Financial slack and venture managers’ decisions to seek a new alliance

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Abstract

We examine two distinct perspectives to analyze the role of financial slack in the decisions of technology venture managers to seek strategic alliances. According to the capabilities perspective, financial slack provides managers with the ability to maximize the benefits from acquiring missing capabilities through alliance formation, whereas according to the resource dependence perspective, financial slack buffers the managers’ motivations to seek alliances as a reaction to external environmental scarcity. Drawing on an experimental design and data on 1632 decisions nested within 51 managers, we find support for a combined perspective demonstrating that managerial discretion in the form of financial slack moderates how internal capabilities and context encourage managers to seek alliances. We discuss implications of our work for the alliance literature.

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1. Executive summary

Two distinct viewpoints provide compelling reasons for technology venture managers’ decisions to seek a new alliance. First, a capabilities perspective suggests that venture managers will evaluate whether their venture has the appropriate stock of necessary resources and capabilities, and the capacity to deploy them effectively. Entering into a new alliance offers managers the opportunity to acquire missing capabilities thereby enhancing the venture’s capabilities stock and efficient capability deployment. Second, the resource dependence perspective, rather than focusing on building an organization’s capabilities, emphasizes the need to focus on the management of external

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relationships with interest groups on which the firm is dependent for resources. Venture managers will decide to enter into alliances to contract and co-opt scarce resources that are held by others in the environment. What these perspectives do not explain are differences in decisions to ally among firms with similar capabilities and/or environmental contexts.

In this paper we introduce a model that describes how managerial discretion in the form of financial slack moderates the impact of internal capabilities and context on the venture managers’ decisions to seek a new alliance. Financial slack facilitates the venture’s development of non-financial capabilities, provides ventures with strategic flexibility, and enables adaptation to complex environments. Since financial slack is an important determinant of managerial decision making, we argue that it will impact the effect of a venture’s capabilities and environmental conditions on its manager’s decision to seek a new alliance. Specifically, we state that high levels of financial slack enhance the motivations of managers to acquire missing capabilities via alliances because slack facilitates the efficient deployment and exploitation of the acquired capabilities. Moreover, high levels of financial slack buffer the managers’ motivations to enter into alliances in hostile environments because slack diminishes resource dependencies.

We tested the proposed model via an experimental design and conjoint analysis using data from 1632 decisions nested within 51 managers. Our results provide support for a combined perspective demonstrating that managerial discretion in the form of financial slack moderates how internal capabilities and context encourage managers to take on new alliance partners. It appears that managers’ view of the relationship between financial slack and alliances varies between complements and substitutes. In the first case, managers see alliances as ways to leverage their financial slack to offset perceived weaknesses in their capabilities. In the second case, financial slack is viewed by managers as a substitute for entering an alliance, particularly during times in which access to equity capital is restricted due to market conditions.

The findings of this article make several contributions to the entrepreneurship and alliance literatures. While antecedents of alliance formation have been addressed by previous scholars, the role of moderating influences has not been examined to explain differences in alliance decisions for firms with similar capabilities and contexts. We address this issue grounding our arguments with two distinct theoretical perspectives showing that the venture’s high-discretion financial slack is a major determinant of managers’ motivations to seek alliances in order to acquire non-financial capabilities. More specifically, the venture’s high-discretion financial slack enhances the desire of its managers to obtain missing capabilities through alliance formation. We also found that financial slack can substitute for the need to form an alliance under unattractive environmental conditions. Therefore, our experimental design allowed us insight into how the prior situation of a firm before alliance formation influences its subsequent engagement in alliances. Our findings also contribute to the understanding of previous empirical research on strategic alliance formation in the biotechnology industry. We provide evidence that high technology managers’ decisions are, even if they were purely rational, complex and take into account more than just the firm’s current rate of product development.

2. Introduction

One of the primary motivations for firms to enter into strategic alliances is the desire to acquire resources and capabilities (Das and Teng, 2000). Scholars have shown that, among others, knowledge (Chi, 1994), financial capital (DeCarolis and Deeds, 1999), and manufacturing and marketing capabilities (Audretsch and Feldman, 2003; Hagedoorn, 1993) can be acquired through alliances. However, while these and numerous other studies have identified capabilities that firms can access through alliance formations, they insufficiently explain why only some firms use alliances to access these capabilities while others do not. Indeed, the patterns of alliances across firms differ substantially, even for apparently very similar firms within the same industry and development stage such as young biotech ventures (Deeds and Hill, 1996). Why do some of these ventures seek alliances while others do not?

In this paper we address this question by analyzing managers’ decisions to seek a new alliance. We define a new alliance as an alliance with a partner where no relationship existed before (and therefore no trust and partner-specific experience). In drawing the decision to seek new partners, venture managers examine two key variables: the combined resources and capabilities their venture possesses and the environment in which it operates. A capabilities-based perspective evaluates whether the firm has the appropriate stock of available assets and the capacity to deploy those resources for a desired end result (Amit and Schoemaker, 1993: 35). Following Gomes-Casseres (1996: 30), we define capabilities as “the set of tangible and intangible assets that enable an organization to develop, make, and market goods and services”. It should be noted that this is a broad definition of capabilities and incorporates what has traditionally...
been termed “resources” by the resource-based view of strategy (Barney, 1991). In contrast, context describes the environmental demands and opportunities for a venture to build up its capabilities (Gomes-Casseres, 1996). The resource dependence perspective suggests that a primary focus in building the firm requires management of external relationships which control access to scarce resources needed by the venture. The munificence of the environment as a source of resources determines the level of emphasis required in co-opting resources from others or possibly the decision to enter into an alliance.

Existing literature, however, suggests that capabilities and context are not independent of each other. It appears that managerial discretion moderates the impact of the capability and context factors on the decision to seek out new alliance partners. Slack is an important source of managerial discretion (Bourgeois, 1981). High-discretion financial slack (cash and receivables available) facilitates the development of other capabilities (George, 2005; Nohria and Gulati, 1996) and the growth of firms developing new products (Mishina et al., 2004). Moreover, high-discretion financial slack provides ventures with strategic flexibility (Romanelli, 1987) and facilitates adaptation to complex environments (Tan and Peng, 2003). Since scholars have shown that financial slack is an important ingredient of managerial decisions (Singh, 1986), we argue that the effect of both a venture’s capabilities and opportunities of the context on its managers’ decisions to seek out new alliances is moderated by the financial slack of the venture.

In order to investigate these interaction effects empirically, we use metric conjoint analysis and data on 1632 alliance decisions nested within 51 managers of entrepreneurial biotechnology firms. These firms constitute a particularly useful sample for our purpose because their R&D processes consume considerable time and financial resources which makes them highly dependent on both financial slack and the formation of strategic alliances (Audretsch and Feldman, 2003). Our study makes the following contributions.

First, while alliance researchers have recognized that the desire to enhance current capabilities is central for the alliance formation process (Das and Teng, 2000; Eisenhardt and Schoonhoven, 1996), existing studies have relatively neglected the possibility that the influences of desire on the decision to enter an alliance depends on the managerial discretion provided by the availability of high-discretion financial slack. High-discretion slack provides managers the opportunity to remedy perceived weaknesses without threatening existing projects. However, when faced with tight financial resources, managers are more likely to enter into transactions to remedy their cash position, even under unfavourable circumstances (Rothaermel and Deeds, 2004) and to avoid committing to new projects which would stretch the firm too thinly. In this paper, we examine the moderating impact of high-discretion slack on the decisions of managers considering entry into a new alliance.

Second, we add to the alliance literature by focusing on the specific perspective of the alliance seeking firm before the formation of an alliance. Most empirical studies on motives for alliance formation focus on established alliances and thus, to a certain extent, are sampling on the dependent variable. Examinations of existing alliances likely find it difficult to consider the capability heterogeneities of firms before an alliance is formed which might influence the decision of managers (Barney, 1991) to seek a partner.

Third, our study offers a possible explanation of previous findings on alliances that indicate that some technology ventures enter into too many alliances (Deeds and Hill, 1996; Rothaermel and Deeds, 2004). Specifically, our results suggest that the differences in alliance formation activities between firms are partially due to managers’ reactions to heterogeneous endowments of capabilities, particularly financial slack. Thus, we provide an explanation for why many young firms form either too few or too many alliances in order to achieve an optimal rate of product development (Deeds and Hill, 1996).

Our article proceeds as follows. In the next section, we formulate our theory and hypotheses. We then describe our research method, sample, and analysis before presenting and discussing the results. Finally, we point to limitations of our study and suggest avenues for further research.

3. Theory and hypotheses

3.1. Internal capabilities, financial slack, and strategic alliances

The alliance literature states that two distinct capabilities-based rationales trigger strategic alliance formation rather than the decision to “go it alone”: obtaining and retaining valuable resources and capabilities (Das and Teng, 2000). Retaining capabilities becomes particularly important for those firms that currently have excess resources (resources not being fully used) but want to maintain them for future utilization (Kogut, 1988). Strategic alliances allow a
temporary usage of these capabilities in combination with the capabilities of another firm (Das and Teng, 2000). In contrast, obtaining capabilities from a strategic alliance represents an extension of a firm’s resource base with the aim of filling gaps in its capability endowment (Das and Teng, 2000).

However, strategic alliances bear the risk that the alliance partner will behave opportunistically and, for example, use the alliance to learn and acquire knowledge rather than contribute the necessary capabilities to make the alliance successful (Das and Teng, 1998). In particular, within knowledge-intensive industries such as biotechnology, the risk to disclose valuable information to an opportunistic partner is substantial (Deeds and Hill, 1998). Therefore, if ventures have sufficient capabilities their managers are unlikely to seek new alliances to avoid these risks and are more likely to go it alone. In contrast, when the venture’s capability endowment is insufficient to bring their products to market, managers are predisposed to accept the risk of opportunistic partner behavior and seek alliance partners.

For high technology ventures, the central goal is to develop new and innovative products and bring them to market. However, due to their liabilities of newness, many of these ventures lack the capabilities necessary for successful product development and thus try to acquire them through formation of strategic alliances. For example, ventures may not have the technological know-how and scientific knowledge and therefore decide to access these capabilities from an alliance partner (Chi, 1994; Hagedoorn, 1993). Even after completion of the development process, firms may lack the necessary capabilities to efficiently and effectively manufacture and market their new products and therefore enter into alliances with established incumbent firms to access these capabilities (Audretsch and Feldman, 2003; Hagedoorn, 1993). In any case, a lack of valuable capabilities, which cannot be purchased efficiently at the factor markets, triggers the decisions of managers to seek an alliance rather than go it alone and develop the ventures’ capabilities without partners.

Existing literature suggests that the motivation of venture managers to acquire missing capabilities through alliances depends on the financial capabilities of their ventures. Slack is a financial capability that can be diverted or redeployed to develop other internal capabilities (George, 2005; Nohria and Gulati, 1996). Therefore, it is central to the development of every firm (Dollinger, 1995). Scholars have shown that financial slack influences managerial decision making (Singh, 1986), facilitates growth of firms developing new products (Mishina et al., 2004), and influences managerial risk-taking (Steensma and Corley, 2001). Following Sharfman et al. (1988), we distinguish financial slack based on the managerial discretion afforded in its deployment. Whereas low-discretion financial slack (debt) provides less flexibility to managers and their strategic decisions, high-discretion financial slack (cash and cash equivalents) can be easily redeployed suggesting that its availability impacts the decisions of technology venture managers to seek a new alliance partner. We will therefore focus on high-discretion financial slack below.

For technology ventures, which are characterized by expensive and time-consuming R&D processes (Kellog and Charnes, 2000), limited financial slack is by itself a driver of alliance formation. In the biotechnology industry, for example, ventures use alliances as a major source of financing (Coombs et al., 2006). When slack is low and external financing is hardly available, ventures are forced to enter into alliances even if the partner has strong control over the alliance (Lerner et al., 2003). In contrast to existing studies, however, we do not focus on this direct substitute effect of financial slack and strategic alliances, but rather analyze how slack moderates the managers’ incentive to acquire non-financial capabilities through alliance formation. The central argument we are building is that low non-financial capabilities push ventures to seek alliances in order to acquire these capabilities, and that this effect is stronger for high slack ventures than for low slack ventures. Although those with higher financial slack are less likely to seek an alliance, high slack provides those firms that need to acquire non-financial capabilities through alliances greater ability to do so and therefore reduces many of the disincentives of alliance formation. These disincentives of alliances largely remain for those with low financial slack.

The alliance literature has identified a number of different capabilities which are necessary for high technology ventures to succeed in bringing innovative products to market and can be accessed through strategic alliances. First of all, technology ventures must have a “pipeline” of product candidates under development (Deeds et al., 1997, 1998; Kellog and Charnes, 2000). In particular in industries where many product candidates fail, managers of high tech ventures desire to build up a balanced and risk-adjusted pipeline. For example, the development of biopharmaceuticals is a 10-year multi-step process and drug candidates can fail at any stage of development with only about 13% of initial candidates reaching the market (Kellog and Charnes, 2000). The value of a product candidate thus significantly

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4 Hambrick and Finkelstein (1987) identified financial slack as an internal organization determinant of managerial discretion.
increases with its development stage since the probability of regulatory approval increases as the product candidate passes through each stage. However, the costs of regulatory trials increase with each stage and the need for complementary assets also increases, particularly requirements on sales, marketing and distribution assets. Thus, a primary concern of managers in biopharmaceutical companies is the creation and maintenance of a balanced pipeline, which contains products in late development stages, and a sufficient number of early stage follow-ups in order to compensate for late stage failures. A deficiency in either will likely encourage them to seek alternatives to enhance product development such as strategic alliances rather than going it alone (Gulati, 1998).

We suggest that the availability of high-discretion financial slack of the venture moderates the impact of gaps in the pipeline on the managers’ motivation to seek new alliances. Financial slack has been shown to be a prerequisite for product development (Mishina et al., 2004) and necessary to buy resources (e.g., at factor markets) for this development. As outlined above, the development of high technology products is a long, complex and expensive process. For example, a biopharmaceutical venture with a pipeline containing products in early pre-clinical development can only advance these products to market if it can access sufficient slack to finance the expensive subsequent clinical trials (Kellog and Charnes, 2000). Similarly, if a venture has products in late phase III clinical trials, it requires significant slack resources to fund the expensive stage III trial process. In addition at this point access to production and marketing capabilities becomes critical. These capabilities must either be developed internally or purchased in the factor markets. Therefore, a manager facing limited slack resources becomes more focused on husbanding current financial resources to move its existing projects through the development process than on investing in an alliance to develop new product candidates for the future.

In contrast, when a manager has high levels of financial slack to advance current projects through the pipeline his or her attention will turn to acquiring new product candidates to fill the gaps in the firm’s pipeline. Simply put, lacking product candidates in the venture’s pipeline will be a stronger driver of new alliance formation for managers of ventures with high levels of financial slack than for managers of ventures with low levels of financial slack because the former are focused on using slack resources to build capabilities and offset weaknesses and the latter are focused on husbanding the venture’s current resources to continue to develop its existing candidates. Thus,

**H1.** (a) The likelihood of venture managers seeking a new alliance partner is higher when there is a low number of early stage product candidates than when there is a high number of early stage product candidates. (b) This impact of the number of early stage product candidates on the likelihood of seeking a new alliance partner is greater for managers of ventures with high financial slack than low financial slack.

**H2.** (a) The likelihood of venture managers seeking a new alliance partner is higher when there is a low number of late stage product candidates than when there is a high number of late stage product candidates. (b) This impact of the number of late stage product candidates on the likelihood of seeking a new alliance partner is greater for managers of ventures with high financial slack than low financial slack.

Scholars have also stressed that human resources in terms of excellent research teams build intangible capabilities of knowledge, expertise, and skills over time (DeCarolis and Deeds, 1999; Liebeskind et al., 1996). Moreover, highly reputable scientists provide the links to universities and research institutes which contribute to venture performance (Liebeskind et al., 1996). If a high tech venture does not possess a high quality scientific team, managers are likely to draw on the experience, skills, and knowledge of other organizations to supplement this perceived weakness (Das and Teng, 2000; Liebeskind et al., 1996; Zucker et al., 2002). That is, the likelihood that managers will form new alliances to complement their venture’s scientific team increases as the quality of the current scientific team decreases.

Financial slack likely moderates the motivation of managers to access missing research team capabilities through alliance formation. First, managers with slack resources will have the discretion to seek capabilities through an alliance to offset the perceived weakness in their scientific team. Second, the exploitation of the knowledge and skills of an expanded scientific capability requires additional investment in complementary assets, such as equipment, research facilities, research staff and support staff. Providing these assets is expensive and draws on the venture’s available financial slack. In cases where a venture has limited discretionary resources the manager will likely be biased against entering a new alliance to offset the perceived weakness in the scientific team because of the threat this additional investment poses to current projects or the perceived inability to benefit from the new alliance since the venture cannot afford to invest in the necessary, additional complementary assets. In contrast, when financial slack is high, venture managers are predisposed to use alliances to offset the perceived weaknesses in the scientific team knowing that they
have slack financial resources with which to invest in the complementary assets necessary to exploit the opportunities created by an expanded scientific team. Thus,

**H3.** (a) The likelihood of venture managers seeking a new alliance partner is higher when the quality of the scientific team is low than when it is high. (b) This impact of the quality of the scientific team on the likelihood of seeking a new alliance partner is greater for managers of ventures with high financial slack than with low financial slack.

The existing network of a high technology firm is an important and valuable capability for successfully developing new products. Consistent with previous literature, we understand a high tech venture’s network as far more than the sum of its alliances; a network also consists of a multitude of non-formal contacts with other firms, universities, research institutions and investors (Estades and Ramani, 1998). These network contacts are tightly linked to the firm and are highly immobile (Das and Teng, 2000). For technology ventures, networks are a crucial source of learning and flexibility (Zucker et al., 2002). University linkages provide a firm with contacts to top scientists that possess valuable scientific knowledge (Liebeskind et al., 1996) which enhances innovative output (George et al., 2002). As compared to formal alliances, business networks not only create opportunities for tradable goods and services, but also are a more efficient source for difficult-to-codify, knowledge-intensive skills which are difficult to enforce through contractual arrangements (Uzzi, 1996). Thus, ventures with larger networks will have a reduced need to acquire resources by forming new alliances. In contrast, ventures with only limited network contacts are more dependent on resource acquisition through new alliance formation. The second benefit of new alliances for ventures with limited networks is that entering into a strategic alliance with another firm not only extends their network by one new contact, but also appears to provide a multiplying effect since the access to potential network partners depends on the number of previously established alliances (Gulati, 1995). Therefore, managers of ventures with limited networks will more likely seek new alliance partners than managers of ventures with extended networks.

We expect that high-discretion financial slack will also moderate the effect of a venture’s network capabilities on the propensity of its managers to seek an alliance. Possessing and managing a network is not costless and will draw on the venture’s available slack. In order to efficiently source capabilities via its network, venture managers need to monitor their network partners and establish contractual control mechanisms in order to protect their firm from the opportunistic behavior of the partners, which can be associated with substantial monitoring and contracting costs (Gulati et al., 2000). Moreover, since network activities involve multiple partners, coordination costs arise (Gulati et al., 2000). Monitoring, contracting and coordination costs expand as a venture’s network is extended. Thus, in order to efficiently exploit an extended network, a venture must have high levels of financial slack at hand. In the case of low financial slack, the expenditure of the financial resources on an expanded network can conflict with the needs of the venture’s current projects. This leaves the manager in the position of either bearing the risk of under funding current projects or the risks that accrue from being unable to invest sufficient resources in contracting, monitoring and coordinating a new alliance. Given the nature of these ventures, the risk of opportunism by the partner created by under funding network governance is substantial and likely outweighs gains from network expansion. Thus, the benefits that arise for ventures extending their network by seeking new alliance partners appear greater for ventures with the financial slack available to fully invest in the development of appropriate governance mechanisms. Given these greater benefits and lower risks, managers of ventures with high financial slack will be more motivated to seek alliance partners to extend the venture network than managers of low financial slack ventures. Thus,

**H4.** (a) The likelihood of venture managers seeking a new alliance partner is higher when the network is limited than when it is extended. (b) This impact of the venture’s network size on the likelihood of seeking a new alliance partner is greater for managers of ventures with high financial slack than with low financial slack.

3.2. **Context, financial slack, and strategic alliances**

The environmental context in which a technology venture operates will play a significant role in the decision of a venture’s manager to seek a new alliance. In this particular study we analyze three critical elements of a technology venture’s context — the level of product competition, the munificence of the industry, and conditions for financing the venture — through a resource dependence lens. We have chosen to limit our research to these three elements, since they are critical determinants in the success and failure of new high technology ventures (Fildes, 1990). Moreover, they represent both the demand for capabilities (patent, competition) and opportunities to acquire capabilities (financing
environment) placed on the organization, consistent with Gomes-Casseres’ (1996) understanding of the organization’s context. The argument we are building is that environmental scarcity will motivate venture managers to seek new alliances, and that financial slack will buffer this motivation because high slack reduces the resource dependence of new ventures.

The level of competition in a product space depends on the strength of the venture’s property rights protection for their key intellectual property. As we know from the cases of EMI and Bowmar, being an innovator is clearly not in itself sufficient to assure success (Teece, 1988). The appropriation of the value of the innovation is substantially determined by the competitive environment, which is influenced by the strength of intellectual property protection.\(^5\) If the innovator is in a strong intellectual property protection position, this buys the innovator time and competitive space needed to continue to develop the innovation, which places little pressure on the innovator to immediately seek an alliance partner to expedite the development process. In contrast, if the innovators are in a weak intellectual property protection position they are in a race to capture the value from the innovation before it can be imitated by competitors. The race to market places a premium on rapid access to complementary assets and will therefore focus managers of these ventures on seeking a new alliance. Granted, the risks of opportunistic action by the partner are also higher with weak intellectual property protection, but the drive to be first to market to gain any benefit from the innovation will take priority in the managers’ decisions, since the alliance contract will at least provide some level of protection and recourse to opportunistic action by the partner. Thus, the weaker the patent position of a venture, the more its managers will seek to improve the venture’s competitive position by entering into new alliances.

It appears that there are two reasons for the moderating impact of financial slack on the relationship between the venture’s intellectual property position and alliance entry. The first is simply that the cost and complexity of defending a patent, particularly in a competitive environment where imitation is likely and when the patent is of questionable strength, can be substantial as evidenced by Lerner’s (1995) study of costly litigation within the biotechnology industry. Also the costs of defending weakly protected intellectual property against competitors infringing on the patent are likely higher than for intellectual property protected by a strong appropriability regime. Ventures with low financial slack are not likely to surmount the costs of litigation and protect weak intellectual property against infringement. Thus, the only possibility they have to appropriate value from their innovation is to enhance development speed and bring it to the market as soon as possible, which places a high need on seeking alliance partners. Ventures with high financial slack, in contrast, are more able to defend weak intellectual property against infringement by providing for the costs of litigation and making it costly for patent infringers.

Second, strong intellectual property position provides the venture the opportunity to internally develop its products, but ventures without high levels of financial slack will be unable to take advantage of this opportunity because they will not have the resources available to support internal development. As noted earlier, development of a new product is an expensive and resources intensive process, which requires ventures to invest in expanding their capabilities. However, only those firms with sufficient financial slack will be in a position to make this investment. These two reasons — the position to protect against infringements and internally exploit strong intellectual property — enables ventures with high financial slack to maintain independence and bring their innovation to the market without an alliance partner. Thus,

**H5.** (a) The likelihood of venture managers seeking a new alliance partner is higher when the patent position is weak than when it is strong. (b) This impact of the venture’s patent position on the likelihood of seeking a new alliance partner is weaker for managers of ventures with high financial slack than with low financial slack.

Although the strength of patents can help explain the level of competition for a particular product, there are also industry determinants that impact the level of competition. This industry-wide competitive context plays a critical role in the decisions of technology ventures’ managers, since being first to market with an innovative product or service is crucial to the success or failure of the venture (Schoonhoven et al., 1990). Therefore the hostility of a venture’s competitors will influence the manager’s view of the need to access complementary assets via alliances in order to speed the venture’s products towards the market. In contrast, in situations in which the venture does not feel substantial competitive pressure, its managers will not feel as compelled to immediately seek an alliance partner to bring the

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\(^5\) Although a patent can be considered a capability, it is more often reflective of an innovative capability, such as the ability to generate early and late stage product candidates, and the quality of the scientific team. Given that these are variables in our model, we focus on the likely competitive/legal environment arising from the strength or weakness of the patent.
product to market as quickly as possible. Instead, they will seek to advance their internal development efforts in order to both move the product towards market and enhance their negotiating position in the event they decide to enter an alliance in the future. Thus, the manager’s likelihood to seek an alliance increases with decreasing munificence of the environment (i.e., increased competition).

The financial slack of the venture likely has a moderating influence on this relationship since it allows the venture to react to competitive pressures. In a highly competitive context, a technology venture will need to increase its speed to market to gain the benefits of being a first mover and avoid being locked out of the market (Lieberman, 1989). This is only possible when the venture has sufficient financial slack at hand because this guarantees that the ventures can access additional resources to compete and win via the strategic factor or labour markets. Under these circumstances, ventures with high levels of financial slack will be able to leverage their capital to gain access to the resources they need and are buffered from the competition. In contrast, when the firm’s financial slack is low, it will not have the opportunity to supplement its capabilities via the factor markets in order to respond to competitive challenges, nor will it be able to increase its rate of product development, since it will not have additional resources to commit to the project. Therefore, low financial slack ventures need to turn to an alliance to acquire the resources needed to speed up product development and overcome competitive challenges. Thus,

H6. (a) The likelihood of venture managers seeking a new alliance partner is higher when competition is high than when it is low. (b) This impact of the munificence of the competitive environment on the likelihood of seeking a new alliance partner is weaker for managers of ventures with high financial slack than with low financial slack.

Raising money at the capital markets is one of the main tasks of managers of high technology firms, however, the munificence of capital markets changes over time (Lerner, 1994). For example, young biotech firms in the German industry faced a highly munificient financing environment during the technology bubble in 2000 and acquired 565 million € capital in VC financing and 655 million € through IPOs. In contrast, when stock markets were declining in 2002, the financing environment became considerably less munificent for biotech startups. The total amount of VC invested was only 207 million €, and no firm went public during this time (Ernst & Young, 2003). Firms will face a higher need to engage in strategic alliances as an alternative to the capital markets in a less munificent financing environment since alliances “can replace financing because they enable the firm to meet its goals without additional investment by piggy-backing on the investment of another firm” (Dollinger, 1995: 36). Moreover, acquiring an alliance partner serves as a legitimizing signal to the financial markets, which enhances a firm’s access to both the private and public financial markets (Stuart, 1998). In summary, our argument above suggests that the less munificent the financing environment the stronger the motivation for venture managers to seek an alliance.

It appears that this motivation depends on the financial slack of the venture. Prior research has found that alliances entered during hostile (non-munificent) financial environments are more likely to assign the bulk of the control to the larger corporate partner, are significantly less successful than other alliances, and are more likely to be renegotiated when the environment becomes more munificent (Lerner et al., 2003). In essence, during periods in which it is difficult to raise equity capital, ventures’ negotiating positions deteriorate relative to their alliance partners. This leads to ventures receiving significantly worse terms in the contract governing the alliance. Financial slack allows managers to buy time and avoid entering into an alliance under adverse conditions, such as a hostile financial environment.

A firm’s dependence on the capital markets is low when it still possesses financial resources from its last financing event (Wasserman, 2003) and therefore maintains high levels of financial slack. In this case, there is less need for short-term financing, and the venture is buffered from the financing environment allowing the managers to buy time and avoid entering into an alliance on unfavourable terms. However, managers of low financial slack ventures do not have the freedom to wait out a low munificent funding environment. In addition, existing literature indicates that a low munificent funding environment is more onerous for firms with low financial slack since a weak financial position diminishes the possibility of attracting investors under any circumstances (Audretsch and Lehmann, 2004).

Therefore, our central argument is that having low access to financial resources pushes ventures to seek alliances in order to acquire these financial resources, and that this effect is weaker for high slack ventures than for low slack ventures. Although those with higher financial slack are less likely to seek an alliance, high financial slack “buys” those that still need to raise external funds much needed time in unattractive markets to find the right alliance or wait out the current unattractive conditions. There is likely only limited ability of ventures with low financial slack to delay alliances in unattractive financing environments. Therefore, we propose that low financial resources within the firm (low financial slack) and low financial resources within the external environment (unattractive financing environment)
magnify each other in explaining the likelihood of seeking an alliance — the need to seek new alliances as a means for financing during times of low munificence of the capital markets is much stronger for those ventures which possess low financial slack than for high financial slack ventures. Thus,

**H7.** (a) The likelihood of venture managers seeking a new alliance partner is higher when the munificence of the financing environment is low than when it is high. (b) This impact of the munificence of the financing environment on the likelihood of seeking a new alliance partner is weaker for managers of ventures with high financial slack than with low financial slack.

### 4. Research method

#### 4.1. Data and sample

Our sample frame is managers of entrepreneurial firms in the German biotechnology industry. This industry consists of 360 firms, most of which are entrepreneurial startups (Ernst and Young 2003). Ernst and Young, who survey the industry annually and publish a biotech industry report, released a list of their 212 survey participants in 2003. We followed previous studies (Deeds et al., 1998; Deeds and Hill, 1996) and included in our sample only firms developing biotherapeutics and biodiagnostics. This left 99 biopharmaceutical firms, of which twelve had gone out of business since the publication of the Ernst and Young list. We contacted all 87 firms by telephone and asked for at least one top management team member to participate in our study. Individuals in 68 firms agreed to participate. Except for the first six firms, which conducted the experiment in the presence of one of the researchers (see below), a survey booklet and a cover letter from the researchers were mailed to these firms. We finally received usable experiments from 51 managers of entrepreneurial biotechnology firms. This response rate (51% in terms of firms contacted) is relatively high. Moreover, the number of participants is consistent with other conjoint studies using a similar number of independent variables (Shepherd, 1999).

Participating managers were on average 41.6 years old (standard deviation 6.9 years) and had a firm tenure of 4.3 (std. dev. 3.2) and a top management team tenure of 3.7 (std. dev. 3.1) years. Their average experience in the biotech sector was 8.0 (std. dev. 6.4), in the pharmaceutical sector 3.7 (std. dev. 5.1), and in top management teams 5.7 (std. dev. 4.1) years. They had on average worked in 1.6 (std. dev. 1.2) firms before. The managers also had considerable experience with alliances and, on average, actively negotiated 7.2 (std. dev. 7.7) alliances, 4.0 (std. dev. 3.5) of which had been successful. Eighty-two percent of the managers had an education in natural sciences. Sixty-seven percent held CEO/CFO/CSO positions and 37% were also founders of their firms. These firms were on average 6.7 years old (std. dev. 2.8 years) and had 50 employees (std. dev. 46).

#### 4.2. Methodology and research instrument

We used a metric conjoint experiment to collect data on the decisions of managers of entrepreneurial biotech firms in their assessments of the likelihood of entering into a strategic alliance. Decision makers are asked to make assessments based on a number of attributes which describe a specific decision situation. Several different attributes with predetermined levels constitute a profile to which the decision maker assigns her/his judgement. Metric conjoint analysis is well established in strategy research and is appropriate for our research for the following two reasons. First, a particular strength of conjoint analysis is that it allows researchers to obtain real time data about the decision maker’s decisions. In contrast to retrospective methods such as questionnaires, interviews or surveys, this method is not biased due to the mistaken or missing introspection of decision makers (Shepherd and Zacharakis, 1997). Second, metric conjoint analysis allows — in contrast to non-metric and rank-order techniques — for the investigation of contingent relationships (two-way interactions) between variables. Since our theory suggests contingent decisions, metric conjoint analysis is the appropriate method for our research.

In the conjoint experiment, the judgements of the decision makers represent the dependent variable, whereas the attributes describing the decision scenarios constitute the independent variables. The dependent variable of our study is

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6 These 51 managers came from 44 firms. In the analyses that follow we found that results did not differ substantially when only one representative from each firm was used. Therefore, we report only the analysis of the full sample.
the manager’s likelihood of seeking a strategic alliance partner. Consistent with previous studies (Deeds and Hill, 1996), we defined strategic alliances as any type of “corporate relationship between firms to develop new products”, which is the major goal of young biotechnology ventures. We asked managers to assess the attractiveness of seeking an alliance partner on a seven-point Likert-type scale from “very unattractive” to “very attractive”.

The scenarios in our experiment are described by eight attributes, each of which is described by two levels. These attributes represent the independent variables and are split among one that describes the high-discretion financial slack of the venture (Slack), four that describe the internal capabilities (Early, Late, Team, Network) and three that describe the context in which the firm operates (Patent strength, Financial environment and Competitive environment). Slack of the firm ranges from high (considerable liquidity which guarantees growth of the firm for the next years) to low (limited liquidity which will ensure survival for less than one year). Early means the number of products in early development stages and ranges from high (considerable number of early products in the firm’s pipeline) to low (few early products in the firm’s pipeline). Late stands for the number of products in late development stages and ranges from high (considerable number of late products in the firm’s pipeline) to low (few late products in the firm’s pipeline). Team means the quality of the firm’s scientific team and ranges from high (team consists of well-known and reputable specialists) to low (team consists of only average scientists). Network is the size of the firm’s existing network and ranges from extended (many contacts to universities, research institutes, and other firms) to limited (few contacts to universities, research institutes, and other firms). Patent strength ranges from high (broad portfolio of secure patents) to low (few patents, insecure due to pending law suits). Competition, which describes the competitive environment of the firm, ranges from high (very competitive projects and direct competition with other firms) to low (little competitive projects and no direct competitors). Finance stands for the description of the firm’s financial environment and ranges from attractive (good possibilities to acquire venture capital or file for IPO) to unattractive (only limited possibilities to acquire venture capital, closed IPO window).

4.3. Design and methodological limitations

We applied an orthogonal factorial design to reduce the number of attribute combinations to 16 (Hahn and Shapiro, 1966). That is, we collected judgements of 16 different attribute combinations from each manager. We chose a fractional factorial design which confounded main effects and all two-way interactions of most interest (involving the financial slack of the firm) with other two-way and higher order interactions (which are of least interest). It is therefore unlikely that the latter will bias the results of our study (Green and Srinivasan, 1990).

We confirmed reliability of decision makers’ judgements and thus the quality of the answers by replicating profiles and performing test–retest checks (Shepherd and Zacharakis, 1997). Full replication of all 16 attribute combinations of our experimental design resulted in 32 profiles. In order to control for effects resulting from the specific order of the profiles and/or the specific order of attributes within each profile, we randomly assigned the 32 profiles as well as the attributes in two ways each resulting in four versions of our experiment. Since we found no significant difference across versions, we conclude that order effects had little impact on our results. Moreover, we included a ‘practice’ profile as a first evaluation task, which we excluded from the statistical analysis, in order to make participants familiar with the decision situation before entering into the experiment.

One possible criticism conjoint analysis faces is that these kinds of experiments do not represent real decision situations and therefore lack external validity. However, scholars have shown that conjoint analyses significantly reflect decision policies employed by individuals (Hammond and Adelman 1976). External validity can be enhanced by not only deriving judgement attributes from theory, but by in addition interviewing or surveying potential study participants with regard to relevance of the decision attributes (Shepherd and Zacharakis, 1997). We therefore conducted four in-depth interviews with managers of entrepreneurial biotech firms before we approached possible participants. In addition, the first six of our experiments were performed in the presence of one of the researchers in order to obtain feedback on the design of the experiment. All interviewees and participants confirmed that our decision attributes are relevant and that the decision profiles are realistic.

5. Results

Our statistical analysis draws on 32 decisions from 51 individuals, thus yielding a total of 1632 data points. However, these data points are not independent since each set of 32 observations is nested within an individual
manager and mental models between individuals differ. We therefore applied Hierarchical Linear Modeling (HLM), which takes into account nested decisions within individuals (Bryk and Raudenbush, 1992). Table 1 presents our results. We report for each decision criterion the standardized coefficient, the corresponding standard error, the t-ratio and level of significance, indicated by the asterisks. The results show that all main effects except for network size (for which we find a significant interaction, see below) are significantly used by entrepreneurial biotech firms’ managers in assessing the likelihood of entering into a strategic alliance. Specifically, managers’ likelihood of seeking strategic alliance partners increases with lower high-discretion financial slack, and also with (i) a lower number of early stage products in the firm’s pipeline, (ii) a lower number of late stage products in the firm’s pipeline, (iii) a lower quality scientific team, (iv) a weaker patent position, (v) a more competitive environment, and (vi) a less attractive financing environment. These results provide support for Hypotheses 1a, 2a, 3a, 5a, 6a and 7a.7

Our theory, however, stated that interactions exist between a venture’s high-discretion financial slack and level of internal capabilities, control, and munificence of the context. Table 1 shows that four out of seven interactions of slack with other attributes are significant. Specifically, we find that interactions between financial slack and late stage products, network, and the munificence of the financing environment are significant at the 0.05 level or better and that the interaction between the quality of the scientific team and financial slack is significant at the 0.06 level. In order to understand these significant interaction effects, we plot each research variable (x-axis) which interacts with high-discretion financial slack against the managers’ evaluation of the likelihood of seeking alliance partners (y-axis). We plot separate lines for low and high financial slack (Fig. 1A–D).

Fig. 1A demonstrates that technology venture managers are more likely to seek a strategic alliance when there are fewer late stage products in the venture’s pipeline than when there are many late stage products in the venture’s pipeline, and that this effect is greater for managers of ventures with high financial slack than for managers of ventures with low financial slack. Fig. 1B shows that technology venture managers are more likely to seek a strategic alliance when they perceive the quality of their scientific team as low than when they perceive it as high, and that this effect is greater

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Table 1
Managers’ decisions to seek strategic alliance partners

<table>
<thead>
<tr>
<th>Evaluation criteria</th>
<th>Coefficient</th>
<th>Std error</th>
<th>t-ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept</td>
<td>4.647</td>
<td>0.089</td>
<td>52.424***</td>
</tr>
<tr>
<td>High-discretion financial slack</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Slack</td>
<td>−1.377</td>
<td>0.187</td>
<td>−7.382***</td>
</tr>
<tr>
<td>Capabilities</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Early stage product candidates</td>
<td>−0.387</td>
<td>0.092</td>
<td>−4.217***</td>
</tr>
<tr>
<td>Late stage product candidates</td>
<td>−0.522</td>
<td>0.140</td>
<td>−3.725***</td>
</tr>
<tr>
<td>Quality of scientific team</td>
<td>−0.140</td>
<td>0.056</td>
<td>−2.495*</td>
</tr>
<tr>
<td>Network size</td>
<td>0.039</td>
<td>0.055</td>
<td>0.720</td>
</tr>
<tr>
<td>Context</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Patent strength (Legal environment)</td>
<td>−0.277</td>
<td>0.069</td>
<td>−4.023***</td>
</tr>
<tr>
<td>Competitive environment</td>
<td>0.213</td>
<td>0.064</td>
<td>3.321**</td>
</tr>
<tr>
<td>Financial environment</td>
<td>−1.000</td>
<td>0.114</td>
<td>−8.770***</td>
</tr>
<tr>
<td>Interactions</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Slack × Early stage product candidates</td>
<td>−0.078</td>
<td>0.130</td>
<td>−0.602</td>
</tr>
<tr>
<td>Slack × Late stage product candidates</td>
<td>−0.358</td>
<td>0.120</td>
<td>−2.975**</td>
</tr>
<tr>
<td>Slack × Quality of scientific team</td>
<td>−0.279</td>
<td>0.150</td>
<td>−1.857</td>
</tr>
<tr>
<td>Slack × Network size</td>
<td>−0.324</td>
<td>0.120</td>
<td>−2.703**</td>
</tr>
<tr>
<td>Slack × Patent strength</td>
<td>−0.162</td>
<td>0.121</td>
<td>−1.340</td>
</tr>
<tr>
<td>Slack × Competitive environment</td>
<td>−0.162</td>
<td>0.117</td>
<td>−1.374</td>
</tr>
<tr>
<td>Slack × Financial environment</td>
<td>0.422</td>
<td>0.119</td>
<td>3.554**</td>
</tr>
</tbody>
</table>

*p<0.10; *p<0.05; **p<0.01; ***p<0.001; n=1632 decisions nested within 51 managers.

7 Our orthogonal design means that there is zero correlation between decision attributes and therefore the results for the main effect relationships reported in the full model of Table 1 are the same as the results for a main-effects-only model.
for managers of ventures with high financial slack than for managers of ventures with low financial slack. Fig. 1C illustrates that technology venture managers are more likely to seek a strategic alliance when the network of their venture is limited than when it is extended, and that this effect is greater for managers of ventures with low financial slack than for managers of ventures with high financial slack. Finally, Fig. 1D demonstrates that technology venture managers are more likely to seek a strategic alliance when the financing environment is unattractive than when it is attractive, and that this effect is weaker for managers of ventures with high financial slack than for managers of ventures with low financial slack. The nature of these significant interactions provides support for H2b, H3b and H7b. Since we do not find significant interactions for the other research variables, H1b, H5b, and H6b are not supported.

6. Discussion

The most important contribution of our study is that by taking into account the contingency relationship between high-discretion financial slack and non-financial capabilities and context in the motivation of managers to seek new
alliance partners we have been able to highlight managers shifting views of alliances as substitutes or complements to financial slack. Existing studies have emphasized the important role that the desire to obtain resources and capabilities that are considered to be deficient plays in the formation of alliances (Das and Teng, 2000), particularly under difficult environmental conditions (Eisenhardt and Schoonhoven, 1996). However, these studies have relatively neglected potential interactions between a venture’s financial slack and those non-financial capabilities it seeks to acquire through strategic alliance formation.

When considering only main effects, our findings suggest that venture managers generally view high-discretion slack and alliances as substitutes for one another. The negative direct impact of high-discretion financial slack on the propensity to enter an alliance indicates a strong preference by venture managers for internally controlled resources over external resources. However, the interaction effects we find between financial slack and non-financial capabilities suggest a complementary relationship between slack and alliances when the primary motive for alliance formation is the acquisition of missing non-financial capabilities. Specifically, the availability of high-discretion financial slack to the venture enhances the desire of its managers to offset perceived weaknesses in the firm’s capabilities through alliance formation. Venture managers appear to shift from seeing internal resources as a pure substitute for external resources to a view in which high-discretion financial slack and alliances become complements that allow the manager to enhance his or her venture’s existing capabilities. When managers have little high-discretion finance slack they focus on husbanding their resources to support existing projects even when they perceive weaknesses in their venture’s capabilities and are less likely to seek out a new alliance. In contrast, when managers have access to high-discretion financial slack they actively seek to enhance their ventures’ capabilities, by enhancing their pipeline and team, via leveraging their slack through entry into alliances.

Managers’ decisions to seek alliances also depend on contingent relationships between their venture’s financial slack and environmental opportunities to acquire financial capital. The findings for the interaction between high-discretion slack and the financing environment indicate that venture managers view financial markets, alliances, and internally controlled high-discretion slack as substitutes for one another. As the availability of one substitute declines (equity financing) managers seek capital from the other. However, managers recognize the increased price in the other substitute (alliances) that comes with the decline in the availability of equity investments. When placed in this situation, venture managers with access to the third substitute, high-discretion financial slack, are less inclined to pay the higher price being asked for the available substitute — an alliance. These findings help explain the earlier findings of Rothaermel and Deeds (2004) and Lerner et al. (2003) that ventures appear to enter alliances on unfavorable terms and later seek to renegotiate or extricate themselves from these at a point in time in which more resources are available to the venture.

An interesting and unexpected observation in Fig. 1B is that the lines for high and low financial slack have different slopes. Since acquisition of network resources by itself is a driver of alliance formation in biotechnology ventures (Coombs et al., 2006), one would expect that (as for late products and the team quality) the line representing low financial slack ventures would be located above the line representing high slack ventures and there is a higher incentive for alliance formation for high than for low slack ventures. For high slack, however, extended networks rather than limited networks appear to be a direct driver of alliance formation. One explanation is that managers of ventures with high slack and extended networks can acquire sufficient capabilities through existing networks to make use of available discretionary resources, so they do not need to seek new alliances for this purpose. We believe that this interesting effect warrants attention in future studies.

Besides the hypothesized interaction effects, we also find that — with the exception of networks — all capabilities have significant main effects on venture managers’ decisions to seek new alliances. These findings are consistent with a capabilities-based view on alliance formation of Kogut (1988) and Teece (1988). The fact that we do not find a direct effect of networks on the managers’ decisions does not mean that networks do not impact managers’ decisions, rather there is a relationship and the nature of this relationship depends on the level of slack. This is demonstrated in Fig. 1B, which shows that for both, high and low slack the managers’ likelihood to seek alliances depends on the size of their venture’s network.

We did not find support for all hypothesized interactions. Although non-findings are, strictly speaking, not confirmations for null-hypotheses, we would like to offer possible explanations which may stimulate future research. There appear to be several possible explanations for the pattern of non-results. One is that we are seeing the primacy of the challenge presented by the weakness of a particular capability (early stage products and patents) or environmental context (competitive pressure) overrides any concerns about the availability or non-availability of discretionary slack.
In the case of each of these three non-findings for the interactions the direct effects are highly significant and in the hypothesized direction. So it is not that these are problems the managers are unconcerned about, but rather that the problems created by these weaknesses are so critical to the managers that their primary consideration is to overcome them without considering their slack at hand. Another possible reason for our non-findings with respect to capability–slack interactions may be that the near term costs to advance and exploit capabilities acquired via alliance formation are not equal for all types of capabilities. For example, when biotech ventures acquire late stage product candidates such as a drug in phase II or III clinical testing through alliances, the continuation of these trials is much more expensive in the near term than when the drug is in early development stages such as pre-clinical trials (Kellog and Charnes, 2000) or simply a patent. Thus, it is more important for ventures which ally in order to acquire late stage products to have high financial slack than for those ventures who seek partners to acquire early stage products. Further, our non-findings for the interaction between patents and financial slack may be explained by the fact that managers generally do not consider the costs to defend their intellectual property but only the strategic necessity of being first to market, which makes the decision to speed up development of weakly protected technologies by seeking an alliances independent of the financial slack of their venture. Finally, when competition is high, it may be that speeding up product development by using financial slack to acquire additional resources is a limited option for biopharmaceutical ventures. For example, clinical development of drug candidates requires following rigid protocols and time tables which are independent of the money invested. This clinical development is the most time-consuming part of drug development (Kellog and Charnes, 2000) and gains of time in other development steps through use of financial slack may be considered less consequential by managers.

Our experimental design allowed us to gain insights how the situation of a firm before alliance formation influences its engagement in alliances. This is the first and fundamental step in the alliance formation process and is independent of alliance opportunities. Whereas previous literature offered insights into which capabilities of potential target firms might trigger alliance formation (Chi, 1994), our analysis provides empirical evidence that a venture’s endowment of internal capabilities and the capability demands and opportunities the environment places for the organization are important antecedents which determine if a firm will likely seek new alliances. We complement the empirical evidence on this argumentation from a decision making perspective: if the necessary capabilities are present in the firm and the environment does not place strong demands for capabilities but offers good opportunities to acquire them, managers are not as likely to seek to acquire capabilities from an alliance partner (Kogut, 1988). This does not, of course, exclude the possibility that they might enter into an alliance if they discover an attractive opportunity. They will, however, not actively seek to attract alliance partners by themselves.

Our findings contribute to the understanding of previous empirical research on strategic alliance formation in the biotechnology industry. Specifically, Deeds and Hill (1996) and Rothaermel (2001) found that there is an optimal number of alliances for technology ventures with regard to their rate of product development. However, many firms in their sample had too few or too many alliances. The authors speculated that “like all human decision makers, managers may be intendedly rational, but because of the constraints imposed by cognitive limits, uncertainty, complexity, and ambiguity, their rationality is bounded” (Deeds and Hill, 1996: 54). Our results provide evidence that high technology managers’ decisions are, even if they were purely rational, complex and take into account more than just the firm’s current rate of product development. Instead, they depend on the firm’s endowment of a variety of different capabilities and interactions between them. Given the death sentence that a cash crisis represents for many ventures, over committing to alliances at the expense of productivity may be rational if the alternative is dissolution of the firm due to a cash shortage.

Finally, our results may also shed some light on the current debate about the benefits of alliances for new ventures offered by Alvarez and Barney (2001). The short-term decision making forced on venture managers by a low financial slack position may lead them to negotiate an alliance from a position of weakness and give away much of the firm’s future. Under these circumstances entering into alliances could quite conceivably have a detrimental impact on the venture’s future rents and survival. However, when alliances are entered into from a position of strength with high financial slack, for example, venture managers are in a position to negotiate stronger alliances and be selective in the alliances in which they engage the firm (Lerner and Merges, 1998). In high financial slack conditions venture managers will choose those alliances which have the greatest potential benefit for the firm in the long run and enable negotiation of better terms making it much more likely that these alliances will enhance the venture’s productivity and odds of survival. It appears that the old adage that ‘the rich get richer’ applies to alliances (Eisenhardt and Schoonhoven, 1996). Understanding the technology venture managers’ decisions and the circumstances under which they are likely to enter
alliances which are beneficial, in contrast to seeking any alliance including those which are likely to be detrimental, may help to resolve the debate about the value of alliances to technology ventures.

6.1. Limitations and future research

As all studies, this one has limitations which we have attempted to minimize in the study’s design. First, we focus on the decisions of high technology venture managers seeking any type of product development alliance based on the capability endowment of their firm and its context. In order to understand the fundamental motivation for formation of strategic alliances, we followed existing literature (Deeds and Hill, 1996) and did not distinguish between different contractual types of alliances (e.g., licensing deals, joint ventures, minority equity participations). This choice might also depend on a firm’s capability endowment (Das and Teng, 2000). An investigation of this effect is likely a fruitful avenue for future research. An experimental design as we employ here might serve as an appropriate method. Second, it is important to note that in this paper we exclusively focus on the basic motivation of managers to seek new alliances with respect to capability needs of their ventures, but neglect alliance opportunities. However, constellations of alliances depend on both, motivation and opportunities (Ahuja, 2000; Eisenhardt and Schoonhoven, 1996). While we complement existing experimental research on alliance opportunity evaluation (Hitt et al., 2004; Tyler and Steensma, 1995) by introducing the motivation perspective, it would certainly be an interesting avenue for future research to study both perspectives within the same experimental design. Third, in this study we focused at the level of the decisions, but 9% of the variance was between individuals, which suggests future research opportunities to investigate differences across alliance managers. For example, research has shown that individual experience (e.g., Parker, 2006) influences decision policies of entrepreneurs. With respect to the motivation to seek alliances, it may be particularly interesting to analyze how previous alliance experience — either the general amount of experience or the amount of positive relative to negative experiences collected by the decision maker — impacts this motivation. Indeed, general and partner-specific experiences are important antecedents of alliance formation (Gulati, 1995) and performance (Hoang and Rothaermel, 2005). Going forward scholars may use experimental methods to explain between individual variance in alliance decision making.

6.2. Conclusion

Our study shows that venture managers’ decisions to seek new alliances are complex since the impact of capabilities and context is moderated by the venture’s financial slack. In fact, the managers’ view of the relationship between financial slack and alliances appears to vary between complements and substitutes. In the first case, managers see alliances as ways to leverage their financial slack to offset perceived weaknesses in their capabilities. In the second case, financial slack is viewed by managers as a substitute for entering an alliance, particularly during times in which access to equity capital is restricted due to market conditions. Our findings on the centrality of considerations of financial slack in venture managers’ decision policies help to understand prior results finding that over commitment to alliances and higher rates of renegotiation for alliances entered during poor funding environments are in fact detrimental to venture performance.

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