an interrelated effect which further suggests that high levels of firm-level GAE not only have negative value creation effects by itself but more importantly, they may spill over onto the effect that relational experiences have on alliance value creation. This confirms expectations from existing literature that overconfidence in GAE may have negative effects (Heimeriks, 2010; Hoang & Rothaermel, 2005). More specifically, findings indicate that such overconfidence directly impacts organizations ability to generate trust among each other, and the ability to develop inter-organizational routines (Dyer & Singh, 1998; Gulati, 1995a).

Moreover, this chapter finds that the firm-level uncertainty exacerbates the spill-over effect. Two aspects lead to the importance of firm-level uncertainty in the interrelationship between GAE and relational experience. Firstly, firm-level uncertainty is a condition under which heuristics such as overconfidence are exacerbated. Due to the uncertainty, firms and executives involved are reliant on such simplification processes in order to make sense of the complexities surrounding them (Busenitz & Barney, 1997). Therefore, they are more likely to learn superstitiously (Zollo, 2009) The potentially negative impact of such heuristics and learning processes can be severe as such conditions require the careful attention of managers involved. Secondly, the spill-over is likely to be exacerbated as the importance of relational experiences to alliance value creation is higher under such uncertain circumstances (Gulati et al., 2009). Relational experience by itself lowers the uncertainty as the partner is known and the partnership more likely to be successful. However, this study finds that firms can only benefit from relational experience when they are not overconfident. Otherwise, the firm-level uncertainty further exacerbates the negative effects GAE has onto the relational experience value creation impact.

This chapter also finds evidence that alliance management mechanisms influence the interrelationship between GAE and relational experience. Such institutionalization mechanisms however do not exacerbate the overconfidence but instead mitigate the negative effects at high levels of GAE. This is partly surprising as existing literature had suggested that the combination of the two has negative implications on the overconfidence generated (Heimeriks, 2010). Instead, results

suggest that alliance management mechanisms only have a negative effect onto relational experiences when GAE is low. This supports existing literature that in order to benefit from capabilities, these need to be developed sequentially. Experience as such needs to be accumulated first before any institutionalizing may offer benefits (Zollo & Winter, 2002). Also, in the alliance context, the importance of sequences in developing alliance capabilities is found (Heimeriks et al., 2007).

This chapter replies firstly to calls for studies which have suggested to investigate the interrelated effect between the two (Schreiner & Heimeriks, 2010; Wang & Rajagopalan, 2015), secondly to studies which have found that many unobserved moderating variables in the relationship between the underlying processes of relational experience and performance still exist (e.g. Vanneste et al., 2014). The identification of the interrelated effect between GAE and Relational experience has six contributions to the strategic alliance literature, while also having contributions to practice.

Firstly, the finding for an interrelated effect between GAE and relational experience is a logical extension and contribution to studies which find that firm-level GAE may have negative effects on performance as firms become overconfident (Heimeriks, 2010), inert in their firm-level alliance management practices or that these may even turn into a core rigidity (Hoang & Rothaermel, 2005; Zollo et al., 2002). Such so-called "competency trap" (Levitt & March, 1988: 322), "traps of distinctive competence" (Levinthal & March, 1993: 103), resulting in an "overconfidence trap" (Heimeriks, 2010: 65) on a firm-level alliance management provide even further complications for firms than previously expected. This highlights that different types of experience may affect each other if they are related to one another but still distinctly different, a main requirement for such a spill-over to occur (Zollo & Reuer, 2010).

Secondly, by introducing the interrelated experience effect and investigating its effect on alliance value creation, this chapter provides clarity as to the large heterogeneity in results investigating the performance effects of relational experiences (Hoang & Rothaermel, 2005; Wang & Rajagopalan, 2015). Thereby, these findings add to a debate in existing literature if and to what extent relational experiences improve alliance performance. While several studies have found positive effects

(Gulati et al., 2009; Reuer & Zollo, 2005; Zollo et al., 2002), others have also found negative effects (Goerzen, 2007; Hoang & Rothaermel, 2005). Therefore it is not surprising that the focus of several studies in existing research has been on identifying boundary conditions to the effect of relational experience on alliance performance. Amongst others, the level of equity involved in the alliance (Zollo et al., 2002), firm-level uncertainty, solvency and the R&D intensity (Gulati et al., 2009) have been identified. While other previous studies have hinted that the level of GAE is important in alliance literature (e.g. Rothaermel & Deeds, 2006), it has not been identified as a boundary condition to relational experience before. The findings may therefore add the level of firm-level GAE as another boundary condition to the literature on the effect of relational experiences on alliance value creation.

Thirdly, this chapter contributes directly to a recently emerging research direction which has investigated the spill-over of different types of experiences onto another in corporate development activities (e.g. Bertrand & Capron, 2015; Mulotte et al., 2013). In this stream, existing research has found that such experiences can spill-over *across* different corporate development activities such as from M&A to alliance (Zollo & Reuer, 2010), or from in-licensing to internal development efforts (Mulotte et al., 2013), this study adds to existing literature by finding that such spill-overs may also occur *within* one corporate development activity: Strategic alliances. Moreover, this chapter contributes to these studies that firm-specific factors may either mitigate or exacerbate such spill-overs.

Fourthly, this chapter contributes to studies which have emphasized the importance of uncertainty in creating value from relational experiences (e.g. Gulati et al., 2009). While this finding is supported in this work, I also find that the level of GAE may have substantial impacts onto this relationship. Essentially, the overconfidence in general alliance management practices may distort the ability of firms to benefit from relational experience. Hence, this finding suggests that firm-level uncertainty and GAE need to be considered together when investigating the impact of relational experiences onto value creation.

Fifthly, this chapter also contributes to existing studies which have investigated alliance capability development from alliance experience to alliance management mechanisms such as integrating or institutionalizing processes

(Heimeriks & Duysters, 2007; Heimeriks et al., 2007; Kale et al., 2002; Kale & Singh, 2007). This chapter finds that the sequential accumulation of alliance experience and only then the institutionalization of alliance knowledge is essential. This chapter contributes directly to the abovementioned studies that otherwise this may not only impact a firm's general alliance performance (Heimeriks et al., 2007) but also the value created from repeated partnerships.

Additionally, this chapter further provides evidence that relational experiences positively influence alliance value creation. This is not widely accepted in existing literature as many studies have identified insignificant or negative effects for firm- or project-related performance measures (Goerzen, 2007; Hoang & Rothaermel, 2005; Pangarkar, 2003) or stock-market based measures of alliance performance (Lee, 2013; Wassmer & Dussauge, 2012; Yang et al., 2015). This study uses a multitude of different measures for relational experience and most importantly based on results from Chapter 4, by differentiating between repeated partnerships entered for positive reasons and repeated partnerships which are entered for network inertial reasons. Results for the effect of relational experience *quality* on alliance value creation as identified in Chapter 4 also holds in the full sample used in this chapter. In addition to the interrelationship dimension identified in this chapter, this provides further support for a *quality*-based dimension.

These findings also contribute to practice by suggesting that managers ought to be cautious in their management of repeated partnerships when they have accumulated high levels of firm-level alliance experience. Effectively building and maintaining trust and partner-specific routines between alliance partners can be difficult due to the dynamics in a strategic alliance (e.g. Kale et al., 2000). Findings indicate that for relational experiences signalled to the market, this effect is less severe. However, findings of this study indicate that firm's own characteristics may inhibit them to develop the necessary benefits from relational experiences. The development of overconfidence in firm-level general alliance processes may also possibly result from codification mechanisms, such as guidebooks on alliance management published by industry associations on strategic alliance management. However, this and other earlier studies have shown that these effects are decreasing dramatically as firms increase experience and institutionalize their practices. This chapter instead emphasizes the importance of relational experiences and the significance to be aware

of the extent of firm-level alliance experience when trying to benefit from them. Additionally, findings may provide insights that particular caution should be paid to repeated partnerships under uncertain conditions. The danger of becoming overconfident in general alliance processes while at the same time neglecting the development of relational capabilities is significant at that stage. Moreover, results indicate that the sequence in which firms develop their alliance capabilities should be based on levels of experience and only then institutionalization ought to follow. This chapter provides evidence that this may negatively impact the benefits derived from repeated partnerships.

5.6 Limitations and directions for future research

This chapter is an attempt to investigate the interrelationship between GAE and relational experience in their impact on alliance value creation. This chapter has some limitations which may open up directions for future research.

Firstly, this chapter tests the interrelationship of alliance experiences in the biopharmaceutical industry. While this is a regularly used context for the investigation of strategic alliances due to their frequent use (Powell et al., 1996) and industry-specific factors have generally not found to be relevant for the effect of alliance experience on value creation (Gulati et al., 2009), this effect may be directly related to the biopharmaceutical industry. Future studies may therefore want to investigate whether the results also hold in different industries. Secondly, this chapter tests alliance value creation of alliances using stock market-based measures of cumulative abnormal returns in an event study. While existing studies find that such value creation measures also predict alliance performance using more subjective long-term measures (Heimeriks et al., 2015; Kale et al., 2002), future studies may wish to investigate whether the interrelationship also holds using other measures of performance. Thirdly, this chapter relies on previous studies which have indicated that overconfidence resulting from superstitious learning is common as firms accumulate more experience (e.g. Heimeriks, 2010). Future studies may wish to investigate the underlying processes of overconfidence and superstitious learning more precisely. Interesting avenues for future research could also be to investigate alliance experience for both firms in the dyad. The measurement of alliance experience for one firm in the

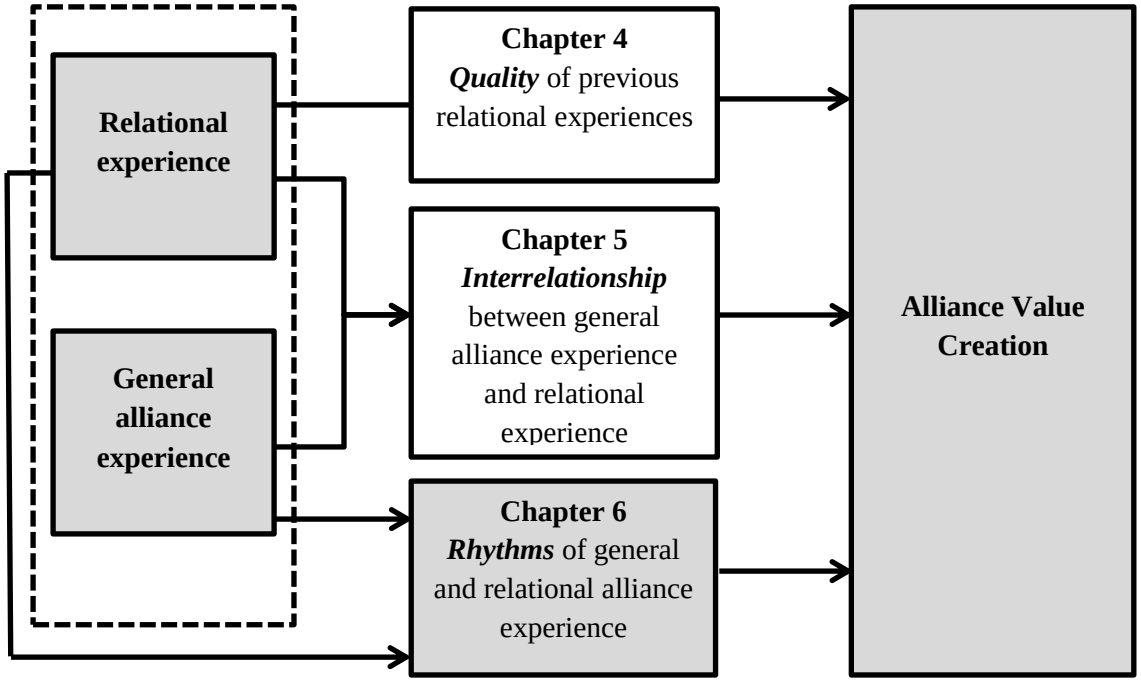
dyad has been the predominant way and an important means for investors to form their opinion on organizations alliance management practices (Gulati et al., 2009; Hoang & Rothaermel, 2005; Park & Mezias, 2005). Future studies may for instance wish to investigate whether aggregate experience levels of both partners influence the interrelationship between different types of alliance experiences.

CHAPTER 6: GENERAL AND PARTNER-SPECIFIC ALLIANCE RHYTHMS AND THEIR IMPACT ON ALLIANCE VALUE CREATION

6.1 Introduction

Chapters 4 and 5 have considered both firm-level alliance and dyad-level relational experience and identified a quality and interrelationship dimension of those. This chapter shifts from the interrelated perspective back to considering GAE and relational experiences separately, however, by considering how these experiences have been accumulated over time (see **Figure 6.1** below)

FIGURE 6.1: Empirical chapter overview (Chapter 6)



Alliance research embracing a temporal perspective has gained increasing interest due to the still-significant failure rates (Gulati et al., 2009; Park & Ungson, 2001; Sampson, 2005; Shi & Prescott, 2011; Shi & Prescott, 2012). In general, temporal alliance studies investigate how managing alliances over time can improve alliance performance (Shi, Sun, & Prescott, 2012). In addition to research using an experience lens (Anand & Khanna, 2000a; Gulati et al., 2009), other temporal

dimensions include the learning (Hamel, 1991), sequence (Shi & Prescott, 2011), speed (Al-Laham et al., 2008), frequency (Standifer & Bluedorn, 2006), and timing perspectives (Oxley & Sampson, 2004). Most recently, however, a new stream in temporal research has emerged relating to alliance rhythms (Shi & Prescott, 2012). Essentially, the rhythm is a second-order function of the experience as it takes into account how experiences are accumulated over time. The rhythm literature has a solid foundation in other corporate development activities, ranging from M&A over international expansions to strategic change in general (Hayward, 2002; Klarner & Raisch, 2013; Laamanen & Keil, 2008; Shi & Prescott, 2011; Vermeulen & Barkema, 2002). Drawing primarily on absorptive capacity (Cohen & Levinthal, 1990) and time compression diseconomies as conceptual foundations (Dierickx & Cool, 1989), research provides evidence that irregular rhythms tend to decrease performance, while regular rhythms have been found to significantly improve performance (Klarner & Raisch, 2013; Laamanen & Keil, 2008; Shi & Prescott, 2011; Shi & Prescott, 2012; Vermeulen & Barkema, 2002).

There are three primary research gaps in the alliance rhythm field, however. Firstly, existing research has exclusively focused on strategic alliances in general, regardless of the partners, in a so-called general alliance rhythm (GAR). However, insignificant negative effects have been found (Shi & Prescott, 2012). Yet, this has been investigated for both equity and non-equity alliances in combination. As non-equity alliances are more challenging to manage (Das & Teng, 1996), I propose to investigate the effect in non-equity settings only.

Secondly, it is, however, surprising that research so far has been silent on how organizations accumulate their *repeated* partnerships with the same alliance partner in rhythms over time. As emphasized above, recent research has primarily regarded repeated partnerships as cumulative (e.g. Gulati et al., 2009) and has not distinguished when these repeated alliance are formed. This is particularly surprising as existing research in the field of strategic alliances has found that such repeated alliances need to be managed differently from alliances in general with more importance on tacit processes such as trust building or inter-organizational routine development (Hoang & Rothaermel, 2005; Zollo et al., 2002). Generating trust is particularly sensitive to time between alliances. Existing research has emphasized that trust ought to be carefully developed, with some studies showing that time lapses between repeated alliances

should not be too long (Gulati, 1995b) and others have emphasized that trust development and maintenance are sensitive processes (Ring & van de Ven, 1994). Consequently, it is not clear whether repeated partnerships which follow each other in close succession may effectively facilitate such trust-building. In contrast, organizations may not benefit from partnerships which had been formed a long time ago. In order to provide further clarity into our understanding regarding the most effective temporal distance between repeated partnerships and to improve our understanding of the heterogeneity in value created from repeated partnerships, this chapter focuses on how the rhythm of repeated partnerships influences alliance value creation. In order to investigate this, I develop the term partner-specific alliance rhythm (PAR) which comprises the temporal rhythm of repeated partnerships with the same alliance partner.

Thirdly, while irregular rhythms have important negative implications for performance (Shi & Prescott, 2012; Vermeulen & Barkema, 2002), several factors may facilitate firms' ability to manage irregular rhythms (Shi et al., 2012). In the context of GAR, existing research has so far used entrainment theory[12] (see Ancona & Chong, 1996) and identified both relationship-, (intra-entrainment i.e. internal synchronization with M&A facilitate performance) and competitor-specific factors (extra-entrainment i.e. the synchronization with competitor sequences). These may significantly impact upon the effect of different rhythms (Shi & Prescott, 2012). Related research on M&A rhythms finds that firm-specific factors may also have a critical role in moderating the impact of irregular rhythms (e.g. Laamanen & Keil, 2008). Due to the similarity of both M&A and strategic alliances in their underlying processes (Zollo & Reuer, 2010) and the importance of firm-specific factors emphasizing heterogeneity of firm characteristics in general (Contractor, 2012), such firm-specific factors may also have an important impact in moderating both GAR and PAR. Existing literature in the field of strategic management has identified slack resources, potential absorptive capacity as two firm-specific factors which may significantly impact on a firms' ability to deal with critical management demands (Cohen & Levinthal, 1990; Iyer & Miller, 2008) and the firm's strategic alliance management in particular (Kale et al., 2002; Lavie & Rosenkopf, 2006). In addition,

[12] The concept of entrainment has been adapted from the field of biology and defined as the "adjustment of the pace or cycle of an activity to match or synchronize with that of another activity" (Ancona & Chong, 1996: 251).

existing alliance research and Chapter 5 have both indicated that GAE may have a significant impact onto the ability to benefit from alliance experience in general and repeated partnerships in particular. GAE provides firms with additional experiences; however, as indicated in Chapter 5 may also lead to overconfidence in the management of alliances which has negative effects onto repeated partnerships. However, it is unclear how these firm-specific factors mitigate or exacerbate firms' ability to manage irregular rhythms of alliances. This leads to the following research questions:

What effect do irregular General Alliance Rhythms (GAR) and Partner-specific Alliance Rhythms (PAR) have on alliance value creation? How can slack resources, absorptive capacity, and GAE mitigate or exacerbate the potentially negative effect of irregular GARs and PARs on alliance value creation, respectively?

In order to answer these questions, the term partner-specific alliance rhythm (PAR) is developed and introduced to the strategic alliance literature and its effect on alliance value creation investigated. I define PAR as the variability of repeated alliances, with the same alliance partner, over a specified period of time. Moreover, this chapter also investigates general alliance rhythm (GAR), which has been investigated in previous alliance literature (e.g. Shi & Prescott, 2012). This study however differentiates itself by only considering non-equity alliances for GAR. As these alliances are particularly difficult to manage (Das & Teng, 1996), the importance of GAR should be more significant in this context. Moreover, the importance of repeated partnerships is particularly salient in non-equity alliances (e.g. Zollo et al., 2002), thereby potentially also increasing the importance of PAR in this context. The theoretical framework draws on literature of the RBV, absorptive capacity, OL and also inter-organizational trust research. I argue that as the capacity of the firm to absorb additional experiences is limited (Cohen & Levinthal, 1990), firms cannot simply add and compress additional alliances in time without incurring performance declines (Dierickx & Cool, 1989). I also add an OL perspective to existing literature. Existing research finds that balancing the amount of strategic activities over time is important as firms need to refresh their experiences in order not

to forget previous experiences (Argote, 2012). This also applies when aiming to benefit from relational experiences due to the necessity to both develop and maintain trustful relationships over time (Gulati, 1995b). Hence, this may require firms to carefully manage their alliances by striking a balance between too many and too few alliances over time. Thus, in order to avoid value creation declines, a constant GAR and PAR should be maintained.

This chapter is structured as follows. In the following section, a summary on existing literature on rhythm in strategic alliances and the underlying theoretical reasoning is provided. Afterwards, hypotheses as to how GAR and PAR affect alliance value creation are derived before developing how firm-specific slack resources, absorptive capacity and GAE may mitigate or exacerbate these relationships. This study draws on the full sample for GAR and the subsample for repeated partnerships for PAR. In line with existing literature (Shi & Prescott, 2012), I cannot find any evidence for GAR also in settings of only non-equity alliances and considering the stock market measure of alliance value creation. However, I do find support for the main effects of PAR, while mixed results for the firm-specific moderating factors can be identified. Subsequently, the implications of the results are discussed, and limitations and future directions of the chapter are presented.

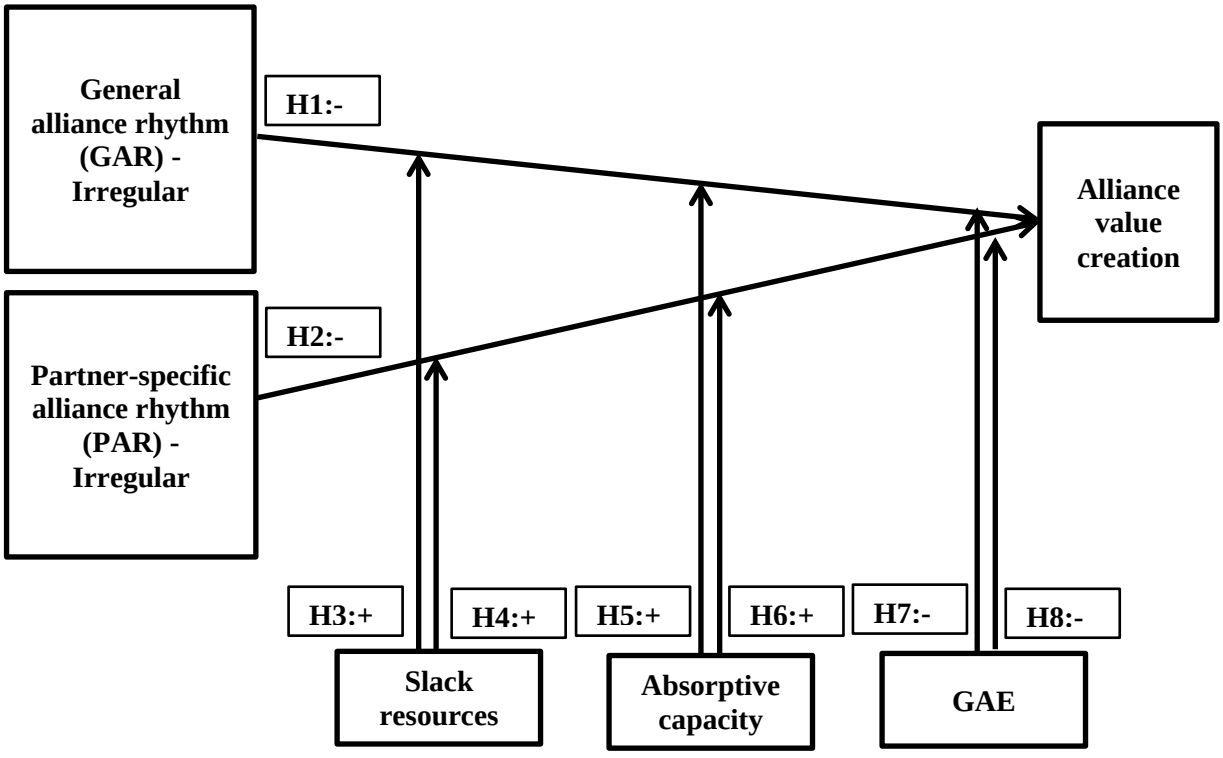
6.2 Theory and Hypotheses

The management of time is a critical dimension in management research (e.g. Abbott, 2001; Ancona, Okhuysen, & Perlow, 2001b; George & Jones, 2000; Mitchell & James, 2001). This study draws on time compression diseconomies based on the RBV (Dierickx & Cool, 1989), absorptive capacity (Cohen & Levinthal, 1990), and OL (Argote, 2012) literature to examine the impact of two different types of strategic alliance rhythms by further distinguishing between GAR and PAR. Research on alliance rhythms is part of a larger literature stream on temporal dynamics which has recently been increasing in the field of strategic management (e.g. Klarner & Raisch, 2013; Laamanen & Keil, 2008; Pacheco-de-Almeida, Hawk, & Yeung, 2015; Shi & Prescott, 2012).

General alliance rhythm (GAR) has previously been defined as “the variability of the firm’s (...) alliance activity over a specified period of time” (Shi & Prescott,

2012: 1282). It therefore builds on literature examining the frequency and experiences of strategic alliances (Anand & Khanna, 2000a). Essentially, the rhythm becomes a second-order function of the frequency and experience and thereby describes a different temporal phenomenon (Shi et al., 2012). Despite increasing research on rhythms, this area is still relatively new in the field of management (Ancona, Goodman, Lawrence, & Tushman, 2001a; Shi et al., 2012). Essentially, only very few studies have undertaken the step to investigate strategic alliance rhythms in general and its effects on performance more specifically (Shi & Prescott, 2012). Most research on rhythms has focused on strategic change in general (Klarner & Raisch, 2013), corporate development actions, such as M&A (Hayward, 2002; Laamanen & Keil, 2008) or international expansion (Vermeulen & Barkema, 2002). Extending existing research in this field, I therefore argue that an irregular rhythm (i.e. a high variability) for both GAR and PAR negatively affects alliance value creation as it causes high managerial demands which have further been shown to have negative influences (e.g. Vermeulen & Barkema, 2002). After that I theorize how slack resources, absorptive capacity, and GAE may impact on the relationship between PAR and alliance value creation. A graphical presentation of the theoretical framework can be found in **Figure 6.2** below.

FIGURE 6.2: Theoretical framework (Chapter 6)

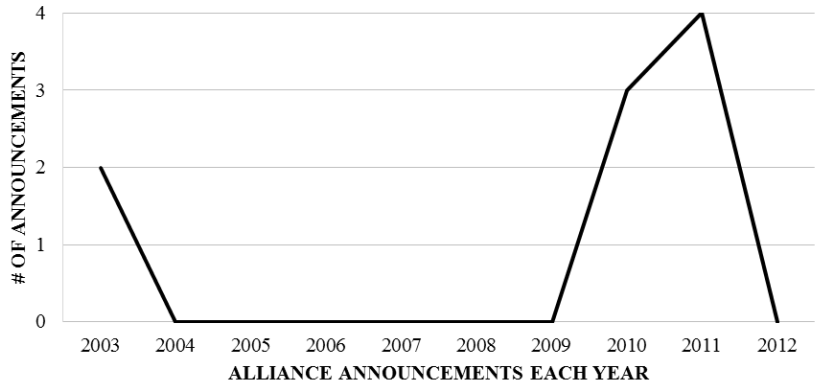


6.2.1 General Alliance Rhythm (GAR)

This chapter proposes that firms' alliance value creation is higher if their GAE is accumulated in a more regular (i.e. even) rhythm. Drawing on previous studies (e.g. Shi & Prescott, 2012), the general alliance rhythm (GAR) is defined as the variability of all alliances, irrespective of any partner characteristics, over a specific period of time. Such a regular rhythm has also been termed an even-paced rhythm (Shi & Prescott, 2012). This has been tested in multiple corporate development contexts, such as strategic alliances (Shi & Prescott, 2012), M&A (Laamanen & Keil, 2008) or international expansion (Vermeulen & Barkema, 2002). However, it has not exclusively for tested for non-equity alliances. While it has been found to be important in the context of M&A (Laamanen & Keil, 2008; Shi & Prescott, 2012), up to this date no evidence of GARs impact on alliance performance has been found (Shi & Prescott, 2012).

Huy (2001: 613) argues that an irregular rhythm is caused by two primary periods: "a pattern of variability in the intensity and frequency of organizational activities, typically characterized by periods of *accelerated* and *slowed* activity." In essence, GAR (and also PAR) consist of, firstly, periods of major alliance activity, followed or proceeded by periods of alliance inactivity. In order to improve understanding of the different periods of alliance rhythms, please refer to **Figure 6.3** below for an example. The solid line in **Figure 6.3** indicates an example of an irregular rhythm. The period between 2004 and 2009 relates to a situation of slowed alliance activity or even inactivity, whereas for the period between 2010 and 2011, major or accelerated alliance activities can be observed. As shown below, reasons for a negative effect of GAR on alliance value creation are caused by both periods.

FIGURE 6.3: Example of an irregular GAR and PAR



6.2.1.1 Periods of accelerated, high general alliance activity

Periods of accelerated alliance activity influence the ability of firms to learn which may cause an ineffective development of alliance capabilities. A large stream of the OL literature argues that periods of high levels of activities cause issues in the interpretation of these (e.g. Argote, 2012). When organizations are in a period of accelerated alliance activity, they may not learn effectively from these changes as the time between the alliances is so short that it does not allow them to. This is because the accumulation of alliances within short time periods may create information overload (Huber, 1991) and thus places significant demands on firms' managers ability to absorb knowledge (Cohen & Levinthal, 1990). As firms are limited in their ability to absorb knowledge, overly frequent events can lead to performance declines (Cohen & Levinthal, 1990; Zahra & George, 2002). As Eisenhardt and Martin (2000: 1115) state: "Experience that comes too fast can overwhelm managers, leading to an inability to transform experience into meaningful learning."

In essence, such events of high activity after or preceding periods of infrequency are called 'rare events' by the OL literature (Lampel, Shamsie, & Shapira, 2009; March et al., 1991). Learning from such rare events can cause difficulties for organizations as it prompts an interruption of routine activities which further causes issues in firms' and managers ability to interpret them (Christianson, Farkas, Sutcliffe, & Weick, 2009). In such situations, managers are also more likely to overestimate previous successes (Zollo, 2009). Hence, they may learn superstitiously and thereby ineffectively (Zollo, 2009). In summary, the OL perspective proposes that firms engage in strategic alliances on a regular basis in order to refresh their knowledge and routines on how to engage in these organizational actions.

Complementing the previous literature streams, Dierickx and Cool (1989) focus on the resource-based implications of irregularity in strategic decisions. They point out that "asset stocks are 'built' or accumulated through a *consistent time pattern* of expenditures or flows" (Dierickx & Cool, 1989: 1509). As such, a rapid increase in a strategic activity does not lead to positive performance effects as "the time between the anticipation of a problem and its arrival may not be adequate for an organization to identify and develop the knowledge, or accumulate the experience, required to respond effectively" (Levinthal & March, 1993: 103). Especially in the case of alliances, such periods of high activity can overwhelm firms as "each alliance

is unique" (De Man, 2014: 8). Despite some similarities across alliances which allow for the creation of firm-level alliance capabilities (as described in Chapter 5), essentially, alliances require customization of the governance and control structures such as contracts and essentially management attention (De Man, 2014). Thus, a level of high alliance activity in a short time period can lead firms to be more ineffective in managing these. Additionally, most alliances are subject to the danger of opportunism by the alliance partner (Das & Teng, 2001; Parkhe, 1993). This is particularly likely in the context of non-equity alliances (Das & Teng, 2000b) Thus, when firms are engaged in many alliances within a short timeframe, this may cause issues in trying to protect valuable firm knowledge (Kale et al., 2000), leading to other firms taking advantage of this overload.

6.2.1.2 Periods of decreased alliance activity or inactivity

The majority of the OL literature has built on the experience curve and investigated how organizations can consistently improve performance through direct learning. A much smaller stream indicates however that organizations essentially 'unlearn' or 'forget' in periods of inactivity (Argote, 2012). Thus, experience may not be cumulative but gaps between experiences may be important to consider. In the context of strategic alliances, such long periods between new alliances can lead to alliance management knowledge decay (Argote et al., 1990; Benkard, 2000). Particularly, in high-tech contexts, such knowledge decays quickly and thus frequently needs to be 'revived' (Argote, 2012; Barkema & Schijven, 2008). As the alliance management lifecycle from alliance formation to alliance termination requires specialized knowledge, not applying this knowledge may easily lead firms to 'forget' how it is most effectively applied. The implications of 'forgetting' such essential knowledge can lead to performance declines in the alliance management as firms in some cases may need to build their knowledge from scratch. In order to effectively learn, firms need the capability to value and absorb experience and assimilate these throughout the firm by means of routines, for instance, in order to maintain their absorptive capacity (Cohen & Levinthal, 1990). Therefore, periods of inactivity or non-use will lead to declines of performance as absorptive capacity needs to be maintained through frequent use (Cohen & Levinthal, 1990). From a RBV perspective, such periods of inactivity are also not performance-enhancing as the flow

of resources does not allow a firm to effectively build up their asset stocks. The notion of time compression diseconomies argument suggests that rhythms should be maintained constant as irregularity in them decreases the marginal effect of investments (Dierickx & Cool, 1989). Combining the arguments that periods of both low and high alliance activity may cause organizational issues leading to lower alliance performance, firms can benefit from an even GAR as it may enable them to effectively generate routines in the processes (Laamanen & Keil, 2008). It can be expected that alliance value creation is negatively affected by an irregular GAR.

Hypothesis 1: For non-equity alliances, the more irregular the rhythms of strategic alliances (GAR), the more negative its effect on alliance value creation.

6.2.2 Partner-specific alliance rhythm (PAR)

As indicated in Chapter 5 and in existing literature the benefits from engaging in repeated partnerships with the same partner may be more significant and sustainable to improving firms' alliance value creation (Gulati, 1995a; Gulati et al., 2009; Zollo et al., 2002). As indicated in previous chapters, existing studies identify ambiguous effects of repeated partnerships finding both positive (Gulati et al., 2009; Zollo et al., 2002) and negative effects (Goerzen, 2007; Hoang & Rothaermel, 2005). In order to provide further clarity on this value creation relationship, this chapter uses a temporal dimension of repeated partnerships, which has not been used in existing literature. This is surprising as the underlying processes of trust and routines are sensitive to the temporal development (Gulati, 1995b; McEvily, Perrone, & Zaheer, 2003; Ring & van de Ven, 1994).

This section first emphasizes the underlying processes that describe how repeated partnerships lead to improved alliance value creation through trust development and the development of inter-organizational structural routines. Subsequently, I develop a hypothesis that the more irregular the rhythm of partner-specific alliances (PAR), the lower its net effect on alliance value creation is. Similar to hypothesis development for Hypothesis 1 I split the arguments into, firstly, periods of high repeated alliance activity and, secondly, periods of slowed alliance activity or inactivity between repeated partnerships.

Increased trust between alliance partners contributes significantly to the benefits arising from repeated partnerships (Gulati, 1995a). The intuition behind this is simple. As organizations partner repetitively, they are developing trust among each other (Gulati, 1995a). This is particularly important as distrust is one of the primary reasons for alliance failure (Park & Ungson, 2001). Hence, it is not surprising that organizations which have gained trust with their alliance partner are subjectively more satisfied with alliance outcomes (Reuer & Zollo, 2005; Zollo et al., 2002). Therefore, trust has been found to facilitate further economic exchanges (Williamson, 1985). Firstly, it helps to decrease costly governance mechanisms to protect against opportunistic behaviour (Parkhe, 1993) by minimizing the transaction costs as it reduces search costs due to the familiarity of the partners (Dyer & Chu, 2003; Gulati, 1995a). Secondly, it reduces the monitoring costs of the alliance partner during the actual alliance exchange as fears of the partners opportunism are reduced (Zaheer et al., 1998).

However, trust is a dynamic process and effectively varies across a 'spectrum' from trust to distrust (Lewicki, McAllister, & Bies, 1998). As such, trust requires both cautious development as well as maintenance over time. As Ring and van de Ven (1994: 93) in their seminal article on inter-organizational trust emphasize: "[Trust development] requires *careful* and s*ystematic* attention to the concrete processes (...) between transacting parties". This indicates that organizations need to pay significant attention to both *building* and *maintaining* trustful alliance relationships. Partnering too frequently with one partner may not allow for effective learning and reflection of previous alliances to judge whether the partner is truly trustworthy. On the contrary, leaving too much time between the alliances may lead to decay in trust as the firms direction may have changed or the key people involved in the alliance such as boundary spanners, executives or the middle management involved in managing the alliance may have changed. Hence, despite a previous relationship, trust may then essentially need to be re-built (Das & Teng, 1998). Benefits from repeated partnerships also derive from shared inter-organizational structural routines such as steering committees which are the highest hierarchical level of alliance governance (Zaheer et al., 1998). Such structural routines represent platforms in which managers from both companies frequently interact and discuss while also providing coordination, control, and conflict resolution practices among the alliance partners (De

Man & Roijakkers, 2009). In a way, such frequent interaction on steering committees further intensifies *inter-organizational* trust through *inter-personal* trust (Perrone, Zaheer, & McEvily, 2003) which makes structural alliance mechanisms a valuable component in improving alliance value creation (Kale et al., 2002). As described above, irregular rhythms are caused by infrequency followed or preceded by accelerated activity. Drawing on resource-based, absorptive capacity and also trust-based perspectives, this study proposes that both accelerated, high repeated alliance activity and repeated alliance inactivity create different problems for organizations. In order to lead to the hypothesis, this study focuses on the two different processes which cause an irregular PAR to have negative effects on alliance performance.

6.2.2.1 Periods of accelerated, high repeated alliance activity

Trust building takes time and requires careful development (Gill & Butler, 1996; Jones & George, 1998; Ring & van de Ven, 1994). Effectively getting to know the partner and waiting for performance feedback may become essential for trust building. In periods of high activity, small gaps between repeated alliances may therefore not facilitate the development of trust between organizations (Arrow, 1974). Essentially, the partnership takes time to generate what Dyer and Chu (2000: 262) term: "Social memory" which refers to trust bonds between partner organizational members. Similarly, firms need time between partnerships as a so-called "period of ambivalence" (Gulati & Sytch, 2008: 180) is present after forming a new alliance. This indicates benefiting from trust from relational experiences may take time to develop.

Additionally, partners in repeated alliances need time to learn to contract with one another (Mayer & Argyres, 2004). As firms can gain benefits from making repeated contracts in the alliance partnership, such benefits are essentially derived from the ongoing partnership as lessons about necessary changes need to be made (Mayer & Argyres, 2004). Hence, not leaving significant time for such learning to occur may negatively impact the benefits derived from repeatedly contracting.

Moreover, such high alliance activity may also have important implications on the development of the firm's inter-organizational structural routines, such as steering committees. Even though both alliance partners may feel that a repeated partnership

with a short gap may be appropriate for further extending their collaboration, both partners may not be able to develop these inter-organizational structural routines effectively and effectively not be able to signal this to investors. This is due to three primary reasons. Firstly, the time compression diseconomies argument as used for GAR should also be applicable to PAR. As Dierickx and Cool (1989) argue the constant flow of resources over time is most effective for building effective asset stocks. Thus, when firms decrease the gaps between alliances (i.e. increase the alliance activity of repeated alliances) the effectiveness of each alliance is also likely to decrease. In order to increase the effectiveness of inter-organizational routines, such investments require a constant flow of resources. Secondly, such inter-organizational routines take time to develop as they require sufficient performance feedback from previous partnerships (Nelson & Winter, 1982). Essentially such routines involve significant amounts of coordination and fine-tuning (Zollo et al., 2002). If multiple routines are set up at the same time, this may not allow for necessary changes to be made to increase their effectiveness. Thirdly, short gaps between strategic alliances may place significant demands on organizations absorptive capacity (Cohen & Levinthal, 1990) which may become overwhelmed and inter-organizational structures such as steering committees may not be effectively formed.

6.2.2.2 Periods of slowed repeated alliance activity or inactivity

Another way in which an irregular, unsystematic PAR harms the effectiveness of repeated strategic alliances is when large gaps between alliances exist. Such gaps therefore decrease the likelihood for repeated alliance formation (Gulati, 1995b). Firstly, such gaps exacerbate the development and maintenance of inter-organizational routines. As Dierickx and Cool (1989) also argue non-frequent resource flows cause the ineffectiveness of resource development. Secondly, trust needs to be *maintained*, not only *developed* (Jones & George, 1998). Leaving large gaps between partnerships may lead to trust quickly turning into distrust (Jones & George, 1998). Essentially, Gulati (1995b) shows empirically that large gaps of four years or more between repeated partnerships have negative effects on the trust maintenance and effectively on the likelihood of forming additional repeated partnerships. Thirdly, the effectiveness of inter-organizational structural routines may also be affected by large gaps between strategic alliances. As Nelson and Winter (1982) have pointed out such

'memory loss' of potentially "social memory" (Dyer & Chu, 2000: 262) can lead to a decay in the effectiveness of a routine which has negative performance implications (Anand, Gray, & Siemsen, 2012). Essentially, firms' knowledge as to how to effectively maintain inter-organizational structural routines is subject to knowledge decay if not regularly used (Argote, 2012; Benkard, 2000; Darr et al., 1995).

In summary, drawing on RBV, absorptive capacity and trust perspectives, organizations which mix periods of high repeated alliance activity with periods of slowed repeated alliance activity or even inactivity (irregular PAR) suffer negative value creation implications. This is because both trust and inter-organizational structural routines need to both be carefully *developed* and also *maintained*. This chapter therefore hypothesizes that firms with an even-paced PAR are more effective in developing and at the same time maintaining trust and inter-organizational structural routines. Not only are investors likely to be influenced by the decreased performance likelihood of alliances by an irregular PAR, but also investors in general prefer simplicity in such rhythms (Rindova et al., 2010). Thus, an irregular PAR may have negative effects on alliance value creation.

Hypothesis 2: The more irregular the rhythms of repeated strategic alliances with the same partner (PAR), the more negative its effect on alliance value creation.

6.2.3 Moderating impacts onto the relationship between GAR and PAR and alliance value creation

The literature on alliance rhythms is still in its infancy (Shi et al., 2012). Existing research has so far focused on the identification of moderating factors using entrainment theory (Shi & Prescott, 2012) and support has been found that the internal synchronization with internal M&A activity (inter-entrainment) as well as the alliance activity of competitors (extra-entrainment) may significantly affect the GAR-performance relationship (Shi & Prescott, 2012). Nevertheless, existing research on moderating factors for GAR is still developing and an understanding of both the mitigating and exacerbating factors is still developing. A group of such moderating factors which may provide additional explanatory power to the concept of rhythms are firm-level characteristics, as also emphasized in the strategic management literature (e.g. Contractor, 2012). In one of the key studies on M&A rhythms, Laamanen and

Keil (2008) find evidence for the importance of firm-specific factors and the experience with M&A in mitigating the effect of irregular M&A rhythms onto performance. Additionally, such firm-specific factors have been found to be relevant in how firms benefit from strategic alliances (e.g. Anand & Khanna, 2000a; Kale et al., 2002). This subsection therefore investigates how firm–specific factors, such as slack resources, absorptive capacity as well as general alliance experience may either mitigate or exacerbate the negative value creation effect of irregular GARs and PARs.

6.2.3.1 Moderating role of slack resources on the effect of GAR and PAR on alliance value creation

The key premise of the RBV is that organizational resources help firms to achieve superior performance (Barney, 1991). As such, financial resources, for instance, slack are an important component for firms (Daniel et al., 2004). Such slack refers to resources accumulated either through positive performance in previous periods or because of a deliberately accumulated buffer and can therefore be used at the firms discretion (Voss, Sirdeshmukh, & Voss, 2008). While some research argues that slack resources foster explorative tendencies such as further innovation (Nohria & Gulati, 1996), most research finds that slack resources are used for exploitative reasons (Levinthal & March, 1993). Other studies have further identified that firms can both more effectively exploit and explore as it improves the ability of firms to learn (Wiersma, 2007). Existing literature has also found that firms are more likely to form acquisitions when they have high levels of slack (Iyer & Miller, 2008).

As such, I propose that organizational slack can have an impact on mitigating exploitative issues caused by irregular GAR. As previous literature in the field of M&A and international expansion has shown, an irregular rhythm creates significant issues for a firm's absorptive capacity (e.g. Laamanen & Keil, 2008; Vermeulen & Barkema, 2002). Using a RBV perspective, this study draws on Dierickx and Cool (1989) to argue that the negative effects of an irregular rhythm is caused by *non-appropriate* resource flows (i.e. a high variability in them). This is because the irregularity of the rhythm creates significant internal pressures, such as managerial issues. However, this is where slack resources are most helpful as they provide a "(…) *cushion* of actual or potential resources which allows an organization to adapt successfully *to internal pressures* for adjustment" (Bourgeois, 1981: 30). Thus, slack

resources may facilitate the management of an irregular GAR and/or PAR. They may help organizations at times of low alliance activity or inactivity and at times of accelerated alliance activity. During the latter, they may provide organizations with additional management resources necessary to cope with the complex demands of irregular rhythms. Additionally, at times of decreased alliance activity, slack resources may provide organizations with the ability to possibly retrieve alliance lessons from previous agreements and enable the organization not to 'forget' these alliance lessons (Argote, 2012). In conclusion, firms with higher levels of slack resources may be more capable of managing irregular rhythms. Thus,

Hypothesis 3: The relationship between an irregular GAR with alliance value creation is positively moderated by firms' slack resources.

Hypothesis 4: The relationship between an irregular PAR with alliance value creation is positively moderated by firms' slack resources.

6.2.3.2 Moderating role of absorptive capacity on the effect of GAR and PAR on alliance value creation

As argued above, an irregular rhythm impacts the firm as absorptive capacity is either over- or under-utilized (Dierickx & Cool, 1989) and may therefore negatively affect managers ability to absorb new experiences (Laamanen & Keil, 2008). It may therefore be logical that firms which have higher levels of absorptive capacity are more effective in dealing with an irregular rhythm. While negative performance implications have frequently been attributed to arguments based on absorptive capacity, there might be a gap in the literature investigating whether firms with more absorptive capacity are actually more capable to mitigate the negative effects of irregular GARs and PARs.

Absorptive capacity facilitates organizations to more effectively value, assimilate and apply external knowledge (Cohen & Levinthal, 1990). It is comprised of potential and realized absorptive capacity which refer to the acquisition, assimilation, transformation and exploitation of external knowledge (Zahra & George, 2002). While potential absorptive capacity refers to the coordination ability of the firm to acquire and assimilate knowledge, the realized absorptive capacity refers to the exploitation and transformation of knowledge (Jansen, Van den Bosch, & Volberda,

2005). Irregular alliance rhythms primarily cause coordination issues of valuing and assimilating external knowledge for alliances in general (Shi & Prescott, 2012), and thereby developing and maintaining general alliance knowledge. For repeated partnerships, absorptive capacity may facilitate firms' ability to value and assimilate external knowledge about the alliance partner and its trustworthiness. Firms with a stronger absorptive capacity may therefore be more effective in developing and maintaining a trustful alliance relationship with the same partner over time. Therefore, the focus here is on the potential absorptive capacity, hence, coordination ability of the firm.

Empirical evidence indicates that potential absorptive capacity increases responsiveness and the assimilation of external knowledge (Deeds, 2001) and improves the ability of firms to learn (Lieberman, 1984; Sinclair, Klepper, & Cohen, 2000). Essentially, firms feel even more comfortable in engaging in alliances as it encourages firms to form even more R&D alliances (Lavie & Rosenkopf, 2006). Moreover, such an absorptive capacity also refers to a higher in-house ability to manage alliances as it may improve the receptivity to external knowledge learned from alliance partners (Mowery et al., 1996). Around two-thirds of all investments in absorptive capacity are related to the management personnel of the firm (Yanadori & Cui, 2013). Of key importance in alliances are those managers, often referred to as 'boundary spanners', who value, assimilate and apply the external knowledge. This is particularly relevant as in situations of long gaps between alliances and repeated partnerships, for example, as knowledge about the alliance management lifecycle in general and related to a specific partner may decay (Gulati, 1995b).

Due to the significant demands of an irregular GAR and PAR on a firm's absorptive capacity, I hypothesize that firms with higher absorptive capacity in general have the capacity to be able to better manage the demands of irregular rhythms. For PAR this relates to development and maintenance of trust and inter-organizational routines. A higher absorptive capacity translates into more boundary spanners which are then more capable of developing and maintaining both inter-organizational and inter-personal trust between boundary spanners of the organizations. Also, with respect to an irregular GAR, absorptive capacity may facilitate the firm's ability to conserve and absorb general alliance knowledge. Hence,

absorptive capacity may positively moderate the relationship between an irregular PAR/GAR and alliance value creation.

Hypothesis 5: The relationship between an irregular GAR with alliance value creation is positively moderated by firms' absorptive capacity.

Hypothesis 6: The relationship between an irregular PAR with alliance value creation is positively moderated by firms' absorptive capacity.

6.2.3.3 Moderating role of GAE on the effect of GAR and PAR on alliance value creation

As evidenced in Chapter 5 and by previous alliance literature, GAE may have negative impacts onto alliance value creation as it indicates that firms are more overconfident instead of more competent in managing alliances (Heimeriks, 2010). As overconfidence leads to the misattribution of cause and effect and failures are attributed to chance, it seems likely that firms are not capable of understanding the demands of irregular rhythms. Instead, it may even exacerbate the negative impacts of an irregular GAR. As also indicated in Chapter 5, high levels of GAE are also likely to impact relational aspects. Therefore, I expect that such overconfidence likely also has an impact when firms manage an irregular PAR. In such situations of long and short gaps between repeated partnerships, strong efforts by the firm are needed to develop and maintain a trustful partnership (Gulati & Sytch, 2008). Moreover, ad-hoc management and flexibility are essential in demanding situations of managing repeated alliances (Das & Teng, 1998). Due to the overconfidence in GAE, I hypothesize that firms' level of GAE exacerbates the negative effects of irregular GARs and PARs. Thus,

Hypothesis 7: The relationship between an irregular GAR with alliance value creation is negatively moderated by firms' general alliance experience.

Hypothesis 8: The relationship between an irregular PAR with alliance value creation is negatively moderated by firms' general alliance experience.

6.3 Variables and measures

6.3.1 Independent variables first introduced in Chapter 6

Following research of rhythms in other organizational corporate development activities (e.g. Shi & Prescott, 2012; Vermeulen & Barkema, 2002), the *general alliance rhythm (GAR)* and the *partner-specific alliance rhythm (PAR)* are measured through the kurtosis of the general alliance experience or the relational experience of the focal firms, respectively. The kurtosis refers to the distribution of observations similar to the skewness. Due to data availability issues in Medtrack, I choose to evaluate the kurtosis of all alliances the focal firm has managed 10 years prior to the alliance formation. More specifically, the kurtosis is measured as:

$$\text{Kurtosis}= \left\{\frac{n(n+1)}{(n-1)(n-2)(n-3)}\sum\left(\frac{x_i-\bar{x}}{s}\right)^4\right\}-\frac{3(n-1)^2}{(n-2)(n-3)} \quad \textbf{(6)}$$

where n is equal to the number of observations, x_i equals the number of alliances (general or partner-specific) in year i, $\bar{x}$ represents the average number over the period and s refers to the standard deviation. High kurtosis levels indicate peakedness in the tails of the distribution, thus leading to irregular rhythms. Low kurtosis levels on the contrary indicate a more even distribution of alliance experiences accumulated over time.

6.3.2 Measures

Measures for control variables are described in detail in Chapter 3. In order to improve readability, an overview of all the measures used in this chapter is provided in the **Table 6.1** below.

TABLE 6.1: Measures table (Chapter 6)

Variable name	Measures	Data source	Chapter 6
Alliance year(s)	0/1 Binary variable for each year in which the alliance was announced	Medtrack	Control
Non-listed alliance partner	0/1 Binary variable. 1, if partner firm is a non-public partner (private firm, research institute or university), 0 if partner firm is a listed public firm	Compustat	Control
Slack resources	Natural logarithm of cash divided by long-term debt in the year preceding the alliance announcement	Compustat	Independent /Moderating
Firm uncertainty	Volatility in monthly stock prices in the year preceding the alliance announcement	Compustat	Control
Absorptive capacity	R&D expenses divided by net sales in the year preceding the alliance announcement	Compustat	Independent /Moderating
R&D Alliance Type	0/1 Binary variable. 1, if alliance is classified as a contractual R&D alliance, 0 if it is classified as comprising a licensing agreement	Medtrack	Control
International alliance	0/1 Binary variable. 1, if alliance is between two partners which have their HQs in different countries. 0, if HQs are in the same country	Compustat	Control
Relational experience	Number of previous partnerships between focal firm and alliance partner.	Medtrack	Control
General alliance experience (log)	Natural logarithm of total number of alliances of either R&D alliance or licensing agreements the focal firm has managed since its inception	Medtrack	Independent /Moderating
General alliance rhythm (GAR)	Kurtosis of all alliances 10 years prior to the focal alliance	Medtrack	Independent
Partner-specific alliance rhythm (PAR)	Kurtosis of all alliances with the same alliance partner 10 years prior to the focal alliance	Medtrack	Independent

6.4 Analyses and results

6.4.1 Analyses

This chapter combines the use of the subsample of repeated partnerships as used in Chapter 4 and the full sample used in Chapter 5. Separate descriptive statistics (mean and standard deviation) and bivariate correlation tables are provided in **Tables 6.2** and **6.3** for the different samples. Descriptive statistics and bivariate correlations for the full sample are already provided in Chapter 5 with the exception of *GAR* which is added in **Table 6.2**. *GAR* is negatively correlated with *GAE* (-0.30, $p<0.01$). This is not surprising as *GAR*, as the kurtosis is the second-order function of *GAE*. Additionally, both the level of *Slack resources* and *Firm uncertainty* are negatively correlated with *GAE* (-0.37 and -0.43, respectively).

Table 6.3 is based on the subsample of repeated partnerships and can also be found in Chapter 4 with the exception that the sample size decreased from 161 to 154 repeated partnerships as 7 repeated partnerships only involved alliances which had been formed more than 10 years prior to the focal alliance. Additionally, this table includes *PAR*. Similar to *GAR*, *PAR* is also negatively correlated with the underlying number of partnerships (in this case *Relational experience*) (-0.14, $p<0.1$). Following Aiken and West (1991), the variables *Absorptive capacity*, *Slack resources, GAE, GAR* and *PAR* in the moderating variables are mean-centred in order to avoid multi-collinearity issues. Multi-collinearity is checked by investigating the variance inflation factors (VIFs). Both the mean values and individual values are below the critical threshold value of 10 (Kleinbaum et al., 1998).

TABLE 6.2: Descriptive statistics and bivariate correlations (full sample) (Chapter 6)

	Mean	Std.	1	2	3	4	5	6	7	8	9	10
1 CAR	1.65	7.05	1									
2 Absorptive capacity	2.60	12.92	0.06	1								
3 Firm uncertainty	0.17	0.14	0.09 **	0.08 **	1							
4 Slack resources	0.29	1.96	0.11 ***	0.09 **	0.10 ***	1						
5 Non-listed alliance partner	0.51	0.50	-0.14 ***	-0.02	-0.03	-0.03	1					
6 R&D alliance	0.53	0.50	0.01	0.06	-0.02	-0.05	0.07	1				
7 International alliance	0.56	0.50	0.03	0.01	-0.06 **	0.00	-0.10 **	-0.08 *	1			
8 Relational experience	0.48	1.09	0.10 **	-0.05	-0.06	-0.05	-0.22 ***	-0.02	-0.02	1		
9 GAE (log)	3.81	1.38	-0.18 ***	-0.21 ***	-0.43 ***	-0.37 ***	0.09 **	-0.05	0.10 **	0.11 ***	1	
10 General alliance rhythm	0.13	1.80	-0.03	0.00	0.09 **	0.06	-0.01	-0.02	-0.03	-0.05	-0.30 ***	1

N=611

*p<0.1; **p<0.05; ***p<0.01

TABLE 6.3: Descriptive statistics and bivariate correlations (repeated partnerships) (Chapter 6)

	Mean	Std.	1	2	3	4	5	6	7	8	9	10
1 CAR	3.19	10.01	1									
2 Absorptive capacity	1.21	2.13	0.29 ***	1								
3 Firm uncertainty	0.16	0.13	0.27 ***	0.34 ***	1							
4 Slack resources	0.19	1.98	0.00	0.05	0.14 *	1						
5 Non-listed alliance partner	0.31	0.46	-0.04	0.01	0.15 *	-0.02	1					
6 R&D alliance	0.53	0.50	0.11	0.16 **	-0.09	-0.14 *	0.07	1				
7 International alliance	0.55	0.50	-0.07	-0.18 **	-0.11	0.16 **	-0.13	-0.14 *	1			
8 Relational experience	1.86	1.44	0.01	-0.06	-0.07	-0.05	-0.15 *	-0.07	-0.03	1		
9 GAE (log)	3.97	1.28	-0.33 ***	-0.34 ***	-0.47 ***	-0.29 ***	0.05	0.00	0.09	0.17 **	1	
10 Partner-specific alliance rhythm	2.17	3.10	-0.15 *	-0.09	-0.14 *	-0.02	-0.10	0.05	0.06	-0.14 *	0.12	1

N=154

*p<0.1; **p<0.05; ***p<0.01

6.4.2 Results

In **Tables 6.4** and **6.5**, the OLS regression results for estimating alliance value creation based on CAR are presented. In order to improve readability, results for the full sample and the investigation of GAR are provided in **Table 6.4**, while results for PAR are presented in **Table 6.5**. Control variables are provided in Models 1a and 1b, respectively. Model 2a introduces the General alliance experience rhythm (GAR) variable in order to test Hypothesis 1. Hypothesis 2 is then tested in Model 2b where Partner-specific alliance experience rhythm (PAR) is added to the model. Models 3a/b investigates the moderating effect of slack resources on the relationship between GAR/PAR and CAR. The same approach is then followed for testing the moderating impact of absorptive capacity and GAE and its moderating impact on the relationship between PAR and CAR in Models 4a/b and 5a/b, respectively.

TABLE 6.4: OLS regression results (Chapter 6) (full sample)

CAR (in percentage) as dependent variable	MODEL 1a Controls	MODEL 2a GAR	MODEL 3a GAR x Slack	MODEL 4a GAR x Absorptive Capacity	MODEL 5a GAR x GAE
Control variables					
Alliance years (dummies)	n.s.	n.s.	n.s.	n.s.	n.s.
Absorptive capacity	0.012	0.009	0.008	-0.009	0.007
	(.01)	(.01)	(.01)	(.02)	(.01)
Firm uncertainty	1.595	1.376	1.440	1.436	1.080
	(1.99)	(1.91)	(1.93)	(1.91)	(1.9)
Slack resources	0.156	0.135	0.129	0.149	0.139
	(.18)	(.19)	(.18)	(.19)	(.19)
Non-listed alliance partner	-1.370 **	-1.351 **	-1.342 **	-1.329 **	-1.320 **
	(.62)	(.61)	(.6)	(.61)	(.6)
R&D alliance	0.323	0.280	0.281	0.265	0.306
	(.62)	(.61)	(.61)	(.6)	(.61)
International alliance	0.598	0.603	0.614	0.571	0.615
	(.62)	(.63)	(.63)	(.63)	(.63)
Relational experience	0.607 *	0.597 **	0.605 **	0.590 *	0.584 *
	(.32)	(.3)	(.3)	(.3)	(.3)
GAE (log)	-0.747 **	-0.906 **	-0.902 **	-0.912 **	-0.936 **
	(.3)	(.37)	(.37)	(.37)	(.39)
Explanatory variables					
General alliance rhythm (GAR)		-0.333	-0.346 *	-0.318	-0.216
		(.21)	(.2)	(.21)	(.15)
GAR x Slack resources			0.032		
			(.08)		
GAR x Absorptive capacity				-0.012	
				(.01)	
GAR x GAE					0.083
					(.07)
Constant	2.035 *	2.007 *	1.984 *	2.007 *	2.053 *
	(1.19)	(1.19)	(1.18)	(1.19)	(1.19)
N	611	611	611	611	611
F-Statistic	2.27 ***	2.26 ***	2.16 ***	2.63 ***	2.08 ***
R-Square	0.07	0.08	0.08	0.08	0.08
Root MSE	6.90	6.88	6.88	6.88	6.88

*p<0.1; **p<0.05; ***p<0.01

Robust Standard Errors calculated through Huber-White sandwich estimators and firm clustering are in parentheses

TABLE 6.5: OLS regression results (Chapter 6) (repeated partnerships)

CAR (in percentage) as dependent variable	MODEL 1b	MODEL 2b	MODEL 3b	MODEL 4b	MODEL 5b	Model 6b
	Controls	PAR	PAR x Slack	PAR x Absorptive Capacity	PAR x GAE	Full model
Control variables						
Absorptive capacity	0.724	0.704	0.716	0.699	0.679	0.425
	(.83)	(.81)	(.82)	(.7)	(.8)	(.39)
Firm uncertainty	10.545	10.118	10.000	9.722	9.113	9.344
	(7.41)	(7.44)	(7.38)	(7.49)	(7.25)	(7.21)
Slack resources	-0.421	-0.409	-0.455	-0.538	-0.515	-0.699 *
	(.35)	(.35)	(.37)	(.34)	(.38)	(.4)
Non-listed alliance partner	-1.072	-1.332	-1.352	-1.598	-1.278	-1.518
	(1.41)	(1.45)	(1.45)	(1.57)	(1.44)	(1.6)
R&D alliance	1.850	1.961	1.997	1.901	1.804	1.712
	(1.49)	(1.5)	(1.5)	(1.47)	(1.51)	(1.45)
International alliance	0.265	0.295	0.191	0.777	0.503	1.232
	(1.8)	(1.82)	(1.79)	(1.93)	(1.85)	(2.2)
Relational experience	0.473	0.352	0.359	0.435	0.393	0.513
	(.37)	(.37)	(.38)	(.35)	(.36)	(.37)
GAE (log)	-1.925 **	-1.830 **	-1.989 **	-1.740 **	-1.993 **	-2.094 **
	(.76)	(.74)	(.82)	(.72)	(.82)	(.85)
Explanatory variables						
Partner-specific alliance rhythm(PAR)		-0.312 **	-0.283 *	-0.508 ***	-0.378 **	-0.405 *
		(.16)	(.14)	(.17)	(.18)	(.21)
PAR x Slack resources			0.143			0.137
			(.11)			(.11)
PAR x Absorptive capacity				-0.377 **		-0.327 **
				(.17)		(.16)
PAR x GAE					0.188	0.023
					(.15)	(.11)
GAR						-0.369
						(.45)
GAR x Slack resources						-0.134
						(.28)
GAR x Absorptive capacity						-0.167
						(.41)
GAR x GAE						0.715
						(.59)
Constant	1.584	1.812	1.852	1.287	1.583	0.810
	(1.7)	(1.73)	(1.74)	(1.77)	(1.7)	(2.03)
N	154	154	154	154	154	154
F-Statistic	2.41 **	2.46 **	2.24 **	2.49 **	2.52 **	1.82
R-Square	0.17	0.18	0.19	0.20	0.19	0.24
Root MSE	9.35	9.33	9.33	9.24	9.34	9.24

*p<0.1; **p<0.05; ***p<0.01

Robust Standard Errors calculated through Huber-White sandwich estimators and firm clustering are in parentheses

Overall, the r-squares across the models are in line with existing alliance experience literature using CAR as alliance value creation measure and even higher than most (Anand & Khanna, 2000a; Gulati et al., 2009; Merchant & Schendel, 2000). For GAR and the moderating effects the root MSE indicates no substantial changes indicating the insignificance of the variables in the models. For PAR, even though the root MSE is higher due to the lower sample size, the fit is improved. The best fitting model is Model 4b in which PAR is interacted with absorptive capacity.

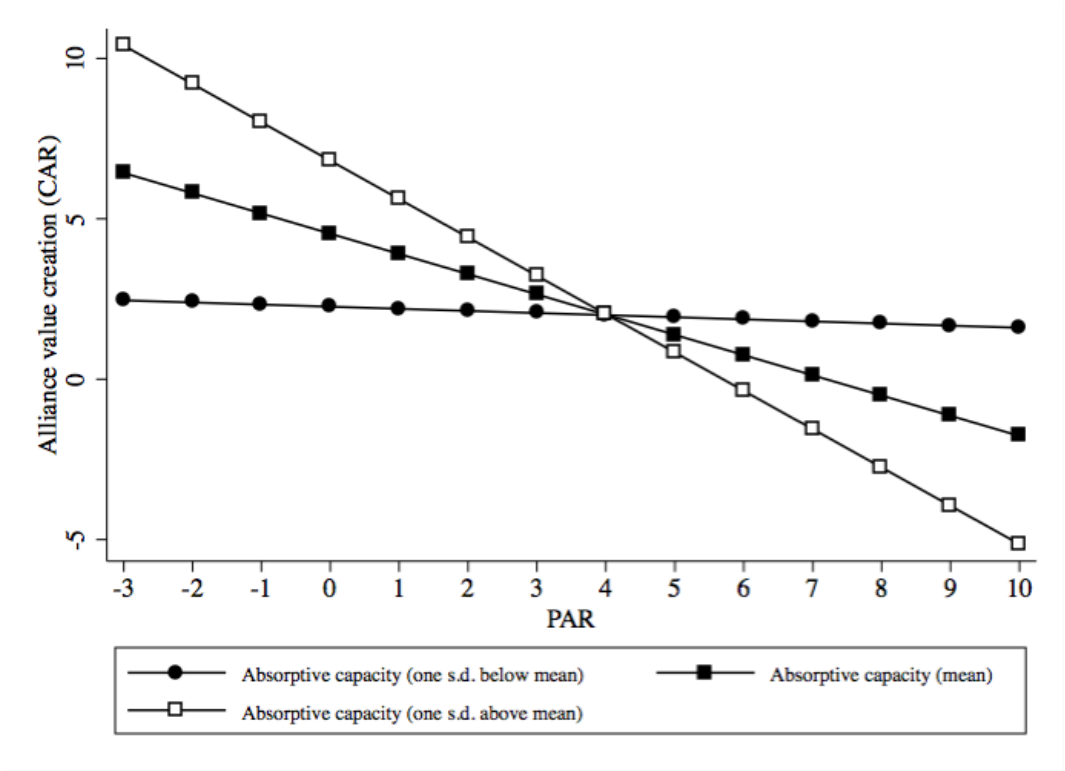
Model 2a indicates that an irregular *GAR* has a non-significant negative effect on alliance value creation (β_{GAR}: -0.33, p-value: 0.11). Hypothesis 1 can therefore not be accepted at the 90% confidence level. This result is however in line with existing literature which have considered both equity and non-equity alliances and could not find empirical evidence for GAR (e.g. Shi & Prescott, 2012). While not explicitly tested in this thesis due the focus on non-equity alliances, the difference in management requirements between equity and non-equity alliances (e.g. Das & Teng, 2000b) does not seem to make the temporal management of alliances in regular rhythms more relevant. On the contrary, support can be found that an irregular *PAR* negatively influences alliance value creation in Model 2b (β_{PAR}: -0.31, p-value: 0.05). This means that a one unit increase in the kurtosis, thus irregularity of *PAR* has a negative impact of 0.31% on alliance value creation. This implies that repeated partnerships with the same partner which are managed in close succession and/or with long gaps in between are valued more negative than repeated partnerships which are developed over time and occur in more regular rhythms. Therefore, Hypothesis 2 can be accepted.

Models 3-5 investigate the firm-level moderating factors for GAR and PAR. Models 3a and 3b test whether *Slack resources* moderate the relationship between an irregular GAR or PAR and alliance value creation, respectively. No statistical evidence can be identified that *Slack resources* moderate the effect of *GAR* onto alliance value creation ($\beta_{GAR\ x\ Slack\ resources}$: 0.032, p-value: 0.7). The same applies to *PAR* ($\beta_{PAR\ x\ Slack\ resources}$: 0.143, p-value: 0.18). This indicates that while slack resources may positively influence an irregular rhythm of either GAR or PAR, this effect is insignificant. Therefore, both Hypotheses 3 and 4 cannot be accepted.

In Models 4a and 4b, the moderating effects of absorptive capacity on the relationship between GAR/PAR and alliance value creation is tested. For GAR, insignificant negative effects are identified ($\beta_{GAR\ x\ Absorptive\ capacity}$: -0.12, p-value: 0.13). Therefore, Hypothesis 5 cannot be accepted. The moderating effect of *Absorptive capacity* on the relationship of *PAR* and *CAR* is also contrary to expectations negative but significant ($\beta_{PAR\ x\ Absorptive\ capacity}$: -0.38, p-value: 0.03). While the null hypothesis that *Absorptive capacity* has no impact on moderating the relationship between PAR and CAR needs to be rejected, Hypothesis 6 cannot be accepted. Instead, the effect is opposite to what was initially expected. Please see **Figure 6.4** below for an interaction graph. This graphical illustration indicates that firms managing an irregular PAR and also have a high absorptive capacity may exacerbate the negative effects of an irregular PAR at high levels. This is surprising as the underlying reasons for an irregular PAR were hypothesized to be related to a neglect of absorptive capacity itself.

Model 5a then investigates whether a firm's GAE may exacerbate the negative effects of an irregular GAR onto alliance value creation. No evidence can be found that GAE moderates the relationship between GAR and Alliance value creation. ($\beta_{GAR\ x\ GAE}$: 0.08, p-value: 0.2). Therefore, Hypothesis 7 is not confirmed. Model 6b tests the impact of the GAE onto the relationship between an irregular PAR and Alliance value creation. A negative moderating relationship had been hypothesized. No support can be found for this ($\beta_{PAR\ x\ GAE}$: 0.18, p-value: 0.2). Therefore, Hypothesis 8 is also not confirmed. Model 6b provides the full model also including the GAR variable. Results for the significance of PAR (β_{PAR}: -0.40, p-value: 0.05) and the interaction of *PAR* with *Absorptive capacity* ($\beta_{PAR\ x\ Absorptive\ capacity}$: -0.32, p-value: 0.05) are significant.

FIGURE 6.4: Two-way interaction graph PAR and absorptive capacity



In contrast to GAR, the results indicate that PAR influences the value created from alliances. As a supplementary analysis for the moderating effects of PAR, I also test whether partnership-specific factors of relationship years, the relationship length, alliance type, and international alliances may either mitigate or exacerbate the negative impact onto alliance value creation from irregular partner-specific rhythms. These are not found to be relevant as moderating factors for the effect of an irregular PAR on value creation. Please see **Appendix 6.1** for OLS regression results.

6.4.3 Robustness checks

Three robustness checks for the main effects of GAR and PAR are conducted. Firstly, additional partnership-specific variables are included as controls to account for (1) *Relationship length* (Continuous variable: number of years since the *first* announced partnership between the two organizations), (2) *Last relationship* (Continuous variable: Number of years since the *last* announced partnership between the two organizations), (3) *Different alliance type* (Binary variable: 1 if previous announced alliance between the two partners was a different alliance type to the focal alliance, 0 if it was the same alliance type). These controls may take into account

whether different partnership characteristics influence the impact of alliance value creation independent of their effect on PAR. Results confirm that PAR holds and can be found in **Appendix 6.2**. This suggests that also despite other critical relationship-factors, maintaining a regular rhythm with the same partner seems important. Secondly, previous chapters are followed by testing whether a subset of the data drives the effect. I therefore randomly delete 10% of the observations and find that the results hold (Lee, 2013). Thirdly, I test whether results also hold in different event windows. I can find evidence that the negative impact of an irregular PAR also impact alliance value creation in other event windows. Please see **Appendix 6.3** for results for event window (-1,+1). For this event window, however, I cannot find any evidence that the effect of absorptive capacity exacerbates this effect in other event windows. Fourthly, I test whether including firm size as a control variable changes the results of the hypotheses. Results hold also when including firm size as a control.

6.5 Discussion

This chapter advances empirical research on alliance experience by investigating an emerging perspective on alliance rhythms (e.g. Shi et al., 2012). As of now, to the best of my knowledge, only few studies on alliance rhythms exist (e.g. Shi & Prescott, 2012), especially considering alliance value creation through stock market evaluations. Building on dyadic alliance research which has divided alliance experience into GAE and relational experience (e.g. Gulati et al., 2009; Zollo et al., 2002), this chapter disentangles alliance rhythms into rhythms of alliances in general and rhythms of alliances with the same partner. This chapter is therefore an attempt to provide further clarity into the alliance value heterogeneity of different types of alliance experience. First and foremost, this chapter introduces and finds evidence for a partner-specific alliance rhythm (PAR) and makes a theoretical distinction from general alliance rhythm (GAR) which has been the focus of the limited prior literature (Shi & Prescott, 2012). Secondly, this chapter identifies how firm-specific as well as partnership-specific moderating variables influence the relationship between GAR/ PAR and value creation.

This chapter finds evidence that the effect of alliance rhythms onto alliance value creation is affected only by rhythms of repeated partnerships, thus PAR. This

hints that the underlying processes of GAE and relational experience may indeed be different. Firstly, the management of alliances in general relies on the development of alliance management processes and institutionalized functions to store and disseminate alliance experiences throughout the organization (Kale et al., 2002). Secondly, managing repeated partnerships with the same alliance partner requires the development and maintenance of trust (e.g. Gulati, 1995a) in addition to the creation of inter-organizational routines between partnering firms to facilitate the knowledge exchange (Zollo et al., 2002). The results indicate that the latter, more tacit processes are more sensitive to temporal dynamics.

Similar to previous studies, this chapter cannot find evidence for significant negative effects of an irregular GAR (Shi & Prescott, 2012). This is even though this thesis focuses exclusively on non-equity alliances which provide greater flexibility in exchange for a loss in control (De Man, 2014). The use of equity supposedly facilitates the management of inter-firm knowledge transfer through aligning alliance objectives (Mowery et al., 1996; Oxley, 1997). This comes at the expense of reduced flexibility which is oftentimes the reason for forming non-equity alliances (Osborn & Hagedoorn, 1997). Contrary to expectations, such non-equity alliances do not place more significant demands on temporal alliance management. This is in line with existing research that equity alliances may provide a perceived feeling of being easier to manage, whereas they are actually not (De Man, 2014). This perception arises from the shared ownership which theoretically aligns the interests and partners may spend fewer resources in building up the relationship. However, both types of alliances are challenging to manage (Das & Teng, 2000b). Thus, no difference seems to be apparent also in their management requirements over time. Moreover, even though investors are influenced by temporal dynamics of corporate activities (Rindova et al., 2010), this chapter identifies that this may not relate to alliances in general.

Furthermore, this chapter is one of the first attempts to investigate the rhythm of repeated partnerships (PAR) and finds that the irregularity of the repeated partnership rhythm does indeed have a negative impact on alliance value creation. The finding that PAR is relevant for firms in their management of strategic alliances might be an important one. While there is some evidence that large gaps between strategic alliances may decrease trust between partnering organizations (Gulati, 1995b), and short gaps may not generate the necessary trust (Gulati & Sytch, 2008) and learning

opportunities about the partner (Mayer & Argyres, 2004), existing literature had not uncovered the importance of keeping gaps between repeated partnerships short while at the same time not accumulating too many repeated partnerships. Such an emphasis on *balance* between repeated partnerships over time adds to the literature and emphasizes the challenges organizations face when developing and maintaining trust between partnering organizations.

Surprisingly, this chapter finds that absorptive capacity exacerbates the negative impacts of an irregular PAR. This is on first sight against expectations but may be explained by findings of existing literature. A strong absorptive capacity essentially refers to the ability of the firm to absorb *new* knowledge (Cohen & Levinthal, 1990). As indicated by Lavie and Rosenkopf (2006) firms which have developed such a strong capacity may be able to digest more new knowledge and assimilate it within the organization. However, importantly this comes at the expense of focusing on internal, local knowledge (Lavie & Rosenkopf, 2006). Therefore, firms which have higher absorptive capacity levels are likely to focus on exploration and the acquisition of external knowledge of other, potentially new alliance partners. Maintaining the relationship with an existing partner may however relate to exploitation. Such exploitative partner-specific processes require commitment to the partnership however (Mohr & Spekman, 1994). Therefore, firms with high levels of absorptive capacity may actually be more committed to tapping into *new* areas which in turn makes them less capable to manage an irregular rhythm with the *same* partner. In the context of the biopharmaceutical industry used in this thesis, this might mean that firms spread their knowledge exploration into several research areas, thereby limiting the commitment to single areas and partners and thereby also increasing demands for organizations. This finding highlights that partner-specific processes are different from the processes required for alliance management in general (Dyer & Singh, 1998)

With the exception of absorptive capacity for the relationship between PAR and alliance value creation, firm-specific factors do not seem to provide an indication how firms can more effectively manage irregular rhythms for both GAR and PAR. There are various reasons why such firm-specific aspects such as organizational slack, absorptive capacity or GAE may have limited impact on explaining the effect of firm's irregular GAR (and also PAR) onto alliance value creation. Firstly, such factors

may not have a direct impact on the alliance management practices. Instead, these factors may provide *potential* inputs to the alliance management, whereas the ability of firms to manage such irregularity depends on the *actual* allocation of resources to the alliance management processes. As indicated by previous research and by results in Chapter 5, the resource allocation process to alliance management may not always be rational and subject to heuristics such as overconfidence (Heimeriks, 2010). Despite their possible impact in mitigating the negative effects of irregular rhythms, such potential inputs may therefore not influence investor valuations. The insignificant findings for these firm-specific moderating factors may therefore also be due to measurement issues. In particular, the measurement of absorptive capacity (Zahra & George, 2002) and organizational slack (Bourgeois, 1981) is particularly controversial. This chapter finds that the *potential* absorptive capacity is insignificant in improving the negative effects of an irregular GAR. Possibly, a better measure for potential absorptive capacity in terms of its impact on GAR may however be the turnover of key boundary spanners in the time between alliances. Such boundary spanners may potentially help to more effectively capture *potential* absorptive capacity. Alternatively, measures for *realized* absorptive capacity such as the alliance capability of the alliance managers involved could help to explain a further factor which might mitigate the negative effects of an irregular PAR and GAR. Regarding slack resources, budgets for alliance management processes might provide a better proxy for potential resources allocated to alliance management even though these are likely not known to investors evaluating the incremental value gains through alliances.

Results indicating that both firm- and partnership-specific factors do not seem to mitigate the effects of an irregular PAR are somewhat surprising. However, literature on trust development and maintenance argues that the effectiveness of repeated partnerships primarily depends on the commitment of the firms to the partnership and not necessarily firm-specific factors (Mohr & Spekman, 1994). Some firms, despite their financial ability, or the absorptive capacity as shown above, may still not commit sufficient resources to an effective trust development or maintenance (Morgan & Shelby, 1994). Therefore, even if firms possess high levels of such firm-specific factors, this does not mean that a lack of familiarity with the partner can be eliminated (Gulati, 1995a). The insignificance of the partnership-specific factors may be related to this argument. For instance, research finds that international alliances are

more challenging to manage (Inkpen & Beamish, 1997). As indicated by recent research, Reuer and Lahiri (2014) find that while international alliances may be an important predictor for alliance formation, there are underlying reasons within each partnership that influence the success or likelihood for additional formations. Additionally, as findings in Chapter 4 indicate, the underlying qualities of previous partnerships may influence the success of those. The insignificant findings for partnership characteristics identified here therefore may suggest that unique partnership characteristics beyond generic firm or partnership factors may influence the significance of an irregular PAR.

This chapter has three specific contributions. Firstly, this chapter contributes to experience studies by adding a further *temporal dimension* to them (Gulati, 1995b; Sampson, 2005; Shi & Prescott, 2012). This may further facilitate improved understanding of the value heterogeneity of alliance experiences (e.g. Anand & Khanna, 2000a; Gulati et al., 2009; Hoang & Rothaermel, 2005; Rothaermel & Deeds, 2006). This chapter provides further insights into the ambiguity arising from existing literature. Studies which have found negative effects of relational experience may actually have uncovered these because the repeated partnerships occurred in an irregular rhythm or because investors valued such repeated alliances lower. Hence, such a temporal measure for repeated partnerships may provide an indication that the *rhythm* is another dimension to the *quality* and the *interrelationship* of previous experiences.

Secondly, this chapter provides an extension to studies which have investigated rhythms by adding a rhythm of activities between partners. Most studies have investigated rhythms investigating distinct strategic actions such as M&A, international expansion or strategic alliances in general (Laamanen & Keil, 2008; Shi & Prescott, 2012; Vermeulen & Barkema, 2002). While rhythms are still a very new phenomenon which is underrepresented in the context of strategic alliance research (Shi et al., 2012), this chapter contributes to the abovementioned few studies by introducing a rhythm not only between distinct *strategic activities* but also between distinct *partners*. Essentially, this also contributes to previous studies on partner-specific processes such as trust (e.g. Gulati, 1995a; Ring & Van de Ven, 1992; Zaheer et al., 1998) by emphasizing that a *balance* of repeated partnerships is most effective.

Thirdly, results of this chapter contribute to abovementioned studies on rhythms by providing an event study methodology. Most studies have used long-term financial indicators for performance. The significance of irregular repeated alliance rhythms on CAR indicates that investors may well be influenced of the timing of strategic activities. As evidence by Rindova et al. (2010) indicates, investors are indeed influenced by the temporal structure of corporate announcements in high ambiguity environments. This study builds on these findings by extending this to the context of alliances in general and repeated partnerships.

More generally, this study has important implications for alliance management as well. Existing literature suggests that organizations form strategic alliances particularly in situations in which they require resources they do not possess (Das & Teng, 2000b; Eisenhardt & Schoonhoven, 1996). Hence, periods of accelerated and high alliance activity can be expected at times when firms lack such critical resources. This chapter suggests that firms need to be careful in such situations as the irregularity may provide additional complexity to the alliance management, particularly if firms manage repeated partnerships. On the contrary irregular rhythms with new alliance partners may not negatively impact alliance value creation. Moreover, this research also finds that firms which are focusing on developing their absorptive capacity may not be able to manage their repeated partnerships as effectively over time.

6.6 Limitations and directions for future research

This chapter is not without limitations. Firstly, this chapter uses the biopharmaceutical industry as a single industry. This industry is particularly dynamic and the impact of such temporal rhythms may also be affected by such industry factors. Due to potential issues of generalizations, future research may explore if the results are also consistent in other industries. Existing research has found that relational experiences are less critical for equity alliances (Zollo et al., 2002). However, future studies may wish to investigate whether negative impacts of a irregular PAR onto value creation also hold for equity agreements which are different in terms of the management requirements. Additionally, the use of CAR as a measure for alliance value creation is not without problems. Despite the fact that it is highly correlated with managers' subjective assessment of alliance performance (Kale et al.,

2002), its use has been criticized due to the inefficiency of the stock market to fully assess long-term performance. However, all measures of alliance performance have their advantages and disadvantages and all measures are essentially approximations to alliance performance (e.g. Kale et al., 2002; Lunnan & Haugland, 2008). As firm- and partnership-level moderating factors do not have a strong impact on the relationship between GAR/PAR and alliance value creation, future research may wish to investigate how other moderating variables impact this relationship. For instance, an industry environment perspective may also influence the impact for firms to engage in irregular PAR. Moreover, while this thesis focuses on value creation implications, the field still lacks an understanding of firm's antecedents to follow particular rhythms and reasons to deviate from them. This may further provide another interesting avenue for future research.

6.7 Robustness check with regard to Chapter 4

In Chapter 4, I had proposed and found evidence for a *perceived quality* dimension of relational experiences. Furthermore, in Chapters 5 and 6, I had identified the *interrelated* and *temporal* dimension of how alliance experiences are accumulated. Findings provide support that both high levels of GAE as well as the irregularity of PAR negatively impact firms' ability to create value from relational experiences. While all three chapters test different dimensions of alliance experience, the quality dimension as identified in Chapter 4 may also be considered as an outcome of the interrelated and temporal dimension of alliance experience. Consequently, the significance of the interrelated and the temporal dimension essentially imply that they are likely to influence the quality dimension itself. Therefore, as a further robustness check to the identification of this quality dimension, a logit model is run which tests whether the irregularity of PAR and the extent of GAE influence the likelihood of a quality dimension being signalled to investors. Results indicate that indeed the *interrelated* as well as the *temporal* dimension negatively impact the likelihood of firms sending a signal of relational experience quality to the market (Please see **Table 6.6**).

TABLE 6.6: Logit model as robustness check for relational experience quality dimension

Relational experience signal as dependent variable	
Logit model	
Control variables	
Absorptive capacity	0.161
	(.1)
Firm uncertainty	-1.139
	(1.87)
Slack resources	-0.118
	(.11)
Non-listed alliance partner	0.639
	(.43)
R&D alliance	0.585
	(.41)
International alliance	0.565
	(.41)
Relational experience	-0.138
	(.2)
Total relationship years	-0.003
	(.08)
Last relationship	-0.215 *
	(.12)
Different alliance type	-0.466
	(.4)
Explanatory variables	
GAE (log)	-0.380 **
	(.19)
Partner-specific alliance rhythm(PAR)	-0.158 **
	(.08)
Constant	-0.521
	(.66)
N	154
Chi-square	28.49 ***
R-Square	0.15

*p<0.1; **p<0.05; ***p<0.01

This provides further support to the quality dimension as the other two dimensions are found to negatively impact the likelihood of sending a signal of higher quality repeated partnerships. This may indicate that both the *interrelated* as well as the *temporal* dimension are important contributors to the *perceived quality* of the repeated partnership and hints that all three dimensions in combination are essential to explaining the significant heterogeneity in how firms create value from previous

alliance experiences. (please see **Figures 6.5** and **6.6** below for a graphical illustration).

FIGURE 6.5: Predicted probabilities of GAE onto Relational experience signal

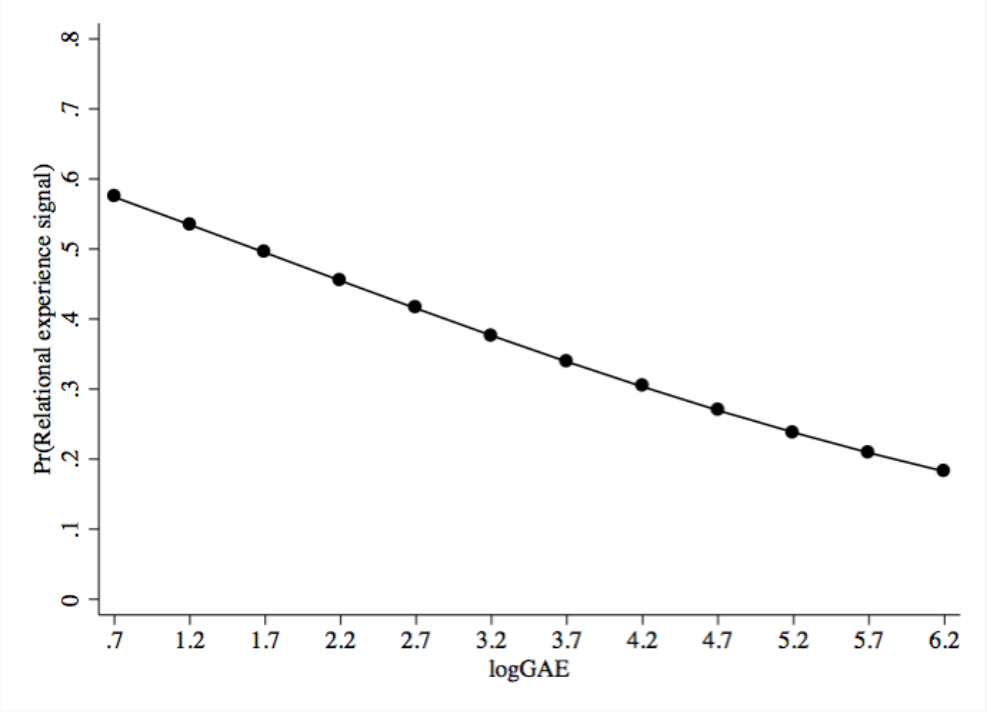
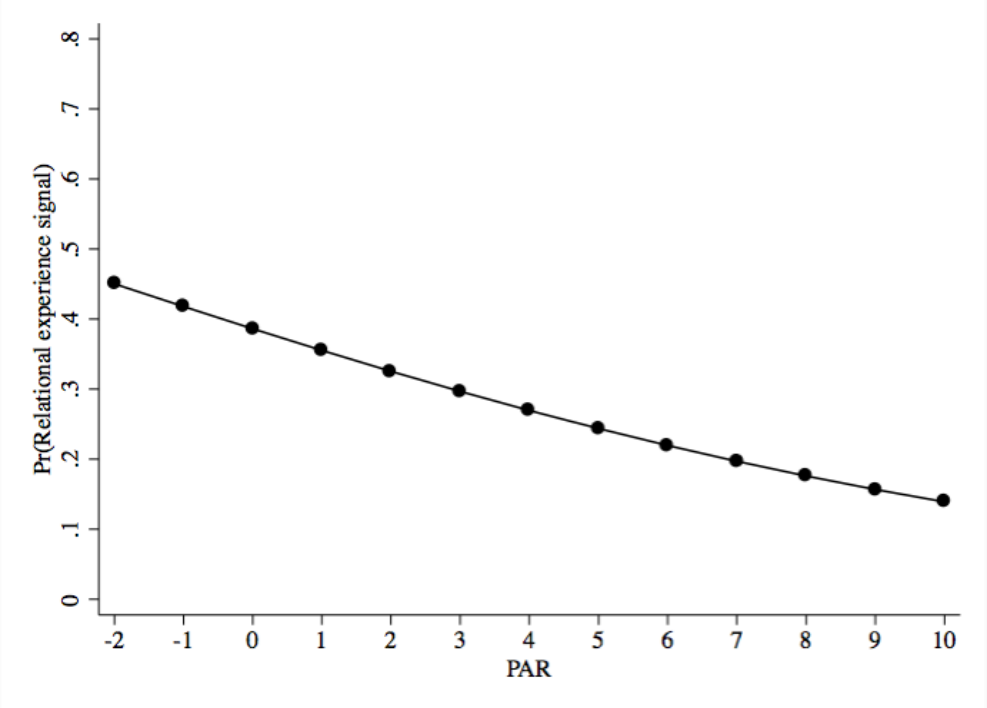


FIGURE 6.6: Predicted probabilities of PAR onto Relational experience signal



CHAPTER 7: DISCUSSION AND CONCLUSION

This thesis advances the strategy field by further investigating alliance experience as an antecedent to value creation. The overarching finding of the thesis is that the effect of alliance experience value creation is influenced by various general alliance and relational experience dimensions. Existing research finds contradictory results as to whether GAE or relational experience actually improve alliance value creation (e.g. Anand & Khanna, 2000a; Goerzen, 2007; Gulati et al., 2009; Hoang & Rothaermel, 2005; Zollo et al., 2002) and can thus be regarded as antecedents to firm-level alliance or dyad-level relational capabilities, respectively. This thesis finds evidence that in order for alliance experiences to create value, the *perceived quality*, the *interrelationship* among the two types of experience and the *temporal rhythms* of alliance experiences are essential.

Firstly, partnerships which include a signal of the previous relationship *quality* with the same alliance partner are valued more positively by investors than alliances which do not include such signals (Chapter 4). This finding indicates that investors believe these partnerships to be superior and perceive that relational capabilities arising from trust and inter-organizational routines may have been generated between partners in the previous partnership. Therefore, through executives' sending of such signals, investors may perceive the quality of the previous partnership as an indication for a more effective repeated focal alliance between the two partners. While the signaller, receiver, and partnership characteristics do not influence the effect of the signal, financial analysts as intermediaries are particularly relevant in influencing the effect of these quality signals.

Secondly, the extent of firm-level GAE influences firms' ability to generate value from dyad-level relational experience (Chapter 5). Findings indicate that investors do not feel convinced that firms can create value from relational experiences when they have accumulated high levels of GAE as well. This builds on and extends existing studies which have found that high levels of GAE facilitate overconfidence in firm-level alliance (e.g. Heimeriks, 2010) or other corporate development activities (e.g. Mulotte et al., 2013). Directly contributing to these studies, this thesis indicates that the overconfidence effect is exacerbated under conditions of firm-level uncertainty. Research in psychology and OL indicates that overconfidence derives directly from uncertainty (Levitt & March, 1988; Tversky & Kahneman, 1974) and

may lead to further exacerbation of a firms' overconfidence in general alliance processes and thereby undermines the development of relational capabilities from relational experiences.

Thirdly, the *rhythm* in which firms accumulate dyad-level relational experiences but not GAE significantly influences firms' ability to generate value from alliances (Chapter 6). This finding indicates that repeated partnerships need to be timed in regular rhythms or firms may not be able to effectively develop dyad-level relational capabilities. Moreover, this chapter also finds that the negative effects of irregular partner-specific rhythms are exacerbated when firms have high levels of absorptive capacity indicating that exploration activities as facilitated by absorptive capacity negatively impacts exploitation activities of managing partnerships with existing partners.

The findings of these chapters have several distinct contributions to the strategic alliance field but also some overarching contributions to the field of strategic management in general. Foremost, all three empirical chapters highlight that experience accumulation matters in explaining firm heterogeneity in alliance value creation. As alliance experience is an important antecedent to alliance capabilities (Anand & Khanna, 2000a; Kale et al., 2002; Kale & Singh, 2009; Wang & Rajagopalan, 2015), the different dimensions may therefore indicate that the way alliance experiences are accumulated is more important than expected. While heterogeneity in value creation from alliance experience has been recognized, existing research has focused on identifying various firm and external characteristics that influence firms' ability to benefit from alliance experience, such as firm-level uncertainty or alliance types (Gulati et al., 2009; Gulati & Sytch, 2008; Hoang & Rothaermel, 2005; Zollo et al., 2002). While these studies have contributed to the improved understanding of the role of alliance experience, this thesis contributes to this line of reasoning by further investigating the alliance experiences themselves through the perceived quality of previous experiences, the context in which they occur and the timing of them.

By introducing a quality dimension of relational experiences, the interrelationship among firm-level alliance and dyad-level relational experiences, as well as a temporal dimension, this thesis contributes to the abovementioned studies

which have called for more fine grained analyses of alliance experience. The chosen dimensions build on "alternative learning mechanisms (…) beyond the well-known "learning-by-doing" processes" (Zollo et al., 2002: 709) and provide a more effective explanation than the differentiation into count-based experience or type dimensions used in existing literature so far. This builds on and contributes to studies which have identified that learning from experience requires interpretation of experience and is therefore subject to both internal and external influences which can impact the effectiveness of experiences (Levitt & March, 1988). This thesis provides various dimensions which may impact the interpretability of previous alliance experience. The interrelationship dimension provides an indication that other types of experiences can influence the ability to benefit from experience as also indicated by recent research (e.g. Mulotte et al., 2013). Additionally, the timing may have negative influences on benefiting from experience, while the quality dimension provides an outcome dimension of previous experiences.

Furthermore, these findings also contribute to the field of capability development for firms. The differences observed in alliance value creation may indicate that the development of alliance capabilities hinges on different dimensions of alliance experience accumulation. Therefore, this thesis contributes to studies which have emphasized the importance of experience in developing capabilities (e.g. Helfat & Peteraf, 2003; Montealegre, 2002; Nelson & Winter, 1982; Winter, 2000; Zollo & Winter, 2002). Previous studies have primarily focused on identifying mechanisms that improve the effectiveness of utilizing experience in the organization, for instance, by institutionalizing mechanisms (Crossan et al., 1999; Helfat & Peteraf, 2003; Zollo & Winter, 2002). However, this thesis contributes to those studies by finding that the way experiences are actually accumulated may also be important for capability development.

Thereby, this thesis also contributes directly to studies in the strategic management field which have investigated contingency effects in performance studies (e.g. Contractor, 2012). More specifically, this thesis finds that firm-level alliance experiences may impact the value creation effect of dyad-level relational experiences. This contributes to studies which have investigated experience and their effect on performance in other fields and *across* activities in so-called spill-overs (e.g. Mulotte et al., 2013; Zollo & Reuer, 2010). This study finds that such spill-overs may also

occur *within* activities. Thus, experience in one area may need to be considered with experience in other related fields in order to fully understand the value creating effect and possibly the impact for developing capabilities.

By investigating different types of alliance rhythms (Chapter 6), this thesis also contributes to studies which have used a temporal perspective in both the field of strategic alliances and more generally in the strategic management field. In the field of alliances, studies have primarily investigated learning (Hamel, 1991), sequences (Shi & Prescott, 2011), speed (Al-Laham et al., 2008), frequency (Standifer & Bluedorn, 2006), timing (Oxley & Sampson, 2004) and most recently rhythms (Shi & Prescott, 2012). While temporal research has for many decades been considered as "peripheral" (Ancona et al., 2001a: 645), there is a growing interest in temporal strategic management research (e.g. Ancona et al., 2001a; Ancona et al., 2001b; Laamanen & Keil, 2008; Shi & Prescott, 2011; Shi & Prescott, 2012; Shi et al., 2012). In line with that, this thesis builds on studies which have found that investors are influenced by such temporal aspects (e.g. Rindova et al., 2010), one of the first which finds evidence for the impact of rhythm irregularity on investor valuations. Based on earlier results which find long-term performance impacts of such irregular rhythms, this finding is in line with the market efficiency arguments that investors are effective in utilizing publicly available information to predict the impact of irregularity in strategic alliances onto performance (Fama et al., 1969).

This thesis also contributes to existing strategy research which has used a signalling perspective (Bergh et al., 2014; Connelly et al., 2011). Signalling theory differentiates directly between *high* quality and *low* quality announcers and thereby identifies an effective separating equilibrium between signallers and receivers. Therefore, it has been applied in many contexts in which quality is essential, such as amongst others in the second-hand car market (Akerlof, 1970), among job market candidates (Spence, 1973), for alliance partner choice (Stuart, 2000) or among entrepreneurial firms seeking financing from external investors (Janney & Folta, 2006; Ragozzino & Reuer, 2011). This thesis essentially provides a way to differentiate between potentially *low* quality and *high* quality previous partnerships.

Building on this, findings of this thesis also contribute methodologically to the field of strategic alliance experience. As indicated and called for by previous studies,

it is essential to notice that the quantity of previous experiences may not be sufficient as it provides only "course-grained" indications (Hoang & Rothaermel, 2005: 343). By investigating whether previous repeated partnerships have been successful (Quality dimension), the spill-over effect of overconfidence in firm-level alliance experience and dyad-level relational experiences (Interrelationship dimension), and the rhythm of both alliance and relational experiences (Temporal dimension), this thesis answers calls for studies measuring the "*quality* of collaborations" (Hoang & Rothaermel, 2005: 343) and the "actual nature of interaction" (Gulati et al., 2009: 1228) instead of only considering "*quantity*" of previous collaborations (Hoang & Rothaermel, 2005: 343).

This thesis also has significant managerial implications. Findings indicate that investors react significantly to various aspects of alliance experience. Thus, their sensitivity to firm-specific alliance aspects is high. This has multiple implications for managers. Firstly, this thesis indicates that experiences are not simply cumulative but instead depend on various contingencies. Managers therefore need to take the various contingencies into account in order to create the most value from their alliances. Secondly, the finding that investors react to alliance-specific factors indicates that the way investors are presented alliance-specific information may influence their value creation impact. Apart from references to the previous partnership quality, no references to the timing within the investigated press releases can be found. As the communication between firms and investors also occurs in other settings, future research may therefore wish to examine whether firms conduct impression management in conference calls or other information material to investors. As these have been shown to actively influence investors (e.g. Kimbrough & Louis, 2011), this may provide a fruitful avenue for future research.

This thesis provides another important step to improving the understanding of the value creation effects of alliance experience. It emphasizes that alliance experience is critical for firms to create more alliance value than others. Future research may wish to examine the underlying processes in more detail. Multiple longitudinal case studies may be an option for this. Additionally, while this thesis has identified quality indicators of relational experiences, we are still lacking a similar quality indicator for general alliance experience besides the recency of experience (e.g. Sampson, 2005). Future research may wish to continue along this line of research and identify other

dimensions, particularly for general alliance experience, which may help to explain the heterogeneity in value created as observed in existing literature. Additionally, while this thesis focuses on the short-term value creation which has been found to be highly correlated to long-term value creation (e.g. Kale et al., 2002), future research may wish to investigate whether the effects also holds for longer timeframes. Moreover, research may also investigate whether findings are generalizable in other contexts as well. Even though, industry-specific factors do not seem to be relevant in the effect of alliance experience onto value creation (e.g. Gulati et al., 2009), the various dimensions of experience may well differ in their effect onto value creation.

APPENDICES

Appendices Chapter 2

APPENDIX 2.1: Empirical studies on the effect of General alliance experience on performance

Author(s)	Journal	Industry and timeframe	Alliance Types	Dependent variable	Key Findings
Anand & Khanna (2000)	Strategic Management Journal	Manufacturing industry	Equity and Non-Equity	Cumulative abnormal stock market return	Positive learning effects for strategic alliances in general; Ambiguous contexts (research) make learning effect stronger more positive than less ambiguous ones (marketing)
Sampson (2005)	Strategic Management Journal	Telecommunications industry between 1991 and 1993	Contractual alliances	Citation weighted patent counts	Positive learning effects, however declining marginal effects. The *presence* of experience matters more than the *extent*
Hoang & Rothaermel (2005)	Academy of Management Journal	Biopharmaceutical industry between 1980 and 2000	Equity and non-equity alliances	Joint R&D project performance	Learning effect positive; depends on *firm size*. Diminishing marginal effects
Reuer & Zollo (2005)	Research Policy	Biopharmaceutical industry between 1982 and 1994	Equity and non-equity alliances	Managerial assessment of alliance termination outcomes	Negative effects of general alliance experience on favourability of termination outcomes
Gulati, Lavie & Singh (2009)	Strategic Management Journal	Multi-industry between 1987 and 1996	Joint ventures	Cumulative abnormal stock market return	Non-positive effect of GAE
Zollo, Reuer & Singh (2002)	Organization Science	Biopharmaceutical industry between 1982 and 1994	Equity and non-equity alliances	Managerial satisfaction with alliance outcome	Negative effects of GAE
Zollo & Reuer (2010)	Organization Science	Survey of US Commercial banking industry in 1996	N/A	Accounting (Changes in ROA) Financial (Abnormal return over 3 years)	Inverted u-shape. GAE can have negative effects on M&A performance when M&A is integrated in more aggressive approaches

Author(s)	Journal	Industry and timeframe	Alliance Types	Dependent variable	Key Findings
Barkema, Shenkar, Vermeulen, Bell (1997)	Academy of Management Journal	Multi-industry of 25 largest Dutch multinationals between 1966 and 1994	Joint ventures	Duration of alliance	Positive effect of GAE for domestic JVs, negative effects for international JVs
Merchant & Schendel (2000)	Strategic Management Journal	Multi-industry of US and non-US between 1986 and 1990	Joint ventures	Cumulative abnormal stock market return	Non-positive effect of GAE
Pangarkar (2003)	Long Range Planning	Sample of biopharmaceutical industry between 1980 and 1996	Equity and non-equity alliances	Long-lasting (above median) and short-lasting alliances	If both partners have GAE, then positive effects on performance
Heimeriks & Duysters (2007)	Journal of Management Studies	Sample of global multi-industry firms	Equity and non-equity alliances	Managerial satisfaction with alliance outcome	Positive effects of GAE, partially mediates by alliance capabilities
Hoang & Rothaermel (2010)	Strategic Management Journal	Biopharmaceutical industry between 1980 and 2000	Equity and non-equity alliances	Joint R&D project performance	Positive effects of GAE for exploitative alliances, negative effects of GAE for explorative alliances

APPENDIX 2.2: Empirical studies on the effect of relational experience on performance

Author(s)	Journal	Industry and timeframe	Alliance Types	Dependent variable	Key Findings
Park & Kim (1997)	Journal of Business Venturing	Electronics industry between 1979 and 1988	Joint Ventures	Cumulative abnormal stock market return	Negative effects of relational experience, however, significantly lower for **larger** firms
Zollo, Reuer & Singh (2002)	Organization Science	Biopharmaceutical industry between 1982 and 1994	Equity and non-equity alliances	Managerial satisfaction with alliance outcome	Positive effects of relational experience, however, negative effects for equity alliances
Hoang & Rothaermel (2005)	Academy of Management Journal	Biopharmaceutical industry between 1980 and 2000	Equity and non-equity alliances	Joint R&D project performance	Negative effects of relational experience
Reuer & Zollo (2005)	Research Policy	Biopharmaceutical industry between 1982 and 1994	Equity and non-equity alliances	Managerial assessment of alliance termination outcomes	Positive effects of relational experience, however, negative for equity alliances
Goerzen (2007)	Strategic Management Journal	1999 survey of 580 Japanese cross-industry firms	Equity alliances	Firm economic performance (operating return on sales, return on assets, and operating return on capital)	Negative effects of relational experience
Gulati, Lavie & Singh (2009)	Strategic Management Journal	Multi-industry between 1987 and 1996	Joint ventures	Cumulative abnormal stock market return	Positive effects of relational experience, more positive in uncertain environments, for firms with more technological and financial resources
Li, Eden, Hitt & Ireland (2008)	Academy of Management Journal	High-tech industry between 1994 and 2003	R&D alliances	Partner selection	Firms more likely to select "Friends" (Relational experiences > =2) than "strangers" (Relational experience=0). However, "strangers" more likely than "acquaintances" (Relational experiences =1).
Pangarkar (2003)	Long Range Planning	Sample of biopharmaceutical industry between 1980 and 1996	Equity and non-equity alliances	Long-lasting (above median) and short-lasting alliances	Non-significant negative effects of relational experiences

APPENDIX 2.3: Empirical studies on the effect of alliance management mechanisms on performance

Author(s)	Journal	Industry and timeframe	Alliance Types	Dependent variable	Key Findings
Kale, Dyer & Singh (2002)	Strategic Management Journal	Survey of computers, pharmaceuticals, chemicals, electronics and services of executives between 1993 and 1998	Equity and non-equity alliances	1) Cumulative abnormal stock market return 2) Managerial satisfaction with alliance outcome	Positive effect on 1) CAR and 2) Managerial satisfaction
Hoffmann (2005)	Long Range Planning	Survey of global multi-industry MNCs	Equity and non-equity alliances	n.a.	Almost all sampled firms have institutionalized alliance functions at the corporate level (>80%); Importance of alliance managers
Heimeriks (2010)	Long Range Planning	Survey of global MNCs	Equity and non-equity alliances	Managerial satisfaction with alliance outcome	Firms with high levels of GAE have higher levels of alliance institutionalizations Alliance institutionalizing mechanisms have no direct effect on alliance performance. However, institutionalizing mechanisms have a negative impact if a firm has high levels of alliance experience. Firms benefit most of institutionalizing at low levels of alliance experience
Heimeriks & Duysters (2007)	Journal of Management Studies	Survey of global MNCs	Equity and non-equity alliances	Managerial satisfaction with alliance outcome	Institutionalized alliance function positively mediates the effect of GAE on alliance performance
Simonin (1997)	Academy of Management Journal	Survey of global MNCs	Equity and non-equity alliances	Managerial assessments of tangible and intangible outcomes of alliances	GAE by itself does not improve alliance performance. Instead, the mechanisms in an institutionalized alliance function moderate the effects of GAE on alliance performance
Heimeriks (2007)	Strategic Organization	Survey of global MNCs	Equity and non-equity alliances	Managerial satisfaction with alliance outcome	Institutionalizing functions more common at high levels of GAE, lower performance effects at high levels of GAE

Appendices Chapter 4

APPENDIX 4.1: Daily abnormal returns and event study statistics

Day relative to announcement	Daily abnormal returns	Percentage of positive abnormal returns
-10	0.03	0.50
-9	-0.07	0.50
-8	0.15	0.49
-7	-0.01	0.45 *
-6	0.06	0.48
-5	-0.12	0.50
-4	-0.02	0.43
-3	-0.13	0.46
-2	0.40	0.51
-1	0.59 **	0.50
0	**2.47** ***	**0.68** ***
1	-0.21	0.46
2	0.03	0.44 *
3	0.13	0.55 **
4	-0.26	0.46
5	-0.06	0.47
6	-0.06	0.48
7	-0.07	0.50
8	0.16	0.52
9	0.14	0.47
10	0.22 **	0.55 **

Patell Z: *p<0.1; **p<0.05; ***p<0.01
Market model equally-weighted index
Repeated Partnerships (N=161)

APPENDIX 4.2: Repeated partnerships event windows

Repeated Partnerships		
Days	**CAR**	**Percentage of positive returns**
(-10,-2)	0.29	51.55%
(-1,0)	**3.06** ***	**66.46%**
(-1, +1)	2.85 ***	61.49%
(-2, +2)	3.28 ***	59.63%
(-3, +3)	3.28 ***	64.60%
(+2, +10)	0.22	49.07%
N	161	

*p<0.1; **p<0.05; ***p<0.01

APPENDIX 4.3: Alternative event window

CAR (in percentage) as dependent variable Event window (-1,+1)	**MODEL 1** **Relational Experience**	**MODEL 2** **Financial Analysts**
Control variables		
Alliance years (dummies)	n.s.	n.s.
Absorptive capacity	0.898	0.915
	(.83)	(.82)
Firm uncertainty	8.320	8.633
	(6.72)	(6.81)
Slack resources	-0.437	-0.535
	(.38)	(.41)
Non-listed alliance partner	-3.180 *	-2.847 *
	(1.8)	(1.66)
R&D alliance	0.584	0.444
	(1.47)	(1.45)
International alliance	-0.988	-0.837
	(1.62)	(1.64)
Relational experience	-0.432	-0.524
	(.68)	(.72)
GAE (log)	-1.829 **	-1.772 **
	(.85)	(.84)
Explanatory variables		
Relational experience signal	3.259 *	3.538 *
	(1.89)	(2.)
Financial analysts		0.053
		(.05)
Relational experience signal x Financial analysts		-0.281
		(.19)
Constant	9.930 *	10.115 *
	(5.86)	(5.95)
N	161	161
F-Statistic	1.84 **	2.18 ***
R-Square	0.22	0.24
Root MSE	9.57	9.53

*p<0.1; **p<0.05; ***p<0.01

Robust Standard Errors calculated through Huber-White sandwich estimators and firm clustering are in parentheses

Appendices Chapter 5

APPENDIX 5.1: Daily abnormal returns and event study statistics

Day relative to announcement	Daily abnormal returns	Percentage of positive abnormal returns
-10	-0.12	0.47
-9	0.06	0.51 *
-8	0.20 **	0.50
-7	-0.11	0.45
-6	-0.01	0.45 *
-5	0.10 *	0.49
-4	0.03	0.46
-3	-0.03	0.50
-2	0.06	0.48
-1	0.13 **	0.47
0	**1.53** ***	**0.57** ***
1	-0.07	0.45 *
2	-0.13	0.47
3	-0.07	0.51 *
4	-0.04	0.47
5	0.11	0.49
6	0.01	0.49
7	-0.02	0.49
8	-0.01	0.47
9	-0.08 *	0.43 **
10	0.17 *	0.51 **

Patell Z Test: *p<0.1; **p<0.05; ***p<0.01

Market model equal-weighted

Full sample (N=611)

APPENDIX 5.2: Event windows repeated partnerships

Full sample		
Days	**CAR**	**Percentage of positive returns**
(-10,-2)	0.18	49.43%
(-1,0)	**1.65** ***	**56.96%**
(-1, +1)	1.58 ***	55.97%
(-2, +2)	1.51 ***	53.52%
(-3, +3)	1.40 ***	54.34%
(+2, +10)	-0.07	45.99%
N	611	

*p<0.1; **p<0.05; ***p<0.01

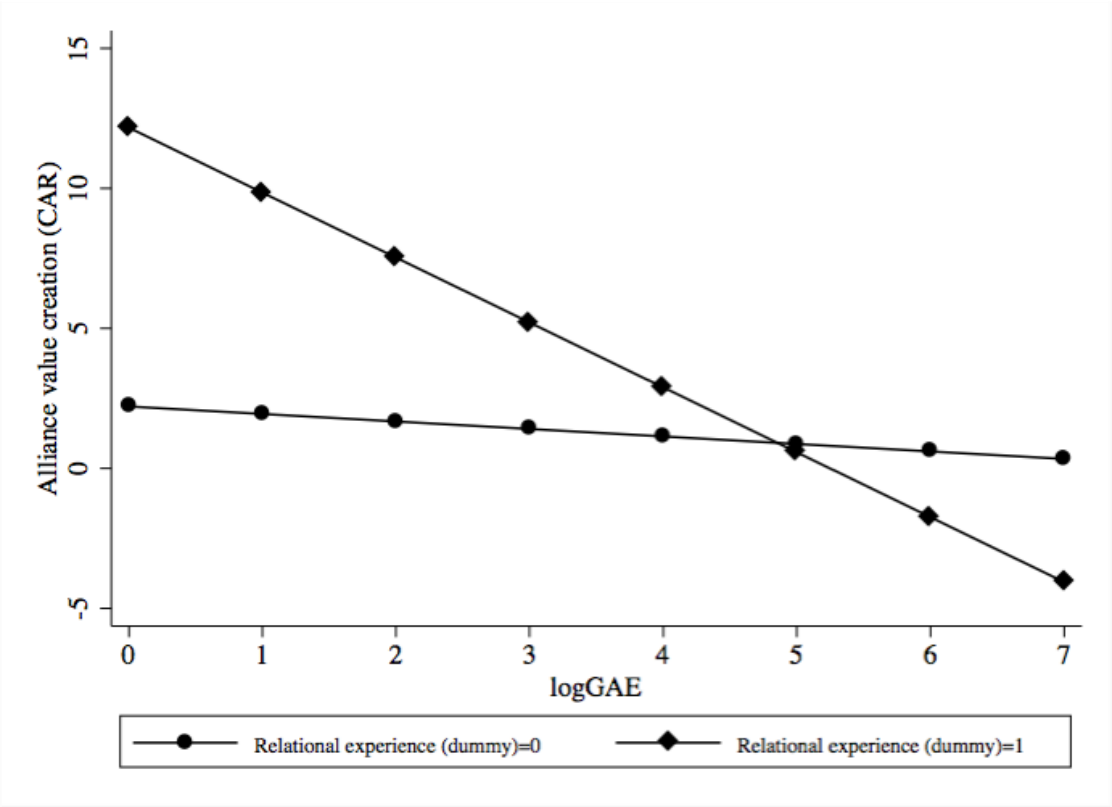
APPENDIX 5.3: OLS interaction GAE x Relational experience (dummy)

CAR (in percentage) as dependent variable	**MODEL 1**
	GAE x Relational experience (Dummy)
Control variables	
Alliance years (dummies)	n.s.
Absorptive capacity	0.022 **
	(.01)
Firm uncertainty	1.527
	(1.89)
Slack resources	0.177
	(.17)
Non-listed alliance partner	-1.359 **
	(.58)
R&D alliance	0.339
	(.59)
International alliance	0.558
	(.6)
Relational experience (Dummy)	2.132 **
	(1.02)
GAE (log)	-0.268
	(.21)
Explanatory variables	
GAE (log) x Relational experience (Dummy)	-2.050 **
	(.95)
Constant	1.804
	(1.16)
N	611
F-Statistic	2.06 ***
R-Square	0.10
Root MSE	6.79

*p<0.1; **p<0.05; ***p<0.01

Robust Standard Errors calculated through Huber-White sandwich estimators and firm clustering are in parentheses

APPENDIX 5.4: Two-way interaction graph GAE x Relational experience (dummy)



APPENDIX 5.5: OLS regression GAE (last 3 years)

CAR (in percentage) as dependent variable	MODEL 1	MODEL 3	MODEL 4	MODEL 5	MODEL 6
	GAE	GAE x Relational experience signal	GAE x Relational experience	GAE x Relational x FLU	GAE x Relational experience x AMM
Control variables					
Alliance Year 2004	-0.568	-0.836	-0.616	-0.821	-0.981
	(1.25)	(1.35)	(1.26)	(1.3)	(1.31)
Alliance Year 2005	-0.492	-0.982	-0.850	-1.030	-1.263
	(1.52)	(1.51)	(1.53)	(1.59)	(1.53)
Alliance Year 2006	-1.889 *	-2.014 *	-1.743	-2.073 *	-2.046 *
	(1.07)	(1.1)	(1.05)	(1.24)	(1.12)
Alliance Year 2007	-0.270	-0.322	-0.283	-0.653	-0.681
	(1.33)	(1.34)	(1.33)	(1.5)	(1.33)
Alliance Year 2008	0.019	-0.053	0.182	-0.208	-0.029
	(1.79)	(1.6)	(1.79)	(1.77)	(1.77)
Alliance Year 2009	-2.188 *	-2.438 **	-2.288 *	-2.684 *	-2.655 *
	(1.24)	(1.21)	(1.19)	(1.28)	(1.25)
Alliance Year 2010	-0.809	-1.069	-0.992	-1.222	-1.551
	(1.28)	(1.28)	(1.28)	(1.37)	(1.4)
Alliance Year 2011	-1.201	-1.457	-1.273	-1.869	-1.616
	(1.08)	(1.07)	(1.1)	(1.31)	(1.17)
Alliance Year 2012	-1.870	-1.697	-1.886	-2.193 *	-2.202 *
	(1.16)	(1.16)	(1.15)	(1.26)	(1.19)
Absorptive capacity	0.010	0.017	0.018 *	0.017 *	0.016 *
	(.01)	(.01)	(.01)	(.01)	(.01)
Firm uncertainty	1.574	1.393	1.072	0.065	0.821
	(2.03)	(1.8)	(1.96)	(2.38)	(1.92)
Slack resources	0.184	0.189	0.211	0.184	0.240
	(.18)	(.17)	(.17)	(.17)	(.16)
Non-listed alliance partner	-1.334 **	-1.273 **	-1.226 **	-1.337 **	-1.269 **
	(.62)	(.57)	(.6)	(.61)	(.58)
R&D alliance	0.292	0.156	0.291	0.296	0.126
	(.62)	(.53)	(.59)	(.57)	(.54)
International alliance	0.620	0.519	0.620	0.648	0.686
	(.6)	(.56)	(.58)	(.58)	(.56)
Relational experience	0.619 *	0.215	1.278 ***	0.981 **	1.646 ***
	(.32)	(.27)	(.41)	(.39)	(.48)
GAE (log) last 3 years	-0.834 **	-0.508 *	-1.008 ***	-1.084 **	-1.764 ***
	(.35)	(.3)	(.37)	(.46)	(.57)
Explanatory variables					
Relational experience signal		4.372 **			
		(1.67)			
GAE (log) last 3 years x Relational experience signal		-4.034 *			
		(2.3)			
GAE (log) last 3 years x Relational experience			-1.113 ***	-1.012 *	-2.018 ***
			(.39)	(.59)	(.69)
Relational experience x FLU				3.302	
				(3.79)	
GAE (log) last 3 years x FLU				-2.876	
				(3.35)	
GAE (log) last 3 years x Relational experience x FLU				-3.943	
				(5.22)	
Alliance management mechanisms (AMM)					-0.035
					(.62)
Relational experience x AMM					-1.243
					(.94)
GAE (log) last 3 years x AMM					1.323 **
					(.58)
GAE (log) last 3 years x Relational experience x AMM					1.774 **
					(.85)
Constant	2.586 *	2.425 *	2.730 **	2.877 **	2.837 **
	(1.21)	(1.24)	(1.21)	(1.21)	(1.18)
N	611	611	611	611	611
F-Statistic	2.27 ***	2.68 ***	2.78 ***	2.8 ***	2.61 ***
R-Square	0.07	0.13	0.10	0.11	0.12
Root MSE	6.89	6.69	6.81	6.78	6.75

*p<0.1; **p<0.05; ***p<0.01

Robust Standard Errors calculated through Huber-White sandwich estimators and firm clustering are in parentheses

APPENDIX 5.6: OLS regression alternative event window

CAR (in percentage) as dependent variable	**MODEL 1**	**MODEL 2**	**MODEL 3**	**MODEL 4**
Event window (-2,+2)	**GAE**	**Relational Experience Signal**	**GAE x Relational experience signal**	**GAE x Relational experience**
Control variables				
Alliance Year 2004	0.775	0.314	0.339	0.672
	(1.35)	(1.41)	(1.44)	(1.37)
Alliance Year 2005	0.539	0.225	0.206	0.270
	(1.48)	(1.48)	(1.47)	(1.5)
Alliance Year 2006	-2.416 *	-2.604 *	-2.496 *	-2.230
	(1.33)	(1.34)	(1.36)	(1.35)
Alliance Year 2007	0.943	1.026	0.800	0.934
	(1.4)	(1.4)	(1.39)	(1.39)
Alliance Year 2008	1.955	2.050	1.777	2.090
	(2.01)	(1.98)	(1.76)	(2.03)
Alliance Year 2009	-1.756	-1.876	-2.056	-1.765
	(1.89)	(1.88)	(1.82)	(1.84)
Alliance Year 2010	1.775	1.752	1.307	1.569
	(1.82)	(1.79)	(1.86)	(1.81)
Alliance Year 2011	2.135 *	1.855	1.922 *	2.084 *
	(1.19)	(1.13)	(1.16)	(1.18)
Alliance Year 2012	-0.250	-0.150	-0.380	-0.201
	(1.27)	(1.28)	(1.21)	(1.26)
Absorptive capacity	-0.025 **	-0.023 **	-0.020 *	-0.018 *
	(.01)	(.01)	(.01)	(.01)
Firm uncertainty	0.666	0.907	0.492	0.538
	(2.79)	(2.81)	(2.68)	(2.71)
Slack resources	0.234	0.254	0.248	0.254
	(.24)	(.23)	(.23)	(.23)
Non-listed alliance partner	-1.955 **	-2.037 **	-1.870 **	-1.859 **
	(.81)	(.8)	(.78)	(.79)
R&D alliance	0.344	0.245	0.237	0.365
	(.77)	(.73)	(.7)	(.74)
International alliance	0.788	0.726	0.685	0.792
	(.83)	(.8)	(.78)	(.82)
Relational experience	0.329	-0.036	0.002	0.864
	(.36)	(.33)	(.33)	(.54)
GAE (log)	-1.037 ***	-0.952 **	-0.761 **	-1.163 ***
	(.38)	(.34)	(.31)	(.41)
Explanatory variables				
Relational experience signal		4.112 *	3.352 **	
		(2.29)	(1.64)	
GAE (log)x Relational experience signal			-3.243	
			(2.23)	
GAE (log) x Relational experience				-0.922 *
				(.48)
Constant	1.597	1.491	1.526	1.679
	(1.25)	(1.25)	(1.24)	(1.24)
N	611	611	611	611
F-Statistic	2.49 ***	2.41 ***	2.49 ***	2.56 ***
R-Square	0.07	0.09	0.10	0.09
Root MSE	8.74	8.68	8.62	8.68

*p<0.1; **p<0.05; ***p<0.01

Robust Standard Errors calculated through Huber-White sandwich estimators and firm clustering are in parentheses

Appendices Chapter 6

APPENDIX 6.1: OLS regression PAR and partnership characteristics (interactions)

CAR (in percentage) as dependent variable	MODEL 1 PAR & Relationship years	MODEL 2 PAR x Years since last relationship	MODEL 3 PAR x International alliance	MODEL 4 PAR x R&D alliance
Control variables				
Alliance years (dummies)	0.682	0.743	0.704	0.701
	(.83)	(.83)	(.82)	(.82)
Absorptive capacity	10.635	10.319	10.123	10.344
	(7.52)	(7.63)	(7.44)	(7.54)
Firm uncertainty	-0.399	-0.391	-0.408	-0.413
	(.35)	(.34)	(.35)	(.35)
Slack resources	-1.775	-1.580	-1.329	-1.403
	(1.62)	(1.52)	(1.46)	(1.49)
Non-listed alliance partner	2.182	1.963	1.963	1.967
	(1.52)	(1.49)	(1.52)	(1.51)
R&D alliance	-0.039	-0.115	0.295	0.306
	(1.8)	(1.78)	(1.83)	(1.84)
Relational experience	0.714	0.138	0.352	0.332
	(.45)	(.43)	(.37)	(.36)
GAE (log)	-1.645 **	-1.706 **	-1.830 **	-1.798 **
	(.7)	(.72)	(.75)	(.74)
Explanatory variables				
Partner-specific alliance rhythm(PAR)	-0.550 **	-0.601 **	-0.307	-0.234
	(.27)	(.24)	(.27)	(.2)
Total relationship years	-0.295			
	(.19)			
PAR x Total relationship years	0.043			
	(.04)			
Last relationship		-0.432		
		(.3)		
PAR x Last relationship		0.071		
		(.06)		
PARx International			-0.009	
			(.31)	
PAR x R&D alliance				-0.154
				(.31)
Constant	3.077	4.108	1.811	1.878
	(2.07)	(2.49)	(1.76)	(1.7)
N	154	154	154	154
F-Statistic	2.44 **	2.3 **	2.37 **	2.3 **
R-Square	0.19	0.20	0.18	0.18
Root MSE	9.34	9.32	9.36	9.36

*p<0.1; **p<0.05; ***p<0.01

Robust Standard Errors calculated through Huber-White sandwich estimators and firm clustering are in parentheses

APPENDIX 6.2: OLS PAR and partnership characteristics (controls)

CAR (in percentage) as dependent variable	**MODEL 1** **PAR & Partnership characteristics**
Control variables	
Absorptive capacity	0.697
	(.82)
Firm uncertainty	10.561
	(7.68)
Slack resources	-0.375
	(.35)
Non-listed alliance partner	-1.557
	(1.52)
R&D alliance	2.189
	(1.63)
International alliance	0.024
	(1.77)
Relational experience	0.311
	(.64)
GAE (log)	-1.753 **
	(.75)
Total relationship years	-0.070
	(.19)
Last relationship	-0.353
	(.36)
Different alliance type	-0.919
	(1.42)
Explanatory variables	
Partner-specific alliance rhythm(PAR)	-0.400 **
	(.2)
Constant	4.022
	(2.6)
N	154
F-Statistic	2.3 **
R-Square	0.19
Root MSE	9.35

*p<0.1; **p<0.05; ***p<0.01
Robust Standard Errors calculated through Huber-White sandwich estimators and firm clustering are in parentheses

APPENDIX 6.3: OLS alternative event window

CAR (in percentage) as dependent variable (-1, +1)	**MODEL 1** **PAR**
Control variables	
Absorptive capacity	0.740
	(.85)
Firm uncertainty	8.094
	(6.46)
Slack resources	-0.464
	(.34)
Non-listed alliance partner	-1.984
	(1.57)
R&D alliance	1.030
	(1.44)
International alliance	-0.174
	(2.05)
Relational experience	-0.058
	(.35)
GAE (log)	-1.823 **
	(.82)
Explanatory variables	
Partner-specific alliance rhythm(PAR)	-0.265 *
	(.14)
Constant	3.267 *
	(1.81)
N	154
F-Statistic	1.76 *
R-Square	0.15
Root MSE	9.89

*p<0.1; **p<0.05; ***p<0.01

Robust Standard Errors calculated through Huber-White sandwich estimators and firm clustering are in parentheses

References

Abbott, A. 2001. ***Time matters: On theory and method***: University of Chicago Press.

ABPI. 2015. Value of the Pharmaceutical Industry in the UK.

Abrams, L. C., Cross, R., Lesser, E., & Levin, D. Z. 2003. Nurturing interpersonal trust in knowledge-sharing networks. ***The Academy of Management Executive***, 17(4): 64-77.

Adler, P. S., Goldoftas, B., & Levine, D. I. 1999. Flexibility versus Efficiency? A Case Study of Model Changeovers in the Toyota Production System. ***Organization Science***, 10(1): 43-68.

Ahuja, G. 2000. Collaboration Networks, Structural Holes, and Innovation: A Longitudinal Study. ***Administrative Science Quarterly***, 45(3): 425-455.

Aiken, L. S., & West, S. G. 1991. ***Multiple regression: Testing and interpreting interactions***: Sage.

Akerlof, G. A. 1970. The Market for "Lemons": Quality Uncertainty and the Market Mechanism. ***The Quarterly Journal of Economics***, 84(3): 488-500.

Al-Laham, A., Amburgey, T. L., & Bates, K. 2008. The Dynamics of Research Alliances: Examining the Effect of Alliance Experience and Partner Characteristics on the Speed of Alliance Entry in the Biotech Industry. ***British Journal of Management***, 19(4): 343-364.

Amit, R., & Schoemaker, P. 1993. Strategic Asset and Organizational Rent. ***Strategic Management Journal***, 14: 13-33.

Anand, B. N., & Khanna, T. 2000a. Do firms learn to create value? The case of alliances. ***Strategic Management Journal***, 21(3): 295-315.

Anand, B. N., & Khanna, T. 2000b. The Structure of Licensing Contracts. ***The Journal of Industrial Economics***, 48(1): 103-135.

Anand, G., Gray, J., & Siemsen, E. 2012. Decay, Shock, and Renewal: Operational Routines and Process Entropy in the Pharmaceutical Industry. ***Organization Science***, 23(6): 1700-1716.

Ancona, D., & Chong, C.-L. 1996. Entrainment: Pace, cycle, and rhythm in organizational behavior. In B. M. S. L. L. Cummings (Ed.), ***Research in organizational behavior: An annual series of analytical essays and critical reviews, Vol. 18***: 251-284. US: Elsevier Science/JAI Press.

Ancona, D. G., Goodman, P. S., Lawrence, B. S., & Tushman, M. L. 2001a. Time: A New Research Lens. ***The Academy of Management Review***, 26(4): 645-663.

Ancona, D. G., Okhuysen, G. A., & Perlow, L. A. 2001b. Taking Time to Integrate Temporal Research. ***The Academy of Management Review***, 26(4): 512-529.

Ansoff, H. I. 1965. ***Corporate strategy: business policy for growth and expansion***: McGraw-Hill Book.

Argote, L. 2012. ***Organizational learning: Creating, retaining and transferring knowledge***: Springer.

Argote, L., Beckman, S. L., & Epple, D. 1990. The persistence and transfer of learning in industrial settings. ***Management Science***, 36(2): 140-154.

Argote, L., & Miron-Spektor, E. 2011. Organizational Learning: From Experience to Knowledge. ***Organization Science***, 22(5): 1123-1137.

Argyres, N. S., Bercovitz, J., & Mayer, K. J. 2007. Complementarity and Evolution of Contractual Provisions: An Empirical Study of IT Services Contracts. ***Organization Science***, 18(1): 3-19.

Ariño, A. 1997. Veracity and commitment: cooperative behavior in first-time collaborate ventures In P. W. Beamish, & J. P. Killing (Eds.), ***Cooperative Strategies: A European Perspective***: 215- 241. San Francisco, CA: New Lexington Press.

Ariño, A., & de la Torre, J. 1998. Learning from Failure: Towards an Evolutionary Model of Collaborative Ventures. ***Organization Science***, 9(3): 306-325.

Arrow, K. 1974. ***The limits of organization*** (1st ed.). New York: Norton.

Balakrishnan, S., & Koza, M. P. 1993. Information asymmetry, adverse selection and joint-ventures: Theory and evidence. ***Journal of Economic Behavior & Organization***, 20(1): 99-117.

Balvers, R. J., McDonald, B., & Miller, R. E. 1988. Underpricing of New Issues and the Choice of Auditor as a Signal of Investment Banker Reputation. ***The Accounting Review***, 63(4): 605-622.

Bamford, J., & Ernst, D. 2002. Managing an alliance portfolio. ***McKinsey Quarterly***(3): 28-39.

Barkema, H. G., & Schijven, M. 2008. How Do Firms Learn to Make Acquisitions? A Review of Past Research and an Agenda for the Future. ***Journal of Management***, 34(3): 594-634.

Barkema, H. G., Shenkar, O., Vermeulen, F., & Bell, J. H. J. 1997. Working Abroad, Working with Others: How Firms Learn to Operate International Joint Ventures. ***Academy of Management Journal***, 40(2): 426-442.

Barney, J. 1991. Firm Resources and Sustained Competitive Advantage. ***Journal of Management***, 17(1): 99.

Barthélemy, J. 2008. Opportunism, knowledge, and the performance of franchise chains. ***Strategic Management Journal***, 29(13): 1451-1463.

Bartov, E., Radhakrishnan, S., & Krinsky, I. 2000. Investor Sophistication and Patterns in Stock Returns after Earnings Announcements. ***The Accounting Review***, 75(1): 43-63.

Baum, J. A. C., Calabrese, T., & Silverman, B. S. 2000. Don't go it alone: alliance network composition and startups' performance in Canadian biotechnology. ***Strategic Management Journal***, 21(3): 267-294.

Baum, J. A. C., & Oliver, C. 1991. Institutional Linkages and Organizational Mortality. ***Administrative Science Quarterly***, 36(2): 187-218.

Beckman, C. M., Haunschild, P. R., & Phillips, D. J. 2004. Friends or Strangers? Firm-Specific Uncertainty, Market Uncertainty, and Network Partner Selection. ***Organization Science***, 15(3): 259-275.

Bednar, M., Love, E. G., & Kraatz, M. 2014. Paying the price? The impact of controversial governance practices on managerial reputation. ***Academy of Management Journal***.

Ben-Menahem, S. M., Kwee, Z., Volberda, H. W., & Van Den Bosch, F. A. J. 2013. Strategic Renewal Over Time: The Enabling Role of Potential Absorptive Capacity in Aligning Internal and External Rates of Change. ***Long range planning***, 46(3): 216-235.

Benkard, C. L. 2000. Learning and Forgetting: The Dynamics of Aircraft Production. ***The American Economic Review***, 90(4): 1034-1054.

Bergh, D. D., Connelly, B. L., Ketchen, D. J., & Shannon, L. M. 2014. Signalling Theory and Equilibrium in Strategic Management Research: An Assessment and a Research Agenda. ***Journal of Management Studies***, 51: 1334-1360.

Bertrand, O., & Capron, L. 2015. Productivity enhancement at home via cross-border acquisitions: The roles of learning and contemporaneous domestic investments. ***Strategic Management Journal***, 36(5): 640-658.

Bertrand, O., & Mol, M. J. 2013. The antecedents and innovation effects of domestic and offshore R&D outsourcing: The contingent impact of cognitive distance and absorptive capacity. ***Strategic Management Journal***, 34(6): 751-760.

Blankespoor, E., & de Haan, E. 2014. CEO Visibility: Are Media Stars Born or Made?: Stanford University.

Bleeke, J., & Ernst, D. 1993. ***Collaborating to Compete***. New York: Wiley.

Borgatti, S. P., & Foster, P. C. 2003. The Network Paradigm in Organizational Research: A Review and Typology. ***Journal of Management***, 29(6): 991-1013.

Bourgeois, L. J. 1981. On the Measurement of Organizational Slack. ***Academy of Management Review***, 6(1): 29.

Brennan, M. J., & Subrahmanyam, A. 1995. Investment analysis and price formation in securities markets. ***Journal of Financial Economics***, 38(3): 361-381.

Bucklin, L. P., & Sengupta, S. 1993. Organizing Successful Co-Marketing Alliances. ***Journal of Marketing***, 57(2): 32-46.

Burt, R. S. 1992. ***Structural Holes: The Social Structure of Competition.*** Cambridge: Harvard Univeristy Press.

Busenitz, L. W., & Barney, J. B. 1997. Differences between entrepreneurs and managers in large organizations: Biases and heuristics in strategic decision-making. ***Journal of Business Venturing***, 12(1): 9-30.

Bushee, B. J. 1998. The Influence of Institutional Investors on Myopic R&D Investment Behavior. ***The Accounting Review***, 73(3): 305-333.

Bushee, B. J., Matsumoto, D. A., & Miller, G. S. 2003. Open versus closed conference calls: the determinants and effects of broadening access to disclosure. ***Journal of Accounting and Economics***, 34(1–3): 149-180.

Butler Jr, J. K. 1991. Toward Understanding and Measuring Conditions of Trust: Evolution of a Conditions of Trust Inventory. ***Journal of Management***, 17(3): 643.

Cannella Jr, A. A., Fraser, D. R., & Lee, D. S. 1995. Firm failure and managerial labor markets evidence from Texas banking. ***Journal of Financial Economics***, 38(2): 185-210.

Carley, K. M., & Lin, Z. 1997. A Theoretical Study of Organizational Performance under Information Distortion. ***Management Science***, 43(7): 976-997.

Carter, S. M. 2006. The Interaction of Top Management Group, Stakeholder, and Situational Factors on Certain Corporate Reputation Management Activities. ***Journal of Management Studies***, 43(5): 1145-1176.

Certo, S. T. 2003. Influencing Initial Public Offering Investors with Prestige: Signaling with Board Structures. ***Academy of Management Review***, 28(3): 432-446.

Chan, S. H., Kensinger, J. W., Keown, A. J., & Martin, J. D. 1997. Do strategic alliances create value? ***Journal of Financial Economics***, 46(2): 199-221.

Chandler, A. D. 1962. ***Strategy and structure: Chapters in the history of the american enterprise***.

Chatterjee, A., & Hambrick, D. C. 2011. Executive Personality, Capability Cues, and Risk Taking: How Narcissistic CEOs React to Their Successes and Stumbles. ***Administrative Science Quarterly***, 56(2): 202-237.

Child, J., & Yan, Y. 2003. Predicting the Performance of International Joint Ventures: An Investigation in China. ***Journal of Management Studies***, 40(2): 283-320.

Christianson, M. K., Farkas, M. T., Sutcliffe, K. M., & Weick, K. E. 2009. Learning Through Rare Events: Significant Interruptions at the Baltimore & Ohio Railroad Museum. ***Organization Science***, 20(5): 846-860.

Cohen, W. M., & Levinthal, D. A. 1990. Absorptive Capacity: A New Perspective on Learning and Innovation. ***Administrative Science Quarterly***, 35(1 (Special Issue: Technology, Organizations, and Innovation)): 128-152.

Connelly, B. L., Certo, S. T., Ireland, R. D., & Reutzel, C. R. 2011. Signaling Theory: A Review and Assessment. ***Journal of Management***, 37(1): 39-67.

Contractor, F. J. 2012. Why Do Multinational Firms Exist? A Theory Note About The Effect of Multinational Expansion on Performance and Recent Methodological Critiques. ***Global Strategy Journal***, 2(4): 318-331.

Corts, K. S., & Singh, J. 2004. The Effect of Repeated Interaction on Contract Choice: Evidence from Offshore Drilling. ***Journal of Law, Economics, and Organization***, 20(1): 230-260.

Crossan, M. M., Lane, H. W., & White, R. E. 1999. An Organizational Learning Framework: From Intuition to Institution. ***Academy of Management Review***, 24(3): 522-537.

Cyert, R. M., & March, J. G. 1963. ***A behavioral theory of the firm***. Englewood Cliff, NJ: Prentice-Hall.

D'Aveni, R. A. 1994. ***Hypercompetition: Managing the Dynamics of Strategic Maneuvering***. New York: The Free Press.

Dacin, M. T., Hitt, M. A., & Levitas, E. 1997. Selecting partners for successful international alliances: Examination of U.S. and Korean firms. ***Journal of World Business***, 32(1): 3-16.

Daniel, F., Lohrke, F. T., Fornaciari, C. J., & Turner Jr, R. A. 2004. Slack resources and firm performance: a meta-analysis. ***Journal of Business Research***, 57(6): 565-574.

Darr, E. D., Argote, L., & Epple, D. 1995. The Acquisition, Transfer, and Depreciation of Knowledge in Service Organizations: Productivity in Franchises. ***Management Science***, 41(11): 1750-1762.

Das, S., & Rahman, N. 2002. Opportunism dynamics in strategic alliances. In F. Contractor, & P. Lorange (Eds.), ***Cooperative Strategies and Alliances***: 89-118. Boston, MA: Elsevier Science.

Das, T. K. 2005. Deceitful behaviors of alliance partners: potential and prevention. ***Management Decision***, 43(5): 706-719.

Das, T. K. 2006. Strategic Alliance Temporalities and Partner Opportunism. ***British Journal of Management***, 17(1): 1-21.

Das, T. K., & Rahman, N. 2001. Partner Misbehaviour in Strategic Alliances: Guidelines for Effective Deterence. ***Journal of General Management***, 27(1).

Das, T. K., Sen, P. K., & Sengupta, S. 1998. Impact of Strategic Alliances on Firm Valuation. ***Academy of Management Journal***, 41(1): 27-41.

Das, T. K., & Teng, B.-S. 1996. Risk Types and the Inter-Firm Alliance Structures. ***Journal of Management Studies***, 33(6): 827-843.

Das, T. K., & Teng, B.-S. 1997. Sustaining Strategic Alliances: Options and Guidelines. ***Journal of General Management***, 22(4): 49- 64.

Das, T. K., & Teng, B.-S. 1998. Between Trust and Control: Developing Confidence in Partner Cooperation in Alliances. ***Academy of Management Review***, 23(3): 491-512.

Das, T. K., & Teng, B.-S. 1999. Managing Risks in Strategic Alliances. ***The Academy of Management Executive (1993-2005)***, 13(4): 50-62.

Das, T. K., & Teng, B.-S. 2000a. Instabilities of Strategic Alliances: An Internal Tensions Perspective. ***Organization Science***, 11(1): 77-101.

Das, T. K., & Teng, B.-S. 2000b. A Resource-Based Theory of Strategic Alliances. ***Journal of Management***, 26(1): 31-61.

Das, T. K., & Teng, B.-S. 2001. Trust, Control, and Risk in Strategic Alliances: An Integrated Framework. ***Organization Studies***, 22(2): 251.

Davis, A. K., Piger, J. M., & Sedor, L. M. 2012. Beyond the Numbers: Measuring the Information Content of Earnings Press Release Language. ***Contemporary Accounting Research***, 29(3): 845-868.

Dawson, J. F., & Richter, A. W. 2006. Probing three-way interactions in moderated multiple regression: Development and application of a slope difference test. ***Journal of Applied Psychology***, 91(4): 917-926.

de Holan, P. M., & Phillips, N. 2004. Remembrance of Things Past? The Dynamics of Organizational Forgetting. ***Management Science***, 50(11): 1603-1613.

De Man, A.-P. 2001. The future of alliance capability: towards a basic necessity for firm survival. In A. P. De Man, G. Duysters, & A. Vasudevan (Eds.), ***The allianced enterprise. Global strategies for corporate collaboration***: 65-71. London: Imperial College Press.

De Man, A.-P. 2005. Alliance Capability:: A Comparison of the Alliance Strength of European and American Companies. ***European Management Journal***, 23(3): 315-323.

De Man, A.-P. 2014. ***Alliances: An Executive Guide to Designing Successful Strategic Partnerships***: John Wiley & Sons.

De Man, A.-P., & Duysters, G. 2005. Collaboration and innovation: a review of the effects of mergers, acquisitions and alliances on innovation. ***Technovation***, 25(12): 1377-1387.

De Man, A.-P., & Roijakkers, N. 2009. Alliance Governance: Balancing Control and Trust in Dealing with Risk. ***Long range planning***, 42(1): 75-95.

Deeds, D. 2001. The role of R&D intensity, technical development and absorptive capacity in creating entrepreneurial wealth in high-technology start-ups. ***Journal of Engineering and Technology Management***, 18(1): 29-47.

Deeds, D. L., & Hill, C. W. L. 1996. Strategic alliances and the rate of new product development: An empirical study of entrepreneurial biotechnology firms. ***Journal of Business Venturing***, 11(1): 41-55.

Dekker, H. C., & Abbeele, A. V. d. 2010. Organizational Learning and Interfirm Control: The Effects of Partner Search and Prior Exchange Experiences. ***Organization Science***, 21(6): 1233-1250.

Desai, H., Hogan, C. E., & Wilkins, M. S. 2006. The Reputational Penalty for Aggressive Accounting: Earnings Restatements and Management Turnover. ***The Accounting Review***, 81(1): 83-112.

Dess, G., Lumpkin, G. T., Eisner, A., & McNamara, G. 2014. ***Strategic Management: Text and Cases*** (Seventh Edition ed.). New York, NY: McGraw-Hill Education.

Dess, G. G., Lumpkin, G. T., & Covin, J. G. 1997. Entrepreneurial strategy making and firm performance: Tests of contingency and configurational models. ***Strategic Management Journal***, 18(9): 677-695.

Dierickx, I., & Cool, K. 1989. Asset Stock Accumulation and Sustainability of Competitive Advantage. ***Management Science***, 35(12): 1504-1511.

Diestre, L., & Rajagopalan, N. 2012. Are all 'sharks' dangerous? new biotechnology ventures and partner selection in R&D alliances. ***Strategic Management Journal***, 33(10): 1115-1134.

Diestre, L., Rajagopalan, N., & Dutta, S. 2015. Constraints in acquiring and utilizing directors' experience: An empirical study of new-market entry in the pharmaceutical industry. ***Strategic Management Journal***, 36(3): 339-359.

DiMasi, J. A., Hansen, R. W., & Grabowski, H. G. 2003. The price of innovation: new estimates of drug development costs. ***Journal of Health Economics***, 22(2): 151-185.

Domowitz, I., Glen, J., & Madhavan, A. 1997. Market Segmentation and Stock Prices: Evidence from an Emerging Market. ***The Journal of Finance***, 52(3): 1059-1085.

Downes, D. H., & Heinkel, R. 1982. Signaling and the Valuation of Unseasoned New Issues. ***The Journal of Finance***, 37(1): 1-10.

Doz, Y. L. 1996. The Evolution of Cooperation in Strategic Alliances: Initial Conditions or Learning Processes? ***Strategic Management Journal***, 17(S1): 55-83.

Doz, Y. L., & Hamel, G. 1998. ***Alliance Advantage: The Art of Creating Value through Partnering***. Boston, MA: Harvard Business School Press.

Draulans, J., De Man, A. P., & Volberda, H. W. 2003. Building alliance capability: Management techniques for superior alliance performance. ***Long Range Planning***, 36(2): 151-166.

Dyer, J., Kale, P., & Singh, H. 2001. How To Make Strategic Alliances Work. ***MIT Sloan Management Review***, Summer 2001.

Dyer, J. H., & Chu, W. 2000. The Determinants of Trust in Supplier-Automaker Relationships in the U.S., Japan, and Korea. ***Journal of International Business Studies***, 31(2): 259-285.

Dyer, J. H., & Chu, W. 2003. The Role of Trustworthiness in Reducing Transaction Costs and Improving Performance: Empirical Evidence from the United States, Japan, and Korea. ***Organization Science***, 14(1): 57-68.

Dyer, J. H., & Nobeoka, K. 2000. Creating and Managing a High-Performance Knowledge-Sharing Network: The Toyota Case. ***Strategic Management Journal***, 21(3): 345-367.

Dyer, J. H., & Singh, H. 1998. The Relational View: Cooperative Strategy and Sources of Interorganizational Competitive Advantage. ***Academy of Management Review***, 23(4): 660-679.

Easley, D., & O'Hara, M. 2004. Information and the Cost of Capital. ***The Journal of Finance***, 59(4): 1553-1583.

Easterby-Smith, M., Thorpe , R., & Jackson, P. R. 2008. ***Management Research*** (3rd edition ed.). London: Sage.

Echambadi, R., & Hess, J. D. 2007. Mean-Centering Does Not Alleviate Collinearity Problems in Moderated Multiple Regression Models. ***Marketing Science***, 26(3): 438-445.

Eggers, J. P. 2012. All experience is not created equal: learning, adapting, and focusing in product portfolio management. ***Strategic Management Journal***, 33(3): 315-335.

Eisenhardt, K., & Martin, J. 2000. Dynamic Capabilities: What Are They? ***Strategic Management Journal***, 21(10/11): 1105-1121.

Eisenhardt, K. M., & Schoonhoven, C. B. 1996. Resource-Based View of Strategic Alliance Formation: Strategic and Social Effects in Entrepreneurial Firms. ***Organization Science***, 7(2): 136-150.

Elfenbein, D. W., & Zenger, T. R. 2014. What Is a Relationship Worth? Repeated Exchange and the Development and Deployment of Relational Capital. ***Organization Science***, 25(1): 222-244.

Epple, D., Argote, L., & Devadas, R. 1991. Organizational Learning Curves: A Method for Investigating Intra-Plant Transfer of Knowledge Acquired Through Learning by Doing. ***Organization Science***, 2(1): 58-70.

Fama, E. F. 1970. Efficient Capital Markets: A Review of Theory and Empirical Work. ***The Journal of Finance***, 25(2): 383-417.

Fama, E. F., Fisher, L., Jensen, M. C., & Roll, R. 1969. The Adjustment of Stock Prices to New Information. ***International Economic Review***, 10(1): 1-21.

Fang, E., Palmatier, R. W., Scheer, L. K., & Li, N. 2008. Trust at Different Organizational Levels. ***Journal of Marketing***, 72(2): 80-98.

Fernald, K., Pennings, E., & Claassen, E. 2014. Biotechnology Commercialization Strategies: Risk and Return in Interfirm Cooperation, ***Journal of Product Innovation Management***.

Flannery, M. J. 1986. Asymmetric Information and Risky Debt Maturity Choice. ***The Journal of Finance***, 41(1): 19-37.

Francis, J., Huang, A. H., Rajgopal, S., & Zang, A. Y. 2008. CEO Reputation and Earnings Quality. ***Contemporary Accounting Research***, 25(1): 109-147.

Francis, J., Philbrick, D., & Schipper, K. 1994. Shareholder Litigation and Corporate Disclosures. ***Journal of Accounting Research***, 32(2): 137-164.

Francis, J., Schipper, K., & Vincent, L. 2002. Expanded Disclosures and the Increased Usefulness of Earnings Announcements. ***The Accounting Review***, 77(3): 515-546.

García-Canal, E., Duarte, C. L., Criado, J. R., & Llaneza, A. V. 2002. Accelerating international expansion through global alliances: a typology of cooperative strategies. ***Journal of World Business***, 37(2): 91-107.

Gassmann, O., Reepmeyer, G., & Zedtwitz, M. 2008. Innovation: Key to Success in the Pharmaceutical Industry, ***Leading Pharmaceutical innovation***: 1-18. Berlin: Springer

George, J. M., & Jones, G. R. 2000. The Role of Time in Theory and Theory Building. ***Journal of Management***, 26(4): 657-684.

Gibbons, R., & Murphy, K. J. 1992. Optimal Incentive Contracts in the Presence of Career Concerns: Theory and Evidence. ***Journal of Political Economy***, 100(3): 468-505.

Gill, J., & Butler, R. 1996. Cycles of trust and distrust in joint-ventures. ***European Management Journal***, 14(1): 81-89.

Goerzen, A. 2005. Managing Alliance Networks: Emerging Practices of Multinational Corporations. ***The Academy of Management Executive (1993-2005)***, 19(2): 94-107.

Goerzen, A. 2007. Alliance networks and firm performance: The impact of repeated partnerships. ***Strategic Management Journal***, 28(5): 487-509.

Grabowski, H. 2011. The Evolution of the Pharmaceutical Industry Over the Past 50 Years: A Personal Reflection. ***International Journal of the Economics of Business***, 18(2): 161-176.

Granovetter, M. 1985. Economic Action and Social Structure: The Problem of Embeddedness. ***American Journal of Sociology***, 91(3): 481-510.

Granovetter, M. S. 1973. The Strength of Weak Ties. ***American Journal of Sociology***, 78(6): 1360-1380.

Grant, R. M. 1996. Toward a Knowledge-Based Theory of the Firm. ***Strategic Management Journal***, 17(Special Issue: Knowledge of the Firm): 109-122.

Grant, R. M. 2002. Corporate Strategy: Managing Scope and Strategy Content. In A. Pettigrew, H. Thomas, & R. Whittington (Eds.), ***Handbook of Strategy & Management***. London: Sage.

Grant, R. M., & Baden-Fuller, C. 2004. A Knowledge Accessing Theory of Strategic Alliances. ***Journal of Management Studies***, 41(1): 61-84.

Greve, H. R. 2003. A Behavioral Theory of R&D Expenditures and Innovations: Evidence from Shipbuilding. ***The Academy of Management Journal***, 46(6): 685-702.

Greve, H. R., Baum, J. A. C., Mitsuhashi, H., & Rowley, T. J. 2010. Built to Last but Falling Apart: Cohesion, Friction, and Withdrawal from Interfirm Alliances. ***Academy of Management Journal***, 53(2): 302-322.

Guillamon-Saorin, E., Osma, B. G., & Jones, M. J. 2012. Opportunistic disclosure in press release headlines. ***Accounting and Business Research***, 42(2): 143-168.

Gulati, R. 1995a. Does Familiarity Breed Trust? The Implications of Repeated Ties for Contractual Choice in Alliances. ***Academy of Management Journal***, 38(1): 85-112.

Gulati, R. 1995b. Social Structure and Alliance Formation Patterns: A Longitudinal Analysis. ***Administrative Science Quarterly***, 40: 619- 652.

Gulati, R. 1998. Alliances and Networks. ***Strategic Management Journal***, 19(4): 293-317.

Gulati, R. 1999. Network Location and Learning: The Influence of Network Resources and Firm Capabilities on Alliance Formation. ***Strategic Management Journal***, 20(5): 397-420.

Gulati, R., & Gargiulo, M. 1999. Where Do Interorganizational Networks Come From? ***American Journal of Sociology***, 104(5): 1439-1493.

Gulati, R., Lavie, D., & Singh, H. 2009. The nature of partnering experience and the gains from alliances. ***Strategic Management Journal***, 30(11): 1213-1233.

Gulati, R., & Nickerson, J. A. 2008. Interorganizational Trust, Governance Choice, and Exchange Performance. ***Organization Science***, 19(5): 688-708.

Gulati, R., & Singh, H. 1998. The Architecture of Cooperation: Managing Coordination Costs and Appropriation Concerns in Strategic Alliances. ***Administrative Science Quarterly***, 43(4): 781-814.

Gulati, R., & Sytch, M. 2008. Does familiarity breed trust? Revisiting the antecedents of trust. ***Managerial and Decision Economics***, 29(2-3): 165-190.

Gulati, R., & Westphal, J. D. 1999. Cooperative or Controlling? The Effects of CEO-Board Relations and the Content of Interlocks on the Formation of Joint Ventures. ***Administrative Science Quarterly***, 44(3): 473-506.

Gurkaynak, R. S., Sack, B. P., & Swanson, E. T. 2004. Do actions speak louder than words? The response of asset prices to monetary policy actions and statements. ***International Journal of Central Banking***, 1(1): 55-93.

Hagedoorn, J. 2002. Inter-firm R&D partnerships: an overview of major trends and patterns since 1960. ***Research Policy***, 31(4): 477-492.

Hagedoorn, J. 2006. Understanding the Cross-Level Embeddedness of Interfirm Partnership Formation. ***Academy of Management Review***, 31(3): 670-680.

Hagedoorn, J., & Narula, R. 1996. Choosing Organizational Modes of Strategic Technology Partnering: International and Sectoral Differences. ***Journal of International Business Studies***, 27(2): 265-284.

Hamel, G. 1991. Competition for Competence and Inter-Partner Learning Within International Strategic Alliances. ***Strategic Management Journal***, 12(Special Issue: Global Strategy): 83-103.

Hamel, G., Doz, Y. L., & Prahalad, C. K. 1989. Collaborate with Your Competitors--and Win. ***Harvard Business Review***, 67(1): 133-139.

Hannan, M. T., & Freeman, J. 1984. Structural Inertia and Organizational Change. ***American Sociological Review***, 49(2): 149-164.

Harbison, J. R., & Pekar, P. 1998. Institutionalising alliance skills: secrets of repeatable success. ***Strategy and Business***: 79-94.

Harrison, J. S., Hitt, M. A., Hoskisson, R. E., & Ireland, R. D. 2001. Resource complementarity in business combinations: Extending the logic to organizational alliances. ***Journal of Management***, 27(6): 679-690.

Hayward, M. L. A. 2002. When do firms learn from their acquisition experience? Evidence from 1990 to 1995. ***Strategic Management Journal***, 23(1): 21-39.

Heckman, J. J. 1979. Sample Selection Bias as a Specification Error. ***Econometrica***, 47(1): 153-161.

Heimeriks, K. H. 2010. Confident or Competent? How to Avoid Superstitious Learning in Alliance Portfolios. ***Long range planning***, 43(1): 57-84.

Heimeriks, K. H., Bingham, C. B., & Laamanen, T. 2015. Unveiling the temporally contingent role of codification in alliance success. ***Strategic Management Journal***, 36(3): 462-473.

Heimeriks, K. H., & Duysters, G. 2007. Alliance Capability as a Mediator Between Experience and Alliance Performance: An Empirical Investigation into the Alliance Capability Development Process. ***Journal of Management Studies***, 44(1): 25-49.

Heimeriks, K. H., Duysters, G., & Vanhaverbeke, W. 2007. Learning mechanisms and differential performance in alliance portfolios. ***Strategic Organization***, 5(4): 373-408.

Heimeriks, K. H., Klijn, E., & Reuer, J. J. 2009. Building Capabilities for Alliance Portfolios. ***Long range planning***, 42(1): 96-114.

Helfat, C. E., & Peteraf, M. A. 2003. The dynamic resource-based view: capability lifecycles. ***Strategic Management Journal***, 24(10): 997-1010.

Hennart, J.-F. 1988. A Transaction Costs Theory of Equity Joint Ventures. ***Strategic Management Journal***, 9(4): 361-374.

Hennart, J.-F., & Reddy, S. 1997. The Choice Between Mergers/Acquisitions and Joint Ventures: The Case of Japanes Investors in the United States. ***Strategic Management Journal***, 18(1): 1-12.

Henry, E. 2006. Market reaction to verbal components of earnings press releases: Event study using a predictive algorithm. ***Journal of Emerging Technologies in Accounting***, 3(1): 1-19.

Henry, E. 2008. Are Investors Influenced by How Earnings Press Releases are Written? ***International Journal of Business Communication***, 45(4): 363-407.

Hess, A. M., & Rothaermel, F. T. 2011. When are assets complementary? star scientists, strategic alliances, and innovation in the pharmaceutical industry. ***Strategic Management Journal***, 32(8): 895-909.

Higgins, M. C., & Gulati, R. 2006. Stacking the Deck: The Effects of Top Management Backgrounds on Investor Decisions. ***Strategic Management Journal***, 27(1): 1-25.

Hirshleifer, D. 1993. Managerial Reputation and Corporate Investment Decisions. ***Financial Management***, 22(2): 145-160.

Hirshleifer, D., & Teoh, S. H. 2003. Limited attention, information disclosure, and financial reporting. ***Journal of Accounting and Economics***, 36(1–3): 337-386.

Hirshleifer, D., & Thakor, A. 1992. Managerial conservatism, project choice, and debt. ***Review of Financial Studies***, 5(3): 437-470.

Hitt, M. A., Bierman, L., Shimizu, K., & Kochhar, R. 2001. Direct and Moderating Effects of Human Capital on Strategy and Performance in Professional Service Firms: A Resource-Based Perspective. ***Academy of Management Journal***, 44(1): 13-28.

Hitt, M. A., Dacin, M. T., Levitas, E., Arregle, J.-L., & Borza, A. 2000. Partner Selection in Emerging and Developed Market Contexts: Resource-Based and Organizational Learning Perspectives. ***Academy of Management Journal***, 43(3): 449-467.

Hoang, H., & Rothaermel, F. T. 2005. The Effect of General and Partner-Specific Alliance Experience on Joint R&D Project Performance. ***Academy of Management Journal***, 48(2): 332-345.

Hoang, H. A., & Rothaermel, F. T. 2010. Leveraging Internal and External Experience: Exploration, Exploitation, and R&D Project Performance. ***Strategic Management Journal***, 31(7): 734-758.

Hoetker, G., & Mellewigt, T. 2009. Choice and performance of governance mechanisms: matching alliance governance to asset type. ***Strategic Management Journal***, 30(10): 1025-1044.

Hoffmann, W. H. 2005. How to Manage a Portfolio of Alliances. ***Long range planning***, 38(2): 121-143.

Hong, H., Lim, T., & Stein, J. C. 2000. Bad News Travels Slowly: Size, Analyst Coverage, and the Profitability of Momentum Strategies. ***The Journal of Finance***, 55(1): 265-295.

Hoskin, R. E., Hughes, J. S., & Ricks, W. E. 1986. Evidence on the Incremental Information Content of Additional Firm Disclosures Made Concurrently with Earnings. ***Journal of Accounting Research***, 24: 1-32.

Huber, G. P. 1991. Organizational Learning: The Contributing Processes and the Literatures. ***Organization Science***, 2(1): 88-115.

Hussainey, K., Schleicher, T., & Walker, M. 2003. Undertaking large-scale disclosures studies when AIMR-FAF ratings are not available: the case of prices leading earnings. ***Accounting & Business Research***, 33(4): 275-294.

Huy, Q. N. 2001. Time, Temporal Capability, and Planned Change. ***The Academy of Management Review***, 26(4): 601-623.

IFPMA. 2014. The Pharmaceutical Industry and Global Health- Facts and Figures.

Inkpen, A. C. 2008. Knowledge transfer and international joint ventures: the case of NUMMI and General Motors. ***Strategic Management Journal***, 29(4): 447-453.

Inkpen, A. C., & Beamish, P. W. 1997. Knowledge, Bargaining Power, and the Instability of International Joint Ventures. ***Academy of Management Review***, 22(1): 177-202.

Inkpen, A. C., & Crossan, M. M. 1995. Believing is Seeing: Joint Ventures and Organization Learning. ***Journal of Management Studies***, 32(5): 595-618.

Inkpen, A. C., & Tsang, E. W. K. 2005. Social Capital, Networks, and Knowledge Transfer. ***Academy of Management Review***, 30(1): 146-165.

Ireland, R. D., Hitt, M. A., & Vaidyanath, D. 2002. Alliance Management as a Source of Competitive Advantage. ***Journal of Management***, 28(3): 413-446.

Irvine, P. J. 2003. The incremental impact of analyst initiation of coverage. ***Journal of Corporate Finance***, 9(4): 431-451.

Iyer, D. N., & Miller, K. D. 2008. Performance Feedback, Slack, and the Timing of Acquisitions. ***Academy of Management Journal***, 51(4): 808-822.

Janney, J. J., & Folta, T. B. 2006. Moderating effects of investor experience on the signaling value of private equity placements. ***Journal of Business Venturing***, 21(1): 27-44.

Jansen, J. J. P., Van den Bosch, F. A. J., & Volberda, H. W. 2005. Managing Potential and Realized Absorptive Capacity: How Do Organizational Antecedents Matter? ***Academy of Management Journal***, 48(6): 999-1015.

Jensen, M. C., & Meckling, W. H. 1976. Theory of the firm: Managerial behavior, agency costs and ownership structure. ***Journal of Financial Economics***, 3(4): 305-360.

Jiang, R. J., Tao, Q. T., & Santoro, M. D. 2010. Alliance portfolio diversity and firm performance. ***Strategic Management Journal***, 31(10): 1136-1144.

Jones, G. R., & George, J. M. 1998. The Experience and Evolution of Trust: Implications for Cooperation and Teamwork. ***Academy of Management Review***, 23(3): 531-546.

Kale, P., Dyer, J., & Singh, H. 2001. Value creation and success in strategic alliances:: alliancing skills and the role of alliance structure and systems. ***European Management Journal***, 19(5): 463-471.

Kale, P., Dyer, J. H., & Singh, H. 2002. Alliance Capability, Stock Market Response, and Long-Term Alliance Success: The Role of the Alliance Function. ***Strategic Management Journal***, 23(8): 747-767.

Kale, P., & Singh, H. 2007. Building firm capabilities through learning: the role of the alliance learning process in alliance capability and firm-level alliance success. ***Strategic Management Journal***, 28(10): 981-1000.

Kale, P., & Singh, H. 2009. Managing Strategic Alliances: What Do We Know Now, and Where Do We Go From Here? ***Academy of Management Perspectives***, August 2009: 45-62.

Kale, P., Singh, H., & Perlmutter, H. 2000. Learning and Protection of Proprietary Assets in Strategic Alliances: Building Relational Capital. ***Strategic Management Journal***, 21(3): 217-237.

Kang, E. 2008. Director Interlocks and Spillover Effects of Reputational Penalties from Financial Reporting Fraud. ***Academy of Management Journal***, 51(3): 537-555.

Kaplan, R. S., Norton, D. P., & Rugelsjoen, B. 2010. Managing Alliances with the Balanced Scorecard. ***Harvard Business Review***, 88(1/2): 114-120.

Khanna, T. 1998. The Scope of Alliances. ***Organization Science***, 9(3): 340- 355.
Khanna, T., Gulati, R., & Nohria, N. 1998. The Dynamics of Learning Alliances: Competition, Cooperation, and Relative Scope. ***Strategic Management Journal***, 19(3): 193-210.
Kim, J.-Y., Kim, J.-Y., & Miner, A. S. 2009. Organizational Learning from Extreme Performance Experience: The Impact of Success and Recovery Experience. ***Organization Science***, 20(6): 958-978.
Kim, T.-Y., Oh, H., & Swaminathan, A. 2006. Framing Interorganizational Network Change: A Network Inertia Perspective. ***Academy of Management Review***, 31(3): 704-720.
Kimbrough, M. D., & Louis, H. 2011. Voluntary Disclosure to Influence Investor Reactions to Merger Announcements: An Examination of Conference Calls. ***Accounting Review***, 86(2): 637-667.
Kimbrough, M. D., & Wang, I. Y. 2013. Are Seemingly Self-Serving Attributions in Earnings Press Releases Plausible? Empirical Evidence. ***The Accounting Review***, 89(2): 635-667.
King, A. W., & Zeithaml, C. P. 2001. Competencies and firm performance: examining the causal ambiguity paradox. ***Strategic Management Journal***, 22(1): 75-99.
Klarner, P., & Raisch, S. 2013. Move to the Beat - Rhythms of Change and Firm Performance. ***Academy of Management Journal***, 56(1): 160-184.
Kleinbaum, D. G., Kupper, L. L., Muller, K. E., & Nizam, A. 1998. ***Applied regression analysis and multivariate methods***. Pacific Grove: Duxbury Press.
Klijn, E., Reuer, J., Buckley, P. J., & Glaister, K. W. 2010. Combinations of partners' joint venture formation motives. ***European Business Review***, 22(6): 576- 590.
Kogut, B. 1988. Joint Ventures: Theoretical and Empirical Perspectives. ***Strategic Management Journal***, 9(4): 319-332.
Kogut, B. 1989. The Stability of Joint Ventures: Reciprocity and Competitive Rivalry. ***The Journal of Industrial Economics***, 38(2): 183-198.
Kogut, B. 1991. Joint Ventures and the Option to Expand and Acquire. ***Management Science***, 37(1): 19-33.
Kogut, B., & Singh, H. 1988. The Effect of National Culture on the Choice of Entry Mode. ***Journal of International Business Studies***, 19(3): 411-432.
Kogut, B., & Zander, U. 1992. Knowledge of the Firm, Combinative Capabilities, and the Replication of Technology. ***Organization Science***, 3(3): 383-397.
Koh, J., & Venkatraman, N. 1991. Joint Venture Formations and Stock Market Reactions: An Assessment in the Information Technology Sector. ***Academy of Management Journal***, 34(4): 869-892.
Koka, B. R., & Prescott, J. E. 2008. Designing Alliance Networks: The Influence of Network Position, Environmental Change, and Strategy on Firm Performance. ***Strategic Management Journal***, 29(6): 639-661.
Kuhn, T. 1962. ***The Structure of Scientific Revolutions***: University of Chicago Press.
Laamanen, T., Brauer, M., & Junna, O. 2014. Performance of acquirers of divested assets: Evidence from the U.S. software industry. ***Strategic Management Journal***, 35(6): 914-925.
Laamanen, T., & Keil, T. 2008. Performance of serial acquirers: toward an acquisition program perspective. ***Strategic Management Journal***, 29(6): 663-672.
Lakatos, I. 1970. Falsification and the methodology of scientific research programmes. In I. Lakatos, & A. Musgrave (Eds.), ***Criticism and the growth of knowledge***: 91-105. Cambridge: Cambridge University Press.
Lakonishok, J., Shleifer, A., & Vishny, R. W. 1992. The impact of institutional trading on stock prices. ***Journal of Financial Economics***, 32(1): 23-43.
Lampel, J., Shamsie, J., & Shapira, Z. 2009. Experiencing the Improbable: Rare Events and Organizational Learning. ***Organization Science***, 20(5): 835-845.
Lane, P. J., Koka, B. R., & Pathak, S. 2006. The Reification of Absorptive Capacity: A Critical Review and Rejuvenation of the Construct. ***The Academy of Management Review***, 31(4): 833-863.

Lane, P. J., & Lubatkin, M. 1998. Relative Absorptive Capacity and Interorganizational Learning. ***Strategic Management Journal***, 19(5): 461-477.

Lavie, D. 2006. The Competitive Advantage of Interconnected Firms: An Extension of the Resource-Based View. ***Academy of Management Review***, 31(3): 638-658.

Lavie, D. 2007. Alliance portfolios and firm performance: A study of value creation and appropriation in the U.S. software industry. ***Strategic Management Journal***, 28(12): 1187-1212.

Lavie, D., Lechner, C., & Singh, H. 2007. The Performance Implications of Timing of Entry and Involvement in Multipartner Alliances. ***Academy of Management Journal***, 50(3): 578- 604.

Lavie, D., & Rosenkopf, L. 2006. Balancing Exploration and Exploitation in Alliance Formation. ***The Academy of Management Journal***, 49(4): 797-818.

Lee, J. J. 2013. Dancing with the Enemy? Relational Hazards and the Contingent Value of Repeat Exchanges in M&A Markets. ***Organization Science***, 24(4): 1237-1256.

Leonard-Barton, D. 1992. Core capabilities and core rigidities: A paradox in managing new product development. ***Strategic Management Journal***, 13(S1): 111-125.

Levinthal, D. A., & Fichman, M. 1988. Dynamics of Interorganizational Attachments: Auditor-Client Relationships. ***Administrative Science Quarterly***, 33(3): 345-369.

Levinthal, D. A., & March, J. G. 1993. The myopia of learning. ***Strategic Management Journal***, 14: 95-112.

Levitt, B., & March, J. G. 1988. Organizational Learning. ***Annual Review of Sociology***, 14: 319-340.

Lewicki, R. J., McAllister, D. J., & Bies, R. J. 1998. Trust and distrust: New relationships and realities. ***Academy of Management Review***, 23(3): 438-458.

Li, D., Eden, L., Hitt, M. A., & Ireland, R. D. 2008. Friends, Acquaintances, or Strangers? Partner Selection in R&D Alliances. ***Academy of Management Journal***, 51(2): 315-334.

Li, S. X., & Rowley, T. J. 2002. Inertia and Evaluation Mechanisms in Interorganizational Partner Selection: Syndicate Formation among U.S. Investment Banks. ***Academy of Management Journal***, 45(6): 1104-1119.

Lieberman, M. B. 1984. The Learning Curve and Pricing in the Chemical Processing Industries. ***The RAND Journal of Economics***, 15(2): 213-228.

Lippman, S. A., & Rumelt, R. P. 1982. Uncertain Imitability: An Analysis of Interfirm Differences in Efficiency under Competition. ***The Bell Journal of Economics***, 13(2): 418-438.

Liu, K., Arthurs, J. D., Nam, D., & Mousa, F.-T. 2014. Information diffusion and value redistribution among transaction partners of the IPO firm. ***Strategic Management Journal***, 35(11): 1717-1726.

Liu, Y., & Ravichandran, T. 2015. Alliance Experience, IT-Enabled Knowledge Integration, and Ex Ante Value Gains. ***Organization Science***, 26(2): 511-530.

Lunnan, R., & Haugland, S. A. 2008. Predicting and measuring alliance performance: a multidimensional analysis. ***Strategic Management Journal***, 29(5): 545-556.

Lyles, M. A. 1988. Learning among joint-venture sophisticated firms. ***Management International Review, Special Issue***.

Lyles, M. A. 1994. The impact of organizational learning on joint venture formations. ***International Business Review***, 3(4): 459-467.

MacKinlay, A. C. 1997. Event Studies in Economics and Finance. ***Journal of Economic Literature***, 35(1): 13-39.

Mahajan, J. 1992. The Overconfidence Effect in Marketing Management Predictions. ***Journal of Marketing Research***, 29(3): 329-342.

Malmendier, U., & Tate, G. 2005. CEO Overconfidence and Corporate Investment. ***The Journal of Finance***, 60(6): 2661-2700.

Malmendier, U., & Tate, G. 2008. Who makes acquisitions? CEO overconfidence and the market's reaction. ***Journal of Financial Economics***, 89(1): 20-43.

March, J. G. 1991. Exploration and Exploitation in Organizational Learning. ***Organization Science***, 2(1): 71-87.

March, J. G., Sproull, L. S., & Tamuz, M. 1991. Learning from Samples of One or Fewer. ***Organization Science***, 2(1): 1-13.

Marketline. 2014. Marketline Industry Profile - Global Pharmaceuticals.

Mayer, K. J., & Argyres, N. S. 2004. Learning to Contract: Evidence from the Personal Computer Industry. ***Organization Science***, 15(4): 394-410.

McConnell, J. J., & Nantell, T. J. 1985. Corporate Combinations and Common Stock Returns: The Case of Joint Ventures. ***The Journal of Finance***, 40(2): 519-536.

McEvily, B., Perrone, V., & Zaheer, A. 2003. Trust as an Organizing Principle. ***Organization Science***, 14(1): 91-103.

McWilliams, A., & Siegel, D. 1997. Event Studies in Management Research: Theoretical and Empirical Issues. ***Academy of Management Journal***, 40(3): 626-657.

Merchant, H., & Schendel, D. 2000. How do international joint ventures create shareholder value? ***Strategic Management Journal***, 21(7): 723-737.

Milbourn, T. T. 2003. CEO reputation and stock-based compensation. ***Journal of Financial Economics***, 68(2): 233-262.

Miller, D. T., & Ross, M. 1975. Self-serving biases in the attribution of causality: Fact or fiction? ***Psychological Bulletin***, 82(2): 213-225.

Mitchell, T. R., & James, L. R. 2001. Building Better Theory: Time and the Specification of When Things Happen. ***Academy of Management Review***, 26(4): 530-547.

Moeller, S. B., Schlingemann, F. P., & Stulz, R. M. 2005. Wealth Destruction on a Massive Scale? A Study of Acquiring-Firm Returns in the Recent Merger Wave. ***The Journal of Finance***, 60(2): 757-782.

Mohr, J., & Spekman, R. 1994. Characteristics of Partnership Success: Partnership Attributes, Communication Behavior, and Conflict Resolution Techniques. ***Strategic Management Journal***, 15(2): 135-152.

Montealegre, R. 2002. A Process Model of Capability Development: Lessons from the Electronic Commerce Strategy at Bolsa de Valores de Guayaquil. ***Organization Science***, 13(5): 514-531.

Montiel, I., Husted, B. W., & Christmann, P. 2012. Using private management standard certification to reduce information asymmetries in corrupt environments. ***Strategic Management Journal***, 33(9): 1103-1113.

Moore, W., Rimland, E., Ritch, H., & Rouner, J. 1998. On the acquisition fast-track to growth and value. ***Mergers and Acquisitions***, 32(4): 10-17.

Morgan, R. M., & Shelby, D. H. 1994. The Commitment-Trust Theory of Relationship Marketing. ***Journal of Marketing***, 58(3): 20-38.

Mowery, D. C., Oxley, J. E., & Silverman, B. S. 1996. Strategic Alliances and Interfirm Knowledge Transfer. ***Strategic Management Journal***, 17(Special Issue: Knowledge and the Firm): 77-91.

Mowery, D. C., Oxley, J. E., & Silverman, B. S. 1998. Technological overlap and interfirm cooperation: implications for the resource-based view of the firm. ***Research Policy***, 27(5): 507-523.

Mulotte, L., Dussauge, P., & Mitchell, W. 2013. Does pre-entry licensing undermine the performance of subsequent independent activities? Evidence from the global aerospace industry, 1944–2000. ***Strategic Management Journal***, 34(3): 358-372.

Muthusamy, S. K., & White, M. A. 2005. Learning and Knowledge Transfer in Strategic Alliances: A Social Exchange View. ***Organization Studies***, 26(3): 415-441.

Myers, S. C., & Majluf, N. S. 1984. Corporate financing and investment decisions when firms have information that investors do not have. ***Journal of Financial Economics***, 13(2): 187-221.

Ndofor, H. A., & Levitas, E. 2004. Signaling the Strategic Value of Knowledge. ***Journal of Management***, 30(5): 685-702.

Nelson, R. R., & Winter, S. G. 1982. ***An Evolutionary Theory of Economic Change***. Cambridge, MA: Harvard University Press.

Nohria, N., & Gulati, R. 1996. Is Slack Good or Bad for Innovation? ***Academy of Management Journal***, 39(5): 1245-1264.

Oler, D. K., Harrison, J. S., & Allen, M. R. 2008. The danger of misinterpreting short-window event study findings in strategic management research: an empirical illustration using horizontal acquisitions. ***Strategic Organization***, 6(2): 151-184.

Osborn, R. N., & Hagedoorn, J. 1997. The Institutionalization and Evolutionary Dynamics of Interorganizational Alliances and Networks. ***Academy of Management Journal***, 40(2): 261-278.

Oxley, J., & Sampson, R. 2004. The scope and governance of international R&D alliances. ***Strategic Management Journal***, 25(8-9 (Special Issue: The Global Acquisition, Leverage, and Protection of Technological Competencies)): 723-749.

Oxley, J. E. 1997. Appropriability Hazards and Governance in Strategic Alliances: A Transaction Cost Approach. ***Journal of Law, Economics, & Organization***, 13(2): 387-409.

Ozcan, S., & Overby, M. L. 2008. A cognitive model of stock market reactions to multi-firm alliance announcements. ***Strategic Organization***, 6(4): 435-469.

Ozmel, U., Reuer, J. J., & Gulati, R. 2013. Signals Across Multiple Networks: How Venture Capital and Alliance Networks Affect Interorganizational Collaboration. ***Academy of Management Journal***, 56(3): 852-866.

Pacheco-de-Almeida, G., Hawk, A., & Yeung, B. 2015. The right speed and its value. ***Strategic Management Journal***, 36(2): 159-176.

Palmiter, A. R. 2008. ***Securities regulation: Examples and explanations***: Aspen Publishers Online.

Pangarkar, N. 2003. Determinants of Alliance Duration in Uncertain Environments: The Case of the Biotechnology Sector. ***Long range planning***, 36(3): 269-284.

Park, N. K. 2004. A Guide to Using Event Study Methods in Multi-Country Settings. ***Strategic Management Journal***, 25(7): 655-668.

Park, N. K., & Mezias, J. M. 2005. Before and after the technology sector crash: the effect of environmental munificence on stock market response to alliances of e-commerce firms. ***Strategic Management Journal***, 26(11): 987-1007.

Park, S. H., & Kim, D. 1997. Market valuation of joint ventures: Joint venture characteristics and wealth gains. ***Journal of Business Venturing***, 12(2): 83-108.

Park, S. H., & Russo, M. V. 1996. When Competition Eclipses Cooperation: An Event History Analysis of Joint Venture Failure. ***Management Science***, 42(6): 875-890.

Park, S. H., & Ungson, G. R. 2001. Interfirm Rivalry and Managerial Complexity: A Conceptual Framework of Alliance Failure. ***Organization Science***, 12(1): 37-53.

Parkhe, A. 1991. Interfirm Diversity, Organizational Learning, and Longevity in Global Strategic Alliances. ***Journal of International Business Studies***, 22(4): 579-601.

Parkhe, A. 1993. Strategic Alliance Structuring: A Game Theoretic and Transaction Cost Examination of Interfirm Cooperation. ***Academy of Management Journal***, 36(4): 794-829.

Parkhe, A. 1998. Understanding trust in international alliances. ***Journal of World Business***, 33(3): 219-240.

Paul, C. C. 2001. The power of the press release. ***Civil Engineering***, 71(1): 64-65.

Perkins, S. J., & Hendry, C. 2005. Ordering Top Pay: Interpreting the Signals. ***Journal of Management Studies***, 42(7): 1443-1468.

Perrone, V., Zaheer, A., & McEvily, B. 2003. Free to Be Trusted? Organizational Constraints on Trust in Boundary Spanners. ***Organization Science***, 14(4): 422-439.

Peteraf, M. A. 1993. The Cornerstones of Competitive Advantage: A Resource-Based View. ***Strategic Management Journal***, 14(3): 179-191.

Pfeffer, J., & Salancik, G. R. 1978. ***The external control of organizations: A resource dependence perspective***. New York: Harper and Row.

PhRMA. 2013. The Economic Impact of the US Biopharmaceutical Industry.

Pisano, G. P., Russo, M. V., & Teece, D. J. 1988. Joint Ventures and Collaborative Arrangements in the Telecommunications Equipment Industry. In D. Mowery (Ed.),

International Collaborative Ventures in U.S. Manufacturing. Cambridge, MA: Ballinger.

Pollock, T. G., Chen, G., Jackson, E. M., & Hambrick, D. C. 2010. How much prestige is enough? Assessing the value of multiple types of high-status affiliates for young firms. ***Journal of Business Venturing***, 25(1): 6-23.

Popper, K. 1962. ***Conjectures and refutations: The growth of scientific knowledge***. London: Routledge.

Popper, K. 1994. Introduction, ***The myth of the framework: In defence of science and rationality***. London: Routledge.

Popper, K. 2009. ***The logic of scientific discovery***. London: Routledge.

Porter, M. E. 1990. ***The Competitive Advantage of Nations***. New York: The Free Press.

Powell, T. C., Lovallo, D., & Caringal, C. 2006. Causal Ambiguity, Management Perception, and Firm Performance. ***Academy of Management Review***, 31(1): 175-196.

Powell, W. W. 1987. Hybrid Organizational Arrangements: New Form or Transitional Development? ***California Management Review***, 30(1): 67-87.

Powell, W. W., Koput, K. W., & Smith-Doerr, L. 1996. Interorganizational Collaboration and the Locus of Innovation: Networks of Learning in Biotechnology. ***Administrative Science Quarterly***, 41(1): 116-145.

Quigley, T. J., & Hambrick, D. C. 2015. Has the "CEO effect" increased in recent decades? A new explanation for the great rise in America's attention to corporate leaders. ***Strategic Management Journal***, 36(6): 821-830.

Ragozzino, R., & Reuer, J. J. 2011. Geographic distance and corporate acquisitions: signals from IPO firms. ***Strategic Management Journal***, 32(8): 876-894.

Reuer, J. J., & Koza, M. P. 2000. Asymmetric information and joint venture performance: theory and evidence for domestic and international joint ventures. ***Strategic Management Journal***, 21(1): 81-88.

Reuer, J. J., & Lahiri, N. 2014. Searching for Alliance Partners: Effects of Geographic Distance on the Formation of R&D Collaborations. ***Organization Science***, 25(1): 283-298.

Reuer, J. J., & Zollo, M. 2005. Termination outcomes of research alliances. ***Research Policy***, 34(1): 101-115.

Reuer, J. J., Zollo, M., & Singh, H. 2002. Post-Formation Dynamics in Strategic Alliances. ***Strategic Management Journal***, 23(2): 135-151.

Rindova, V., Ferrier, W. J., & Wiltbank, R. 2010. Value from gestalt: how sequences of competitive actions create advantage for firms in nascent markets. ***Strategic Management Journal***, 31(13): 1474-1497.

Ring, P. S., & Van de Ven, A. H. 1992. Structuring Cooperative Relationships between Organizations. ***Strategic Management Journal***, 13(7): 483-498.

Ring, P. S., & van de Ven, A. H. 1994. Developmental Processes of Cooperative Interorganizational Relationships. ***Academy of Management Review***, 19(1): 90-118.

Rothaermel, F. T. 2001. Incumbent's advantage through exploiting complementary assets via interfirm cooperation. ***Strategic Management Journal***, 22(6-7): 687-699.

Rothaermel, F. T., & Boeker, W. 2008. Old technology meets new technology: complementarities, similarities, and alliance formation. ***Strategic Management Journal***, 29(1): 47-77.

Rothaermel, F. T., & Deeds, D. L. 2006. Alliance type, alliance experience and alliance management capability in high-technology ventures. ***Journal of Business Venturing***, 21(4): 429-460.

Roulstone, D. T. 2003. Analyst Following and Market Liquidity. ***Contemporary Accounting Research***, 20(3): 552-578.

Rowley, T., Behrens, D., & Krackhardt, D. 2000. Redundant governance structures: an analysis of structural and relational embeddedness in the steel and semiconductor industries. ***Strategic Management Journal***, 21(3): 369-386.

Ryall, M. D., & Sampson, R. C. 2009. Formal Contracts in the Presence of Relational Enforcement Mechanisms: Evidence from Technology Development Projects. ***Management Science***, 55(6): 906-925.

Sadowski, B., & Duysters, G. 2008. Strategic technology alliance termination: An empirical investigation. ***Journal of Engineering and Technology Management***, 25(4): 305-320.

Sampson, R. C. 2004. Organizational choice in R&D alliances: Knowledge-based and transaction cost perspectives. ***Managerial and Decision Economics***, 25(6-7): 421-436.

Sampson, R. C. 2005. Experience effects and collaborative returns in R&D alliances. ***Strategic Management Journal***, 26(11): 1009-1031.

Sampson, R. C. 2007. R&D alliances and firm performance: The impact of technological diversity and alliance organization on innovation. ***Academy of Management Journal***, 50(2): 364- 386.

Saxton, T. 1997. The Effects of Partner and Relationship Characteristics on Alliance Outcomes. ***Academy of Management Journal***, 40(2): 443-461.

Schildt, H., Keil, T., & Maula, M. 2012. The temporal effects of relative and firm-level absorptive capacity on interorganizational learning. ***Strategic Management Journal***, 33(10): 1154-1173.

Schilke, O., & Goerzen, A. 2010. Alliance Management Capability: An Investigation of the Construct and Its Measurement. ***Journal of Management***, 36(5): 1192-1219.

Schreiner, M., & Heimeriks, K. H. 2010. Relational quality, alliance capability, and alliance performance: an integrated framework. In V. Narayanan (Ed.), ***Enhancing Competences for Competitive Advantage*** 145-171: Emerald Group Publishing Limited.

Schreiner, M., Kale, P., & Corsten, D. 2009. What really is alliance management capability and how does it impact alliance outcomes and success? ***Strategic Management Journal***, 30(13): 1395-1419.

Sears, J., & Hoetker, G. 2013. Technological overlap, technological capabilities, and resource recombination in technological acquisitions. ***Strategic Management Journal***.

Shah, R. H., & Swaminathan, V. 2008. Factors influencing partner selection in strategic alliances: the moderating role of alliance context. ***Strategic Management Journal***, 29(5): 471-494.

Shan, W., Walker, G., & Kogut, B. 1994. Interfirm Cooperation and Startup Innovation in the Biotechnology Industry. ***Strategic Management Journal***, 15(5): 387-394.

Shi, W., & Prescott, J. E. 2011. Sequence Patterns of Firms' Acquisition and Alliance Behaviour and their Performance Implications. ***Journal of Management Studies***, 48(5): 1044-1070.

Shi, W., & Prescott, J. E. 2012. Rhythm and Entrainment of Acquisition and Alliance Initiatives and Firm Performance: A Temporal Perspective. ***Organization Studies***, 33(10): 1281-1310.

Shi, W., Sun, J., & Prescott, J. E. 2012. A Temporal Perspective of Merger and Acquisition and Strategic Alliance Initiatives: Review and Future Direction. ***Journal of Management***, 38(1): 164-209.

Shipilov, A. V. 2006. Network Strategies and Performance of Canadian Investment Banks. ***Academy of Management Journal***, 49(3): 590-604.

Simonin, B. L. 1997. The Importance of Collaborative Know-How: An Empirical Test of the Learning Organization. ***Academy of Management Journal***, 40(5): 1150-1174.

Simonin, B. L. 2004. An Empirical Investigation of the Process of Knowledge Transfer in International Strategic Alliances. ***Journal of International Business Studies***, 35(5): 407-427.

Sims, N., Harrison, R., & Gueth, A. 2001. Managing Alliances at Lily. ***Windhover's In Vivo*** 19(6).

Sinclair, G., Klepper, S., & Cohen, W. 2000. What's Experience Got to Do With It? Sources of Cost Reduction in a Large Specialty Chemicals Producer. ***Management Science***, 46(1): 28-45.

Sirower, M. L., & Lipin, S. 2003. Investor Communications: A Message of Confidence In the Deal. ***Mergers & Acquisitions: The Dealermaker's Journal***, 38(10): 21.

Sitkin, S. B. 1992. Learning through failure-The strategy of small losses. ***Research in organizational behavior***, 14: 231-266.

Sleptsov, A., Anand, J., & Vasudeva, G. 2013. Relational configurations with information intermediaries: The effect of firm-investment bank ties on expected acquisition performance. ***Strategic Management Journal***, 34(8): 957-977.

Sleurs, K., Jacobs, G., & Van Waes, L. 2003. Constructing press releases, constructing quotations: A case study. ***Journal of Sociolinguistics***, 7(2): 192-212.

Smith, M., & Taffler, R. J. 2000. The chairman's statement-a content analysis of discretionary narrative disclosures. ***Accounting, Auditing & Accountability Journal***, 13(5): 624-647.

Soh, P.-H., Mahmood, I. P., & Mitchell, W. 2004. Dynamic Inducements in R&D Investment: Market Signals and Network Locations. ***Academy of Management Journal***, 47(6): 907-917.

Spence, A. M. 1974. ***Market signaling: Informational transfer in hiring and related screening processes***. Cambridge, MA: Harvard University Press.

Spence, M. 1973. Job Market Signaling. ***The Quarterly Journal of Economics***, 87(3): 355-374.

Spence, M. 2002. Signaling in Retrospect and the Informational Structure of Markets. ***The American Economic Review***, 92(3): 434-459.

Stam, W., & Elfring, T. 2008. Entrepreneurial Orientation and New Venture Performance: The Moderating Role of Intra- and Extraindustry Social Capital. ***Academy of Management Journal***, 51(1): 97-111.

Standifer, R., & Bluedorn, A. 2006. Alliance management teams and entrainment: Sharing temporal mental models. ***Human Relations***, 59(7): 903-927.

Stiglitz, J. E. 2000. The Contributions of the Economics of Information to Twentieth Century Economics. ***The Quarterly Journal of Economics***, 115(4): 1441-1478.

Stuart, T., E., Hoang, H., & Hybels, R. C. 1999. Interorganizational Endorsements and the Performance of Entrepreneurial Ventures. ***Administrative Science Quarterly***, 44(2): 315-349.

Stuart, T. E. 2000. Interorganizational alliances and the performance of firms: a study of growth and innovation rates in a high-technology industry. ***Strategic Management Journal***, 21(8): 791-811.

Stuckey, A. 1983. ***Vertical Integration and Joint Ventures in the Aluminum Industry***. Cambridge, MA: Harvard University Press.

Swaminathan, V., & Moorman, C. 2009. Marketing Alliances, Firm Networks, and Firm Value Creation. ***Journal of Marketing***, 73(5): 52-69.

Teece, D. J., Pisano, G., & Shuen, A. 1997. Dynamic capabilities and strategic management. ***Strategic Management Journal***, 18(7): 509-533.

Teng, B.-S. 2007. Corporate Entrepreneurship Activities through Strategic Alliances: A Resource-Based Approach toward Competitive Advantage. ***Journal of Management Studies***, 44(1): 119-142.

Thompson, J. D. 1967. ***Organizations in action: Social science bases of administrative theories***. New York: McGraw-Hill.

Tversky, A., & Kahneman, D. 1974. Judgment under Uncertainty: Heuristics and Biases. ***Science***, 185(4157): 1124-1131.

Vanneste, B. S., & Puranam, P. 2010. Repeated Interactions and Contractual Detail: Identifying the Learning Effect. ***Organization Science***, 21(1): 186-201.

Vanneste, B. S., Puranam, P., & Kretschmer, T. 2014. Trust over time in exchange relationships: Meta-analysis and theory. ***Strategic Management Journal***, 35(12): 1891-1902.

Vasella, D. D. 2004. The Population is Not Really the Attraction. In B. Carvalho (Ed.), ***Business Today***.

Vermeulen, F., & Barkema, H. 2002. Pace, rhythm, and scope: process dependence in building a profitable multinational corporation. ***Strategic Management Journal***, 23(7): 637-653.

Voss, G. B., Sirdeshmukh, D., & Voss, Z. G. 2008. The effects of slack resources and environmental threat on product exploration and exploitation. ***Academy of Management Journal***, 51(1): 147- 164.

Wang, J. 1993. A Model of Intertemporal Asset Prices Under Asymmetric Information. ***The Review of Economic Studies***, 60(2): 249-282.

Wang, L., & Zajac, E. J. 2007. Alliance or acquisition? a dyadic perspective on interfirm resource combinations. ***Strategic Management Journal***, 28(13): 1291-1317.

Wang, Y., & Rajagopalan, N. 2015. Alliance Capabilities: Review and Research Agenda. ***Journal of Management***, 41(1): 236-260.

Wasserman, C. M. 2003. ***Partnerships, Joint Ventures and Strategic Alliances***: Law Journal Press.

Wassmer, U. 2010. Alliance Portfolios: A Review and Research Agenda. ***Journal of Management***, 36(1): 141-171.

Wassmer, U., & Dussauge, P. 2012. Network resource stocks and flows: how do alliance portfolios affect the value of new alliance formations? ***Strategic Management Journal***, 33(7): 871-883.

Wassmer, U., Dussauge, P., & Planellas, M. 2010. How to manage alliances better than one at a time. ***MIT Sloan Management Review***.

Weigelt, K., & Camerer, C. 1988. Reputation and Corporate Strategy: A Review of Recent Theory and Applications. ***Strategic Management Journal***, 9(5): 443-454.

Wernerfelt, B. 1984. A Resource-Based View of the Firm. ***Strategic Management Journal***, 5(2): 171-180.

Westphal, J. D., & Zajac, E. J. 1998. The Symbolic Management of Stockholders: Corporate Governance Reforms and Shareholder Reactions. ***Administrative Science Quarterly***, 43(1): 127-153.

Wiersma, E. 2007. Conditions That Shape the Learning Curve: Factors That Increase the Ability and Opportunity to Learn. ***Management Science***, 53(12): 1903-1915.

Williamson, O. E. 1975. ***Markets and Hierarchies: Analysis and Antitrust Implications.*** New York: Free Press.

Williamson, O. E. 1985. ***The Economic Institutions of Capitalism***. New York: Free Press.

Williamson, O. E. 1991. Comparative Economic Organization: The Analysis of Discrete Structural Alternatives. ***Administrative Science Quarterly***, 36(2): 269-296.

Winter, S. G. 2000. The Satisficing Principle in Capability Learning. ***Strategic Management Journal***, 21(10-11): 981-996.

Winter, S. G. 2003. Understanding dynamic capabilities. ***Strategic Management Journal***, 24(10): 991-995.

Xia, J. 2011. Mutual dependence, partner substitutability, and repeated partnership: the survival of cross-border alliances. ***Strategic Management Journal***, 32(3): 229-253.

Yan, A., & Zeng, M. 1999. International Joint Venture Instability: A Critique of Previous Research, A Reconceptualization, and Directions for Future Research. ***Journal of International Business Studies***, 30(2): 397-414.

Yanadori, Y., & Cui, V. 2013. Creating incentives for innovation? The relationship between pay dispersion in R&D groups and firm innovation performance. ***Strategic Management Journal***, 34(12): 1502-1511.

Yang, H., Zheng, Y., & Zaheer, A. 2015. Asymmetric Learning Capabilities and Stock Market Returns. ***Academy of Management Journal***, 58(2): 356-374.

Yoshino, M., & Rangan, S. 1995. ***Strategic alliances: An entrepreneurial approach to globalization***. Boston, MA: Harvard Business School Press.

Yoshino, M. Y., & Fagan, P. 2003. The Renault-Nissan Alliance. ***Harvard Business School Case (303-023)***.

Young-Ybarra, C., & Wiersema, M. 1999. Strategic Flexibility in Information Technology Alliances: The Influence of Transaction Cost Economics and Social Exchange Theory. ***Organization Science***, 10(4): 439-459.

Zaheer, A., Hernandez, E., & Banerjee, S. 2010. Prior Alliances with Targets and Acquisition Performance in Knowledge-Intensive Industries. ***Organization Science***, 21(5): 1072-1091.

Zaheer, A., McEvily, B., & Perrone, V. 1998. Does Trust Matter? Exploring the Effects of Interorganizational and Interpersonal Trust on Performance. ***Organization Science***, 9(2): 141-159.

Zahra, S. A., & George, G. 2002. Absorptive Capacity: A Review, Reconceptualization, and Extension. ***Academy of Management Review***, 27(2): 185-203.

Zajac, E. J., & Westphal, J. D. 1995. Accounting for the Explanations of CEO Compensation: Substance and Symbolism. ***Administrative Science Quarterly***, 40(2): 283-308.

Zajac, E. J., & Westphal, J. D. 2004. The Social Construction of Market Value: Institutionalization and Learning Perspectives on Stock Market Reactions. ***American Sociological Review***, 69(3): 433-457.

Zhang, J., & Baden-Fuller, C. 2010. The Influence of Technological Knowledge Base and Organizational Structure on Technology Collaboration. ***Journal of Management Studies***, 47(4): 679-704.

Zhang, X. F. 2006. Information Uncertainty and Stock Returns. ***The Journal of Finance***, 61(1): 105-137.

Zhang, Y., & Wiersema, M. F. 2009. Stock market reaction to CEO certification: the signaling role of CEO background. ***Strategic Management Journal***, 30(7): 693-710.

Zollo, M. 2009. Superstitious Learning with Rare Strategic Decisions: Theory and Evidence from Corporate Acquisitions. ***Organization Science***, 20(5): 894-908.

Zollo, M., & Reuer, J. J. 2010. Experience Spillovers Across Corporate Development Activities. ***Organization Science***, 21(6): 1195-1212.

Zollo, M., Reuer, J. J., & Singh, H. 2002. Interorganizational Routines and Performance in Strategic Alliances. ***Organization Science***, 13(6): 701-713.

Zollo, M., & Winter, S. G. 2002. Deliberate Learning and the Evolution of Dynamic Capabilities. ***Organization Science***, 13(3): 339-351.

Zuckerman, E. W. 1999. The Categorical Imperative: Securities Analysts and the Illegitimacy Discount. ***American Journal of Sociology***, 104(5): 1398-1438.