ALLIANCE EXPERIENCE AND ACCOMMODATION IN THE CHOICE OF ALLIANCE GOVERNANCE STRUCTURE

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ABSTRACT

This paper explores a less-recognized aspect of alliance management capabilities, accommodation, which occurs when a firm refrains from applying its bargaining power, agreeing to terms that address their partner's concerns or interests to a greater degree than their own. Despite its potential importance, the strategy and marketing literatures provide few insights into when and how accommodation occurs in alliances. We propose that firms with greater alliance experience are more likely to accommodate their partner's concerns through the choice of governance structure, relying on their accumulated alliance capabilities to mitigate their own governance concerns. We find evidence to support our propositions in innovation alliances initiated between target and client firms in the biotechnology and pharmaceutical industries. In addition to formally introducing the concept of accommodation into the literature on the governance of alliances, we establish that there are boundary conditions for accommodation to occur; in our case, sufficient alliance experience. Moreover, we provide evidence in support of the transaction value perspective, which—while intellectually appealing—has been difficult to test empirically. Lastly, we demonstrate the value of considering the (possibly conflicting) concerns and preferences of all partners in the alliance, rather than focusing on the hazards faced by a focal partner.

KEYWORDS

Accommodation, alliance experience, resource integration, alliance governance structure.

INTRODUCTION

Alliance experience helps firms develop their alliance management capabilities, potentially leading to superior alliance performance (Anand and Khanna 2000; Kale and Singh 2007). Simonin (1997) identified that learning occurred across multiple stages of the alliance process, including selecting collaborators, negotiating terms and conditions, monitoring and managing the collaboration, and recognizing the optimal time to terminate a collaboration. Across these phases, experience helps firms develop appropriate procedures and systems, interpret situations based on prior experience and engage in second-order learning (Anand and Khanna 2000; Lyles 1988). This paper explores a less-recognized aspect of alliance management capabilities, accommodation. Accommodation occurs when a firm refrains from applying its bargaining power, agreeing to terms that address their partner's concerns or interests to a greater degree than their own.

The idea of accommodation stands in contrast to much of the strategy (Bae and Gargiulo 2004; Harrigan 1983; Harrigan 1985; Porter 1976, 1985) and marketing (Beier and Stern 1969; Frazier and Summers 1986) literatures, which assume, explicitly or implicitly, that firms will exert the full extent of whatever bargaining power they have in order to extract for themselves the maximum share of the gains from an exchange. Previous empirical evidence largely supports this assumption (Bae and Gargiulo 2004; Harrigan 1983).

In the context of inter-firm alliances, a firm can apply its bargaining power to shape the terms of an alliance to suit its preferences and maximize its share of the value created. However, the example of Eli Lilly, a highly innovative pharmaceutical firm, stands in apparent contradiction to the naively assumed behavior. As an attractive potential partner, Lilly could attempt to impose its vision onto an alliance, shifting risks on its partners, while retaining most of the potential

rewards (cf. Baum et al. 2000). Rather, Lilly broadly publicizes its efforts to identify and advocate the interests of its alliance partners. According to Lilly, its Corporate Business Development group seeks to build a "shared perspective of alliance expectations and goals" and offer "flexibility and creativity in risk and reward sharing". The Office of Alliance Management is responsible for "bringing benefit to each alliance partner" and serving "as an advocate within Lilly for the alliance partner". (http://www.lilly.com/about/partnerships/sourcing/, accessed August 5, 2010). Lilly's efforts appear to be more than window dressing, as a survey of biotechnology firms ranked Lilly as the most desirable partner in terms of partnering capabilities in the pharmaceutical industry (PRNewswire Dec 9, 2005).

The logic of transaction value analysis (Dyer 1997; Zajac and Olsen 1993) provides a potential explanation for Lilly's accommodation of its alliance partners' concerns and for accommodation more generally. Transaction *value* analysis extends transaction *cost* analysis's focus on minimizing transaction costs to consider the maximization of joint value creation. Inherent in its logic is that joint value creation requires that each partner give "some consideration of the satisfaction of their partner's valued interests" (Zajac and Olsen 1993: 134), rather than fully applying its bargaining power. A partner may find it rational to "refrain from using its bargaining power and make concessions regarding governance structure in order to motivate the less powerful partner to participate and simulate the development of trust," (Neumann 2010: 7), that is, to accommodate its partners' concerns in order to set the stage for superior value creation. Thus, accommodation of a partner's concerns is consistent with self-interested, profit-seeking behavior if the firm's share of the joint value created as a result is

greater than what it would have received in the absence of accommodation.[1] Colloquially, accommodation may lead to a smaller slice of a larger pie than would have otherwise been created—indeed, some degree of accommodation may be necessary for the creation of any pie.

In the context of alliances, accommodation can generate joint value creation through a greater willingness to exchange information, leading to identification of additional opportunities to create value through cooperation (Moran and Ghoshal 1999; North 1990). Accommodation may also lead to a greater willingness to take risks, resolve problems interactively and engage in creative activities (cf. Gulati 1995a; North 1990). In sum, accommodation enhances "access to economic gains from cooperation" (Rousseau et al. 1998: 396). However, we understand little about when and how accommodation occurs in alliances.

In particular, the question of which firm will be most accommodating of the other's concerns when negotiating the terms of an alliance remains unaddressed. Each firm has its own set of concerns, based on the transaction hazards it will face in the alliance. Each firm would prefer that the terms of the alliance address its set of concerns, even though those terms may not address the concerns of the partner. When deciding how much to accommodate its partner's concerns, each firm in an alliance must balance competing considerations. On the one hand, the firm can contribute to greater joint value creation through accommodation. On the other hand, the firm must protect its own interests and avoid yielding too much of that value to its partner through being overly accommodating. Therefore, firms will accommodate their partner's

[1] It does not, however, exclude a role for altruism (Heide and Miner 1992), a point we will address in the discussion section.

concerns only to the degree that they can protect their own interests and capture greater value than they would otherwise.

A key variable in this balancing act is the firm's prior alliance experience. Through experience with alliances, firms learn to manage multiple aspects of collaborative inter-firm relationships (Ahuja 2000; Anand and Khanna 2000; Gulati et al. 2000; Westney 1988). As a result, experienced firms can accept terms that respond primarily to their partner's concerns, relying on their alliance management capabilities to mitigate threats to their interests and to claim value from the alliance despite terms that are, from their viewpoint, sub-optimal. Inexperienced firms, having inferior alliance management capabilities, are unable to address their partner's concerns and their own concerns simultaneously. Rather than accommodating their partner's concerns, they focus on mitigating the transaction hazards most relevant to them.

Thus, we propose that firms with more alliance experience will be more willing to accommodate their partner's preference regarding the terms of the alliance. We further propose that asymmetry in alliance experience increases the probability of the more experienced firm accommodating its less experienced partner because the less experienced firm is much more dependent on favorable alliance terms to mitigate the transaction hazards it faces. Empirical investigation of R&D alliances in the biotechnology and pharmaceutical industries provides evidence that strongly supports these hypotheses.

Our theoretical contribution is four fold. First, we formally introduce the concept of accommodation into the literature on the governance of alliance and inter-firm relationships more generally. Second, we provide empirical evidence that accommodation occurs, demonstrating that the fundamental and often implicit assumption that firms will fully apply their bargaining power to enforce their preferences needs to be examined on a case-to-case basis.

Firms can and do accommodate the concerns of their partners. However, our third contribution is to establish that there are boundary conditions for accommodation to occur; in our case, sufficient alliance experience. This makes it possible to predict when accommodation is likely to occur. Fourth, we provide evidence in support of the transaction value perspective which, while intellectually appealing, has been difficult to test empirically.

We also make a broader methodological and theoretical contribution. Most studies of governance within alliances focus on mitigating the transaction hazards faced by a focal firm, providing "one-sided analysis of what is clearly a dyadic phenomenon" (Wang and Zajac 2007: 1292). Our result demonstrate the value of considering the (possibly conflicting) concerns and preferences of all partners in the alliance, as governance choices derive from the interaction of each firm's efforts to create and claim value within the relationship.

THEORY AND HYPOTHESIS

Accommodation can occur with respect to many aspects of an alliance's governance. In this study, we examine accommodation vis-à-vis the governance structure of the alliance, specifically, whether the alliance is equity or non-equity based. In addition to being highly visible, the equity/non-equity decision sets the overarching framework under which all subsequent governance activities will occur (Gulati 1995a). As a result, it has been extensively studied (Gulati and Singh 1998; Oxley 1997; Oxley and Sampson 2004; Pisano 1989; Sampson 2004), providing a well-established basis for our hypotheses.

Innovation alliances involving a *target firm*, a technology holder that shares its knowledge or capabilities with a client firm, and a *client firm*, a technology recipient that accesses the target firm's knowledge or capabilities through the alliance (Robinson and Stuart 2007), are an ideal setting in which to study accommodation regarding the equity/non-equity decision. As we detail

below, target and client firms have different concerns and therefore face potential conflicts of interest regarding the use or non-use of equity.

RESOURCE INTEGRATION AND GOVERNANCE CHOICE

Alliances involve the process of combining intangible, knowledge-based resources between legally independent entities (Dussauge et al. 2000; Wang and Zajac 2007). An important decision in forming an alliance is the way such knowledge-based resources are integrated or shared between partners (Das and Teng 2000). In particular, a distinction has been made between link and scale alliances (Hennart 1988). Link alliances refer to exchanging resources without resource pooling between partners by performing different functions across the value chain (Kalaignanam et al. 2007), such as the client firm outsourcing R&D to the target firm. In scale alliances, in contrast, the client and target firms "contribute similar resources pertaining to the same stage or stages in the value-chain" (Dussauge et al. 2000: 102) to create new knowledge or capabilities by jointly building on the target firm's technological resources.

The alliance between Bristol-Myers Squibb and Epitome Biosystems is an example of a link alliance. Bristol-Myers Squibb, the client firm, outsourced a product development project to Epitome Biosystems, the client:

> "Epitome Biosystems announced that it has signed a technology access and product development agreement with Bristol-Myers Squibb Co. for use of Epitome's proprietary EpiTag protein measurement platform. Epitome will develop custom antibody arrays for quantitative and high-throughput measurement of proteins specified by Bristol-Myers Squibb to accelerate introduction of newly discovered biomarkers into clinical development programs. Under the terms of the agreement, Epitome will receive

development funding and license fees from Bristol-Myers Squibb. . . .” (DrugWeek January 27, 2006)

The alliance between Merck & Co. and Alnylam provides an example of a scale alliance. Here, Merck & Co., the client firm, jointly developed an advanced technology by pooling resources with Alnylam, the target firm, based on Alnylam’s intellectual property, technology, and expertise:

> “Merck & Co., Inc. and Alnylam Holding Co., the leading therapeutic RNA interference (RNAi) company, announced today that they have entered into a multi-year collaboration to develop RNAi-based technology and therapeutics. . . . For technology development, Merck and Alnylam will each commit significant resources and expertise to the collaborative development of advanced RNAi technology, building on Alnylam’s leading position in intellectual property, technology and know-how for RNAi-based therapeutics. Under the terms of the agreement, Merck will make an upfront and annual cash payments and also make an equity investment in Alnylam. . . .” (PRNewswire September 9, 2003)

The distinction between link and scale alliances reflects different goals or benefits that alliance partners expect to achieve through their alliance. Link alliances aim at leveraging innovation efforts across the value chain, as in the case of one partner providing market access to the other partner developing new products; in contrast, scale resource integration enables partners to achieve economies of scale or synergy for innovation by pooling technological resources for the same functions in the value chain (Dussauge et al. 2004).

These resource integration structures also involve different types of interdependence between partners (Thompson 1967). Link resource integration involves serial interdependence, which

requires serial coordination of the activities of partners across separate stages of the value chain (Gulati and Singh 1998). While serial coordination is required across the innovation process, many decisions can be made independently by each partner responsible for each stages. Moreover, the contributions of partners tend to be clearly distinguished in link resource integration, in which the roles of partners are distinguished across the innovation process.

In contrast, scale resource integration creates much more interdependence between the partners to ensure the effective pooling of resources within the same activity. Thus, more comprehensive and involved coordination is necessary (Gerwin 2004; Killing 1988; Park and Russo 1996). Moreover, the contributions of partners are less clearly distinguished in scale resource integration because their resources are integrated for the same functions in the innovation process (Park and Russo 1996).

These differences mean that, relative to link alliances, scale alliances raise different concerns for target and client firms. For the target firm, the primary concern specific to scale alliances is the potential for unintended knowledge leakage. The extensive interdependence and frequent interactions between partners in scale alliances provide the client firm more opportunities to observe the target firm beyond the scope of activities agreed on at the time the alliance was formed (Mitchell et al. 2002; Oxley 1997; Park and Russo 1996). The client could then apply the knowledge outside of the alliance without making further payment (Arrow 1974). Thus, scale alliances increase the target firm's vulnerability to unintended knowledge leakage (Gulati and Singh 1998; Teece 1986). Additionally, since knowledge resources from each firm were integrated within the same function, third parties such as the courts may be unable to ascertain if misappropriation of knowledge has occurred (Schwartz 1992). Further limiting the value of recourse to the courts is the limited range of potential remedies. Firms can be forced to return

property, but it is difficult to force the client firm's employees to unlearn the knowledge once transferred (Arora et al. 2001; Hoetker and Mellewigt 2009). Therefore, the target firm will have a greater need for a governance structure that protects its technological resources in scale alliances than in link alliances.

The inclusion of an equity investment in the target firm by the client firm helps provide that protection (Teece 1992). The usefulness of equity in governing such alliances is long established (e.g., Gulati and Singh 1998; Kale and Puranam 2004; Teece 1992), although prior work has not distinguished the interests of the target and the client in having equity. An equity stake aligns the interests of the parties by aligning the incentives of the partners (Pisano 1989; Teece 1992). In particular, it assures that both parties have a financial stake in the success of the target firm (Gulati and Singh 1998; Pisano 1989). So, relative to a link alliance, a scale alliance induces a stronger preference on the part of the target firm for an equity-based alliance and the incentive alignment and dispute resolution mechanisms equity provides.

For the client firm, the primary concern specific to scale alliances is the loss of flexibility (Balakrishnan and Wernerfelt 1986; Folta 1998). In developing new products, multiple options often coexist for feasible designs or technologies, and these compete to dominate the other options (Osborn and Baughn 1990). For instance, pharmaceutical firms typically search through more than 5,000 compounds to develop a single new drug (Giovannetti and Morrison 2000). These technological uncertainties in exploring new opportunities require flexibility in monitoring technological changes in the industry and in forming and dissolving collaborative interfirm relationships, i.e., search flexibility (Hansen 1999; Rowley et al. 2000). Scale alliances, in and of themselves, restrict search flexibility to a greater degree than link alliances by occupying more managerial resources to coordinate the extensive interdependence and interactions between

partners (Gerwin 2004; Gulati et al. 2005; Park and Russo 1996). Eager to avoid further reducing their search flexibility, client firms in scale alliances prefer to avoid the use of equity, which limits flexibility through commitment to a long-term relationship, significant demands on managerial effort, and the difficulties of unwinding the investment (Das and Teng 2000; Gulati 1995a; Li et al. 2010). Therefore, relative to link alliances, a scale alliance induces a preference on the part of client firms to avoid equity.

The interests of the target and client firm in a scale alliance thus conflict, since in a scale alliance, equity helps address the concerns of target firms, but exacerbates the concerns of client firms. Consistent with the assumptions of the existing literature, each firm could fully exercise its negotiating power in pursuit of its preferred outcome, seeking to minimize its exposure to transaction hazards. Or, seeking to maximize transaction value, a firm could accommodate its partner, accepting a governance structure more responsive to its partner's concerns than its own.

Given the respective preferences of target and client, accommodation by the client would mean that an alliance being scale, rather than link, would have a strong positive impact on the probability of using equity. Accommodation by the target would mean that an alliance being scale, rather than link, has a less positive or negative impact on the probability of using equity. By framing our hypotheses in terms of the effect of an alliance being scale rather than link, we isolate the firm's response to challenges specific to scale alliances from other factors that could influence each firm's preferences for the use or non-use of equity. Thus, we can identify the conditions under which one firm accommodates the other's concerns.

Self-interested firms will only accommodate their partner to the degree that they can still protect their own interests. Prior literature suggests that a key determinant of their ability to do so is their prior experience with alliances. Over repeated alliances, firms learn to manage

multiple aspects of collaborative inter-firm relationships (Ahuja 2000; Anand and Khanna 2000; Gulati et al. 2000; Westney 1988). As a result, experienced firms can accept terms that respond primarily to their partner's concerns, relying on their alliance capabilities (Kale and Singh 2007) to mitigating threats to their interests and to claim value from the alliance despite a governance structure that is, from their viewpoint, sub-optimal. Thus, we propose that firms with more alliance experience will be more likely to accommodate their partner in determining the governance structure of an alliance.

As a target firm accumulates alliance experience, it identifies the most likely opportunities for unintended knowledge leakage or knowledge misappropriation. Therefore, it can better anticipate and respond to such opportunities, which often cannot be prespecified in a formal contract (Anand and Khanna 2000). Further, firms that frequently engage in alliances often develop internal organizations dedicated to managing alliance activities (Kale et al. 2002), which are able to monitor activities within the alliance and proactively manage the flow of knowledge. Therefore, an experienced target firm sees a scale alliance as a less elevated threat for knowledge leakage and has less need for equity as protection. Hence, as the target firm has more alliance experience, it becomes more able to accommodate the client firm's desire to maintain search flexibility by forming a non-equity alliance.

Hypothesis 1: The greater the alliance experience of the target firm, the weaker the association between an alliance being scale, rather than link, and the use of equity.

As a client firm accumulates alliance experience, it develops a network of relationships from past collaborations that become a source of flexibility in monitoring and capturing new technological or business opportunities (Ahuja 2000). By engaging in various alliance activities over time, a client firm has more opportunities to access diverse information and learn about the reliability

and capability of potential partners (Gulati 1995b, 1999; Kogut and Zander 1992; Powell et al. 1996). Accordingly, the use of equity in an alliance will have a diminishing marginal effect on the search flexibility of the client firm as it accumulates more alliance experience (Soh et al. 2004). Hence, as the client firm has more alliance experience, it becomes more able to accommodate the target's desire to protect itself from unintended knowledge leakage or misappropriation by forming an equity alliance.

Hypothesis 2: The greater the alliance experience of the client firm, the stronger the association between an alliance being scale, rather than link, and the use of equity.

Accommodation will be maximized when the partners have substantially asymmetric alliance experience, as illustrated in Figure 1. When both firms have a low level of alliance experience, accommodation is impeded by each firm's limited capability for accommodation, in spite of both firms' high level of need for accommodation. Similarly, when both firms have a high level of alliance experience, accommodation is less likely to occur because of the low level of need for accommodation, in spite of both firms' high capability for accommodation.

In contrast, when firms have asymmetric alliance experience, the firm with a high level of alliance experience has greater ability to accommodate its partner, while the less experienced firm, possessing inferior alliance management capabilities, has a greater need for accommodation. Accordingly, we make the following predictions, which mirror hypotheses 1 and 2 respectively.

Hypothesis 3: The association between an alliance being scale, rather than link, and the use of equity will be weakest when the target firm has considerable alliance experience and the client firm has little alliance experience.

Hypothesis 4: The association between an alliance being scale, rather than link, and the use of equity will be strongest when the client firm has considerable alliance experience and the target firm has little alliance experience.

--- Place Figure 1 about here ---

All four hypotheses reflect our core proposition: alliance experience makes a firm more willing to accommodate the concerns of its alliance partner. The final two hypotheses provide particular insight because they reflect situations in which accommodation is the most germane.

RESEARCH METHODS

We tested the hypotheses with R&D alliances initiated in the biotechnology and pharmaceutical industries. The biotechnology and pharmaceutical industries are knowledge-rich sectors in which alliances are widely used for product innovations (Powell et al. 1996; Rothaermel and Deeds 2004). Moreover, advances in biotechnology since the mid-1970s have brought extensive alliances between firms with advanced biotechnology and firms with the capability for developing and commercializing specific applications (Rothaermel and Thursby 2007).

We gathered data on alliance formation between 2002 and 2006 from the *Deloitte Recap* database, a leading commercial database of alliance agreements dedicated to the biotechnology and pharmaceutical industries (cf. Hoang and Rothaermel 2010). This database covers all R&D agreements from mid-1980s, and provides information on the identity of the parties to the agreement and the nature of the agreement relevant to this study, such as functional activities to be performed under the alliances and the way partners have combined their resources. ReCap uses multiple data sources to ensure the accuracy of its database: trade literature, press releases, and its close links and interactions with experts involved in biotechnology and pharmaceutical industries.

To examine the formation of alliances for product innovations, we focused on alliances that included R&D as a part of the alliance agreements. We omitted pure licensing agreements because licensing is done to buy or sell the output of fully developed innovations (i.e., a technology or product), rather than to cooperate in the innovation process to create such outputs. We also omitted alliances involving universities or firms outside the biotechnology and pharmaceutical industries. These selection criteria led to 2,184 alliance agreements.

In line with common perception (cf. Wuyts et al. 2004), alliances in which a pharmaceutical firm acts as the client and a biotechnological firm acts as the target are frequent, comprising 46.3 percent of all observations. However, we observe other combinations: 49.5% of our observations were between biotechnology firms, while 4.2% were between pharmaceutical firms. We provide illustrative examples in Table 1.

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Since firms from both industries can serve as either target or client firms, we characterized a firm's role as target or client in the context of each alliance (Robinson and Stuart 2007). We base this characterization on ReCap classification. ReCap defined the client company as "The party in the alliance that is gaining access to a technology developed by the R&D partner," and the R&D company (target firm in our terminology) as "The party in the alliance associated with the technology's research and development." Examination of a subset alliance announcements confirmed ReCap's classification. In particular, it confirmed that it was possible to identify one firm as the target even in alliances involving joint R&D, as one firm's material or knowledge was clearly the foundation for the technology around which the alliance was formed. Of the 1627 firms in our data, 30.6% appeared as the client in every alliance, 47.6% appeared as the

target in every alliance, and 21.8% appeared as the client in some alliances and the target in others.

Contrary to a commonly held perception, target firms were not limited to small start-ups. Fifty-three percent of the alliances involved publicly traded target firms, meaning they had at least reached the initial public offering stage. Among targets, private firms averaged 252 employees and public firms averaged 2323 employees. Among frequent targets were well-established firms including Exelixis (9 alliances as target, founded in 1994, $169 million revenue and 676 employees in 2009), Albany Molecular Research (7 alliances as target, founded in 1991, $192 million revenue and 1,266 employees in 2009), and Nektar Therapeutics (7 alliances as target, founded in 1990, $125 million in revenues and 335 employees in 2009). Many prominent firms were targets in one or more alliances including Sumitomo Pharmaceuticals, Abbott and Schering-Plough.

Variables

The key variables for this study included whether an alliance is equity or non-equity, whether an alliance is link or scale, and each partner firm's alliance experience. Our measures are consistent with the prior literature and based upon ReCap's definitions and classifications (www.recap.com), ensuring they are objective and reflect the judgment of industry experts (Filson and Morales 2006; Wuyts et al. 2004).

Equity alliance is a dichotomous variable set to 1 for alliances meeting ReCap definition of an equity agreement, i.e., one involving "the issuance of a minority share (<50%) of legal ownership interest in an entity." The variable was set to 0 for alliances not involving the issuance of legal ownership interest. This coding matches the prior literature, e.g., Gulati and Singh (1998), Pisano (1989), Pisano *et al.* (1988). Equity investments were by the client firm in the

target firm. Our data included eight joint ventures, which we treated as equity alliances, consistent with Gulati (1995). Omitting these observations did not substantively change our results.

Scale alliance is a dichotomous variable set to 1 for alliances that ReCap characterized as "Collaboration" ("…two or more parties perform research and/or development activities in a single R&D program") or "Co-Development" ("both parties participate to some degree in the clinical development of a compound or project"). It was set to 0 for alliances ReCap characterized as *Research* ("a sponsoring party engages another party to perform R&D services in the discovery and/or lead stages of an R&D project.") or *Development* ("a sponsoring party engages another party to perform R&D services beyond the stage of lead generation."). Thus, consistent with Kalaignanam *et al.* (2007) and Dussauge *et al.* (2000), scale alliances are those that involve the pooling of R&D resources and link alliances are those in which they do not.

Alliance experience for a client or target firm is the number of alliances that the firm had initiated in the prior five years (Ahuja 2000). Given the lack or inaccuracy of information on the ending date of the alliance, we followed the example of prior work and also measured alliance experience with a six- and seven-year window as a robustness check, with consistent results.

Following Sampson (2005: 1016), we assumed that "Coordination across firm boundaries is always challenging and, therefore, skills gained in improving this coordination likely are gained from any type of alliance," and did not distinguish between prior link and scale alliances in measuring alliance experience. In robustness checks discussed below, we examined whether they had differential effects.

By comparing link and scale alliances, we were able to account for factors that might make a target or client favor or disfavor equity, independent of the type of resource integration

occurring, e.g., a need for cash, a desire to retain control of equity, or a perceived post-IPO payoff. Drawing on the prior literature, we also controlled for various factors that might affect the choice of alliance governance structure.

Equity-sharing experience takes into account partner firms' overall orientation toward using equity in forming alliances by including equity-sharing experience as a control variable. Equity-sharing experience of the target (client) firm was measured by the number of alliances initiated in the last five years in which the target (client) firm used equity sharing.

Repeated partnering between the same partners can generate trust between these partners and therefore affect the choice of governance structure (Gulati and Singh 1998; Hoetker 2005). We therefore included the number of alliances initiated in the last five years between the partners in the focal alliance.

Alliance scope refers to the breadth of functional activities that partners agreed to perform under the alliance agreement (Varadarajan and Cunningham 1995). Broad-scope alliances require more coordination across different stages or functional activities in the innovation process, thus increasing the complexity of communication and coordination tasks and creating more risk of knowledge leakage (Alvarez and Barney 2001; Oxley and Sampson 2004). Consistent with previous studies, we measured alliance scope by the number of functional activities covered by a collaboration agreement, including research, development, manufacturing, and marketing, as adapted from Kalaignanam *et al.* (2007).

Alliances between biotechnology and pharmaceutical firms were coded via a dichotomous variable set to 1 for alliances between biotechnology and pharmaceutical firms and set to zero for alliances between either biotechnology firms or pharmaceutical firms.

Public target (or client) firm were coded with two indicator variables, respectively set to one if the target and/or client firm were public.[2]

International alliance: Alliances between partners from different countries can be exposed to additional risks associated with different cultural, legal, or political environments compared with those between partners from the same country (Lavie and Miller 2008). In response, we distinguished between domestic and international alliances to control for these different environments across countries, including an indicator variable set to one if the headquarters of the alliance partners are located in different countries.

Stage in the innovation process refers to the stage in which alliances are initiated. Different stages in the innovation process involve different task characteristics, which may affect the choice of governance structure. Following Rothaermel and Deeds (2004) and McNamara and Baden-Fuller (2007), we code the stage of the innovation process from 1 to 8, as described in Table 2.

Alliance formation year: We also included indicator variables for alliance formation year. Table 2 summarizes the variables for this study.

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[2] There were a substantial minority of private firms among both targets and clients. Time varying data on firm size was unavailable for these firms. As with most studies in similar situations, we were therefore unable to control for firm size. However, as a robustness check, we gathered non-time-invariant size data from various sources for as many private firms as possible and reran our analysis. The substantive conclusions were unchanged.

Statistical Model

Our dependent variable was the binary choice of governance structure. We therefore tested the choice of alliance governance structure by using a logit model. The propensity of alliance partners to an equity alliance, y_i^*, is the linear combination of a vector of observable variables, $\mathbf{X}_i$, and unobservable factors (the error term), ε_i:

(1) $$y_i^* = \boldsymbol{\alpha} \boldsymbol{X}_i + \varepsilon_i.$$

However, because y_i^* is not observable, the actual choice of alliance governance structure, y_i, is examined: $y_i = 1$ for an equity alliance and $y_i = 0$ for a non-equity alliance. The probability of alliance partners using equity in alliance *i* is

(2) $$P(y_i = 1|\boldsymbol{X}_i) = \frac{exp\left(\boldsymbol{X}_i' \boldsymbol{\beta}\right)}{1+exp\left(\boldsymbol{X}_i' \boldsymbol{\beta}\right)},$$

where $\boldsymbol{\beta}$ is the vector of coefficients to be estimated.

Although the logit model is standard in the governance choice literature (Gulati 1995a), it makes it more challenging to detect the moderating effect of alliance experience. Because the logit model is non-linear, the significance of the interaction effect cannot be determined simply by the significance of the interaction effect and the sign of the coefficient may not even indicate the direction of the interaction effect (Hoetker 2007; Huang and Shields 2000).

For ease of accurate interpretation, we therefore divided the sample into two subgroups based on the median value of the target (client) firm's alliance experience (Hoetker 2007).[3] Models were then estimated separately for each group, and coefficients were compared across groups in

[3] Splitting at the mean gave substantively similar results.

three ways. First, we simply compared the statistical significance of the coefficients in each subsample (Hoetker 2007).

Second, we compared the coefficients, β, across subsample via the Wald chi-square statistic (Greene 2003):

(3) $$\frac{(\beta_1-\beta_2)^2}{\sigma^2_{\beta_1}+\sigma^2_{\beta_2}},$$

where β_i (i=1, 2) is the estimated coefficient for group i, $\sigma^2_{\beta_i}$ is the estimated standard error, and the degree of freedom is 1. However, the estimated coefficients, β, may not be directly comparable across groups because $\beta = \alpha/\sigma$, where σ is the standard deviation of the error term, ε, that is, the unobserved heterogeneity across subsamples. Any difference in β coefficients can be caused by the difference in σ, even when α, the effect of a variable on the propensity to form an equity alliance, is not different across groups. Therefore, before applying the Wald test, we tested for equivalence of unobservable heterogeneity across groups using the method suggested by Allison (1999). Doing so revealed no evidence that unobservable heterogeneity varied meaningfully across subsamples in any of our models, indicating that the Wald test was valid.

Third, we used the comparison of coefficient ratios technique suggested by Train (1998). Calculating the ratio of any two coefficients, β_k/β_j, removes the impact of the unobserved variation, σ, which is constant within each subsample. That is,

(4) $$\frac{\beta_k}{\beta_j} = \frac{\alpha_k/\sigma}{\alpha_j/\sigma} = \frac{\alpha_k}{\alpha_j}.$$

The ratio β_k/β_j can therefore be compared across subsamples without regard to the unobserved heterogeneity in each (Train 2004: 43). Specifically, we compared the ratio of the

coefficient for scale alliance to the coefficient for alliance scope, thus expressing the impact of a scale alliance as a function of the impact of increasing alliance scope by one function.

We also supply graphical interpretations of our results. Doing so follows the recommendations of Long (1997), Huang and Shields (2000), and Hoetker (2007).

Our sample included multiple alliances initiated by the same firms. In particular, client firms, such as pharmaceutical or large biotechnology firms, were typically engaged in multiple alliances simultaneously to access diverse technological and new product opportunities. To control for possible autocorrelation resulting from unobserved characteristics of client firms, we used robust standard errors, clustered by client firms (Rogers 1993).

Table 3 presents descriptive statistics and correlations between variables. The mean variance inflation factor was 1.56 and the maximum variance inflation factor was 3.10, indicating no evidence of multicolinearity in our sample.

--- Place Table 3 about here ---

RESULTS

We first examine the moderating effect of the target firm's alliance experience (Table 4), finding strong support for Hypothesis 1. Model 1 indicates a significant and positive association between an alliance being scale, rather than link, and the use of equity when the target firm had a low level of alliance experience (β=0.579, p<0.05). In contrast, Model 2 shows that when the target firm had a high level of alliance experience, the relationship between a scale alliance and the use of equity became insignificant (β= −0.335, p=0.20). More experienced targets were more likely to accommodate the client firm's preferences for non-equity in scale alliances by accepting non-equity in a scale alliance than in a link alliance, as illustrated in Figure 2(a).

To further investigate these results, we applied the second and third tests discussed above. Having failed to reject (p=0.49) the null hypothesis of equal unobservable variations across the subsamples (cf. Allison 1999), we compared the coefficient for *scale alliance* across the low-experience and high-experience subsamples via a Wald test. We found a significant difference in the coefficient for scale alliance across the two groups (p<0.05) in support of Hypothesis 1. Lastly, we performed a group comparison based on the ratio of coefficients (Hoetker 2007; Train 1998). Taking the ratio of *scale alliance* to *alliance scope* in each subsample yielded a ratio of 1.96 and −0.71 for low and high experience target firms respectively. The difference between these ratios was significant (p<0.05) in support of hypothesis one. Thus, support for hypothesis one was consistent across the three tests.

Table 5 examines the moderating effect of the client firm's alliance experience. Consistent with Hypothesis 2, model 4 indicates a positive association between a scale alliance and the use of equity when the client firm had a high level of experience (β=0.479, p<0.10), while the association is negative and insignificant for client firms with a low level of experience (β=−0.008, p=0.98), as Figure 2(b) illustrates. More experienced clients were more likely to accommodate the target firm's preference for equity in scale alliances. However, the difference between the coefficients was not statistically significant according to either the Wald chi-square statistic (p=0.20, after failing to reject the hypothesis of equal unobserved variation across groups with p=0.39) or a comparison of the ratio of the coefficients for scale alliance and alliance scope (p=0.54). Thus, evidence in support of Hypothesis 2 was weak at best. As we discuss below, however, results for alliances with asymmetric experience support the underlying assumption of this hypothesis—that alliance experience makes a client firm more willing and able to accommodate the concerns of its partner.

--- Place Table 4 and Table 5 about here ---

--- Place Figure 2 about here ---

Table 6 presents the effects of the different combinations of the target and client firms' experience. Comparing the cases with greatest asymmetry (high-experience client/low-experience target versus low-experience client/high-experience target), Hypotheses 3 and 4 were supported. The relationship between a scale alliance and the use of equity was the most positive when the client firm had a high level and the target firm had a low level of alliance experience (β=0.921, p<0.05, Model 5). In contrast, this relationship was the most negative when the client firm had a low level and the target firm a high level of alliance experience (β=−0.480, p=0.262, Model 8). Figure 3 illustrates these results.

Further evidence comes from examining whether these coefficients differed significantly across subsamples. Finding no evidence of meaningful differences in unobservable variation across each pair of subsamples (p-values ranged between 0.28 and 0.98), we used the Wald chi-square statistic for group comparison. The coefficient for scale alliance was significantly higher (p<0.05) for the case of high-experience client/low-experience target (model 5) than for the case of low-experience client/high-experience target (model 8).

--- Place Table 6 about here ---

--- Place Figure 3 about here ---

Comparisons with intermediate cases—both partners with low experience or high experience—were less definite, as one would expect. The coefficient for scale alliance was significantly higher for high-experience client/low-experience target than when both partners were high-experience (p<0.05), but not significantly different than when both parties were low-experience (p=0.18). The coefficient for scale alliance was insignificantly lower for low-

experience client/high-experience target than when both parties had low levels of alliance experience (p=0.24) or both parties had high levels of alliance experience (p=0.50). For a summary of group comparisons, see Table 7.

Both targets and clients accommodated their partner's concerns when they had an asymmetrically high amount of alliance experience, demonstrating that experience provides both targets and clients with the ability to make such accommodations, although our earlier results (Table 4 and Table 5) only found this effect for target firms. Taken together, our results suggest that client firms were more reluctant to turn experience into actual accommodation. That is, they only did so when there was significant asymmetry and they were much more experienced than their partners, as shown in Models 5 and 7 in Table 6. This could be because clients find it particularly hard to maintain search flexibility and thus are willing to accommodate only when there was considerable asymmetry. So, we observed an effect consistent with Hypothesis 2, although the impact of experience appears to be weaker for clients than targets.

Overall, the results as summarized in Table 7 strongly support our hypotheses. The relationship between scale alliances and the use or non-use of equity was contingent on the partner firms' alliance experience. Firms with more alliance experience were better able to accommodate a choice of governance structure that responds to their partner's concerns. We saw the greatest accommodation when partner firms had asymmetric alliance experience.[4]

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[4] We performed several robustness checks. First, we split the samples at the mean values of client and target firms' alliance experience rather than median value, finding substantively similar results. Second, we separately modeled experience with link and scale alliances. Results were generally consistent with the results for total alliance experience, with two exceptions. Both

--- Place Table 7 about here ---

DISCUSSION AND CONCLUSION

This paper found empirical evidence of accommodation within alliances. Specifically, alliance experience made a firm more likely to accept a governance structure (e.g., equity or non-equity) that was more relevant to the concerns of its partner than its own concerns. This finding contrasts with the often implicit assumption in much of the existing literature that firms will maximally exert their bargaining power in order to structure transactions to their advantage.

We propose that accommodation is consistent with self-interest seeking and profit maximization. We do not rule out altruism playing a role in accommodation; rather we are saying that (a) accommodation can occur in the absence of altruism and the presence of self-interest and (b) our findings are strongly consistent with accommodation driven by self-interest seeking.[5] In particular, it is unclear why more experienced firms would be more altruistic, a phenomenon easily by explained by self-interested firms being willing to accommodate only to the degree that they are still able to protect their own interests.

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regard comparisons with intermediate models in Table 6. For scale alliances, the model 5 to model 6 comparison gained significance, whereas for link alliances, the model 5 to model 7 comparison lost significance. Our central proposition holds strongly: experience leads to accommodation, particularly when experience is asymmetric.

[5] Macneil (1986: 578) expresses this point well: "The capacity of an exchange to produce exchange-surplus … constitutes a pool of wealth which can be shared as well as grabbed, shared not to make a gift but out of deep economic self-interest."

The observation the self-interested firms may accommodate their partner's concerns indicates that they find it value enhancing. This provides empirical support for a central pillar of transaction value analysis: joint value creation occurs when firms give "some consideration of the satisfaction of their partner's valued interests" (Zajac and Olsen 1993: 134). While attractive, the concept of transaction value creation has been difficult to demonstrate empirically. We do so in a rigorous way, pointing to the promise of additional work based on the concept of transaction value maximization.

In summary, despite the importance of accommodation for value creation in alliances, there has been little understanding of firms' motivations and capabilities for accommodation. This paper has contributed to enhancing this understanding in four primary ways: formally introducing the concept of accommodation into the literature on alliances and interfirm relationships more generally, providing empirical evidence that it occurs, establishing alliance experience as a boundary condition for accommodation, and providing evidence in support of the transaction value perspective.

This study also contributes to the broader study of governance in interfirm relationships, by addressing the limitations of a single party, cost minimization emphasis in examining interfirm relationships (Wang and Zajac 2007; Zajac and Olsen 1993). Accommodation draws attention to the distinct and potentially conflicting roles, preferences and concerns of all partners. This contrasts with most studies of governance, which focus on mitigating the transaction hazards faced by a focal firm, providing "one-sided analysis of what is clearly a dyadic phenomenon" (Wang and Zajac 2007: 1292). It offers a more multi-polar view of governance, which recognizes that the governance structures and mechanisms in a relationship result from interactions between each firm's efforts to create and claim value within the relationship. This

multi-polar view of governance is particularly relevant when relationships involve strongly heterogeneous firms, which perceive different hazards and possess differing abilities to manage those hazards. Examples include relationships between venture capital investors and start-ups or between firms in different countries. Beyond its theoretical implications, accounting for accommodation in the context of a multi-polar view of governance allows us to predict more accurately the choice of alliance governance structure between partners.

Importantly, this view expands upon the large body of work on alliance governance based on transaction cost economics, rather than contradicting it. None of the assumptions required are incompatible with the assumption of boundedly rational, self-interest seeking and potentially optimistic managers and firms. Thus, it can both draw upon and contribute to the existing literature.

As with any study, we are aware of several limitations that future work could gainfully address. We studied a single type of alliance (R&D) in a single setting. While this type of alliance is increasingly common, especially in the high-tech industries (Rothaermel and Thursby 2007), further studies in diverse contexts would elaborate our findings and provide opportunities to identify other important boundary conditions under which accommodation occurs.

Consistent with existing literature, we used a simple count measure for alliance experience. However, alliances may differ in the capabilities they generate. In particular, one could go beyond our controls and robustness checks to develop more sophisticated theory on the differential experience generated by equity versus non-equity and scale versus link alliances.

We have also not considered the impact of reputations that firms may develop regarding their willingness and ability to accommodate their partners. Ahuja (2000) demonstrated that firms with substantial stocks of technical, commercial and social capital are more attractive partners to

other firms and thus have superior opportunities to form alliances. The example of Lilly suggests that a reputation for accommodation may have a similar effect. However, it is not enough simply to be known for giving partners what they want. Competitive advantage will only result if a firm also has the alliance management capabilities to capture a sufficient share of the enhanced value created in those alliances.

We believe that accommodation pervades many aspects of interfirm relationships. In addition to affecting decisions about high-level governance structures, it may influence lower-level *ex ante* decisions, such as the specification of contract terms. It likely plays an important role *ex post* also, shaping dispute resolution, renegotiation, and other elements of governance throughout the duration of the alliance. Doubtlessly, the various aspects of accommodation have distinct boundary conditions and distinct impacts on the performance of alliances and their member firms. Exploring the many faces of accommodation will enhance our understanding of interfirm relationships in multiple dimensions. We hope to have set the stage for, and encouraged others to join, that exploration.

Table 1: Examples of innovation alliances between target and client firms

Client	Target	Type	Governance structure	Key technology	Description
Abbott (Pharmaceutical firm)	Myriad Genetics (Biotech firm)	Scale alliance	Non-equity sharing	Myriad's genetics and other discovery technologies	Under the five-year research agreement, Myriad will use its genetics and other discovery technologies to identify human genes and regulatory networks associated with a variety of diseases. Abbott will advance the genes through its chemical genomics platform to identify targets and leads for drug discovery. (Formed in 2006)
Amgen (Biotech firm)	Cyto-kinetics (Biotech firm)	Scale alliance	Equity sharing	Cytokinetics' lead drug candidate, CK-1827452	They will collaborate to discover, develop, and commercialize novel small-molecule therapeutics that activate cardiac muscle contractility for potential applications in the treatment of heart failure. Cytokinetics receives a nonrefundable up-front license and technology access fee of $42 million. In addition, Amgen has purchased 3,484,806 shares of Cytokinetics common stock. (Formed in 2006)
Warner-Lambert Company (Pharmaceutical firm)	Allergan (Pharmaceutical firm)	Link alliance	Non-equity sharing	Allergan's retinoid compounds for metabolic diseases	Warner-Lambert receives exclusive worldwide commercialization rights for up to two RXR subtype selective retinoid preclinical lead compounds. In exchange, Allergan will have the opportunity to receive up to $104 million in technology access fees and development milestones, assuming successful development of both lead compounds. (Formed in 1998)

Table 2: Description of variables

Variable	Type	Description
Equity alliance	Indicator variable	1 (equity alliance) and 0 (non-equity alliance)
Scale alliance	Indicator variable	1 (scale alliance) and 0 (link alliance)
Target firm's alliance experience	Count variable	Number of alliances initiated by the target firm in the last five years
Client firm's alliance experience	Count variable	Number of alliances initiated by the client firm in the last five years
Target firm's equity-sharing experience	Count variable	Number of target firm's alliances involving equity sharing in the last five years
Client firm's equity-sharing experience	Count variable	Number of client firm's alliances involving equity sharing in the last five years
Repeated partnering	Count variable	Number of alliances initiated in the last five years between the same partners as in the current alliance
Alliance scope	Count variable	Number of functional activities covered by the alliance (Kalaignanam et al. 2007)
Alliance between biotechnology and pharmaceutical firms	Indicator variable	1 (between firms from different industries) and 0 (others)
Public client firm	Indicator variable	1 (client firm publicly traded in the stock market) and 0 (others)
Public target firm	Indicator variable	1 (target firm publicly traded in the stock market) and 0 (others)
International alliance	Indicator variable	1 (alliance partner's headquarters are in different countries) and 0 (others)
Alliance formation year (Year 2003, Year 2004, Year 2005, and Year 2006)	Indicator variable	e.g., Year 2003 = 1 for alliances formed in 2003, 0 for the others
Stage in the innovation process	Discrete-ordinal variable	Stage of the innovation process in which the alliance was initiated: 1 (discovery), 2 (lead molecule), 3 (preclinical), 4 (formulation), 5 (phase 1), 6 (phase 2), 7 (phase 3), and 8(BLA/NDA* filing and FDA approval) (McNamara and Baden-Fuller 2007; Rothaermel and Deeds 2004).

* BLA: Biologics License agreement, NDA: New Drug Application

Table 3: Descriptive statistics

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
1. Equity alliance	1.00																
2. Year 2003	-0.06	1.00															
3. Year 2004	0.04	-0.24	1.00														
4. Year 2005	-0.04	-0.25	-0.24	1.00													
5. Year 2006	0.05	-0.25	-0.24	-0.25	1.00												
6. Alliance between biotech and pharma	0.04	0.01	0.02	0.01	0.01	1.00											
7. Public client firm	0.07	0.05	0.03	-0.05	-0.04	0.30	1.00										
8. Public target firm	0.08	-0.01	0.01	-0.02	0.00	0.08	0.08	1.00									
9. Client firm's equity sharing alliance experience	0.09	0.11	-0.05	-0.05	-0.07	0.29	0.32	0.06	1.00								
10. Target firm's equity sharing alliance experience	0.00	0.04	0.02	-0.03	-0.07	0.02	0.04	0.23	0.05	1.00							
11. International alliance	-0.06	-0.02	-0.02	0.00	0.04	0.09	-0.02	-0.01	-0.06	-0.07	1.00						
12. Alliance scope	0.10	-0.06	0.00	0.04	0.06	-0.06	0.04	0.20	0.01	0.09	0.02	1.00					
13. Repeated partnering	0.01	0.01	0.00	0.02	0.00	0.15	0.07	0.09	0.14	0.12	0.00	0.02	1.00				
14. Stage in the innovation process	0.08	-0.07	0.03	0.05	0.06	-0.04	0.05	0.26	-0.03	0.01	0.04	0.29	-0.08	1.00			
15. Client firm's alliance experience	0.08	0.04	-0.01	0.02	0.00	0.46	0.37	0.07	0.77	0.06	-0.08	0.00	0.23	-0.07	1.00		
16. Target firm's alliance experience	-0.05	0.04	0.06	-0.01	-0.05	0.04	0.04	0.29	0.06	0.67	-0.02	0.06	0.18	-0.07	0.10	1.00	
17. Scale alliance	0.01	-0.04	0.09	0.09	-0.03	0.00	-0.01	-0.04	0.00	0.01	0.01	0.03	0.02	-0.21	0.04	0.08	1.00
Mean	0.08	0.20	0.19	0.20	0.20	0.46	0.76	0.53	2.15	0.54	0.56	1.50	0.08	2.42	18.54	5.64	0.71
Std. Dev.	0.27	0.40	0.39	0.40	0.40	0.50	0.43	0.50	3.46	1.42	0.50	0.64	0.31	2.09	22.08	8.70	0.45
Min	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0
Max	1	1	1	1	1	1	1	1	26	12	1	4	4	8	97	77	1

N=2,184

Table 4: Moderating effect of target firm's alliance experience on the probability of an equity alliance

	Model 1		Model 2	
	Low-experience target firm		High-experience target firm	
Constant	-4.145***	(0.469)	-3.771***	(0.654)
Year 2003	-0.700**	(0.350)	-0.573	(0.392)
Year 2004	0.202	(0.307)	0.147	(0.414)
Year 2005	-0.673*	(0.354)	-0.187	(0.457)
Year 2006	-0.009	(0.326)	0.645*	(0.348)
Alliance between biotech and pharma	0.086	(0.248)	0.196	(0.314)
Public client firm	0.671**	(0.328)	0.001	(0.396)
Public target firm	0.109	(0.234)	1.055***	(0.374)
Client firm's equity sharing alliance experience	0.084***	(0.032)	0.089**	(0.042)
Target firm's equity sharing alliance experience	0.347	(0.273)	-0.084*	(0.049)
International alliance	-0.549**	(0.238)	-0.380	(0.234)
Alliance scope	0.295*	(0.164)	0.472**	(0.201)
Repeated partnering	0.660	(0.505)	-0.141	(0.233)
Stage in the innovation process	0.148***	(0.050)	-0.031	(0.057)
Client firm's alliance experience	0.001	(0.007)	-0.003	(0.008)
Scale alliance	0.579**	(0.265)	-0.335	(0.261)
Observations	1255		929	
Log-likelihood	-325.28		-236.65	
Pseudo-R^2 (McFadden's)	0.087		0.083	

Groups divided based on median value of the target firm's alliance experience (=3)
Standard errors in parentheses; *p<0.1, **p<0.05, ***p<0.01 (two-tailed tests for all variables)

Table 5: Moderating effect of client firm's alliance experience on the probability of an equity alliance

	Model 3		Model 4	
	Low-experience client firm		High-experience client firm	
Constant	-3.200***	(0.487)	-4.628***	(0.820)
Year 2003	-0.299	(0.418)	-0.781**	(0.357)
Year 2004	0.405	(0.368)	0.128	(0.332)
Year 2005	-0.715	(0.468)	-0.209	(0.342)
Year 2006	0.123	(0.387)	0.364	(0.341)
Alliance between biotech and pharma	0.103	(0.302)	0.202	(0.263)
Public client firm	0.381	(0.291)	0.649	(0.721)
Public target firm	0.268	(0.264)	0.810***	(0.251)
Client firm's equity sharing alliance experience	0.235	(0.153)	0.087***	(0.022)
Target firm's equity sharing alliance experience	0.434***	(0.143)	-0.025	(0.081)
International alliance	-0.641**	(0.252)	-0.375*	(0.208)
Alliance scope	0.201	(0.209)	0.517***	(0.163)
Repeated partnering	1.103*	(0.632)	0.036	(0.233)
Stage in the innovation process	0.106*	(0.058)	0.015	(0.044)
Target firm's alliance experience	-0.097***	(0.028)	-0.052**	(0.024)
Scale alliance	-0.008	(0.276)	0.479*	(0.264)
Observations	1123		1061	
Log-likelihood	-260.81		-294.91	
Pseudo-R^2 (McFadden's)	0.079		0.104	

Groups divided based on median value of client firm's alliance experience (=9)
Standard errors in parentheses; *p<0.1, **p<0.05, ***p<0.01 (two-tailed tests for all variables)

Table 6: Moderating effect of client and target firms' alliance experience on the probability of an equity alliance

	Model 5		Model 6		Model 7		Model 8	
	High-experience client/ low-experience target		Low-experience client/ low-experience target		High-experience client/ high-experience target		Low-experience client/ high-experience target	
Constant	-4.943***	(1.002)	-3.615***	(0.597)	-5.294***	(0.947)	-3.088***	(0.788)
Year 2003	-0.772	(0.476)	-0.542	(0.493)	-1.070**	(0.466)	0.176	(0.760)
Year 2004	0.357	(0.476)	0.054	(0.451)	-0.268	(0.512)	0.767	(0.679)
Year 2005	-0.010	(0.440)	-1.492**	(0.683)	-0.655	(0.573)	0.236	(0.781)
Year 2006	0.117	(0.491)	-0.193	(0.480)	0.434	(0.362)	0.832	(0.735)
Alliance between biotech and pharma	0.109	(0.304)	0.133	(0.358)	0.366	(0.475)	0.213	(0.512)
Public client firm	0.809	(0.920)	0.530	(0.372)	0.616	(0.609)	0.156	(0.485)
Public target firm	0.484	(0.350)	-0.216	(0.317)	1.586***	(0.458)	0.378	(0.550)
Client firm's equity sharing alliance experience	0.087***	(0.022)	0.302	(0.184)	0.110***	(0.035)	-0.143	(0.373)
Target firm's equity sharing alliance experience	-0.007	(0.419)	0.864**	(0.405)	-0.133**	(0.062)	-0.015	(0.086)
International alliance	-0.475	(0.346)	-0.644**	(0.308)	-0.244	(0.273)	-0.879**	(0.417)
Alliance scope	0.376*	(0.199)	0.261	(0.270)	0.651***	(0.247)	0.184	(0.323)
Repeated partnering	0.684	(0.607)	0.492	(1.002)	-0.249	(0.267)	1.077	(0.868)
Stage in the innovation process	0.123*	(0.068)	0.172**	(0.072)	-0.122**	(0.053)	0.097	(0.100)
Scale alliance	0.921**	(0.389)	0.195	(0.377)	-0.113	(0.334)	-0.480	(0.428)
Observations	519		736		542		387	
Log-likelihood	-158.18		-159.99		-129.74		-98.75	
Pseudo-R^2 (McFadden's)	0.098		0.098		0.150		0.064	

Groups divided based on median values of the target and client firms' alliance experience (=3 and 9, respectively)
Standard errors in parentheses; *p<0.1, **p<0.05, ***p<0.01 (two-tailed tests for all variables)

Table 7: Comparison of the effect of alliance type on the probability of an equity alliance

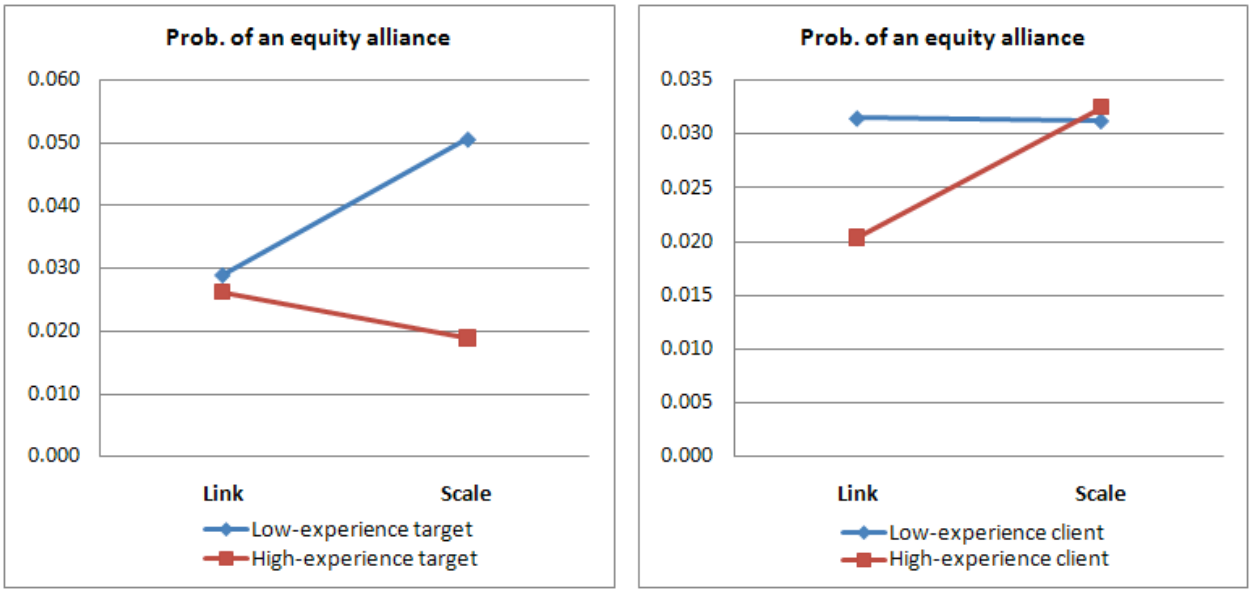
Hypothesis	Criterion for grouping	Group comparison	Hypothesis test result
Hypothesis 1	Target firm's alliance experience	Model 1 > Model 2**	Supported
Hypothesis 2	Client firm's alliance experience	Not significant between Models 3 and 4	Not supported
Hypothesis 3	Target and client firms' alliance experience	Model 5 > Model 7** Model 5 > Model 8**	Supported
Hypothesis 4	Target and client firms' alliance experience	Model 8 < Model 5**	Supported

*p<0.1, **p<0.05, ***p<0.01 (tests with Wald chi-square statistic)

Figure 1. Alliance experience and accommodation

Client firm's alliance experience	Target firm's alliance experience: Low	Target firm's alliance experience: High
Low	High need for accommodation by both partners Low ability for accommodation by both partners	High need for accommodation by the client firm High ability for accommodation by the target firm
High	High need for accommodation by the target firm High ability for accommodation by the client firm	Low need for accommodation by both partners High ability for accommodation by both partners

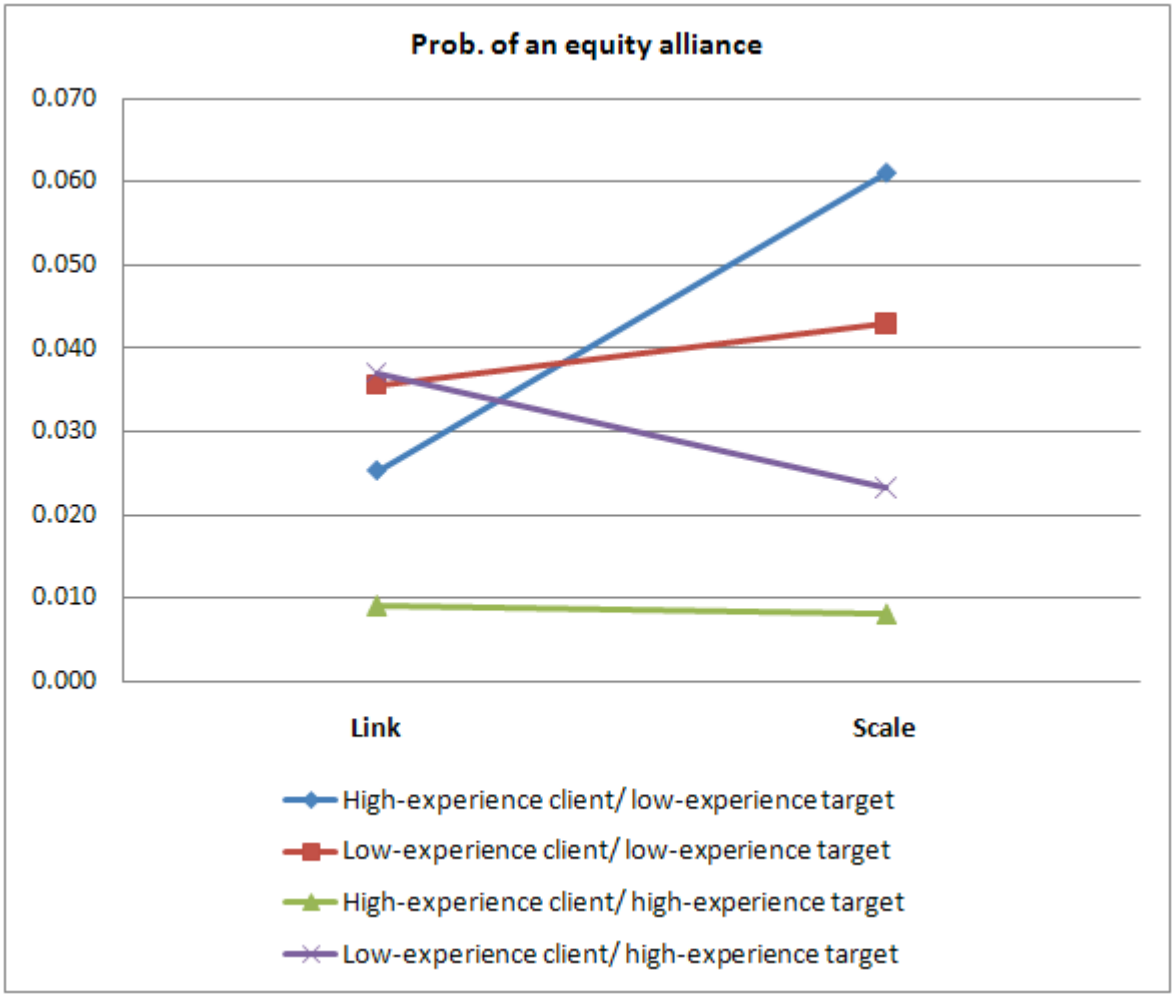
Figure 2. The moderating effect of partner firms' alliance experience*



(a) Target firm's alliance experience (b) Client firm's alliance experience

* Year 2005=1, Public client firm=1, Public target firm=0, Alliance between biotech and pharma=1, International alliance=1, and mean value for the other variables.

Figure 3. The moderating effect of partner firms' asymmetric alliance experience*



* Year 2005=1, Public client firm=1, Public target firm=0, Alliance between biotech and pharma=1, International alliance=1, and mean value for the other variables.

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