



Requisite expertise, firm reputation, and status in venture capital investment allocation decisions

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Abstract

Drawing together research in the upper echelon perspective, strategy, and organizational sociology, this paper examines (1) the relationship between the finance expertise of a venture capital (VC) firm's management team and investment selection, and (2) the moderation of this relationship by the VC firm's social position. We find that while finance expertise is associated with a lower proportion of early-stage investments, this relationship is *weaker* for firms with high reputation and *stronger* for firms with high status. We conclude with a discussion of the importance and nuances of external image considerations on investment decisions as well as insights into the importance of the requisite nature of expertise.

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1. Executive summary

There has been significant scholarly interest in understanding the investment selection decisions of venture capital (VC) firms, e.g., the selection criteria or cognitive processes involved in making these decisions. Researchers have made a substantial contribution to the literature by identifying common elements to the decision making processes across VC firms.

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With this paper, we seek to understand why these processes lead to different selection results, i.e., why equally aspiring VC firms make early-stage investments to varying degrees. Acknowledging the importance of top management team (TMT) composition for decision making and the inclusion of VC firms in investment and fundraising networks, we concomitantly consider the effects of finance expertise of the VC firm's management team and the firm's reputation and status on investment selection.

We find that VC firms with higher finance expertise select *fewer* early-stage investments. In addition, despite the apparent similarity of the constructs of reputation and status as representations of how a firm is perceived by its external constituents, this study allows us to disentangle their distinct facets. We find that both reputation and status moderate the finance expertise–investment decision relationship but in opposing ways. Status magnifies this relationship: for higher-status VC firms, higher finance expertise induces an even stronger avoidance of early-stage investments. Interestingly, reputation appears to have the opposite, alleviating effect: the negative relationship between finance expertise and early-stage investments is stronger for less reputable firms than for more reputable firms. We account for this surprising finding in our discussion by developing a number of possible explanations around management discretion, affordability of experimentation, and the role of reputation in increasing the odds of success.

Our study contributes to the entrepreneurship literature by explaining why some VC firms make more early-stage investments than others and by enhancing the theoretical arsenal for studying VC decision making. We also contribute to the broader organizational literature in two important ways. First, our results suggest that researchers need to pay closer attention to the type rather than simply the amount of management team expertise. Second, although external image considerations play important roles in management decision making, we tease out important but heretofore ignored nuances in the concepts of reputation and status.

There are a number of practical implications that emerge from our study. From the VC firm's perspective, the results provide insight into how their management team expertise and social standing affect their deal flow and ultimate investment selection. From the perspective of the recipient of venture capital, our results suggest that entrepreneurs looking for early-stage financing for their ventures would be well served by an in-depth examination of the management expertise of their potential VC firms. Given the strong network repercussions of a “no decision”, it pays to be exposed to the “right” VC firm early on.

2. Introduction

There has been substantial scholarly interest in understanding the investment selection decisions of venture capital (VC) firms. In particular, researchers have sought to explore the decision-making process in terms of the selection criteria applied (MacMillan et al., 1985; Muzyka et al., 1996; Shepherd et al., 2000; Tyebjee and Bruno, 1984; Wright et al., 1997) or the cognitive processes employed (Hisrich and Jankowicz, 1990; Rosman and O'Neill, 1993; Zacharakis and Shepherd, 2001). What is common to all these studies is that researchers have focused on the commonalities across VC firms, thereby identifying a proto-typical decision making process. As a result, the differences in investment decisions, reflecting individual or organizational differences in evaluating the opportunities or risks associated with prospective ventures, have received relatively little attention.

It is now well established in organizational research that a firm's strategic choices are driven by its top management team (TMT), and that differences in such choices can be explained by TMT demographics (Hambrick and Mason, 1984). Recent application of this view to the context of VC firm performance has shown that the nature of the VC partners' expertise indeed affects both the successes and failures in the firm's portfolio (Dimov and Shepherd, 2005). Yet, in addition to such firm-specific effects, there are also external influences. Specifically, in order to mitigate the uncertainty they face in selecting potential investments, VC firms are continuously involved in investment syndicates (Bygrave, 1987; Lerner, 1994) and are thus part of a broader social network. Their standing in this network appears to influence their investment decisions (Podolny, 2001; Sorenson and Stuart, 2001).

The purpose of this paper is to examine the degree to which VC firms' investment decisions are affected by the (requisite) nature of their TMT expertise and their social network standing. To capture the latter, we use two constructs – reputation and status – used in the fields of strategy and economic sociology to represent an organization's social standing. Despite the apparent similarity of these two constructs, as evidenced by the significant overlap in their use (e.g. Gulati and Higgins, 2003; Podolny, 2001; Shane and Cable, 2002; Stuart, 1998; Stuart et al., 1999), this study follows recent work that disentangles their distinct facets (Washington and Zajac, 2005). Specifically, we study the investment allocation decisions of 108 US venture capital firms over a 6-year period. We highlight the importance of relevant (i.e. requisite) expertise and also show that reputation and status moderate the expertise–decision relationship in opposing ways.

Our study contributes to the entrepreneurship literature by enhancing its theoretical arsenal for the study of VC decision making and by explaining why, among equally aspiring VC firms, some make more early-stage investments than others. In line with recent arguments presented by Vogus and Sutcliffe (2003), our results suggest that researchers need to pay closer attention to the type rather than simply the amount of management team expertise. Our findings contribute to the upper echelon perspective by highlighting the role of external image considerations in TMT decision making. And we also contribute to the strategy and economic sociology literatures by teasing out important, heretofore ignored nuances in the constructs of reputation and status, representing a firm's external image.

The article proceeds as follows. First, we provide an overview of the concept of requisite expertise and discuss its specific form in the context of venture capital firms and their portfolio investments. We then discuss the concepts of reputation and status and provide specific arguments for their moderating effects on the relationship between TMT requisite expertise and investment selection. In the remaining sections, we describe our methodology and results, and then discuss our findings.

3. Theory and hypotheses

Venture capital firms raise funds from various investors and then seek to invest these funds in private companies with the purpose of achieving superior investment returns. While some VC firms invest in companies that are in the process of exploring ideas for which there are not yet developed commercial products or tested markets (i.e. early-stage companies), others prefer late-stage companies, i.e. those with well-defined market and product characteristics, seeking to expand or improve their established business. The less

developed a prospective company, the higher the uncertainty that a VC firm faces in making its investment decision (Podolny, 2001).

3.1. Management team expertise and investment choice

The contemplation of any investment essentially entails weighing the opportunities and threats that it poses to a particular investor. A considerable body of research in organizations suggests that although top managers within firms perceive environmental threats and opportunities similarly, they perceive them differently from top managers in other organizations, even within the same industry (Milliken, 1990; Sutcliffe and Huber, 1998). And while a number of factors may account for these inter-organizational differences (Boyd et al., 1993; Sutcliffe, 1994), the diversity of team members' past work experiences often affects the team's perspectives and opinions (e.g., Sutcliffe, 1994), actions (McDonald and Westphal, 2003), as well as organizational outcomes (Bunderson and Sutcliffe, 2002). With differences in the composition of organizations' top management teams (TMTs), there are different strategic actions towards uncertain markets (Flood et al., 1997).

The relationship between TMT's functional diversity and performance, although widely studied, has shown mixed results (see Bunderson and Sutcliffe (2002) for a review). Functional background is a proxy for the information, knowledge, skills, and expertise that individuals bring to a group (Williams and O'Reilly, 1998). Researchers have generally focused on the breadth or amount of variety within a team, i.e., whether the different dominant functional perspectives across team members cover a broad range of functional categories or are restricted to a subset of categories, thereby overlooking the "relevance" of the variety. Although studies have assumed that any variety will do, a growing body of work suggests that variety alone is insufficient to benefit an organization. Rather, as Vogus and Sutcliffe (2003) argue (and empirically show), it is the content of variety that matters (Cohen, 1986) and the extent to which a team's variety matches the characteristics of the firm's environment(s). In other words, performance depends on the appropriateness of the team's specific knowledge for the organization's environment(s) or strategy. Relevant expertise affects the team's understanding of the uncertainty that exists and is likely to influence the team's decisions to enter particular market segments (Van de Ven, 1986).

Although the tasks of the VC firm can be classified in terms of pre- and post-investment activities,¹ in this study we are concerned with the former rather than the latter. Pre-investment activities involve those tasks up to, and including, the signing of an investment contract, e.g., soliciting new venture proposals for submission to the VC firm, determining whether these proposals meet the firm's broad screening criteria, conducting due diligence (more extensive research to determine the likely success of the venture), and then negotiating and structuring a relationship with the entrepreneur. While some of the investment proposals pertain to companies that are in the process of exploring ideas for which there are not yet fully developed commercial products or tested markets (i.e. early stage), others involve companies with well established products and markets, seeking to expand or optimize their business (i.e. late stage). Decisions to invest in early- versus late-stage ventures are likely to hinge on the extent to

¹ Tyebjee and Bruno (1984) proposed a model of the venture capital process with five stages: deal origination, deal screening, deal evaluation, deal structuring and post-investment.

which decision makers perceive the venture to be risky, as well as the extent to which they expect that there will be a proper risk–return balance. Assessments of these factors will be shaped by the distinct expertise held by a firm’s TMT. On one hand, while early-stage ventures have higher perceived risk, relevant industry (operations, marketing, general management) or prior entrepreneurial experience reduce this risk (March and Shapira, 1987). This is driven at least in part by the expectation of adding value to the particular venture. On the other hand, an investment decision needs to be an efficient allocation of capital and thus requires a proper risk–return balance. The estimation of the latter is facilitated by finance experience and is more robust in the context of more established ventures. Therefore, a VC firm’s experience may help explain the investment allocation diversity among VC firms.

We focus explicitly on the TMT’s expertise in finance, what we call *finance capacity*, and explore its implications for the investment allocation decisions by VC capital firms. Accordingly, we implicitly treat other industry experience as a boundary condition for our theoretical development.² As indicated above, finance capacity is important as it ensures that financial resources are put to their most efficient use based on the criteria established by capital markets. Research has shown that when capital market considerations permeate an organization’s performance environment, the number of executives with finance backgrounds increases (Fligstein, 1987; Thornton and Ocasio, 1999). In this regard, one of the main responsibilities of VC firms towards their fund investors is ensuring adequate returns given the risk profile of their portfolio and the opportunity cost for the fund investors (i.e. alternative investment vehicles such as stocks, bonds or real estate trusts).

The finance capacity of a VC firm specifically refers to its top management team’s expertise in evaluating the return potential as well as in managing the financial resources of a prospective venture. The value of a team’s finance capacity comes from TMT members’ abilities to assess the future payoffs of potential investments and the risks associated with those payoffs. Teams with greater finance capacity will also be more likely to recognize those contexts in which assessments of payoff and risk are not possible (or are too costly). Because it provides the team with greater understanding of the investment potential, finance capacity improves the managers’ comprehension of the requirements for making the potential investment successful. Furthermore, portfolio companies often look to the VC firm to provide finance and accounting information (Mitchell et al., 1995).

Later-stage ventures have well-defined product-market characteristics, which allows for a better estimation of the potential portfolio company’s future payoffs and the level of unsystematic risk. As a consequence, later-stage investments represent a context in which risk (including agency risk) can be better managed (Amit et al., 1998; Carter and Van Auken, 1994; Eisenhardt, 1989). Finance capacity is a source of knowledge on how to best manage the risk of a particular investment, such as determining the most appropriate financial structure (e.g., a mix of voting and preference shares), as well as on how to improve portfolio firm performance, such as through introducing more “sophisticated” financial and information systems. Accordingly, if faced with two potential ventures with similar characteristics but at different stages of development, a VC firm with high finance capacity would prefer the later- to the earlier-stage venture.

² Other experiences are also important. For example, VC firm managers with considerable experience in a particular industry are more likely to invest in and able to add value to portfolio companies in that industry.

Hypothesis 1. There is a negative relationship between a VC firm's finance capacity and its decision to invest in early-stage ventures.

3.2. Organization's perceived quality, TMT expertise, and investment choice

Entangled in a network of syndication partners and institutional investors who have limited information to appropriately judge the quality of a VC firm, VC firms strive to project and maintain signals of their quality (Gompers, 1996). The concept of perceived quality has been well developed in strategy and economic sociology. In strategy research, firm quality is captured by the construct of reputation – a “perceptual representation of a company's past actions and future prospects that describe the firm's overall appeal to all its key constituents when compared to other leading rivals” (Fombrun, 1996, p. 72). In economic sociology, firm quality is captured by the construct of status. It pertains to the external perception of the organization, based on the structural position that it occupies in its wider network of inter-organizational relationships (Podolny, 1993) and is essentially an “unearned ascription of social rank” (Washington and Zajac, 2005, p. 282).

A firm's *reputation* is established based on its past performance, whereas its *status* is the consequence of its pattern of social relationships and the quality of its network partners. Despite the high degree of closeness between these two constructs, as evidenced by the significant overlap in their usage (e.g. Gulati and Higgins, 2003; Podolny, 2001; Shane and Cable, 2002; Stuart, 1998; Stuart et al., 1999), there might be distinct, heretofore unexplored facets to them. Indeed, as Washington and Zajac argue, “status is fundamentally a sociological concept that captures differences in social rank that generate privilege or discrimination (not performance-based rewards), while reputation is fundamentally an economic concept that captures differences in perceived or actual quality or merit that generate earned, performance-based rewards” (Washington and Zajac, 2005, p. 283). Hence, in this section, we will focus on the particular effects that these two different “channels” to perceived quality may exert on the relationship between TMT finance expertise and investment allocation decisions.

3.2.1. Reputation and perceived quality

Reputation serves as a signal of future performance based on perceptions of past performance (Fombrun and Shanley, 1990; Podolny, 1994; Roberts and Dowling, 2002; Shane and Cable, 2002). For example, in their discussion of technological and commercial prominence, Stuart et al. (1999) found that those firms that had successfully exploited technological innovations or had been successful in evaluating biotechnology companies had built up reputations that underlay expectations by external parties that these firms would continue to be successful in the future. In the context of the VC industry, reputation is associated with the success of a VC firm's previous investments, which in turn affects the VC firm's ability to raise and invest new funds. For instance, the amount of money available to be invested in future portfolio companies is dependent, in part, upon VC firms' past performances in terms of returns on investment and association with initial public offerings (IPOs) (Gompers, 1996). In addition, VC firms that have made successful investments in the past are more desirable syndication partners (Lerner, 1994) and thus have access to more deals. Visibility is also an important aspect of reputation (Lang and Lang, 1988) as it contributes to increasing the inflow of investments into funds (Siri and Tufano, 1998).

In the finance literature, there is a long tradition of examining the effects of reputation on investment behavior in financial markets. Reputation is often positively linked to the past performance of an actor. That is, external agents learn about the quality of the focal actor through observing its past performance over time (Milgrom and Roberts, 1982). In the context of fund management, there is a positive relationship between the inflow of new investment into a fund and the fund's past performance (Ippolito, 1992; Siri and Tufano, 1998). Because fund management companies typically receive a fixed percentage of assets under management as compensation, there is a strong incentive for them to increase the total assets of the portfolio (Chevalier and Ellison, 1997). But increasing the total assets of the portfolio creates an additional incentive to alter its overall risk profile (Chevalier and Ellison, 1997). Specifically, those firms with superior past performance are more likely to develop a reputation for quality and this reputation represents a valuable asset, one worth protecting (Diamond, 1989). Reputation is protected by reducing the overall riskiness of the portfolio by making future investments in "safer" projects (Diamond, 1989).

The above argument suggests that VC firms with high reputation may prefer "safer", i.e. later-stage projects. In other words, protecting a VC firm's reputation may move a firm away from early-stage projects. However, some VC firms may have made their reputation with investments in early-stage companies and thus be less willing to adjust their investment strategy away from such companies. As we argued earlier, the investment allocation into early- vs. late-stage projects depends on the VC firm managers' possessing expertise that is requisite for the particular type of project. Where such expertise is lacking, there is lower perceived control over the project's outcomes and thus greater perceived risk for the project overall (March and Shapira, 1987). This is especially relevant to the VC context given the direct involvement of VCs in the management of their portfolio companies (Lerner, 1994, 1995; Sandberg, 1986; Tyebjee and Bruno, 1984) and thus in their ultimate success or failure (Dimov and Shepherd, 2005). This suggests that expertise-allocation combinations that give rise to high perceived risk (i.e. when there is requisite mismatch) are likely to be perceived as less attractive investments, especially by those with high reputation who perceive that they have more to lose. Hypothesis 1 suggests that the requisite environment for a team of high finance capacity is that of later-stage investments. Therefore, for TMTs with high finance capacity, investing in early-stage companies is likely to be perceived as a riskier choice. This increased risk would constitute a particularly high concern for the more reputable VC firms as they strive to preserve their established reputations. Thus:

Hypothesis 2. VC firm reputation strengthens the negative relationship between finance capacity and the decision to invest in early-stage ventures.

3.2.2. Status and perceived quality

The sociological view of markets focuses on the social construction of the positions that the various organizations occupy (White, 1981). When there is uncertainty over the quality of organizations involved in a particular market as well as prohibitive costs of carrying out evaluative search, an organization's status provides a signal of quality (Podolny, 1993). The status-based nature of market competition creates an uneven distribution of rewards and cost burdens within markets, such that high status organizations have lower transaction

costs in acquiring resources (Podolny, 1993) and are the preferred partners of other high-status organizations (Podolny, 1994), both of which are positively associated with performance (Stuart et al., 1999).

As Podolny (2001) argues, however, high status is not universally valuable; it is of little value when there is high uncertainty about the decisions an organization should make to achieve market success. Put differently, without knowing what market opportunities to pursue, it is difficult for a firm to leverage its high status due to the possibility that it might line up resources towards the “wrong” opportunity. To the extent that the “wrong” allocation of resources creates a negative association for the firm, it will have an undermining effect on its status (Washington and Zajac, 2005). High-status firms thus tend to avoid projects of high uncertainty. The corollary of this logic for the context of venture capital investment decisions is that as the status of a VC firm increases, the firm tends to move away from investments in early-stage companies, i.e., those projects for which there is greater uncertainty about what it takes to achieve market success (Podolny, 2001).

Yet, as we have argued so far, project uncertainty is not absolute but rather firm specific, dependent upon the requisite nature of the VC firm’s management expertise. For a VC team with particular finance capacity, some projects will elicit higher uncertainty than others and thus put more strain on the VC firm’s status. A VC firm would utilize better the transaction cost benefits derived from its status for its less uncertain projects – it could access high quality exchange partners to sell-off some inventory, factor accounts receivable, or renegotiate lease agreements. Lining up similar support for projects it considers more uncertain creates the anxiety of compromising its status. This implies that, while VC firms with high finance capacity avoid early-stage investments, those with high status among them would have an even stronger incentive to do so.

Hypothesis 3. VC firm status strengthens the negative relationship between finance capacity and the decision to invest in early-stage ventures.

4. Method

4.1. Sample

We designed the study with four factors in mind. First, we required VC firms that faced decisions to invest in the “same” industry (Wireless Communication), but an industry that provided considerable choice of portfolio companies at different stages of development. Second, we required VC firms that have made a sufficient number of investments, so that enough data would be available to infer the top managers’ various investment choices. Third, since background data were to be collected on current team members, we had to limit the time period examined so that it would be reasonable to attribute the investment decisions made over the selected period to the identified team members. Finally, we limited our analysis to independent VC firms since subsidiaries of financial or other corporations are likely to have goals and/or strategies imposed on its team by the parent company. Thus, we used Thomson Financial’s *VentureXpert* database to create a sampling frame of all independent VC firms in the US that have invested in at least 20 portfolio companies over the 1997–2002 period, with at least one investment in the Wireless Communication

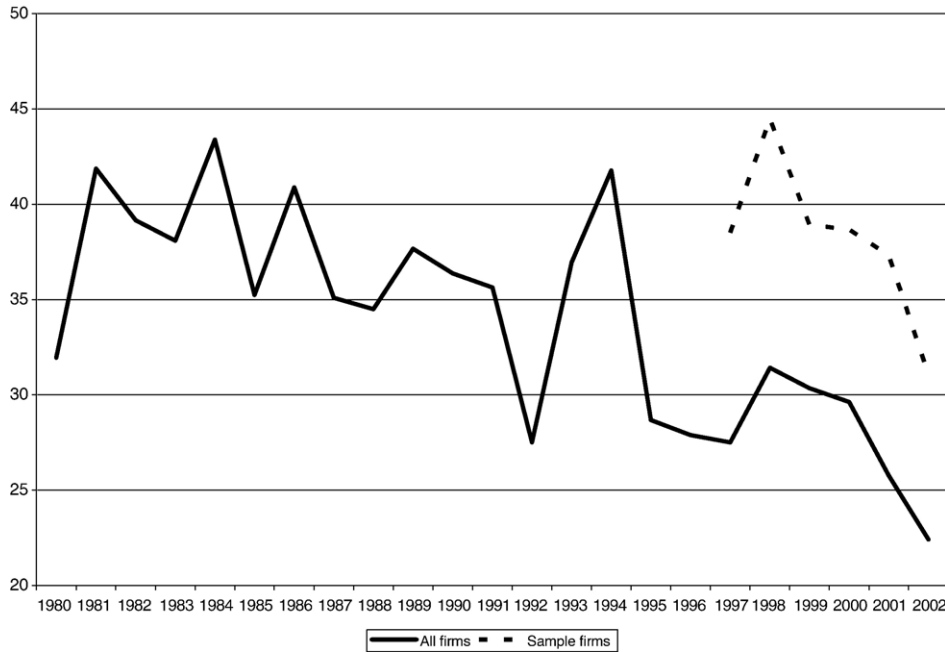


Fig. 1. Proportion of first-time investments in early-stage companies by US VC firms.

industry. From this list of 252 VC firms, we collected information on a random selection of 108 firms.

Because the 1997–2002 period was quite distinct in the development of the US VC industry, with a rapid increase of investment activity between 1997 and 2000 and a rapid decline thereafter, we needed to ensure that it would not affect the generalization of our results. Fig. 1 shows the proportion of first-time early-stage investments by US VC firms over the period 1980–2002 as well as the proportion of early-stage investments by our sample firms over the 1997–2002 period. The figure shows that the proportion of first-time early-stage investments diminishes over time, especially in the latter part of the 1990s. This may be indeed due to the gradual increase in funds under management, leading to higher deal sizes, as well as to the large number of new entrants in the VC industry in the 1990s. Nevertheless, for our particular sample VC firms, given that they tend to be bigger and thus more experienced, the level of early-stage investing in the 1997–2002 period is more consistent with the earlier industry development and also follows the overall industry pattern.³

4.2. Measures

4.2.1. Dependent variable

As is commonly done in the VC community, the *VentureXpert* database classified investments into stages, representing an increasing degree of development. We used six

³ A separate analysis for the 1997–1999 sub-period revealed no change in the reported results.

main categories to represent a portfolio company's development stage: (1) seed, (2) start-up, (3) other early stage, (4) expansion, (5) later/acquisition, and (6) other late stage. We measured the extent to which the VC firm managers chose to invest in early-stage ventures as the proportion of first-time investments made by the VC firm in companies at the seed, start-up or other early stage. We focused on the first-time investments (i.e. when a VC firm invests in a particular company for the first time) in order to exclude from consideration the repeated investments by a VC firm in the same company (i.e. follow-on investments).

4.2.2. Independent variables

We operationalized *finance capacity* as the extent to which team members have worked in finance industries – commercial, investment, and merchant banking as well as investment fund management, in both public and private markets. These industries are especially relevant for the VC context since they represent a major career path for entry into the VC industry. Because decisions in such industries are often based on sophisticated modelling of various market processes and their associated risks, there is much reliance on historical information in estimating various prediction parameters. For example, one of the most popular parameters reflects the volatility of a particular asset (its *beta*) and is typically derived by regressing the daily returns of the asset on the overall market's daily returns. This provides validity for our notion of finance capacity as associated with preferences for more precise estimation of risks and returns.

Data on the experiences of the team were collected from the VC firm's website. Our operational definition of team was all people holding the title "general partner" or, in the absence of such a title, the highest ranking title in the firm hierarchy, such as, "partners", "managing directors", "directors", and "principals". The total number of team members on whom data were collected was 731, which represents an average of 6.8 members per team. We coded each team member for whether he or she had worked in the finance industries listed above, and then calculated a score representing the proportion of team members that have worked in these industries. For example, a score of 0.35 indicates that 35% of the team members have worked in finance-related industries.⁴

While the above measure does not fully capture the qualitative differences in finance capacity due to individual team members' different lengths of experience in finance-related industries, there are several considerations related to the particular ways in which we have executed our study that attenuate this concern. First, our conception of finance capacity pertains to how "dominating" the finance experience is for the top management team as a whole. In this regard, when examined at the group level, i.e. across all general partners, the effect of the experience of individual people oscillates less. This is reinforced by the fact that our sample firms tend to be older and larger, and thus have on average more experienced partners. Second, as the descriptive statistics below suggest, finance experience tends not to be mixed with other experience. Therefore, by including more experienced partners, our sample is less susceptible to wide variation in the number of years of finance experience. Our approach

⁴ Data on years of experience were not available and therefore it was not possible to calculate a "dominant" experience for each member. However, we did calculate an alternative, more conservative measure of finance capacity where dominant expertise in finance was attributed only to those team members who had no experience outside finance-related industries or functions. There was no substantive change in the results when this alternate measure for finance capacity was used in the analysis (detailed below).

here is consistent with recent work that uses a team-level representation of the backgrounds of the individual TMT members (Higgins and Gulati, 2006).

In measuring *reputation* as a reflection of past performance, we captured both evidence of past investment activity and media visibility. We captured such activity by the following three items: the total amount of invested capital by the VC firm, the total number of companies in its portfolio, and its age. This is consistent with other measurements of VC reputation (Gulati and Higgins, 2003; Gompers, 1996). We measured media visibility by the number of times the firm had been mentioned in *The Wall Street Journal* over the period of the study (1997–2002).⁵ Thus, our overall measure of reputation was a composite variable consisting of the three items for past investment activity and the item for visibility. The reliability of this measure was within the accepted limits ($\alpha = .72$).

We measured a VC firm's *status* using Bonacich's (1987) power centrality measure, which is consistent with recent research on the network positions of VC firms (Podolny, 2001; Sorenson and Stuart, 2001). Based on this measure, the status of a firm is dependent on the number and status of other firms with which it has participated in financing particular portfolio companies. In order to produce an unbiased measure of status, we examined the pattern of co-investment not among the firms in our sample, but within the group of all active VC firms over the period of the study. We considered a firm an active investor if it conducted at least five deals per year (Podolny, 2001). Therefore, we calculated the status measure using the 563 VC firms that had invested in at least 30 portfolio companies during the 1997–2002 period, to capture all active investors. The measure, $c_i(\alpha, \beta)$ takes the form: $c_i(\alpha, \beta) = \sum_j (\alpha + \beta c_j) \mathbf{R}_{ij}$, where \mathbf{R}_{ij} is an element of a relational matrix \mathbf{R} , representing the number of companies in which firms i and j have invested together over the period of the study. The parameter α is for arbitrary scaling of the measure, while β represents the degree to which the centrality of firm i is a function of the centralities of other firms in the network. Following recommendations for setting β at less than the reciprocal of the largest eigenvalue of \mathbf{R} (Borgatti et al., 2002), we set β equal to three-quarters of the largest eigenvalue (see Podolny, 1993; Sorenson and Stuart, 2001). We calculated Bonacich's power centrality scores for each VC firm and normalized the scores so that the highest score was equal to 1 and the lowest to 0. The higher a firm's score the higher its status.

4.2.3. Control variables

In choosing control variables, we sought to eliminate various alternative explanations based on findings in the economic sociology, upper echelon, and entrepreneurship literatures. First, consistent with Podolny (2001), we controlled for the informational benefits that an organization's social network might bestow. In particular, the more *structural holes* there are in an organization's network the broader the range of market opportunities to which an organization has access (Burt, 1992). We measured structural holes using the method proposed by Burt (1992), which captures the proportion of an organization's network activity that involves ties that are not redundant. The higher a score on this measure the more structural holes in the VC firm's network.

⁵ As the vast majority of mentions were positive, we did not distinguish between positive and negative visibility.

Second, consistent with the literature on top management team demography, we controlled for several team factors including a *team's functional diversity, diversity of prior industry experience, team size, founder tenure, and entrepreneurial experience*. The diversity of an organization's TMT has been identified as having a major influence on important organizational decisions (Bantel and Jackson, 1989; Hambrick and Mason, 1984). In particular, the functional diversity of TMT members has been shown to capture important decision making effects stemming from the team's composition (Hambrick et al., 1996). In measuring TMT diversity we kept to established conventions in the literature while making allowances for the unique context of the VC industry. A large number of professionals entering the VC industry come from the finance industries described above. These industries are unique in that they do not have the traditional functional separations of other industries (e.g. operations, R&D, human resources, sales and marketing, etc.). As a consequence, we used a coarser set of functional areas for categorizing each TMT members' prior functional experience: sales and marketing, accounting and finance, and operations. These categories broadly reflect the distinctions made by Hambrick and Mason (1984) between output, throughput, and peripheral functions. We coded each TMT member on whether he or she had had experience in any of these functional areas, and then calculated the proportion of TMT members that had had experience in each functional category. We then measured functional diversity using Blau's (1977) method, $1 - \sum p_i^2$, where p_i is the proportion of TMT members with experience in a particular functional area. Because our coding allowed for more than one experience per team member, we rescaled the p_i scores used in the formula above so that they would add up to 1.

The VC industry is also unique in that TMT members come from a variety of industries. Therefore, we complemented our measure of functional diversity with a measure of the diversity of prior industry experience among TMT members. We used the same procedure described above for functional diversity, with the following industry categories: finance industries, non-finance industries, consulting, law, and entrepreneurship (having founded a company). In order to account for the possible effects of TMT size on our diversity measures, we also controlled for team size, measured as the number of general partners.

The organizational tenure of TMT members can promote or deter an organization in conducting innovation – longer-tenured teams make strategic choices that adhere to established decision-making routines that impede innovation (Finkelstein and Hambrick, 1990; Hambrick and Mason, 1984). Controlling for the average tenure of TMT members accounts for the degree to which decision-making within the TMT is routinized. Because we lacked detailed information on the tenure of each TMT member, we calculated the proportion of TMT members that were founders of the VC firm. Because organizational founders carry the institutional spirit of the organization's initial strive for legitimacy (Stinchcombe, 1965), they create a lasting imprint on the organization's decision processes (Boeker, 1989). Therefore, the extent to which founders are still present on the TMT captures the relative rigidity of decision-making processes within the TMT.⁶

Last among our control variables on particular characteristics of the TMT was the proportion of team members with prior entrepreneurial experience. Ventures at the earliest

⁶ We also note that the proportion of founder decreases as the number of TMT members increases. To the extent that the number of TMT members increases as a result of the VC firm's growing size, there are more slack resources and tenure variety, which in turn imply higher decision making discretion.

stages of development are often newly founded and led by ambitious entrepreneurs. To the extent that team members have had such experience in the past, they likely have a better understanding of the complexities of start-up and emerging environments, and may be more inclined to invest in these early-stage portfolio companies. In measuring prior entrepreneurial experience, we coded each TMT member for whether he or she had previously founded a company and calculated the proportion of team members that have done so.

Finally, we accounted for the differences in investment opportunities available to the VC firms. On one hand, such differences stem from the VC firm's prior investment activity and developed expertise – early-stage deals may not be equally accessible by all VC firms. In order to control for deal flow availability, we included two variables: the number of first-time deals executed prior to 1997 and the proportion of these deals that were early-stage. On the other hand, VC firms focusing on different industries may also have different exposure to early-stage deals. Therefore, in order to account for between-industry differences in sources and number of opportunities (Klevorick et al., 1995), we controlled for the *industry of the investments*. In particular, we acknowledge that the majority of early-stage investments tend to be in high-technology industries. Therefore, we used two such industry groups based on the industry classifications of *VentureXpert* database – ICT (including communications, computer-related, semiconductors and electronics) and Medical/Biotech (including medical and pharmaceutical, and biotechnology) – and created variables representing the proportion of investments made in each of these industry categories.

5. Results

Table 1 presents the correlations and descriptive statistics for the variables. To test the hypotheses, we used OLS regression analysis. Our diagnostic tests indicated that the data did not violate the assumptions of linearity, normality, homoskedasticity, and independence necessary for an unbiased and efficient OLS estimation.⁷ In addition, we identified 4 multivariate outliers in the dataset using the method developed by Hadi (1992) and a strict significance level ($p < .001$). Our examination revealed that these outliers pertained to some of the largest buyout firms. Given the distinction made between buyout and venture capital investing (e.g., Wright and Robbie, 1998), we excluded these outliers from further analysis.

The results of the regression analysis are reported in Table 2. In the first estimation, we entered the control variables for industry, investment activity prior to 1997, TMT characteristics, and structural holes. This base model explained a statistically significant share of the variance in the proportion of early-stage investments in the VC firms' portfolios ($R^2 = .52$, $p < .001$). Next, we added the main effects for finance capacity, reputation, and status. The variables improved the model fit over the base model ($\Delta R^2 = .04$, $p < .05$). Hypothesis 1 proposed a negative relationship between finance capacity and early-stage investing. The effect of finance capacity was negative and significant ($\beta = -.30$, $p < .01$) – higher finance capacity was associated with fewer investments in early-stage companies (and hence more investments

⁷ Residual plots indicated a linear relationship between independent variables and dependent variables. In addition, an information matrix test (Cameron and Trivedi, 1990) revealed no evidence for heteroskedasticity ($p > .45$) or non-normal skewness ($p > .24$).

Table 1
Descriptive statistics and correlations^a

	Mean	S.D.	1	2	3	4	5	6	7	8	9	10	11	12	13
1. Early-stage investments	.43	.19													
2. ICT industries	.77	.21	.43												
3. Medical/Biotech industries	.09	.10	.01	-.41											
4. Number of first-time deals, pre-1997	74.47	92.99	.11	-.09	.22										
5. Proportion of early-stage investments pre-1997	.40	.27	.53	.12	.18	.33									
6. Functional diversity	.59	.16	.27	.15	-.08	.12	.23								
7. Industry diversity	.55	.18	.30	.27	-.09	.00	.11	.56							
8. Team size	6.65	3.03	.11	.08	-.01	.53	.18	.30	.28						
9. Founder tenure	.18	.22	-.09	-.09	-.04	-.16	-.15	-.06	-.25	-.32					
10. Entrepreneurial experience	.19	.20	.38	.21	.01	-.06	.15	.20	.48	.04	-.05				
11. Structural holes	.03	.02	-.11	-.37	-.15	-.35	-.21	-.05	-.15	-.24	.10	-.08			
12. Finance capacity	.56	.32	-.52	-.25	-.20	-.30	-.40	-.44	-.23	-.19	.25	-.41	-.25		
13. Reputation	-.04	.67	.15	.01	.16	.88	.38	.10	.05	.59	-.24	.00	.35	-.34	
14. Status	.12	.11	.22	.26	.10	.71	.33	.14	.15	.49	-.10	.10	.45	-.30	.80

^a $n=104$, except for the pre-1997 variables ($n=103$). All correlations with absolute values above 0.19 are significant at $p<.05$.

Table 2
Results of regression analysis for proportion of early-stage investments^a

	Base model	Main effects	Full model
Constant	-.262 *	-.078	-.133
ICT industries	.474***	.423***	.534***
Medical/Biotech industries	.146****	.077	.134
Number of first-time deals prior to 1997	.084	.163	.225
Proportion of early stage investments prior to 1997	.426***	.411***	.351***
Functional diversity	.052	-.115	-.104
Industry diversity	.059	.168	.193****
Team size	-.021	.039	-.029
Founder tenure	.033	.107	.111
Entrepreneurial experience	.207 *	.092	.022
Structural holes	.227 *	.230 *	.210 *
Finance capacity		-.301**	-.326**
Reputation		-.134	-.211
Status		-.059	-.065
Finance capacity × Reputation			.326 *
Finance capacity × Status			-.483***
<i>Model</i>			
R^2	.517	.560	.614
Adjusted R^2	.465	.496	.547
F -statistic	9.86 ***	8.72 ***	9.22 ***
ΔR^2		.043	.054
ΔF		2.88 *	6.04 **
n	103	103	103

^a Standardized coefficients are shown in the table.

* $p < .05$.

** $p < .01$.

*** $p < .001$.

**** $p < .10$.

in late-stage companies).⁸ This provides support for Hypothesis 1. The main effects for reputation and status were not significant ($\beta = -.13$, $p > .10$ and $\beta = -.06$, $p > .10$, respectively).

Finally, we estimated the full model by adding the interaction terms for finance capacity and reputation and for finance capacity and status. In order to reduce the collinearity of the interaction terms, we computed them by using the mean-centered values of finance capacity, reputation, and status. We ensured that multicollinearity did not affect the results

⁸ The other side of this relationship suggests that low finance capacity is associated with more early-stage investing. As we indicated earlier, in addition to the entrepreneurial experience included in the model, experience that gives the VC partners extensive marketing or operations knowledge of particular industries may make them more inclined to invest in these industries at earlier stages. We therefore examined the nature and effect of the proportion of VC partners with experience in industries other than finance, consulting or law. Including this variable in the model did not change the pattern or significance of the results presented here. In addition, this variable was an almost direct opposite of finance capacity – VC partners tend to have experience either in finance industries or in such non-finance industries, with few incidences of experience in both areas. This suggests that low finance capacity implies more experience in these alternative industries, thereby explaining the higher degree of early-stage investing.

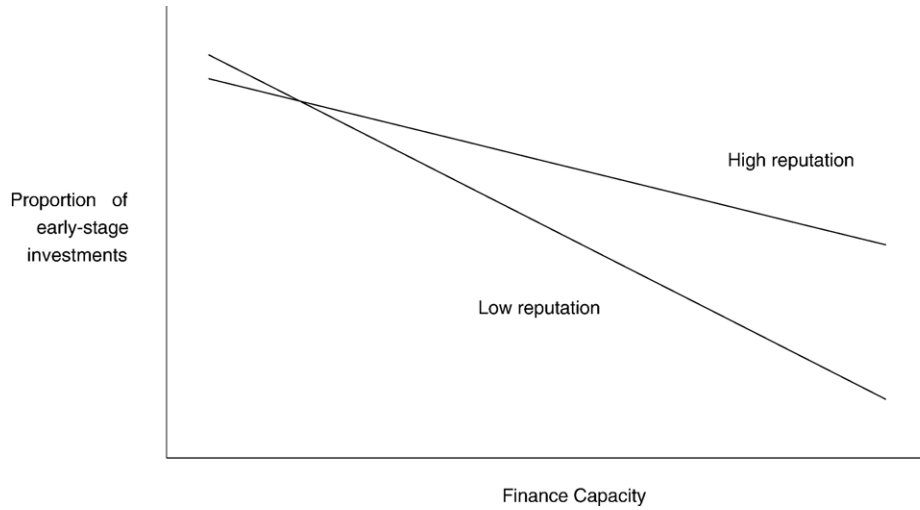


Fig. 2. The moderating effect of reputation on the relationship between finance capacity and early-stage investing.

by calculating variance inflation factors – the highest value was 8.35, which was well within the accepted limits (cf. Hair et al., 1998).

As the full model shows, the interactions explained a significant amount of the variance over and above the main-effects model ($\Delta R^2 = .05$, $p < .01$) and further reinforced the negative effect of finance capacity ($\beta = -.33$, $p < .01$). Specifically, the interactions of finance capacity with both reputation ($\beta = .33$, $p < .05$) and status ($\beta = -.48$, $p < .001$) were significant. In order to examine the nature of these interactions, we followed the

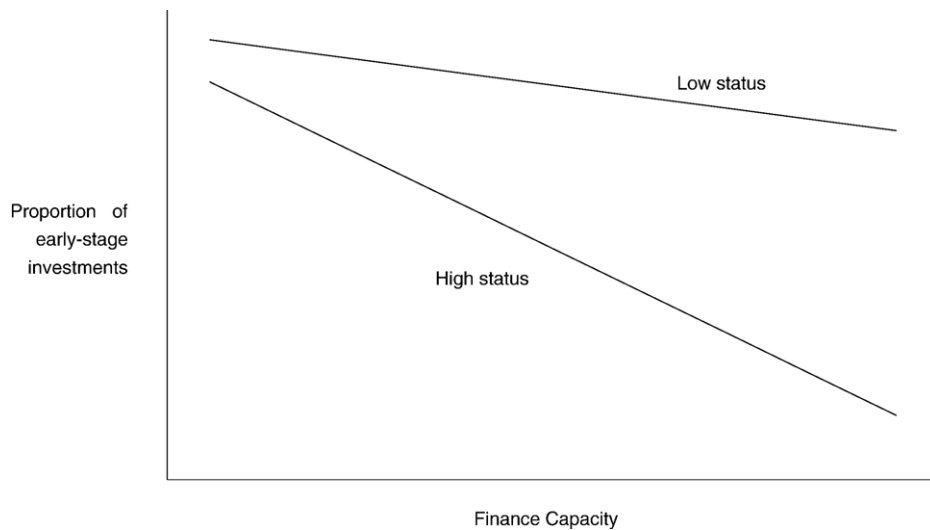


Fig. 3. The moderating effect of status on the relationship between finance capacity and early-stage investing.

recommendation of Cohen and Cohen (1983) and plotted the effects of finance capacity on early-stage investments for reputation and status values of one standard deviation above and below their means. The interaction plots are shown in Figs. 2 and 3. As Fig. 2 shows, with increasing levels of finance capacity there is a decrease in the proportion of early-stage investments but this decrease is greater for low-reputation firms than for high-reputation firms. This suggests that as a VC firm's finance capacity increases, it is more likely to avoid early-stage investments (i.e. allocate its funds to late-stage investments) if it has a low reputation. This alleviating effect of reputation is opposite to that offered in Hypothesis 2.

As illustrated in Fig. 3, with increasing levels of finance capacity there is a decrease in the proportion of early-stage investments and this decrease is greater for high-status firms than for low-status firms. This suggests that for VC firms with high finance capacity, those with high status are even more likely to avoid early-stage investments. This enhancing effect of status provides support for Hypothesis 3.

6. Discussion and conclusion

The results of this paper suggest that investment choices are strongly influenced by the type of expertise possessed by the VC firm's management team. In addition, this expertise-choice relationship is moderated by the VC firm's social standing – its dynamics change as the firm's reputation or status increase. While the current research view of venture capitalists is predominantly as homogeneous decision makers, the theoretical insights of this paper add important team- and firm-specific elements to our understanding of the VC decision making process. These in turn allow us to more rigorously and systematically understand why equally aspiring VC firms make different investment choices. Such differences arise, in part, from differences in how management teams interpret and react to the market information brought by prospective ventures. Interpretation and reaction are thus endogenous to the decision making process – they are largely dependent on decision makers' expertise and the social standing of their firm. We thus demonstrate how the inclusion of psychological and sociological constructs can enrich the study of venture capital decision making, long studied only through the lenses of finance.

More broadly, this work builds on and extends research suggesting that a team's variety must be "requisite" to the complexities and challenges posed by the sub-environments that the organization faces (Vogus and Sutcliffe, 2003). In addition, it adds fuel to arguments that researchers need to move beyond the assumption that the environment is an undifferentiated whole (Vogus and Sutcliffe, 2003). For example, this sample of VC firms faced the "same" environment, but there was variance among these firms in terms of the sub-environments (investment stages) in which they chose to invest. Finance capacity explained a significant portion of this variance. It better equips VC firms to examine and select late-stage deals and thus, to the extent that it is not offset by other experiences, steers them away from early-stage deals. However, our findings also suggest that a main-effects-only relationship is too simplistic; it is also dependent on the VC firm's status and reputation. We thus contribute to the upper echelon perspective (Hambrick and Mason, 1984) by highlighting the moderating role of an organization's external image and social position in top management team decision processes.

As expected, organizational status magnified the negative relationship between the management team's finance capacity and investing in early-stage ventures. We followed Podolny (2001) by investigating the VC industry, but while he focused on the effects of within-

firm changes in status, we focused on between-firm differences in status. Our contributing finding is that while some high-status VC firms avoid early-stage ventures (consistent with Podolny (2001)), others prefer them. The distinguishing factor between the two is the management team's finance capacity. As status offers privileges that are not based on merit (Washington and Zajac, 2005), our results suggest that these privileges are not easily extended in all contexts – firms would not exert such privileges in situations where their expertise clashes with the particular merit basis. To the extent that being involved in areas where one lacks expertise could lead to negative outcomes, such an action may also be seen as a way of avoiding negative association that could ultimately undermine one's status.

Contrary to what we expected, we found that reputation alleviated the relationship between the finance capacity of the VC firm's management team and early-stage investing. Less reputable firms with high finance capacity made fewer early-stage investments than their more reputable counterparts. A possible explanation for this initially surprising finding might involve the notion of slack resources, generally defined as the pool of resources in excess of the minimum needed to produce a given level of organizational output (Nohria and Gulati, 1996). As reputation reflects good prior performance (Fombrun and Shanley, 1990), firms with higher reputation may have higher accumulations of slack resources. These resources may in turn enable them to engage in experimentation (Cyert and March, 1963) and in implementation of new strategies (Hambrick and Snow, 1977). Thus, where slack resources are available top managers have greater discretion to act (Finkelstein and Hambrick, 1990; Levinthal and March, 1981). In the context of VC firms, the slack resources generated by reputation may encourage VC firms to make "experimental" investments, i.e., those that fall outside the scope of their current investment strategy as characterized by their requisite expertise. The above argument is consistent with findings that reputation lowers the entry barriers into innovative domains (Carrow, 1999).

Alternatively, the positive moderating effect of reputation may be explained by the VCs' beliefs that they can influence the success of the portfolio company. Although a VC firm may not have the requisite expertise for early-stage investments, its high reputation may enable it to attract the necessary expertise externally. In addition, reputable VC firms may attract better-quality ventures (Shane and Cable, 2002), which serves as additional alleviation of the lack of requisite expertise.

The differential effects for status and reputation also raise some interesting possibilities about the ways in which these two constructs are related to one another. Although they each represent an aspect of perceived quality, our results suggest that they are tapping into different facets of this underlying construct. The position in a social network (status) seems to put a damper on behavior perhaps because it represents TMT's consideration for consistency between behavior and social position – "we need to protect our position!" On the other hand, reputation appears to do the opposite and may reflect a TMT's proactive adaptation, as represented by the notion of experimentation (Cyert and March, 1963). By including both status and reputation as separate measures, we were able to evaluate the influence of social position and capture reputation effects.

With this study, we open the door to examining the interaction between intra- and inter-organizational cognition (reputation and status ordering). This creates several possibilities for future research into the relationship between an organization's reputation and status and its perception of various dimensions of the environment. While researchers have shown that some

aspects of the environment are commonly perceived within industries, others, such as hostility and controllability, are not (Sutcliffe and Huber, 1998). The findings of this paper suggest that there may be reputation and/or status-based clustering in within-industry perceptions that can be uncovered by future research. This may be particularly relevant to the VC industry where top VC firms are often associated with the emergence of new technologies. Further, while TMT composition is currently used as an exogenous predictor of organizations' perceptions and actions (Hambrick and Mason, 1984), our findings suggest that there may be reputation and/or status-related considerations affecting the composition of top management teams.

As with all studies there are a number of limitations to our study. First, although theory and previous longitudinal research have suggested the causal direction hypothesized here, the cross-sectional nature of our study does not allow us to rule out the possibility of reverse causality. Second, we have not considered the possible effects of a potential venture's reputation. For ventures started by renowned scientists or entrepreneurs there may be different dynamics to the investment selection process than those alluded to in the paper. Third, by taking a single snapshot of the management team, we were not able to consider the effects of changes in the management team composition prior to our study and within the specified investment period. Although the VC industry is not a high-turnover one (especially at the general partner level), there nevertheless remains a possibility that some of the team members were not involved in all the investments over the study period. Finally, we selected a sample that reduced possible confounding factors but in doing so limited the generalizability of our results. For those that do wish to relate the findings to the broader population of VC firms, we point out that the firms in our sample tend to be older and larger than those in the broader population, e.g., this sample includes 50% of the top 100 and 40% of the top 200 VC firms.

There are also a number of practical implications that emerge from our study. From the VC firm's perspective, the results provide insight into how their management team expertise and social standing affect their deal flow and ultimate investment selection. From the perspective of the recipient of venture capital, our results suggest that entrepreneurs looking for early-stage financing for their ventures would be well served by an in-depth examination of the management expertise of their potential VC firms. Given the strong network repercussion of a "no decision" it pays to be exposed to the "right" VC firm early on.

In conclusion, there is a long-standing debate in the organizational and management literatures on the internal versus external determinism of organizational outcomes. Although there is implicit acceptance of the idea that the two are somehow intertwined in the complex picture of organizational reality, researchers predominantly focus on one to the exclusion of the other. We have shown that by combining both sets of considerations our explanatory power greatly increases. More generally, the integration of complementary perspectives is a fruitful avenue for advancing organizational research.

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