Marriage of Unequals? Investment Quality Heterogeneity, Market Heat, and the Formation of Status-Asymmetric Ties in the Venture Capital Industry

Pavel I. Zhelyazkov
The Hong Kong University of Science and Technology
Lee Shau Kee Business Building
Clear Water Bay, Kowloon
Hong Kong
pzhelyazkov@ust.hk

Adam Tatarynowicz
Singapore Management University
50 Stamford Road
Singapore 178899
adam@smu.edu.sg

Marriage of Unequals? Investment Quality Heterogeneity, Market Heat, and the Formation of Status-Asymmetric Ties in the Venture Capital Industry

ABSTRACT

In this study, we investigate the emergence of status-asymmetric ties among venture capital firms. In particular, we highlight the venture's performance trajectory as a powerful antecedent of upward-status asymmetries (in which a lower-status actor brings a higher-status alter into a venture) as well as downward-status asymmetries (in which a higher-status actor brings in a lower-status alter). We hypothesize that lower-status firms tend to bring higher-status alters into ventures on a better performance trajectory, whereas higher-status firms tend to bring lower-status alters into poorly performing ventures. Furthermore, we argue that these effects will be moderated by market heat, which affects whether investors would focus on the upside or downside of deals. We test our hypotheses in a longitudinal analysis of venture capital syndication patterns in the US between 1990 and 2017. We find support for most of our predictions and document that the ability of lower-status lead investors to bring higher-status followers into good ventures is particularly accentuated in hot markets, which can heighten market participants' concerns about missing good deals. We thus highlight the interplay between the internal and the external context in shaping the formation of status-asymmetric relationships.

INTRODUCTION

Researchers have long investigated the importance of status in interorganizational relationships. High-status actors tend to enjoy favorable pricing terms, which gives them an advantage vis-à-vis their competitors (Benjamin & Podolny, 1999; Hsu, 2004; Podolny, 1993; Zhang, Wong, & Ho, 2016). Such firms become highly desirable exchange partners (Gulati & Gargiulo, 1999), both because their high status serves as a signal of quality (Podolny, 1993) and because the mere existence of a high-status affiliation can boost the status of their exchange partners and favorably affect their outcomes (Milanov & Shepherd, 2013; Podolny & Phillips, 1996; Stuart, Hoang, & Hybels, 1999). Because status leaks across relationships (Podolny, 2005), however, it can also constrain the partnering behavior of high-status actors, as they do not want to jeopardize their own status—and all the benefits that come with it—by affiliating with lower-status alters. If few high-status actors are willing to accept lower-status ties, ultimately most ties should be between actors of similar status, a tendency known as status homophily (Ahuja, Polidoro, & Mitchell, 2009; Podolny, 1994; Powell, White, Koput, & Owen-Smith, 2005; Shipilov, Li, & Greve, 2011). However, status asymmetries do occur, which begs the question of what drives them.

The existing explanations for the origins of status asymmetries have focused generally on either the properties of the collaborating parties or the properties of the macro environment. First, some types of actors are disproportionately more likely to form relationships across status divides. For example, low-status actors are more likely to form relationships with high-status partners when they have access to unique resources (Ahuja, 2000) or a track record of significant accomplishments (Hallen, 2008). Furthermore, actors in brokerage positions are more willing to overlook status differences when forming relationships because of their superior access to

information about valuable exchange opportunities (Shipilov et al., 2011). Second, researchers have highlighted the role of the broader environmental context in the formation of status-asymmetric ties. Classic research in the investment banking industry by Podolny (1994) suggested that actors are more attentive to the relative status of their collaborators in less mature markets. More recent work has highlighted how financial market heat can reduce the risk aversion of actors and increase their willingness to engage with both distant (Sorenson & Stuart, 2008) and status heterophilous others (Collet & Philippe, 2014).

While existing research has significantly enriched our understanding of the origins of status asymmetric ties, it has left two significant lacunae. First, in its focus on the nodal properties of the collaborating parties and their macro-environment, existing research on status asymmetries has neglected the internal context of the collaboration project itself. Collaboration projects can take on identities and trajectories of their own that differ from the identities and trajectories of the collaborating parties. For example, a joint venture could be regarded as a collaboration setting between two or more firms, but it also has a distinct legal identity and performance. Likewise, a venture capital (VC) syndicate could be considered a collaboration setting among a group of VC firms, but it also functions as an independent company with its own resources and outcomes. Most existing literature has been silent on how the internal context of the collaboration project and its interaction with the external market environment affect network outcomes, despite recent calls to "[bring] the context back" into the study of interorganizational relationships (Sorenson & Stuart, 2008: 292).

A second lacuna in the literature on status-asymmetric ties is the lack of attention to the directionality of the tie formation process. In many collaborative settings, a clear distinction exists between the lead actors who initiate and control access to the collaboration project and the

followers that the lead brings into the project. For example, in investment banking syndication, deals are typically allocated to a lead manager who is responsible for bringing in follower banks and orchestrating the syndicate (Podolny, 1993). Likewise, in VC syndicates, the lead investor, who has typically invested the largest amount of capital, has a significant influence on who the subsequent co-investors would be (Sorenson & Stuart, 2008). Understanding the directionality of the tie formation process is thus important in and of itself. It involves a clear asymmetry in power—whereas the follower can choose to join the project or not, it is the lead's prerogative to offer such an opportunity in the first place. Furthermore, the lead plays a significant role in shaping the terms of the collaboration. For example, in the VC syndicate setting, the lead investor is typically responsible for negotiating with company founders, leading the board, and interfacing with other external stakeholders (Gorman & Sahlman, 1989; Ma, Rhee, & Yang, 2013).[1]

Directionality also matters because it can help us distinguish between two types of status asymmetries with distinct implications for the governance and ultimate outcomes of the venture: upward-status asymmetries (i.e., those in which a lower-status lead brings in a higher-status follower) and downward-status asymmetries (i.e., those in which a higher-status lead brings in a lower-status follower). In the case of downward-status asymmetries, the existing power structure of the syndicate is reinforced because the follower has less power (as well as less status) than the lead by virtue of its subordinate position in the syndicate. By contrast, upward-status asymmetries can undermine the existing power relations, because a higher-status follower can

---

[1] For the sake of better exposition and analytical tractability, we assume that the lead investor is a single actor. We do recognize, however, that in the VC setting there could be two or more VCs sharing the role of the lead; furthermore, non-lead VCs as well as the entrepreneur could also exert an influence on the investor selection process (Hallen & Eisenhardt, 2012; Zhang, 2018; Zhang & Guler, 2019; Zhang, Gupta, & Hallen, 2017). In our robustness analyses, we examine whether our results hold even if we relax the simplifying assumption of a unitary lead.

challenge the original authority of the lead. The emergence of such competing power centers can lead to dysfunctional power struggles and disagreements that can undermine the subsequent outcomes of the syndicate (Ma et al., 2013). To date, however, we are not aware of any research that has directly examined the antecedents of such directed status asymmetries.

In the present paper, we take steps to rectifying these lacunae by specifying how the internal collaboration context and the external market environment jointly shape the formation of directed status-asymmetric ties. We argue that projects with a strong performance trajectory increase the likelihood of upward-status asymmetries primarily because the low-status lead can use such projects to compensate a high-status partner for accepting the risk of negative status spillovers (Shipilov et al., 2011). Conversely, we articulate why the poorer performance of a project increases the likelihood of downward-status asymmetries, in part because the lead can use the implied social benefits of a high-status affiliation to induce a low-status follower to join a less compelling deal. We further explore how the external market context—in particular, the market's heat—moderates the effects of the internal performance trajectory. Whereas earlier research has argued that market heat reduces firms' inhibition to engage in status-asymmetric exchanges (see esp. Collet & Philippe, 2014), we argue that the market context shapes the locus of attention of market participants and affects how they trade off the project's performance trajectory and the relative status of the project's lead. Ultimately, although a hotter market can facilitate upward-asymmetric relationships involving well-performing projects, it dissuades upward-asymmetric relationships involving poorly performing projects.

We test these arguments in the context of the venture capital (VC) industry, which embodies all of the key elements of our theory. First, it features a well-established status order that is measurable from the network of syndication ties. Second, it features directed ties because

syndicates often bring in new investors between rounds; as such, it is relatively straightforward to determine the identity of the lead and the followers. Third, significant variation exists in the quality and risk profile of new ventures that are not *ex ante* observable. Thus, lower-status VCs can become the lead investors in high-quality ventures, whereas higher-status VCs can lead some poor-quality ventures. Finally, the venture capital industry features significant variations of market heat, both across time and across industries, with well-documented effects on VC firms' behavior (Gompers, Kovner, Lerner, & Scharfstein, 2008; Sorenson & Stuart, 2008; Zhang et al., 2017).

Our study makes several contributions to the literature on network dynamics. In relation to this literature, we propose that the quality variation across venture capital projects can be a significant driver of status asymmetries, beyond the features of the collaborating parties or the broader environment. Simply put, we bring consideration of the venture into the study of venture capital syndication, a perspective largely absent from current research (Sorenson & Stuart, 2008). Relatedly, the present work is a rare study that highlights the distinct antecedents of upward- and downward-asymmetric ties, which prior research has identified as important for the ventures' ultimate outcomes (Ma et al., 2013). Finally, we contribute to the literature on the environmental influences that affect network dynamics (Collet & Philippe, 2014; Sorenson & Stuart, 2008). Although such research has highlighted the greater willingness of actors to engage in riskier collaborations (i.e., distant partners of different status) in hot markets, we show that these tendencies depend on the internal performance trajectory of the collaboration. In general, the present study's findings are consistent with the predictions of prior literature for well-performing companies but depart somewhat from the predictions for poorly performing

companies. We thus highlight the need to consider the internal context of collaboration in conjunction with the external context in predicting the origins of syndication relationships.

We also contribute to the broader conversation on the role of status in markets. Within this stream, we build on existing research on how higher-status actors extract superior terms of trade (Castellucci & Ertug, 2010; Hsu, 2004; Zhang et al., 2016), as well as the research on the importance of performance signals for overcoming status disadvantages (Ahuja, 2000; Claes & Vissa, 2019; Hallen, 2008). We follow these conceptual priors to paint a more nuanced picture of how actors can actively trade two distinct types of resources: the status signals of their network position and the performance signals of their portfolio companies (cf. Clough, Fang, Vissa, & Wu, 2019). Low-status VCs can capitalize on leading high-performing ventures to access elite connections; at the same time, high-status leads can use their status position to compensate for the poorer performance of their ventures by bringing in lower-status followers. However, such exchanges do favor the highest-status actors, who get access to the best opportunities while primarily sharing the least promising ones with their lower-status partners. We believe that these dynamics may represent a new and previously unexplored explanation for the enduring performance advantages of high-status actors in markets (Hochberg, Ljungqvist, & Lu, 2007).

THEORY

Asymmetric relationships in the VC setting

The co-investment of VC firms in the same portfolio company—often referred to as syndication—is one of the most extensively studied forms of interorganizational relationships in both organization theory and finance. Multiple reasons explain such collaborations. At a basic level, VC syndicates help spread the risk and resource commitments, allowing VCs to more effectively diversify away the extremely high idiosyncratic risk of investing in young and

8

unproven companies (Gompers & Lerner, 1999; Hopp, 2010; Zhang et al., 2017). Furthermore, different VCs can offer complementary resources, such as abundant financial capital, human capital such as industry or functional knowledge, and social capital such as connections to prospective partners, suppliers, and clients (Brander, Amit, & Antweiler, 2002; Hochberg, Lindsey, & Westerfield, 2015; Hopp, 2010; Lindsey, 2008). Such complementarities can materially affect the likelihood of a successful exit of the portfolio company, such as an acquisition or an initial public offering (IPO) (Tian, 2012).

Importantly, although syndication can occur from the first investment round (Zhang et al., 2017), many syndicates add new members in each successive funding round (Lerner, 1994; Zhang & Guler, 2019). Such follower VCs can add new perspectives and resources that may be well suited to the venture's evolving needs. Furthermore, there are governance benefits to bringing in outsiders who can independently validate the venture's valuation (cf. Admati & Pfleiderer, 1994; Broughman & Fried, 2012). Beyond the immediate benefit for the focal portfolio company, syndication has long-term benefits for the VC firms. Syndication ties are valuable conduits of information and deal flow (Hochberg et al., 2007; Sorenson & Stuart, 2001; Zhelyazkov & Gulati, 2016), and centrality in the syndication network can elevate a firm's standing in the VC community (Guler & Guillen, 2010; Podolny, 2001; Pollock, Lee, Jin, & Lashley, 2015).

High-status VCs are sought-after syndication partners for multiple reasons. First, status is a signal of quality (Podolny, 1993; Podolny, 2001). High-status VCs are considered more capable of securing tangible resources (e.g., financial capital from investors) and intangible resources (e.g., information about opportunities and potential suppliers, clients, or alliance partners) for the portfolio companies in which they are involved (Lee, Pollock, & Jin, 2011;

Lindsey, 2008; Ozmel, Reuer, & Gulati, 2013). Second, high-status VCs can leverage their status to confer a halo of endorsement to their ventures, thus maximizing their chances of a successful exit (Stuart et al., 1999). Third, building a relationship with high-status VCs can help lower-status VCs secure part of their partner's superior deal flow and serve as a signal of the focal VC's quality to other investors (Milanov & Fernhaber, 2009; Milanov & Shepherd, 2013).

Such high-status VCs, however, can choose from among a wide variety of deals (Sørensen, 2007; Sorenson & Stuart, 2001). Furthermore, they may fear that associating with a low-status partner may tarnish their standing due to status leakage to the lower-status partner (Podolny, 2001; Podolny & Phillips, 1996). If everyone looks for superior-status exchange partners but strenuously avoids lower-status ones, the equilibrium outcome that we can expect based on prior literature is status homophily, whereby firms generally pursue relationships with other firms of similar status.[2] Related settings, such as strategic alliances or investment bank syndicates (Chung, Singh, & Lee, 2000; Gulati & Gargiulo, 1999; Podolny, 1994; Shipilov et al., 2011), have exhibited this general pattern.

We depart from this well-established stream of literature by interrogating the direction of the status asymmetry rather than its overall presence or absence. An important feature of the VC setting—neglected in virtually all prior research on VC syndication—is that one can use VC data to deduce the directionality of VC syndication ties. As such, the VC syndication network can be considered a network of directed ties between lead VCs that initiate the ties and follower VCs that accept the invitation and join an already existing syndicate. Combining this data with information on status asymmetries thus allows for distinguishing between upward status-

---

[2] A separate stream of literature has shown that status similarity can also be an antecedent of competitive conflict (e.g., Piezunka, Lee, Haynes, & Bothner, 2018), highlighting the shared structural origins of cooperation and competition (Ingram & Yue, 2008).

asymmetric ties, in which a lower-status lead brings in a higher-status follower, and downward status-asymmetric ties, in which a higher-status lead brings in a lower-status follower.

To the extent that status-asymmetric relationships happen, our baseline expectation is that downward status asymmetries will be more common than upward status asymmetries, for two reasons. First, given the importance of lead investors in orchestrating the collaboration inside of the syndicate and signaling the value of the venture to the outside world (Gorman & Sahlman, 1989; Lee et al., 2011), it is likely that lead investors will be of higher status than the typical VC firm, including most potential followers. Relatedly, Hallen (2008) suggests that while entrepreneurs generally strive to attract high-status VCs to serve as the early leads and confer the maximum possible signaling value to the syndicate, lower-status followers may be preferred in later rounds due to their greater willingness to accept unfavorable terms of trade and higher valuation (cf. Hsu, 2004). As a result, there is some evidence that followers generally tend to be of lower status than the initial lead investors (Hallen, 2008).

Second, upward status asymmetric relationships have different governance implications than downward ones, as new followers tend to enter syndicates in a subordinated position relative to the lead investor due to their lower status ranking. From this perspective, downward status asymmetries reinforce the existing power structure within the syndicate as the status disadvantage of the follower persists and does not help it to challenge the lead's formal authority. Conversely, upward status asymmetries may undermine the existing power structure within the syndicate, as the higher-status follower may not acquiesce to a subordinated position and may ultimately challenge the formal authority of the lead (Ma et al., 2013). Therefore, we expect that lead VCs will be more likely to initiate downward status-asymmetric ties over the potentially riskier from a governance perspective upward status-asymmetric ties:

Baseline Hypothesis: Upward-status asymmetric ties are less likely to form than downward-status asymmetric ties.

To further investigate the varying frequency of upward- versus downward-status asymmetric ties, we use another important feature of the VC context: information on the quality of the collaboration setting. Much research on both the antecedents and consequences of interorganizational relationships has focused on the characteristics of participating actors, without adequately considering the features of the collaboration setting itself. Such features include the type of product the two companies are co-developing or the type of IPO that two investment banks are co-managing. Indeed, prominent scholars have called for research that "bring[s] the context back" (Sorenson & Stuart, 2008: 292) into the study of how ties form and evolve (see also Ghosh & Rosenkopf, 2015; Vasudeva, Spencer, & Teegen, 2013). In the present study, the portfolio company in which the syndicate is investing has a performance trajectory that is distinct from the identities of the investors. Specifically, although the ability to select successful ventures may be correlated with VC status, low-status VCs may still find themselves involved in portfolio companies that are on a great trajectory, whereas high-status VCs may be involved in companies that are struggling. We propose that the performance trajectory of the focal portfolio company can serve as an equalizing valve that facilitates either an upward- or a downward-status asymmetric relationship. A rising performance trajectory should lead to upward-status asymmetry because the low-status lead VC leverages high deal performance to secure relationships with desirable partners who would otherwise be out of reach. A declining performance trajectory, in contrast, should lead to downward-status asymmetry, because the high-status lead VC—who is potentially unable to secure co-investors of equal status for its struggling investments—may reach down the status ladder for partners.

A third useful feature of the venture capital context is that VC markets are highly volatile across both time and industries. High public market valuations and a string of high-profile IPOs can trigger hot markets in which capital and investments rush into some industries (Bermiss, Hallen, McDonald, & Pahnke, 2017; Gompers et al., 2008; Gulati & Higgins, 2003; Sorenson & Stuart, 2008). At the same time, the industry has experienced many cold periods of investor retrenchment, most famously after the burst of the dotcom bubble in the early 2000s (Townsend, 2015). Research in financial economics has suggested that market heat has important implications for the locus of investors' attention (Cohn, Engelmann, Fehr, & Marechal, 2015). Furthermore, organizational theorists have suggested that industry heat would increase the tolerance of venture capitalists for riskier distant syndication relationships (Sorenson & Stuart, 2008). Jointly investigating the effects of the external context (i.e., market heat) and the internal context (i.e., venture performance trajectory) promises to yield insights that are not easily accessible by solely focusing on one effect or the other.

Venture performance and status-asymmetric relations

We first evaluate the perspective of a VC leading a well-performing portfolio company that considers adding a new member to the syndicate. The greater attractiveness of the investment may constitute a resource that can help attract a higher-status investment partner, just as award-winning intellectual property can help even poorly connected firms secure alliances with high-status counterparties (Ahuja, 2000). Bringing in high-status follower VCs offers significant advantages in terms of better performance outcomes for the portfolio company (Lee et al., 2011; Ozmel et al., 2013; Stuart et al., 1999), while also having social capital payoffs for the lead VC. The lead VC may expect, for example, reciprocity and hope to gain access to the future deal flow of the high-status partner it invites; indeed, scholars have documented this in

other settings such as investment banking (Chung et al., 2000; Li & Rowley, 2002). Furthermore, the lead VC may hope to raise its own status via the affiliation and using it to secure future high-profile relationships with other high-status VCs (Milanov & Fernhaber, 2009; Milanov & Shepherd, 2013).

The strong performance of the portfolio company can also alleviate a low-status lead's governance concerns with respect to inviting a high-status follower. Ordinarily, inviting a high-status follower creates an alternative power center that undermines the original authority of the low-status lead and at worst creates dysfunctional tensions that negatively affect the venture's subsequent outcomes (Ma et al., 2013). Such problems, however, are less likely to occur if the venture is already performing well before including the new follower, for two reasons. First, research on strategic alliances has suggested that the strong performance trajectory of a collaboration project decreases the likelihood of disagreements among the collaborating parties (Faems, Janssens, Madhok, & Van Looy, 2008; Gulati, Wohlgezogen, & Zhelyazkov, 2012). Second, a venture's higher performance is normally associated with greater autonomy for the founders and can shield the management team from any dysfunctional relationships among the investors (Ma et al., 2013). Overall, the potential downsides to initiating an upward status-asymmetric relationship are minimized for the leads of better-performing ventures.

From the perspective of the follower, a high-status VC would only accept an invitation from a lower-status partner if the venture presents a compelling opportunity. First, the opportunity cost—and thus the threshold of acceptance—for high-status players is much higher because their position affords them greater access to high-quality deal flow (Hochberg et al., 2007; Sorenson & Stuart, 2001), often at highly advantageous terms (Hsu, 2004). Second, the threshold of acceptance may be raised even higher due to the potential for status leakage by

affiliating with a low-status partner (Jensen, 2006; Podolny, 2005; Podolny & Phillips, 1996).

Third, higher-status VCs might be inherently suspicious of the quality of start-ups led by lower-status firms; indeed, only compelling signals to the contrary (such as the business achievements that underlie large valuation improvements) could reverse their negative priors. For these reasons, we expect that the better the performance of the new venture, the more likely it is that a high-status follower VC will accept an invitation from a lower-status lead VC.

Based on the preceding arguments, we have established that a higher performance trajectory of the venture 1) alleviates the lead VC's governance concerns when inviting a higher-status follower, and 2) allows a higher-status follower to overlook the lower status of the lead in order to gain access to a compelling opportunity. As such, a higher performance trajectory should weaken the forces preventing upward-status asymmetry and make upward-status asymmetric relationships more likely than they would be for ventures that perform more poorly.

Hypothesis 1: Upward-status asymmetric ties become more likely to form for ventures on a better performance trajectory.

Conversely, consider a VC leading a venture that is on a poor performance trajectory. In such cases, the most rational decision may be to cut the losses and shut down the venture or withdraw from the syndicate. VCs (especially large, high-profile VCs), however, are not immune to the escalation of commitment biases and tend to stick with deteriorating ventures (Guler, 2007). Furthermore, unilateral withdrawals can have negative consequences for relationships with the abandoned co-investors and may have wider reputational effects for the lead VC (Zhelyazkov & Gulati, 2016). Although higher-status partners may have the resources, connections, and signaling capabilities to save the investment, inviting them into a poorly performing syndicate can be risky. First, disagreements among collaborating parties may manifest themselves primarily during periods of poor performance (Arino & de la Torre, 1998;

Chung & Beamish, 2010), and such tensions can be especially damaging for the syndicate's ultimate outcome when the follower's higher status empowers it to stand up to the lead (Ma et al., 2013). Second, bringing in higher-status partners is also riskier because they can inflict more damage to the lead's social capital if the collaboration ultimately fails: high-status actors are well-positioned to disseminate negative information about the lead to other prospective collaborators (Zhelyazkov & Gulati, 2016) and capital providers (Zhelyazkov, 2018). By contrast, inviting a lower-status partner may be a low-risk, low-reward strategy. It may be less effective in saving the company, but it is less likely to rock the boat in the face of performance troubles, and it cannot create severe social capital repercussions if the relationship fails. Overall, the lead is incentivized to look for safer, lower-status affiliations in case of venture underperformance.

Now consider the follower's perspective. High-status alters have no reason to accept invitations to underperforming deals considering their superior options and the potential negative implications of affiliating with low-status partners. By contrast, lower-status VCs are plausible targets, even for suboptimal opportunities. Based on the preceding logic, lower-status VCs may have a poorer deal flow and thus also a lower quality threshold for accepting an unfavorable option. Furthermore, they may be willing to accept a suboptimal investment in exchange for the social benefits of affiliating with high-status counterparties—either in terms of access to a future deal flow or for the endorsement value that the invitation signals to the broader market. This logic is similar to how companies that are peripheral in the alliance network may willingly enter into alliances with more central partners on rather disadvantageous terms (Ahuja et al., 2009), or how Asian VCs that are active in Silicon Valley try to overcome their status disadvantages and invest in mainstream ventures at the expense of accepting higher valuations (Zhang et al., 2016).

In summary, we expect that when the performance trajectory of a new venture is poor, it is less risky for a high-status lead to invite a low-status follower into the syndicate. At the same time, poor venture performance should be less of a deal-breaker for a low-status follower that is approached by a high-status lead. Based on this reasoning, we propose the following hypothesis:

> *Hypothesis 2: Downward-status asymmetric ties become more likely to form for ventures on a worse performance trajectory.*

The moderating role of market heat

We next argue that broader environmental conditions shape the perceptions of the trade-off between the status of the co-investor and the performance trend of the venture. Finance research has highlighted that both public and private markets experience alternating hot periods of investor exuberance, readily available capital, and escalating valuations, as well as cold periods of investor retrenchment, diminished liquidity, and depressed valuations (Baker & Stein, 2004; Baker & Wurgler, 2006; Gompers et al., 2008). Crucially, the market heat shapes how investors process the risk-return characteristics of prospective investments. Behavioral finance scholars have documented a pattern of countercyclical risk aversion, in which investors alternate between highly risk-seeking behavior (such as investing in younger, smaller, higher-volatility stocks) during hot markets, then swinging to high levels of risk aversion during cold markets (Baker & Wurgler, 2006, 2007). Experimental research has further linked this change of behavior to the fear generated by market contractions, which can focus attention on the downside potential of investments rather than on their potential upside (Cohn et al., 2015).

Switching the locus of attention from prospective upside risk (i.e., positive framing of uncertainty) during hot markets to potential downside risk (i.e., negative framing of uncertainty) during cold markets has implications for firms' alliancing strategy, particularly their tolerance for riskier relationships of various types. For example, Sorenson and Stuart (2008: 271) argued

that during hot periods, "optimism…overcomes prudence" and pushes VCs to step outside their comfort zone and engage in more diverse syndicates (in terms of industry and geographic specialization) than they otherwise would. Furthermore, Collet and Philippe (2014) demonstrated that the hot markets of the dot-com bubble resulted in the greater propensity of firms to form status-asymmetric alliances, presumably because their focus on the prospective upside risk motivated them to search more widely for promising, even if riskier, matches outside their status bracket. Conversely, the cold period that followed the bubble's burst refocused firms' attention on the potential downside of status-asymmetric relationships, thus limiting their appeal.

The underlying logic of both studies is that relationships with distant and/or status-heterophilous others are inherently riskier but also offer a greater performance upside. However, neither of these studies directly measured the expected rewards of the collaboration. While some of the rewards emerge from outside the collaboration context—for example, learning from diverse partners can benefit a firm even when the focal collaboration fails (cf. Khanna, Gulati, & Nohria, 1998)—much of the expected benefit of the collaboration is tied to its ultimate performance. We thus build on our earlier discussion to develop a theory of how the shifting locus of attention on upsides (downsides) during hot (cold) periods affects the trade-offs between the venture performance trajectory and syndication partner status in which both the leads and the followers engage.

First, we consider the moderating effects of hotter markets on upward-status asymmetries. Specifically, we argue that as the market gets hotter and generally sees more investment activity, VC's will shift their attention away from the prospective downside of affiliations with partners of lower status and will focus on the prospective upside of joining high-quality deals. Under such conditions, an upward-status symmetric tie will be even more likely if

the new venture performs well because the hot market will make high-status followers less risk-averse and more focused on not missing great opportunities (Collet & Philippe, 2014). Such high-status followers will then be even more inclined to ignore the downside of the lead's lower status as they focus more on the potential upside of the deal. In a cold market, by contrast, high-status followers may shift their focus to the potential downsides of working with a lower-status partner and be more inclined to ignore the deal's economic promise. Similarly, a low-status lead will be more willing to extend invitations to a promising opportunity if the market is hot. In hot markets, the lead's attention is focused on the potential upsides of affiliating with a high-status partner and less on the potential downsides, such as impeded decision-making due to status-ownership mismatch (Ma et al., 2013) or even losing control of a good project (Ahuja et al., 2009). A cold market, however, may shift attention toward the perceived costs of high-status affiliations and the potential hazards of such relationships may loom larger than their benefits. In summary, we propose the following hypothesis:

> *Hypothesis 3: A hotter market increases the tendency of upward-status asymmetric ties to form for ventures on a better performance trajectory.*

The opposite pattern should hold true for downward-status asymmetric ties. While lower-status followers should normally perceive an invitation to a low-performing deal led by a high-status player as an opportunity to increase their own status standing, in a cold market, the salience of business risks associated with a poorly performing project may loom large. The greater focus on the prospective downside risk of a low-quality project during a cold market may thus make lower-status VCs less susceptible to taking on poorly performing ventures. By contrast, in a hot market, the focus on the potential upside of affiliating with a higher-status partner may outweigh the downside of accepting a poor-quality venture. We expect, therefore, that in hotter markets, the tendency of a low-status follower to trade poorer performance for

19

access to a high-status lead will be most pronounced. This leads us to propose the following hypothesis:

> *Hypothesis 4: A hotter market increases the tendency of downward-status asymmetric ties to form for ventures on a worse performance trajectory.*

DATA AND METHODS

Data source

We collected data from the VentureXpert database administered by Thompson Reuters. Since the 1970s, this database has recorded the investments, fundraising, and performance of venture capital firms. As such, it has been the primary source of VC-related data for research in finance (e.g., Hochberg et al., 2007; Hochberg, Ljungqvist, & Lu, 2010; Lindsey, 2008), sociology (e.g., Podolny, 2001; Trapido, 2007), and management (e.g., Guler, 2007; Guler & Guillen, 2010; Sorenson & Stuart, 2008; Zhelyazkov & Gulati, 2016). Because researchers have expressed concern about the accuracy of the database's early coverage (e.g., Podolny, 2001; Sorenson & Stuart, 2001), we downloaded more recent data for the period between January 1985 to June 2017 (inclusive). Because many variables in our analyses were collected over a 5-year rolling window, we used deals from 1990 to 2017 for our main analyses and reserved the 1985–1989 data to create our initial window (i.e., for use in the 1990 observations).

In line with prior research, we cleaned up the dataset in several ways (Sorenson & Stuart, 2001, 2008; Zhelyazkov & Gulati, 2016). First, we focused on investments in US-based portfolio companies with available industry classification and geographic information. Second, we excluded non-VC forms of financing such as mezzanine, leveraged buyouts, and private investments in public equity (commonly known as PIPEs). Third, in selecting potential leads and followers, we focused on US-based, independent VC partnerships investing in US portfolio

companies, which excluded foreign firms and corporate/bank-affiliated funds, as well as individuals and angel investors who may have different roles and objectives than traditional VCs (Andrieu & Groh, 2012; Hallen, Katila, & Rosenberger, 2014; Katila, Rosenberger, & Eisenhardt, 2008). Finally, we removed all VCs that had no investments in the preceding five years, because the vast majority of the network- and investment-related independent variables would be undefined for such firms.

The present study's theory centers on the interactions between the lead VC and the follower VC. Thus, properly identifying the lead VC is of critical importance. To qualify as the lead, a VC firm has to be either the sole investor from the preceding round or have the largest cumulative investments in a portfolio company compared to any other single investor in that company. The identity of the lead investor can, therefore, potentially change from one round to the next, especially if the original lead falls by the wayside or another firm dominates later-stage fundraising. In cases where the lead could not be identified conclusively (i.e., there was a tie between two or more firms), we randomly selected one of the plausible candidates to be the lead VC. Finally, we defined the follower VC as one that had invested for the first time in an already existing syndicate.

Dataset construction and analytical technique

The present study's analytical task is to explain why certain VCs are invited to and ultimately join a syndicate, whereas other VCs which are active at the same time do not join the syndicate. Factual-counterfactual conditional logit models are well suited for answering such questions (e.g., Sorenson & Stuart, 2008; Zhelyazkov, 2018). The approach is to create groups that each involve a single factual observation—a tie that has actually formed—and a set of counterfactual observations of plausible but ultimately unrealized ties. The first step in

assembling our dataset involved creating the factual observations, that is, the follower VCs that the lead had selected, and that accepted the lead's invitation. For cases in which multiple follower VCs were added simultaneously, we viewed those additions as independent events and included them in the dataset as separate observations. Overall, we identified 23,843 lead-follower combinations from among 12,878 discrete investment rounds. Limiting our attention to the investment rounds with a known valuation trend to test the core hypotheses of this paper reduced the number of factuals to 4,886 observations across 2,950 discrete investment rounds.[3]

For each factual observation, we then created the full risk set of counterfactual ones. Following Sorenson and Stuart (2008), we held the preexisting syndicate, which included the lead VC, other preexisting VCs, and the portfolio company's investment round into which they were about to add a new member, fixed; the only feature we replaced was the identity of the follower. Specifically, instead of the actual follower that had joined the round, we selected an alternative follower that had invested in a new venture in the same investment stage, the same industry, and the same US state during the same year as the focal round. This generated a large pool of 370,822 counterfactual observations. We then randomly selected up to 10 counterfactuals for every factual observation.[4] The final sample included 4,886 factuals and 40,491 counterfactuals.

Having assembled the final dataset, we analyzed it using a conditional logit model with standard errors clustered at the factual-counterfactual group level (Sorenson & Stuart, 2008; Zhelyazkov, 2018). The conditional logit model functions much like a logit regression with fixed

---

[3] In 3,596 of these factual observations, we could identify the lead unambiguously; for the remaining 1,290 several plausible leads emerged per round, from which we selected one at random. Our results are robust to excluding all non-definite leads and to including all possible leads.
[4] Due to the restrictive requirements, some factuals had less than 10 associated counterfactuals; in such cases, we retained the whole counterfactual set.

effects at the group level, controlling for all the group-invariant characteristics and using only the within-group variation to predict the probability that a given observation is factual rather than counterfactual. Within each group, both the factual and the associated counterfactual share the same variables related to the investment round of the focal company (such as the company industry, geography, or round valuation), as well as the lead investor and other co-investors (such as their status or prior performance). The effects of such group-invariant variables are absorbed by the conditional logit, and the only difference between the factual and counterfactual observations comes from different identities of the follower VCs associated with them. The models are thus solely identified by monadic or dyadic variables involving the follower VC.[5]

Independent variables

Our core independent variable was the status asymmetry between the lead and the follower VC. As our starting point for measuring status, we applied the Bonacich power centrality measure (Bonacich, 1987). Researchers have used measure extensively to capture social status in a variety of interorganizational networks, including investment banking syndication (e.g., Chung et al., 2000; Podolny, 1993; Podolny, 1994; Shipilov et al., 2011), strategic alliances (e.g., Ahuja et al., 2009; Gulati & Gargiulo, 1999), and venture capital syndication (e.g., Guler & Guillen, 2010; Podolny, 2001; Pollock et al., 2015). This measure draws on the idea that an actor's prominence is a function of his or her own centrality in the network, as well as the prominence of the actor's partners. Bonacich (1987) demonstrated that the logic could be pursued iteratively until converging on a stable centrality score for every actor

---

[5] Monadic variables are attributes of the follower VC at the time of the investment round (e.g., company age, investment performance). Some dyadic variables are defined at the level of the lead VC-follower VC dyad at the time of the investment round (e.g., status asymmetry between the two firms, number of direct and indirect ties, investment similarity). Other dyadic variables are defined at the level of the follower VC-portfolio company dyad (e.g., geographic distance between the two, the follower VC's level of specialization in the portfolio company). Finally, even though the main effects of group invariant variables cannot be directly estimated, their interactions with group-varying variables involving the follower VC can be included in the model.

in the network that reflects both the individual's centrality and the centralities of all the individual's direct and indirect contacts. The Bonacich power centrality is computed using the following formula (Bonacich, 1987; Podolny, 2001):

$$Status_i = \alpha \sum_{k=0}^{\infty} \beta^k \mathbf{R}_{i,j}^{k+1} \mathbf{1}$$

where α is an arbitrary scaling constant (in the present case, selected so that the maximum status for a given year equals one); $\mathbf{R}_{i,j}$ is the adjacency matrix denoting syndication ties between VC firms i and j over the relevant sliding window; $\mathbf{1}$ is a column vector of 1s; and β is a scaling constant that determines how much an actor's status is determined by its partners' status. The β constant can range from zero (at which rate the status converges to pure degree centrality) to the inverse of the maximum eigenvalue (at which rate the measure converges to eigenvector centrality). In the present paper, we followed prior convention in setting β at three-quarters of the inverse of the maximum eigenvalue (e.g., Podolny, 1993, 1994; Pollock et al., 2015). We calculated the status of each VC in each year based on the preceding five years of syndication activity (e.g., VC i's status in 1990 was based on its syndication activity from 1985 to 1989). In robustness tests, we verified that the results are substantively unchanged when using the alternative measure of *eigenvector centrality*, which is often used in finance (e.g., Hochberg et al., 2007).

To measure status asymmetry, we followed existing research (e.g., Shipilov et al., 2011) by taking the difference between the status of the lead and the follower, divided by their sum. In the equation below, i is the lead investor, and j is the follower:

$$Status\ asymmetry_{ij} = \frac{(status_i - status_j)}{(status_i + status_j)}$$

Unlike prior examinations of status asymmetry in the context of undirected ties (Ahuja et al., 2009; Gulati & Gargiulo, 1999), the model in the present study features directionality in the relationship between the lead and the follower VC. Therefore, instead of using the absolute value of the status difference, as done in prior studies, we created a pair of spline variables. The first variable was equal to status asymmetry when the status of the lead was greater than the follower, and equal to zero otherwise (i.e., *downward-status asymmetry*). A positive coefficient on this variable would indicate greater willingness to bring in VCs of lesser status, whereas a negative coefficient would indicate greater aversion to bringing in VCs of lesser status. The second variable was equal to the absolute value of the status asymmetry when the follower was of greater status than the lead and equal to zero otherwise (i.e., *upward-status asymmetry*). This index measured the ability of lower-status leads to bring higher-status VCs into a syndicate.

The second key independent variable was the performance trajectory of the syndicate, which we operationalize based on the trend in the portfolio company's valuation.[6] To the extent that companies make acceptable progress toward the exit, VC firms steadily increase their valuations at each successive round, which reflects their updated expectations and incentivizes the entrepreneurs' effort (Gompers, 1995; Gompers & Lerner, 1999). Importantly, this value is negotiated between the syndicate's new entrants, who are incentivized to minimize the valuation to reduce their price of entry, and the syndicate's insiders, who may favor a higher valuation that renders their preexisting stakes more valuable. Because the valuation change is the outcome of the tug of war between two groups with contradictory incentives, it represents a relatively unbiased indicator of the change in the company's prospects since the previous round (cf. Davila,

---

[6] Importantly, our analyses feature implicit fixed effects at the investment round level; indeed, because the valuation trend is invariant at the investment round level, this variable can never enter the regressions on its own. We use its interactions with the status asymmetry variables, which do vary across different leader–follower dyads in the same investment round.

Foster, & Gupta, 2003). Such momentum is particularly important to the venture capitalist's

calculus because it can help pinpoint those ventures that are break-out performers, which account

for a disproportionate share of the VC industry's returns (Kaplan & Schoar, 2005).[7] To capture a

portfolio company's valuation change between the rounds, we created the measure of valuation

trend as the logged ratio between the pre-money valuation of the company in the focal round

(i.e., before any of the focal round's investments were added to the company value) and its post-

money valuation after the conclusion of the preceding funding round:[8]

$$Valuation\ trend_{i,t} = \log(\frac{Portfolio\ company\ pre-money\ valuation_{i,t}}{Portfolio\ company\ post-money\ valuation_{i,t-1}})$$

A notable challenge is that VentureXpert reports the valuation data quite sparsely.

Furthermore, computing the valuation trend for a given investment round required valuation data

from the preceding round. Such data were available for just around 23% of all the deals in our

sample, leading to a significant truncation of the sample size.[9]

Our final independent variable is market heat. To measure market heat in the VC setting,

we followed earlier research and focused on the level of investment activity in the industry of the

focal portfolio company (Sorenson & Stuart, 2008; Zhang et al., 2017). Specifically, we took the

---

[7] Although the valuation change represents the portfolio company's momentum, one could argue that venture capitalists should also care about the company's overall valuation level. It is a noisier construct of investment attractiveness, because there can be tremendous heterogeneity among ventures. For example, the valuation of a 10-year-old company that has previously received 50 million dollars of financing has different meaning than the valuation of a one-year-old start-up raising its first million dollars of funding. By contrast, the valuation trend reduces the noise as it compares the company with itself in the very recent past. This said, valuation level and valuation trend represent slightly different conceptions of venture attractiveness. In our robustness tests, we examine the implications of these differences.

[8] There are several reasons to log the valuation trend. First, logged values are symmetric (i.e., they are centered around zero and range from $-\infty$ to $+\infty$), whereas unlogged values are asymmetric and always positive. Second, unlogged valuation change exhibits much lower variance on the downside than on the upside. For example, a 10-fold decrease in the value of a company would bring the non-logged valuation from 1 to 0.1, whereas a 10-fold increase would bring it from 1 to 10. Thus, unlogged valuation uptrends exhibit greater variance than unlogged downtrends, while logged trends vary exactly the same regardless of the direction of the change [$\ln(.1) = -\ln(10)$].

[9] In the present study's model, the main effect of any nonrandom selection of the investment rounds is not a concern; our fixed effects account for all unobservable variance at the investment round level, including the probability that it has any missing information. The one concern that remains is whether the selection has any interactive effect with our status asymmetry splines, a possibility we explore in the Appendix.

number of distinct companies within the focal company's industry funded in the given year and divided it by the average number of companies funded within the preceding three years. As in the case of the valuation trend, we logged the ratio to reduce skewness and ensure the symmetry of the measure. Below is the formula for industry i in year t.

$$Market\ heat_{it} = \ln(\frac{Companies\ funded_{it} * 3}{\sum_{k=t-3}^{t-1} Companies\ funded_{ik}})$$

Control variables

As aforementioned, the conditional logit holds constant all group-invariant characteristics. This means that the model fully accounts for any variable defined at the level of the lead investor, the other investors in the syndicate, the investment round, the portfolio company, or the time of the investment. We still needed to control for other sources of variance related to the follower VC, however. These factors include monadic characteristics that may affect its attractiveness as an exchange partner, its fit with the portfolio company, and its proximity to and relationships with the lead VC.

The first set of controls related to the attractiveness of the follower VC. Two critical concerns among syndication partners are the VC's experience and the quality implied by its record of accomplishment. To capture experience, we measured the number of portfolio companies in which the VC invested in the previous five years, logged to reduce overdispersion. To capture signals of quality, however, we need to consider the ultimate outcome of those investments. The most desirable outcome by far is an IPO, which is almost invariably considered a home-run for the participating VCs (e.g., Gompers, 1996). We controlled, therefore, for the proportion of investments over the previous five years that resulted in an IPO. We also controlled for the logged age of the follower VC, because some scholars have proposed that older VCs, having stood the test of time, may command greater legitimacy. Finally, we controlled for the

27

logged number of funds that the VC firm raised in the preceding five years as a proxy of its

attractiveness to investors (cf. Lee et al., 2011).[10]

The second set of controls we used related to the fit between the portfolio company and

the follower VC. A major concern with our research is that there could be an assortative

matching process between high-status VCs versus well-performing companies. We, therefore,

constructed an assortative matching index in an equivalent fashion to our status asymmetry

index. We first standardized the logged valuation trend of the portfolio company so that the

minimum for any particular year was zero, and the maximum was one (recall that our Bonacich

centrality measure had already been standardized in a similar fashion). We then constructed the

assortative matching measure between firm i and company j as follows:

$$Assortative\ matching_{ij} = \frac{(status_i - standardized\ perf\ trend_j)}{(status_i + standardized\ perf\ trend_j)}$$

To maintain consistency with our status asymmetry measure, we also split this variable

into two splines, corresponding to situations in which the status of the follower exceeded the

standardized performance trend and *vice versa*.

Furthermore, prior research has documented that VC firms are often averse to investing

in portfolio companies that diverge significantly from their industry or geographic

specializations (e.g., Sorenson & Stuart, 2001). To account for the follower VC's industry

---

[10] We considered other monadic variables associated with the follower VC, but ultimately did not include them due to multicollinearity concerns. For example, we did not include Lee, Pollock, and Jin's (2011) VC reputation index that several prior studies (e.g., Hallen & Pahnke, 2016; Pollock et al., 2015; Zhelyazkov, 2018) had favored. Our control variables fully captured three of the six components of the index (total number of companies invested, total number of IPOs, age of the VC firm) and were highly correlated with the remaining three (amounts invested in portfolio companies, number and size of the funds raised). Also, note that we could not include the status of the follower VC, because this variable was used to calculate the status asymmetry splines. Collectively, these splines represent the absolute value of the difference between the lead and the follower VC. Given that the status of the lead is fixed within each group, however, introducing the follower status and the status asymmetry variables together would result in collinearity. For the same reason, we were not able to use the sum of the lead and the follower statuses as some earlier studies of alliance formation had done (e.g., Gulati & Gargiulo, 1999), or any other network measures that were correlated with the Bonacich centrality measure (e.g., overall degree centrality of the follower).

preferences, we controlled for its specialization in the industry of the portfolio company. We defined this as the proportion of the portfolio companies in which the VC had invested in the prior five years that were in the same VentureXpert industry grouping as the focal portfolio company.[11] To account for the follower VC's geographic preferences, we used two variables. First, we used the VC's specialization in the US state in which the portfolio company was located. We defined this as the proportion of the portfolio companies in which the VC had invested in the previous five years that were in the same state as the focal portfolio company. Furthermore, we controlled for the logged distance between the address ZIP codes of the VC firm and the portfolio company, calculated based on the formula described by Sorenson and Stuart (2001: 1564).

Third, we incorporated proximity measures between the follower VC and the lead investor in the syndicate, given the general preference of VCs to select proximate coinvestors (Sorenson & Stuart, 2008; Trapido, 2007). First, we calculated the ZIP code distance between the address registrations of the lead and the follower investors, using the same method when calculating the distance between the follower VC and the portfolio company. Second, we calculated the industry specialization overlap between the follower and the lead investor, which we defined as follows:

$$Industry\ Overlap_{i,j} = \sum_{k=1}^{9} \min(p_{ik}, p_{jk})$$

In the equation above, p_{ik} represents the specialization of firm i in industry k (as previously defined), and p_{jk} represents the specialization of firm j in industry k. This overlap

---

[11] We use nine defined industry groupings: Biotechnology, Communication and Media, Computer Hardware, Computer Software and Services, Consumer Related, Industrial/Energy, Internet Specific, Medical/Health, Semiconductors/Other Electronics. VentureXpert assigns each company into a single one of these categories. In constructing the dataset, we dropped the small number of companies that were classified in the residual "Others" category.

measure varies from zero (virtually no overlap between the industries in which the two VC firms had invested previously) to one (complete overlap). Similarly, we calculated the state overlap between the lead and the follower VC, measuring the overlap in VC firms' investment specializations in all 50 US states and two territories (Washington, D.C. and Puerto Rico), instead of the nine industry categories.[12]

In addition to proximity in the industry and geographic spaces between the lead and the VC firm, we also accounted for prior relationships between both firms. Indeed, existing direct and indirect relationships could serve as channels of information exchange and trust-building between the partners (e.g., Gulati, 1995a; Gulati, 1995b; Gulati & Gargiulo, 1999; Robinson & Stuart, 2007). We, therefore, controlled for the number of prior relationships between the lead and the follower VCs, defined as the number of distinct syndicates in which they had both participated during the preceding five years. In addition to direct relationships, we also calculated the total number of indirect ties between the lead and the follower VC, defined as the number of VC firms to which both firms had syndication ties in the preceding five years. We logged all counts of direct and indirect ties to reduce their skewness.

RESULTS

Table 1 summarizes the means and standard deviations for the core dataset, split between the factual and counterfactual observations for ease of comparison. Overall, the lead investors tend to have higher status than do the followers across both the factual and the counterfactual samples. This was expected given that entrepreneurs typically prefer a well-established VC as

---

[12] We also confirmed the robustness of our results to an alternative measure used in previous research (Sorenson & Stuart, 2008; Zhelyazkov, 2018; Zhelyazkov & Gulati, 2016), which is based on the summed Euclidean distances of the industry and state specialization vectors. In the case of industry specialization, this measure was defined as:

$$Industry\ Specialization\ Distance_{i,j} = \sum_{k=1}^{9}(p_{ik} - p_{jk})^2$$

their anchor investor (Hallen, 2008). Furthermore, downward-status asymmetric ties may be less

threatening to the lead investor because they do not involve disruptions in the power

relationships within the syndicate (Ma et al., 2013). Interestingly, smaller VCs (defined as the

number of investments or the number of funds) tend to be relatively overrepresented among the

factual relationships. The factual followers tend to be closer to the portfolio company and the

lead investor and have a higher number of direct ties to the lead investor. We also report the

bivariate correlations in Table 2, which are consistent with these impressions.[13]

-Insert Table 1 around here-

-Insert Table 2 around here-

Table 3 reports our main analyses. Model 1 through Model 5 are based on the conditional

logit model with group fixed effects, with robust standard errors clustered at the group level, as

discussed in the *Methods* section. Model 1 focuses on the control variables. We find several

interesting implications. The assortative matching coefficients suggest that the likelihood of a

match is maximized when the standardized performance of the portfolio company exceeds the

status of the follower VC. Consistent with prior research, VCs are also more likely to have

higher overlap in state specialization with the lead investor (Sorenson & Stuart, 2008; Trapido,

2007) and have a greater number of both direct and indirect ties with the lead investor (Chung et

al., 2000; Gulati, 1995b). Interestingly, a high level of specialization in the industry and state of

the focal company has a negative coefficient in our models. One reason for this may be the

restrictive sampling of counterfactuals; recall that we required the follower VCs to have invested

---

[13] Given that some pairs of variables—such as the overall investment count for the follower and upward-status asymmetry—were highly correlated, we ran variance inflation factor (VIF) diagnostics across all the regressions. We confirmed that they were within acceptable ranges: the maximum VIF was around 5 and the mean VIF was around 2.3, well below the conventionally accepted limit of 10 (Hair, Anderson, Tatham, & Black, 1995; Kennedy, 1992; Kutner, Nachtsheim, & Neter, 2004).

in the same state and the same industry as the focal company. In other words, the effect of the specialization variables is already implicit in our sampling. In unreported analyses, we relaxed this restriction and obtained strong positive effects for these coefficients.

-Insert Table 3 around here-

Model 2 adds the main effects of the status asymmetry splines. Consistent with the descriptive statistics, upward-status asymmetry does not increase the likelihood of matching. Downward-status asymmetry, however, significantly increases the likelihood of matching. In other words, lower-status VCs have no particular preference or aversion toward higher-status VCs as followers than expected by chance. Higher-status lead VCs, however, have a stronger likelihood of ultimately bringing in lower-status followers. The difference in the coefficients of the two status asymmetry splines is highly significant (p<.001). This result provides support for our baseline hypothesis and is consistent with earlier research (e.g., Hallen, 2008).

Model 3 through Model 5 test Hypotheses 1 and 2. Model 3 adds the interaction between upward-status asymmetry and the valuation trend. This effect is strongly positive ($p < .001$), which suggests that, consistent with Hypothesis 1, lower-status VCs are more likely to bring in higher-status followers when the venture is performing well. Model 4 examines the interaction between downward-status asymmetry and the valuation trend. This effect is strongly negative ($p < 0.001$), suggesting that higher-status VCs become increasingly unlikely to bring in lower-status followers to portfolio companies that are on a stronger performance trajectory. Conversely, their likelihood of bringing in lower-status partners increases as the portfolio company struggles with poor performance, thus providing support for Hypothesis 2. Model 5 demonstrates that both interactions hold when included in the same regression.

To explore Hypotheses 3 and 4, Models 6 and 7 present a split-sample analysis in which we separate the syndicates that occur in hot markets (i.e., when market heat is above average for the sample) from those that occur in cold markets. Consistent with Hypothesis 3, the coefficient for the interaction between performance trend and upward-status asymmetry is more than three times as large in the hot market subsample as in the cold market sample. In other words, upward-status-asymmetric relationships involving good (bad) portfolio companies become more (less) likely in hotter markets than in colder markets. Contrary to Hypothesis 4, the negative interaction between downward-status asymmetry and performance trend is similar in magnitude in the cold market and hot market subsamples. Overall, even though we cannot directly compare the coefficients from different nonlinear models, the pattern of the results suggests greater sensitivity of upward-status asymmetry to performance during hot markets than during cold markets.

Building on the split-sample analyses, Model 8 formally tests Hypotheses 3 and 4 by presenting a three-way interaction among the status asymmetry, performance trend, and market heat variables.[14] The two-way interactions involving market heat and status asymmetry are both insignificant, suggesting that in our setting—contrary to the findings of Collet and Philippe (2014)—the incidence of status-asymmetric ties in either direction does not vary across hot and cold markets. Consistent with the split sample analyses, a statistically significant three-way interaction exists among upward-status asymmetry, valuation trend, and market heat, which lends support to Hypothesis 3. There are no meaningful interactions involving market heat and downward-status asymmetry; as such, we find no support for Hypothesis 4.

Although the conditional logit model provides consistent support for our hypotheses, the results are difficult to interpret directly. As extant research has noted, the coefficients in such

---

[14] The equations do not include a two-way interaction between performance trend and market heat because both are invariant within groups; as such, the conditional logit fully absorbs them.

nonlinear models do not translate neatly into changes in probabilities; indeed, interpreting the meaning of interactions is particularly challenging in such situations (Hoetker, 2007). To help interpret our results, we replicated Model 1 through Model 8 using fixed-effects linear probability models with the same fixed effects and clustered standard errors as used in the main conditional logit models (see Table 4). The pattern of the coefficients is generally consistent across both the conditional logit and the linear probability model, suggesting that the results are not sensitive to the chosen functional form.

-Insert Table 4 around here-

Based on the results of the fixed-effects linear probability models, Figures 1a and 1b depict the predicted probabilities of matching based on the observable ranges for upward- and downward-status asymmetry. Here, the performance trend is fixed at plus or minus one standard deviation above zero. At zero status asymmetry, the likelihood of tie formation is approximately 7%. At one standard deviation from zero (approximately .24 on the graph) of upward-status asymmetry, the predicted probability for tie formation is approximately 6% for an average portfolio company. The likelihood of such a status-asymmetric relationship, however, falls to 4.5% for a poorly performing company (valuation trend of one standard deviation below mean) and climbs to 7.4% for a well-performing company (valuation trend of one standard deviation above mean). In other words, even if VC firms generally have difficulty bringing higher-status VCs into their syndicates, this effect disappears and reverses as the venture's valuation trend increases more than one standard deviation above the mean.

By contrast, the likelihood of tie formation increases significantly for downward-status asymmetric ties. At one standard deviation from zero (at approximately 0.33), the likelihood becomes 12% if the valuation trend is held at its sample mean. The likelihood can range from

11% to 13%, however, for valuation trends that are one standard deviation above or below the mean.

-Insert Figures 1a and 1b around here-

To illustrate the effects of the three-way interaction among status asymmetry, performance trend, and market heat, Figure 2 presents the predicted likelihood of tie formation for an upward-status asymmetric relationship (i.e., upward-status asymmetry set at one standard deviation above zero). In extremely cold markets (–.5 corresponds to the 5th percentile of the market heat distribution), such a status-asymmetric relationship is relatively unlikely irrespective of whether the portfolio company is performing well or poorly (the predicted likelihood of tie formation in both cases is approximately 5.3 percent). In hotter markets, however, the likelihood of an upward-status asymmetric relationship diverges significantly, depending on how well the portfolio company is performing. In very hot markets (in the 95th percentile of the market heat distribution), the likelihood of an upward-status asymmetric tie becomes approximately 9.9% (i.e., greater than the baseline 7% for equal status) when the company's performance trend is one standard deviation above the mean, while it becomes just 3.6% when the performance trend is one standard deviation below the mean. In other words, venture performance matters more for establishing upward-status asymmetric relationships in hotter markets, as we predicted in Hypothesis 3.

-Insert Figure 2 around here-

Robustness tests and supplemental analyses

We conducted several tests to ascertain the robustness of the present study's results. We explored a variety of approaches to the sampling of counterfactuals. Although we sampled 10

counterfactuals for every factual observation for our main analyses, our results are robust to the selection of 5 or 15 counterfactuals, as well as using the entire counterfactual set. An even more restrictive sampling approach we took was conditioning on prior ties. In our dataset, approximately 60% of the realized dyads had no prior connections, 20% had exactly one connection, and the remaining 20% had more than one connection. We matched the counterfactual observations to the factual observations based on this classification. For example, if the lead and the factual follower had more than one prior tie, we only preserved counterfactual followers that also had more than one tie with the lead. Even with this more restrictive sampling, the results are consistent.

Another set of robustness tests examined the role of non-lead investors in the syndicate and the definition of the lead investor. First, we reran our models with additional controls for the average number of direct ties, indirect ties, geographic distance, and state and industry overlap between the follower and all the other investors in the syndicate.[15] As expected, state overlap and the direct and indirect ties between the follower and the non-lead investors had a strongly positive effect across all model specifications. This result is consistent with recent findings that all syndicate members have a role to play in the recruitment of new members (Zhang & Guler, 2019; see also Zhang et al., 2017). However, the introduction of these additional controls did not materially affect the significance and magnitude of our hypothesized effects. In other words, even though the non-lead investors may be involved in bringing in new members into the syndicate, this process does not interfere with the status-based dynamics between the follower and the lead VC.

---

[15] For these analyses, we limited our sample only to those groups that included at least one non-lead investor (30,433 observations across 3,255 factual-counterfactual groups). For the remaining groups, the new controls would be undefined.

Second, we considered the sensitivity of our results to other definitions of the lead. The reported results used all leads that could be unequivocally identified in the data. In those cases where multiple VCs tied as prospective leads for the same round, we would randomly assign the lead investor. In a more constrained sample, we used only the unequivocally identified leads, which resulted in 33,504 observations across 3,596 factual cases. We also created an expanded sample that included every plausible candidate for the lead, even if there were multiple candidates per round. This resulted in 62,244 observations across 6,704 factual cases. All our substantive results held across both alternative samples. This suggests that our estimates are not materially sensitive to the definition of the lead and that they are also robust to allowing for the involvement of multiple existing investors in the recruitment of new followers into the syndicate.

In further analyses, we considered not only the overall performance of the follower and the lead but also their trends in performance. To do that, we constructed additional variables for every VC in the sample capturing the logged trends in IPOs, acquisitions, and overall exits two years prior to the focal round relative to the third and fourth year prior to the focal round. Adding the main effects of these trends as well as their two-way and three-way interactions with the key independent variables did not materially affect the magnitude or significance of our coefficients. These analyses also bear some potential implications. The most interesting one is that the higher-status VCs more likely to accept lower-status lead invitations to high-performing ventures have experienced diminished IPOs and overall exits over the preceding years. As a result of such performance decline, higher-status VCs may become more willing to endure the association with a lower-status lead for the opportunity to participate in a promising deal. Such willingness to turn toward downward status-asymmetric relationships in response to performance declines has similarly been documented in the investment banking setting (Shipilov et al., 2011).

We also tested different specifications of the independent variables. All our results were robust to alternative measures of status asymmetry, such as the differences between either raw or z-standardized (by year) status values. In addition, we considered two alternative measurements of venture performance measured as valuation level, rather than valuation trend (as we did in our main analyses). The first measure is the logged post-money valuation following the round. It is a relatively naïve measure to compare different ventures because it does not take into account factors such as stage and prior tangible and intangible investments into the company. We also constructed, however, a more refined excess valuation measure after accounting for common factors that can explain valuation.[16] Using either of these measures in place of the valuation trend yields strong support for both Hypotheses 1 and 2; however, it yields no statistically significant results regarding Hypothesis 3. One way to interpret this finding is that during hot periods, VC firms are particularly fearful of missing out on high growth opportunities (i.e., those with a high valuation trend) rather than on high-value opportunities (i.e., those with high valuation level). This interpretation is consistent with empirical evidence from the public markets, which has found that investors are especially likely to bid up extreme growth opportunities (rather than value investments) during hot market periods (Baker & Wurgler, 2006).

We also explored robustness to alternative measures of market heat. Within the main analysis, we measured market heat based on the number of ventures funded in the focal year divided by the average over the preceding three years. The results are also robust to using two- and four-year averages in the denominator. An alternative way to conceptualize market heat is by

---

[16] To construct the excess valuation measure, we constructed a dataset of all rounds with available valuation data. We then ran a linear regression of logged post-money valuation as a function of the logged prior investments (the coefficient was allowed to vary by investment stage), as well as investment stage fixed effects, industry fixed effects, year fixed effects and metropolitan statistical area (MSA) fixed effects. The R-square of the regression was approximately 74%, suggesting a relatively good fit. The positive (negative) residual from this regression is a measure of how much better (worse) the post-money valuation of the focal round is, given what would be expected for companies in the same industry, geography, investment stage, and prior investments.

the number of IPOs in a given industry, given that IPOs are high-profile events that can generate enthusiasm among venture investors (Bermiss et al., 2017). Hypothesis 3 is supported if we operationalize market heat as the number of IPOs in the industry relative to the average number of IPOs over the preceding two, three, or four years.

Our models were also robust to removing the assortative matching variable or specifying it in several different ways. Specifically, rather than basing the variable on the status of the follower VC, we based it on the reputation (Lee et al., 2011; Pollock et al., 2015) or the overall IPO rate of the follower VC, with little meaningful change. We also verified that the results were robust to specifying it as a raw difference of the z-scores for the status of the follower and the performance trend of the company.

In our analysis, we have included relevant controls and accounted for as much unobservable heterogeneity as possible through our use of the conditional logit model, which effectively controls for all variation at the levels of the lead, company, round, and time period. We can still be susceptible, however, to endogeneity or omitted variables involving the follower. One potential source of omitted variable bias could come from the financial resources of the follower. For example, it is possible that we are observing an association between upward-status asymmetry and greater valuation trend, precisely because only higher-status VCs can afford rich valuations. To rule out this mechanism, we not only controlled for the main effects of the (logged) amount of capital the follower raised in the preceding five years, but we also controlled for its interaction with the valuation trend. The coefficients for the interactions between the status asymmetry variables and the valuation trend are unaffected by these controls, suggesting that the financial resources of the follower are not an alternative explanation for Hypotheses 1 or 2. Furthermore, including a three-way interaction involving the amount of capital the follower

39

raised, the valuation trend of the company, and market heat fails to negate the three-way

interaction underlying Hypothesis 3.

Another potential source of endogeneity involves potential reverse causality from the

status of the follower to the valuation of the round. Because round valuations are determined

based on negotiations between the follower and the existing syndicate, our estimated effects

would be biased if the status of the follower affects the round's valuation. Although we cannot

exclude this possibility, existing theory suggests that the bias should operate in the opposite

direction of our predictions. The newcomer to the syndicate is incentivized to negotiate for a

lower valuation, and evidence suggests that higher-status investors are able to extract lower

valuations in such negotiations (Hsu, 2004). The fact that we find the opposite association

between valuation and status suggests that our findings are conservative relative to the true

effect.

Finally, we explored the implications of the nonrandom nondisclosure of valuation data.

Due to this nondisclosure, we lost approximately 77% of our observations when we included the

valuation trend data (i.e., we were only able to use 2,950 of the 12,878 investment rounds that

added new entrants). Other researchers experienced similar attrition (Hochberg et al., 2007;

Shafi, Mohammadi, & Johan, 2019). Our research design is robust to the main effects of any

round-level unobservables that may affect nondisclosure, as it involves implicit fixed effects for

all round-level variations. It may still be vulnerable, however, if some of the unobservables that

affect nondisclosure also interact with some of our independent variables. For example, if they

affect the tendency for upward- and downward-status asymmetry and are correlated with the

performance trend, our estimates for H1 and H2 could be misspecified. Our Online Appendix

details our efforts to control for such selection effects by using a modification of the Heckman

selection models (Heckman, 1979) used by prior researchers (Hochberg et al., 2007; Hwang, Quingley, & Woodward, 2005). Overall, all our findings are robust to those additional tests.

DISCUSSION

The present paper's objective was to investigate the directionality of status-asymmetric relationships among venture capital firms. Our analysis of US venture capital syndication networks showed that upward-asymmetric relationships become more likely, and downward-asymmetric relationships become less likely, as the performance trajectory of the syndication target improves. In other words, venture performance and the syndication partner's status can serve as mutually compensating factors. Being a lead investor of a high-performance portfolio company allows venture capitalists to reach up the status ladder and offer an irresistible deal to higher-status firms that they would not normally try to attract. By contrast, the lead VC of a poorly performing venture may face challenges when seeking syndication partners at equal or higher status levels; however, it may still reach down the status ladder and secure the participation of a lower-status partner, who would be willing to accept an inferior deal for the opportunity to engage in a high-status affiliation.

Furthermore, we built on the idea that investors' locus of attention may shift throughout the business cycle to argue that hot market periods strengthen both the positive association between the venture's valuation trend and upward-status asymmetry and the negative association between the valuation trend and downward-status asymmetry. Interestingly, we found evidence only for the former hypothesis: that the performance trend of the portfolio company primarily matters for attracting higher-status co-investors during hot periods, when such co-investors focus more on upside performance and are willing to accept the potential for status leakage by affiliating with a lower-status lead. We did not find a corresponding effect for the opposite

41

hypothesis that the relationship between downward-status asymmetry and venture performance would also be magnified by market heat: instead, the tendency to bring lower-status collaborators to poorer projects was consistent throughout the business cycle. One potential explanation is that downward-status asymmetry is a more common scenario. Higher-status leads may thus be more comfortable bringing in lower-status VCs that would not challenge their position in the syndicate and create ownership–status mismatch, which prior research has shown to be detrimental to venture functioning (Ma et al., 2013). Therefore, although downward-status asymmetric relationships are a default option throughout the business cycle, an upward-status asymmetric tie requires both favorable market conditions and an excellent portfolio company.

Altogether, we see several contributions of our project to the literatures on network dynamics and status.

Contributions to the literature on network dynamics

The present paper is one of the very few studies on network dynamics that explicitly address the distinct origins of upward- versus downward-status asymmetric ties. Traditional research in the area of network dynamics, which initially focused on strategic alliances of various types (Ahuja, 2000; Gulati & Gargiulo, 1999; Stuart, 1998), has almost universally treated alliances as undirected ties. In large part, this implicit assumption has carried over to the studies of VC syndication networks (Sorenson & Stuart, 2001; Trapido, 2007; Zhelyazkov & Gulati, 2016), even though VC syndication features directed ties in which the lead VC brings follower VCs into the syndicate. Similarly, studies of investment bank syndicates—in which the networks are also directed given that the syndicate is typically formed by a single lead manager—have generally neglected the directionality of ties, even though some of those studies have explicitly considered the origins of status-asymmetric exchanges (e.g., Chung et al., 2000;

Podolny, 1994; Shipilov et al., 2011). For us, directionality matters because it implies that one type of power-asymmetric relationship can cast a long shadow in the future operation of a syndicate (i.e., ownership-based power in the terminology of Ma et al., 2013) and because it opens a wide variety of questions that cannot be answered in an undirected network setting. Future research could examine a number of such questions, including the presence and antecedents of reciprocity in the VC industry (cf. Li & Rowley, 2002) and the patterns of role specialization within it (e.g., how firms may develop distinct resources for scouting promising opportunities versus supporting existing projects) (Hochberg et al., 2015). Another question could include the distinct performance implications of interorganizational outbound ties versus inbound ties, which have been shown to have different effects in interpersonal networks (e.g., Gargiulo, Ertug, & Galunic, 2009).

We further speak to the network dynamics literature with regards to how environmental conditions may shape interorganizational tie formation. Extant research on the effects of market heat on tie formation has concluded, in general, that although market heat reduces risk aversion, it facilitates the creation of more distant status-asymmetric ties (Collet & Philippe, 2014; Sorenson & Stuart, 2008). We depart from this conclusion by highlighting the important role that a project's internal performance trajectory plays in the calculus of prospective collaborators. We find that upward-status asymmetric relationships are indeed more likely in hot periods for high-quality ventures; however, they become less likely during hot periods for poor-quality ventures. By contrast, during cold periods, upward-status asymmetric ties are equally unlikely both for poor- and high-quality ventures. We thus highlight an important interplay between the internal and the external context in influencing tie formation. We subsequently develop a theory of how

the external context plays a role that focuses attention on particular aspects of the risk-reward potential of a particular project but does not create a blanket preference for riskier types of ties.

Contributions to the literature on status

Beyond our contributions to the study of network dynamics, we also add several insights to the literature on status. In doing so, we join the growing line of research that probes the generalizability and boundary conditions of status homophily as the driving mechanism of network ties. While early research on this topic has generally assumed that two-sided matching in markets would induce similar-status actors to partner together (Chung et al., 2000; Podolny, 1994), more recent work has highlighted that low-status actors have two principal ways to induce higher-status partners to form ties with them. First, they can offer more favorable pricing (Hsu, 2004; Zhang et al., 2016), accept a subordinate position (Ahuja et al., 2009), or commit more resources to the relationship (Castellucci & Ertug, 2010). Second, they need to exhibit compelling signals of quality (Ahuja, 2000; Claes & Vissa, 2019; Hallen, 2008). The latter approach certainly resonates with our result that having a high-quality deal helps a low-status lead attract a higher-status follower. However, our findings also challenge the conventional wisdom in three ways.

First, we found that the presumption of status homophily as the default mechanism of network formation is only partially correct. While in our results, upward status asymmetry had either a null or a negative effect on matching across different model specifications, downward status asymmetry had a strong positive effect on matching in all our models (see Hallen, 2008 for a similar finding). Our primary explanation of this finding is that while downward status asymmetry is hierarchically consistent (i.e., the lead investor also has a higher status), upward status asymmetry can destabilize the syndicate by allowing a higher-status follower to challenge

44

the authority of the lower-status lead (also see a similar explanation in Claes & Vissa, 2019, based on caste differences in the Indian VC context).

Second, while we showed the default tendency of leads to bring in lower-status followers, that tendency was strengthened (weakened) by a poorer (stronger) performance of the portfolio company. This highlighted a previously unexplored pathway of how lower-status VCs can forge relationships with higher-status alters. Even if they are not leading a high-performance portfolio company that they can invite a higher-status VC into, they can still accept the invitation of a high-status VC to join a less promising portfolio company. In other words, low-status actors have a dual pathway to a high-status affiliation: either by offering up a high-quality deal (the scenario most in line with the existing literature, such as Hallen, 2008 or Ahuja, 2000) or acquiescing to a low-quality one.

Finally, our work highlights some of the previously neglected benefits of status in markets. Much of the extant literature on network dynamics has focused on the ease with which high-status players can secure alliances because they are more attractive as exchange partners and have privileged access to information across the network (e.g., Gulati & Gargiulo, 1999). The present research, however, highlights that high-status and low-status partners are brought into different types of alliances. Unlike their lower-status peers, high-status actors can secure access into more valuable collaborations; at the same time, high-status actors find it easier to bring participants into less-promising ventures. More broadly, our results have implications for the mechanisms through which differences in status can translate into differences in performance. Traditionally, two key processes have explained the superior performance of high-status VCs: 1) picking ex ante good investments and 2) adding value ex post (e.g., Baum & Silverman, 2004; Brander et al., 2002). By contrast, our results suggest two alternative channels

related to the inbound and outbound syndication ties of the focal VC. A VC can boost its performance by getting invited into high-performance investments that others have previously identified and nurtured and by recruiting other VCs to prop up, and potentially turn around, its own underperforming investments. Our results suggest that high-status VCs are well-positioned to benefit from both processes. As a result, directed deal flow can be an alternative channel for the observed association between status and performance in the VC industry (Hochberg et al., 2007; Pollock et al., 2015). More broadly, such processes can help explain the enduring inequalities between organizational players in markets alongside other typical explanations, such as the price or cost advantages of high-status actors (Benjamin & Podolny, 1999; Hsu, 2004; Podolny, 1994), as well as preferential treatment by the assessing audiences (Kim & King, 2014; Merton, 1968; Simcoe & Waguespack, 2011; Waguespack & Sorenson, 2011). This insight applies to a variety of settings, from interorganizational alliances to collaborations between inventors and academics.

Limitations and future research

Our work is not without limitations. Although our empirical design accounts for many sources of potential confounders via controls and fixed effects, and our supplemental analyses ruled out other alternative explanations, our study is based fundamentally on econometric modeling of archival data. To make truly causal claims and definitively isolate the operating mechanisms, future research can use experimental designs, such as the ones exchange theorists pioneered to study the emergence of norms, affect, and power dynamics within small exchange networks (Cook, Emerson, Gillmore, & Yamagishi, 1983; Lawler, Thye, & Yoon, 2000; Lawler & Yoon, 1996). All of the key constructs in the present study—status asymmetry, venture

performance trajectory, and market heat—can be manipulated experimentally, either in the context of a dedicated experiment or as a part of some type of a venture game used in teaching.

Another limitation of the present paper is that we can only observe accepted invitations rather than the full set of partners that a firm approaches for possible collaboration. Modeling both the first stage of the initial invitation and the second stage of its acceptance or rejection can provide additional insights that the outcome (i.e., the realized tie) cannot. Research on the multistage nature of tie formation decisions is extremely rare, but it can provide insights that single-stage models cannot.[17] For example, it may be possible that rather than just inviting lower-status VCs to join struggling projects, lead VCs try to cast the net more widely and issue invitations to firms of different status levels. It may be only the lower-status players, however, that ultimately accept the suboptimal invitations. By contrast, it is quite likely that when a low-status VC has a well-performing investment, it may wish to start with a narrower set of prospective high-status partners, and then broaden the search only if none of those partners accepts. One way to capture such multi-stage dynamics would be by administering surveys asking firms about the prospective partners they had approached for deals and which of those invitations were accepted (e.g., Wang, 2016).

Finally, future research can also deepen our appreciation for the variety of actors involved in the follower selection process. By focusing on the lead VC, our research potentially neglects two important types of stakeholders with influence over the syndication decision. First, recent research suggests that non-lead investors can also play an important and often non-trivial

---

[17] We are aware of two studies showing the distinctive promise of multi-stage models. Vissa (2011) used business card data of Indian entrepreneurs to distinguish between intending to form a tie versus forming a business relationship; Wang (2016), in contrast, used surveys of VCs to distinguish between granting an entrepreneur the opportunity to pitch their venture versus funding the venture. Both studies highlight that some variables—such as referrals—are influential at the intention/consideration stage but make little difference at the tie formation/selection stage.

role in the syndication process (Zhang & Guler, 2019; Zhang et al., 2017). While accounting for the role of the non-lead investors in our robustness tests did not alter our main results, future research could examine in more detail the complex interplay between the lead investor, the non-lead investors, and the prospective followers. For example, high-status non-leads could try to push for a lower-status follower whose arrival would represent a lower risk of disruption in the existing power structure of the syndicate. By contrast, low-status non-leads could try to recruit a higher-status follower who could then support them in upending the existing power structure.

Second, while much existing research has focused on the role of the venture capitalist in knitting together the syndication network, the entrepreneurs could also exercise some agency in shaping the composition of the syndicate network (e.g., Hallen, 2008; Hallen & Eisenhardt, 2012; Zhang, 2018). The limited research from the entrepreneurs' perspective does suggest some interesting patterns that are complementary to the VC perspective presented here. For example, depending on the venture's life cycle, entrepreneurs might be willing to accept lower valuations from high-status VC's at earlier stages (Hsu, 2004) and higher valuations from low-status VC's at later stages of the new venture (Hallen, 2008). Ultimately, a complete account of the nuances of the syndication process would require examining the complex multiparty interactions between a variety of stakeholders, a task that is well beyond the scope of the present research.

In conclusion, our paper shows that VC syndication (just like any other type of social action aimed at creating social ties) does not occur in a vacuum (Granovetter, 1985). Researchers have long been aware of the fact that features of the surrounding environment, such as the levels and types of market uncertainty (Beckman, Haunschild, & Phillips, 2004; Podolny, 1994) or market heat (Collet & Philippe, 2014; Sorenson & Stuart, 2008), can fundamentally shape network dynamics. Our research indicates that besides these characteristics of the external

environment, certain qualities of the internal context of collaboration also matter in determining social and organizational network behaviors. In addition, we explore an often overlooked quality of social ties, which is their inherent directionality. Taken together, our focus and results are only the first step toward a more complete understanding of the multi-level, multi-actor processes through which networks, also potentially those well beyond the VC syndication setting, emerge and acquire their shape.

The Online Appendix to this paper is available at
https://bmvh29.ust.hk/mgmt/files/staff/papers/Pavel/AMJ-2018-0969.online_appendix.pdf

REFERENCES

Admati, A. R., & Pfleiderer, P. 1994. Robust financial contracting and the role of venture capitalists. *The Journal of Finance*, 49(2): 371-402.

Ahuja, G. 2000. The duality of collaboration: Inducements and opportunities in the formation of interfirm linkages. *Strategic Management Journal*, 21(3): 317-343.

Ahuja, G., Polidoro, F., & Mitchell, W. 2009. Structural homophily or social asymmetry? The formation of alliances by poorly embedded firms. *Strategic Management Journal*, 30(9): 941-958.

Andrieu, G., & Groh, A. P. 2012. Entrepreneurs' financing choice between independent and bank-affiliated venture capital firms. *Journal of Corporate Finance*, 18(5): 1143-1167.

Arino, A., & de la Torre, J. 1998. Learning from failure: Towards an evolutionary model of collaborative ventures. *Organization Science*, 9(3): 306-325.

Baker, M., & Stein, J. C. 2004. Market liquidity as a sentiment indicator. *Journal of Financial Markets*, 7(3): 271-299.

Baker, M., & Wurgler, J. 2006. Investor sentiment and the cross-section of stock returns. *Journal of Finance*, 61(4): 1645-1680.

Baker, M., & Wurgler, J. 2007. Investor sentiment in the stock market. *The Journal of Economic Perspectives*, 21(2): 129-151.

Baum, J. A. C., & Silverman, B. S. 2004. Picking winners or building them? Alliance, intellectual, and human capital as selection criteria in venture financing and performance of biotechnology startups. *Journal of Business Venturing*, 19(3): 411-436.

Beckman, C. M., Haunschild, P. R., & Phillips, D. J. 2004. Friends or strangers? Firm-specific uncertainty, market uncertainty, and network partner selection. *Organization Science*, 15(3): 259-275.

Benjamin, B. A., & Podolny, J. M. 1999. Status, quality, and social order in the California wine industry. *Administrative Science Quarterly*, 44(3): 563-589.

Bermiss, Y. S., Hallen, B. L., McDonald, R., & Pahnke, E. C. 2017. Entrepreneurial beacons: The Yale endowment, run-ups, and the growth of venture capital. *Strategic Management Journal*, 38(3): 545-565.

Bonacich, P. 1987. Power and centrality: A family of measures. *American Journal of Sociology*, 92(5): 1170-1182.

Brander, J. A., Amit, R., & Antweiler, W. 2002. Venture capital syndication: Improved venture selection vs. the value-added hypothesis. *Journal of Economics & Management Strategy*, 11(3): 423-452.

Broughman, B. J., & Fried, J. M. 2012. Do VCs use inside rounds to dilute founders? Some evidence from Silicon Valley. *Journal of Corporate Finance*, 18(5): 1104-1120.

Castellucci, F., & Ertug, G. 2010. What's in it for them? Advantages of higher-status partners in exchange relationships. *Academy of Management Journal*, 53(1): 149-166.

Chung, C. C., & Beamish, P. W. 2010. The trap of continual ownership change in international equity joint ventures. *Organization Science*, 21(5): 995-1015.

Chung, S., Singh, H., & Lee, K. 2000. Complementarity, status similarity and social capital as drivers of alliance formation. *Strategic Management Journal*, 21(1): 1-22.

Claes, K., & Vissa, B. 2019. Does social similarity pay off? Homophily and venture capitalists' deal valuation, downside risk protection and financial returns in India. *Organization Science*, forthcoming.

Clough, D. R., Fang, T. P., Vissa, B., & Wu, A. 2019. Turning lead into gold: How do entrepreneurs mobilize resources to exploit opportunities? *Academy of Management Annals*, 13(1): 240-271.

Cohn, A., Engelmann, J., Fehr, E., & Marechal, M. A. 2015. Evidence for countercyclical risk aversion: An experiment with financial professionals. *American Economic Review*, 105(2): 860-885.

Collet, F., & Philippe, D. 2014. From hot cakes to cold feet: A contingent perspective on the relationship between market uncertainty and status homophily in the formation of alliances. *Journal of Management Studies*, 51(3): 406-432.

Cook, K. S., Emerson, R. M., Gillmore, M. R., & Yamagishi, T. 1983. The distribution of power in exchange networks: Theory and experimental results. *American Journal of Sociology*, 89(2): 275-305.

Davila, A., Foster, G., & Gupta, M. 2003. Venture capital financing and the growth of startup firms. *Journal of Business Venturing*, 18(6): 689-708.

Faems, D., Janssens, M., Madhok, A., & Van Looy, B. 2008. Toward an integrative perspective on alliance governance: Connecting contract design, trust dynamics and contract application. *Academy of Management Journal*, 51(6): 1053-1078.

Gargiulo, M., Ertug, G., & Galunic, C. 2009. The two faces of control: Network closure and individual performance among knowledge workers. *Administrative Science Quarterly*, 54(2): 299-333.

Ghosh, A., & Rosenkopf, L. 2015. Shrouded in structure: Challenges and opportunities for a friction-based view of network research. *Organization Science*, 26(2): 622-631.

Gompers, P. 1995. Optimal investment, monitoring, and the staging of venture capital. *Journal of Finance*, 50: 1461-1489.

Gompers, P., Kovner, A., Lerner, J., & Scharfstein, D. 2008. Venture capital investment cycles: The impact of public markets. *Journal of Financial Economics*, 87(1): 1-23.

Gompers, P. A. 1996. Grandstanding in the venture capital industry. *Journal of Financial Economics*, 42(1): 133-156.

Gompers, P. A., & Lerner, J. 1999. *The venture capital cycle*. Cambridge MA: MIT Press.

Gorman, M., & Sahlman, W. A. 1989. What do venture capitalists do? *Journal of Business Venturing*, 4(4): 231-248.

Granovetter, M. 1985. Economic action and social structure: The problem of embeddedness. *American Journal of Sociology*, 91(3): 481-510.

Gulati, R. 1995a. Does familiarity breed trust? The implications of repeated ties for contractual choice in alliances. *Academy of Management Journal*, 38(1): 85-112.

Gulati, R. 1995b. Social structure and alliance formation patterns: A longitudinal analysis. *Administrative Science Quarterly*, 40(4): 619-652.

Gulati, R., & Gargiulo, M. 1999. Where do interorganizational networks come from? *American Journal of Sociology*, 104(5): 1439-1493.

Gulati, R., & Higgins, M. C. 2003. Which ties matter when? The contingent effects of interorganizational partnerships on IPO success. *Strategic Management Journal*, 24(2): 127-144.

Gulati, R., Wohlgezogen, F., & Zhelyazkov, P. 2012. The two facets of collaboration: Cooperation and coordination in strategic alliances. *Academy of Management Annals*, 6(1): 531-583.

Guler, I. 2007. Throwing good money after bad? Political and institutional influences on sequential decision making in the venture capital industry. *Administrative Science Quarterly*, 52(2): 248-285.

Guler, I., & Guillen, M. F. 2010. Home country networks and foreign expansion: Evidence from the venture capital industry. *Academy of Management Journal*, 53(2): 390-410.

Hair, J. F. J., Anderson, R. E., Tatham, R. L., & Black, W. C. 1995. *Multivariate data analysis (3rd ed)*. New York, NY: McMillan.

Hallen, B. L. 2008. The causes and consequences of the initial network positions of new organizations: From whom do entrepreneurs receive investments? *Administrative Science Quarterly*, 53(4): 685-718.

Hallen, B. L., & Eisenhardt, K. M. 2012. Catalyzing strategies and efficient tie formation: How entrepreneurial firms obtain investment ties. *Academy of Management Journal*, 55(1): 35-70.

Hallen, B. L., Katila, R., & Rosenberger, J. D. 2014. How do social defenses work? A resource-dependence lens on technology ventures, venture capital investors, and corporate relationships. *Academy of Management Journal*, 57(4): 1078-1101.

Hallen, B. L., & Pahnke, E. C. 2016. When do entrepreneurs accurately evaluate venture capital firm's track records? A bounded rationality perspective. *Academy of Management Journal*, 59(5): 1535-1560.

Heckman, J. J. 1979. Sample selection bias as a specification error. *Econometrica*, 47(1): 153-161.

Hochberg, Y. V., Lindsey, L. A., & Westerfield, M. M. 2015. Resource accumulation through economic ties: Evidence from venture capital. *Journal of Financial Economics*, 118(2): 245-267.

Hochberg, Y. V., Ljungqvist, A., & Lu, Y. 2007. Whom you know matters: Venture capital networks and investment performance. *Journal of Finance*, 62(1): 251-301.

Hochberg, Y. V., Ljungqvist, A., & Lu, Y. 2010. Networking as a barrier to entry and the competitive supply of venture capital. *Journal of Finance*, 65(3): 829-859.

Hoetker, G. 2007. The use of logit and probit models in strategic management research: Critical issues. *Strategic Management Journal*, 28(4): 331-343.

Hopp, C. 2010. When do venture capitalists collaborate? Evidence on the driving forces of venture capital syndication. *Small Business Economics*, 35(4): 417-431.

Hsu, D. H. 2004. What do entrepreneurs pay for venture capital affiliation? *Journal of Finance*, 59(4): 1805-1844.

Hwang, M., Quingley, J., & Woodward, S. 2005. An index for venture capital, 1987–2003. *Contributions to Economic Analysis and Policy*, 4(1): 1-43.

Ingram, P., & Yue, L. Q. 2008. Structure, affect and identity as bases of organizational competition and cooperation. *Academy of Management Annals*, 2: 275-303.

Jensen, M. 2006. Should we stay or should we go? Status accountability anxiety and client defections. *Administrative Science Quarterly*, 51(1): 97-128.

Kaplan, S. N., & Schoar, A. 2005. Private equity performance: Returns, persistence, and capital flows. *Journal of Finance*, 60(4): 1791-1823.

Katila, R., Rosenberger, J. D., & Eisenhardt, K. M. 2008. Swimming with sharks: Technology ventures, defense mechanisms and corporate relationships. *Administrative Science Quarterly*, 53(2): 295-332.

Kennedy, P. 1992. *A guide to econometrics*. Oxford: Blackwell.

Khanna, T., Gulati, R., & Nohria, N. 1998. The dynamics of learning alliances: Competition, cooperation, and relative scope. *Strategic Management Journal*, 19(3): 193-210.

Kim, J. W., & King, B. G. 2014. Seeing stars: Matthew effects and status bias in major league baseball umpiring. *Management Science*, 60(11): 2619-2644.

Kutner, M. H., Nachtsheim, C. J., & Neter, J. 2004. *Applied regression models* (4th Edition ed.). New York, NY: McGraw Hill/Irwin.

Lawler, E. J., Thye, S. R., & Yoon, J. 2000. Emotion and group cohesion in productive exchange. *American Journal of Sociology*, 106(3): 616-657.

Lawler, E. J., & Yoon, J. K. 1996. Commitment in exchange relations: Test of a theory of relational cohesion. *American Sociological Review*, 61(1): 89-108.

Lee, P. M., Pollock, T. G., & Jin, K. 2011. The contingent value of venture capitalist reputation. *Strategic Organization*, 9(1): 33-69.

Lerner, J. 1994. The syndication of venture capital investments. *Financial Management*, 23(3): 16-27.

Li, S. X., & Rowley, T. J. 2002. Inertia and evaluation mechanisms in interorganizational partner selection: Syndicate formation among US investment banks. *Academy of Management Journal*, 45(6): 1104-1119.

Lindsey, L. 2008. Blurring firm boundaries: The role of venture capital in strategic alliances. *Journal of Finance*, 63(3): 1137-1168.

Ma, D. L., Rhee, M., & Yang, D. 2013. Power source mismatch and the effectiveness of interorganizational relations: The case of venture capital syndication. *Academy of Management Journal*, 56(3): 711-734.

Merton, R. K. 1968. The Matthew effect in science. *Science*, 159(3810): 56-&.

Milanov, H., & Fernhaber, S. A. 2009. The impact of early imprinting on the evolution of new venture networks. *Journal of Business Venturing*, 24(1): 46-61.

Milanov, H., & Shepherd, D. A. 2013. The importance of the first relationship: The ongoing influence of initial network on future status. *Strategic Management Journal*, 34(6): 727-750.

Ozmel, U., Reuer, J. J., & Gulati, R. 2013. Signals across multiple networks: How venture capital and alliance networks affect interorganizational collaboration. *Academy of Management Journal*, 56(3): 852-866.

Piezunka, H., Lee, W., Haynes, R., & Bothner, M. S. 2018. Escalation of competition into conflict in competitive networks of Formula One drivers. *Proceedings of the National Academy of Sciences*, 115(15): E3361-E3367.

Podolny, J. M. 1993. A status-based model of market competition. *American Journal of Sociology*, 98(4): 829-872.

Podolny, J. M. 1994. Market uncertainty and the social character of economic exchange. *Administrative Science Quarterly*, 39(3): 458-483.

Podolny, J. M. 2001. Networks as the pipes and prisms of the market. *American Journal of Sociology*, 107(1): 33-60.

Podolny, J. M. 2005. *Status signals: A sociological study of market competition*. Princeton, NJ: Princeton University Press.

Podolny, J. M., & Phillips, D. J. 1996. The dynamics of organizational status. *Industrial and Corporate Change*, 5(2): 453-471.

Pollock, T. G., Lee, P. M., Jin, K., & Lashley, K. 2015. (Un)Tangled: Exploring the asymmetric coevolution of new venture capital firms' reputation and status. *Administrative Science Quarterly*, 60(3): 482-517.

Powell, W. W., White, D. R., Koput, K. W., & Owen-Smith, J. 2005. Network dynamics and field evolution: The growth of interorganizational collaboration in the life sciences. *American Journal of Sociology*, 110(4): 1132-1205.

Robinson, D. T., & Stuart, T. E. 2007. Network effects in the governance of strategic alliances. *Journal of Law Economics & Organization*, 23(1): 242-273.

Shafi, K., Mohammadi, A., & Johan, S. 2019. Investment ties gone awry. *Academy of Management Journal*, forthcoming.

Shipilov, A. V., Li, S. X., & Greve, H. R. 2011. The prince and the pauper: Search and brokerage in the initiation of status-heterophilous ties. *Organization Science*, 22(6): 1418-1434.

Simcoe, T. S., & Waguespack, D. M. 2011. Status, quality, and attention: What's in a (missing) name? *Management Science*, 57(2): 274-290.

Sørensen, M. 2007. How smart is smart money? A two-sided matching model of venture capital. *The Journal of Finance*, 62(6): 2725-2762.

Sorenson, O., & Stuart, T. E. 2001. Syndication networks and the spatial distribution of venture capital investments. *American Journal of Sociology*, 106(6): 1546-1588.

Sorenson, O., & Stuart, T. E. 2008. Bringing the context back in: Settings and the search for syndicate partners in venture capital investment networks. *Administrative Science Quarterly*, 53(2): 266-294.

Stuart, T. E. 1998. Network positions and propensities to collaborate: An investigation of strategic alliance formation in a high-technology industry. *Administrative Science Quarterly*, 43(3): 668-698.

Stuart, T. E., Hoang, H., & Hybels, R. C. 1999. Interorganizational endorsements and the performance of entrepreneurial ventures. *Administrative Science Quarterly*, 44(2): 315-349.

Tian, X. 2012. The role of venture capital syndication in value creation for entrepreneurial firms. *Review of Finance*, 16(1): 245-283.

Townsend, R. 2015. Propagation of financial shocks: The case of venture capital. *Management Science*, 61(11): 2782-2802.

Trapido, D. 2007. Competitive embeddedness and the emergence of interfirm cooperation. *Social Forces*, 86(1): 165-191.

Vasudeva, G., Spencer, J. W., & Teegen, H. J. 2013. Bringing the institutional context back in: A cross-national comparison of alliance partner selection and knowledge acquisition. *Organization Science*, 24(2): 319-338.

Vissa, B. 2011. A matching theory of entrepreneurs' tie formation intentions and initiation of economic exchange. *Academy of Management Journal*, 54(1): 137-158.

Waguespack, D. M., & Sorenson, O. 2011. The ratings game: Asymmetry in classification. *Organization Science*, 22(3): 541-553.

Wang, Y. 2016. Bringing the stages back in: Social network ties and start-up firms' access to venture capital in china. *Strategic Entrepreneurship Journal*, 10(3): 300-317.

Zhang, J., Wong, P. K., & Ho, Y. P. 2016. Ethnic enclave and entrepreneurial financing: Asian venture capitalists in Silicon Valley. *Strategic Entrepreneurship Journal*, 10(3): 318-335.

Zhang, L. 2018. Founders matter! Serial entrepreneurs and venture capital syndicate formation. *Entrepreneurship Theory and Practice*, forthcoming.

Zhang, L., & Guler, I. 2019. How to join the club: Patterns of embeddedness and the addition of new members to interorganizational collaborations. *Administrative Science Quarterly*, forthcoming.

Zhang, L., Gupta, A. K., & Hallen, B. L. 2017. The conditional importance of prior ties: A group-level analysis of venture capital syndication. *Academy of Management Journal*, 60(4): 1360-1386.

Zhelyazkov, P. I. 2018. Interactions and interests: Collaboration outcomes, competitive concerns, and the limits to triadic closure. *Administrative Science Quarterly*, 63(1): 210-247.

Zhelyazkov, P. I., & Gulati, R. 2016. After the break up: The relational and reputational consequences of withdrawals from venture capital syndicates. *Academy of Management Journal*, 59(1): 277-301.

Figure 1a: Predicted probability of tie formation as a function of upward-status asymmetry (the lead has a lower status than the follower).

Predictive Margins with 95% CIs
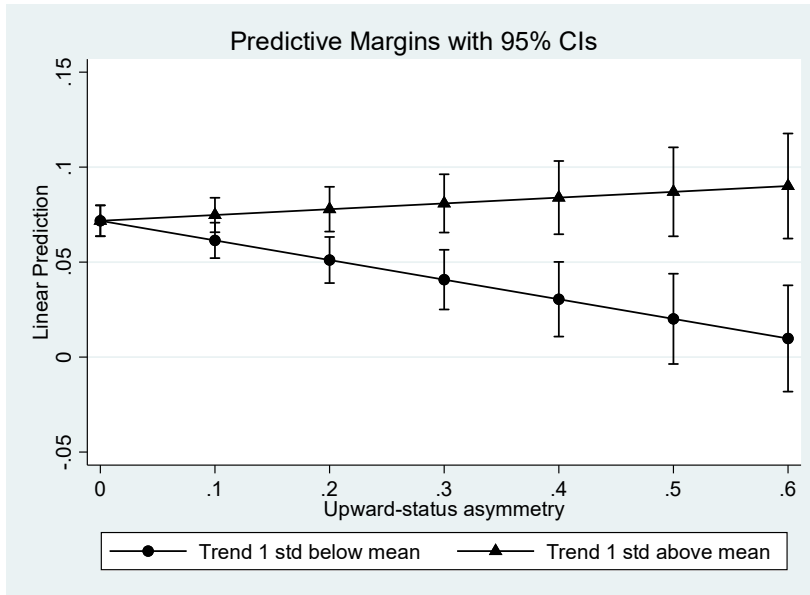
Note: Based on Model 5, Table 4. Sets downward-status asymmetry at zero and all other variables at their sample mean.

Figure 1b: Predicted probability of tie formation as a function of downward-status asymmetry (the lead has a higher status than the follower).

Predictive Margins with 95% CIs
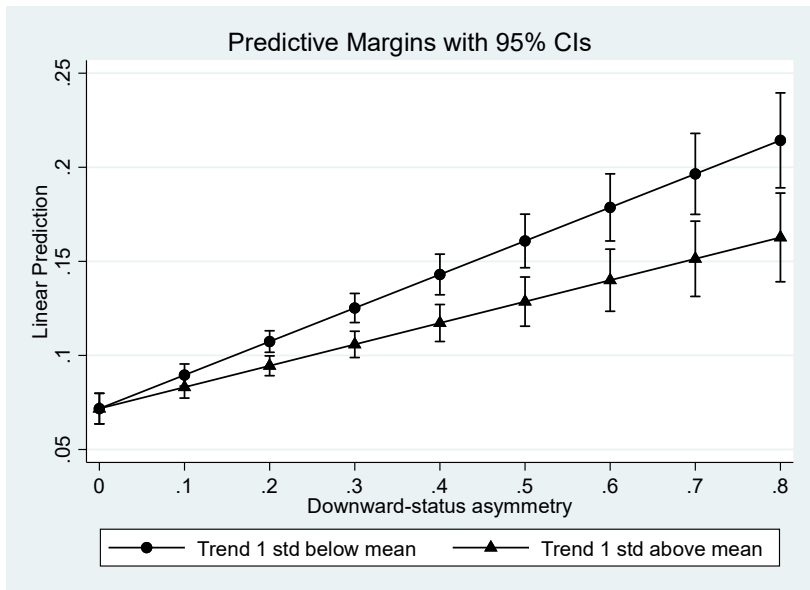
Note: Based on Model 5, Table 4. Sets upward-status asymmetry at zero and all other variables at their sample mean.

Figure 2: Predicted probability of tie formation as a function of market heat, for different levels of the valuation trend. Upward-status asymmetry fixed at one standard deviation above zero.
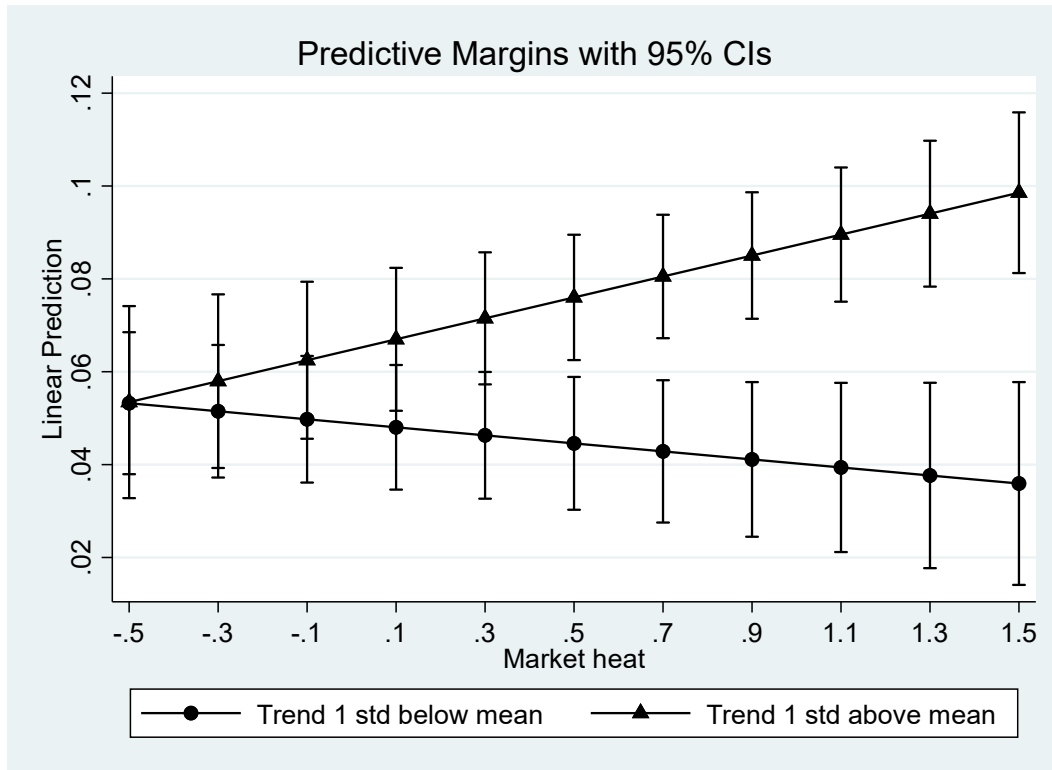
Note: Based on Model 8, Table 4. Sets downward-status asymmetry at zero, upward-status asymmetry at one standard deviation above zero, and all other variables at their sample mean.

TABLE 1
TABLE 1
Descriptive Statistics

Variable	Factual observations			Counterfactual observations			All observations		
	Obs.	Mean	SD	Obs.	Mean	SD	Obs.	Mean	SD
Factual observation	4,886	1.00	0.00	40,491	0.00	0.00	45,377	0.11	0.31
Upward-status asymmetry	4,886	0.13	0.24	40,491	0.16	0.26	45,377	0.16	0.26
Downward-status asymmetry	4,886	0.34	0.34	40,491	0.28	0.32	45,377	0.28	0.32
Assortative matching (superior follower)	4,886	0.02	0.08	40,491	0.03	0.10	45,377	0.03	0.10
Assortative matching (superior company)	4,886	0.47	0.34	40,491	0.40	0.32	45,377	0.41	0.32
Follower IPO percentage	4,886	0.17	0.18	40,491	0.16	0.14	45,377	0.16	0.15
Follower investment count	4,886	2.75	1.24	40,491	3.09	1.13	45,377	3.06	1.14
Follower fund count	4,886	0.83	0.57	40,491	0.96	0.55	45,377	0.95	0.55
Follower age	4,886	2.02	0.91	40,491	2.22	0.78	45,377	2.21	0.80
Follower industry specialization	4,886	0.23	0.22	40,491	0.23	0.19	45,377	0.23	0.19
Follower state specialization	4,886	0.33	0.31	40,491	0.34	0.30	45,377	0.34	0.30
Follower distance to company	4,886	5.50	2.27	40,491	5.69	2.20	45,377	5.67	2.20
Industry overlap between lead and follower	4,886	0.54	0.21	40,491	0.55	0.20	45,377	0.55	0.20
State overlap between lead and follower	4,886	0.48	0.23	40,491	0.48	0.22	45,377	0.48	0.22
Distance between lead and follower	4,886	5.29	2.70	40,491	5.58	2.62	45,377	5.55	2.63
Direct ties between lead and follower	4,886	0.44	0.65	40,491	0.34	0.57	45,377	0.35	0.58
Indirect ties between lead and follower	4,886	2.53	1.32	40,491	2.66	1.25	45,377	2.65	1.26
Valuation trend	4,886	0.55	0.90	40,491	0.55	0.90	45,377	0.55	0.90
Market heat	4,886	0.39	0.57	40,491	0.40	0.58	45,377	0.40	0.57

TABLE 2
Correlation Matrix (N = 45,377)

	Variable	1	2	3	4	5	6	7	8	9	10
1	Factual observation	1.00									
2	Upward-status symmetry	-0.04	1.00								
3	Downward-status asymmetry	0.06	-0.52	1.00							
4	Assortative matching (superior follower)	-0.02	0.17	-0.23	1.00						
5	Assortative matching (superior company)	0.07	-0.37	0.74	-0.41	1.00					
6	Follower IPO percentage	0.01	0.11	-0.24	0.06	-0.29	1.00				
7	Follower investment count	-0.09	0.37	-0.71	0.32	-0.80	0.20	1.00			
8	Follower fund count	-0.07	0.21	-0.34	0.13	-0.36	-0.01	0.49	1.00		
9	Follower age	-0.08	0.19	-0.39	0.12	-0.41	0.07	0.54	0.26	1.00	
10	Follower industry specialization	0.00	-0.11	0.20	-0.09	0.24	-0.06	-0.30	-0.15	-0.17	1.00
11	Follower state specialization	-0.01	-0.12	0.12	0.00	0.06	-0.04	-0.17	-0.11	-0.10	0.11
12	Follower distance to company	-0.03	0.05	-0.03	-0.01	-0.01	0.03	0.06	0.02	0.04	-0.03
13	Industry overlap between lead and follower	-0.02	-0.14	-0.21	0.13	-0.34	0.11	0.37	0.18	0.15	0.03
14	State overlap between lead and follower	0.01	-0.14	-0.14	0.12	-0.28	0.12	0.20	0.08	0.07	0.01
15	Distance between lead and follower	-0.03	0.04	0.04	-0.08	0.12	-0.03	-0.05	-0.03	0.01	-0.01
16	Direct ties between lead and follower	0.05	-0.13	-0.20	0.25	-0.39	0.10	0.35	0.17	0.17	-0.06
17	Indirect ties between lead and follower	-0.03	-0.22	-0.34	0.24	-0.65	0.19	0.63	0.30	0.32	-0.14
18	Valuation trend	0.00	0.02	0.00	-0.20	0.12	0.12	-0.07	-0.06	-0.05	-0.02
19	Market heat	0.00	0.02	0.02	-0.01	0.00	0.18	-0.14	-0.09	-0.10	-0.03

TABLE 2 (continued)
Correlation Matrix (N = 45,377)

	Variable	11	12	13	14	15	16	17	18	19
11	Follower state specialization	1.00								
12	Follower distance to company	-0.55	1.00							
13	Industry overlap between lead and follower	0.02	-0.04	1.00						
14	State overlap between lead and follower	0.49	-0.28	0.25	1.00					
15	Distance between lead and follower	-0.33	0.50	-0.11	-0.47	1.00				
16	Direct ties between lead and follower	0.08	-0.08	0.36	0.36	-0.22	1.00			
17	Indirect ties between lead and follower	0.03	-0.03	0.54	0.47	-0.17	0.57	1.00		
18	Valuation trend	0.02	-0.01	-0.04	0.00	-0.03	-0.02	-0.09	1.00	
19	Market heat	-0.02	0.01	-0.10	-0.04	-0.02	-0.05	-0.15	0.47	1.00

TABLE 3
Conditional logit models predicting factual ties, based on groups of one factual observation and the associated counterfactual observations

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8
Follower IPO percentage	0.522***	0.549***	0.546***	0.538***	0.540***	0.522**	0.446***	0.531***
	(5.30)	(5.55)	(5.50)	(5.42)	(5.43)	(2.99)	(3.54)	(5.33)
Follower investment count	-0.322***	-0.298***	-0.310***	-0.307***	-0.313***	-0.369***	-0.243***	-0.309***
	(-10.05)	(-9.16)	(-9.50)	(-9.43)	(-9.60)	(-8.50)	(-4.83)	(-9.44)
Follower fund count	-0.239***	-0.241***	-0.236***	-0.235***	-0.233***	-0.0907	-0.385***	-0.235***
	(-6.55)	(-6.61)	(-6.47)	(-6.48)	(-6.41)	(-1.80)	(-7.34)	(-6.45)
Follower age	-0.139***	-0.133***	-0.131***	-0.132***	-0.130***	-0.104**	-0.167***	-0.134***
	(-6.01)	(-5.77)	(-5.65)	(-5.69)	(-5.62)	(-3.24)	(-4.83)	(-5.74)
Follower industry specialization	-0.493***	-0.511***	-0.507***	-0.507***	-0.505***	-0.487***	-0.622***	-0.508***
	(-5.33)	(-5.50)	(-5.45)	(-5.45)	(-5.43)	(-4.05)	(-4.15)	(-5.45)
Follower state specialization	-0.788***	-0.826***	-0.841***	-0.838***	-0.845***	-0.848***	-0.857***	-0.855***
	(-8.30)	(-8.68)	(-8.81)	(-8.79)	(-8.84)	(-6.99)	(-5.52)	(-8.94)
Follower distance to company	-0.0535***	-0.0534***	-0.0535***	-0.0534***	-0.0534***	-0.0533***	-0.0554***	-0.0539***
	(-5.17)	(-5.16)	(-5.16)	(-5.15)	(-5.15)	(-3.91)	(-3.47)	(-5.19)
Industry overlap between lead and follower	-0.146	-0.102	-0.109	-0.123	-0.122	-0.240	0.0433	-0.132
	(-1.40)	(-0.97)	(-1.03)	(-1.17)	(-1.15)	(-1.73)	(0.26)	(-1.25)
State overlap between lead and follower	0.466***	0.531***	0.544***	0.536***	0.544***	0.691***	0.354*	0.546***
	(4.05)	(4.58)	(4.68)	(4.61)	(4.67)	(4.50)	(1.97)	(4.69)
Distance between lead and follower	-0.0214**	-0.0195*	-0.0179*	-0.0187*	-0.0178*	-0.0323**	-0.00186	-0.0179*
	(-2.62)	(-2.39)	(-2.19)	(-2.28)	(-2.17)	(-2.95)	(-0.15)	(-2.19)
Direct ties between lead and follower	0.607***	0.604***	0.598***	0.590***	0.590***	0.557***	0.622***	0.592***
	(17.24)	(16.97)	(16.77)	(16.54)	(16.53)	(11.84)	(11.37)	(16.62)
Indirect ties between lead and follower	0.289***	0.419***	0.424***	0.430***	0.429***	0.431***	0.438***	0.431***
	(7.10)	(9.33)	(9.40)	(9.55)	(9.51)	(7.26)	(6.18)	(9.52)
Assortative matching (superior follower)	-0.989***	-1.047***	-0.779**	-0.715**	-0.626*	-0.915**	-0.371	-0.651*
	(-3.72)	(-3.87)	(-2.83)	(-2.62)	(-2.27)	(-2.59)	(-0.84)	(-2.34)
Assortative matching (superior company)	0.841***	0.463**	0.458*	0.419*	0.436*	0.689**	0.251	0.468**
	(6.08)	(2.62)	(2.57)	(2.36)	(2.43)	(2.99)	(0.89)	(2.59)
Upward-status asymmetry (A)		0.0315	-0.571**	-0.0285	-0.474**	-0.279	-0.839**	-0.488**
		(0.20)	(-3.17)	(-0.18)	(-2.63)	(-1.27)	(-2.66)	(-2.69)
Downward-status asymmetry (B)		0.991***	0.979***	1.257***	1.145***	1.012***	1.164***	1.192***
		(6.75)	(6.60)	(8.14)	(7.40)	(5.12)	(4.43)	(7.63)
A × Valuation trend			0.981***		0.754***	0.338	1.096***	0.401*
			(6.97)		(5.08)	(1.72)	(4.46)	(2.28)
B × Valuation trend				-0.430***	-0.282***	-0.205*	-0.232	-0.223**
				(-6.71)	(-4.14)	(-2.32)	(-1.76)	(-2.81)
A × Market heat								-0.170
								(-0.70)
B × Market heat								-0.135
								(-1.09)
A × Market heat × Valuation trend								0.678**
								(3.01)
B × Market heat × Valuation trend								-0.0905
								(-0.94)
Sample	Full	Full	Full	Full	Full	Cold market	Hot market	Full
Observations	45377	45377	45377	45377	45377	25384	19993	45377
Adj. Pseudo R-square	0.057	0.06	0.063	0.062	0.064	0.073	0.06	0.065
Log Likelihood	-10094	-10065	-10031	-10038	-10022	-5578	-4408	-10011
Wald chi2	1085	1181	1219	1217	1229	792	522	1261

Note: Robust standard errors clustered around factual-counterfactual groups; t-statistics in parentheses.

*p < .05
**p < .01
***p < .001

TABLE 4
Linear probability models predicting factual ties, with fixed effects based on groups of one factual observation and the associated counterfactual observations

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8
Constant	0.197***	0.126***	0.127***	0.131***	0.130***	0.132***	0.128***	0.130***
	(8.64)	(5.12)	(5.19)	(5.34)	(5.33)	(3.88)	(3.61)	(5.29)
Follower IPO percentage	0.0667***	0.0712***	0.0709***	0.0695***	0.0697***	0.0602*	0.0627***	0.0685***
	(4.73)	(5.06)	(5.04)	(4.94)	(4.96)	(2.38)	(3.70)	(4.88)
Follower investment count	-0.0370***	-0.0337***	-0.0348***	-0.0347***	-0.0353***	-0.0443***	-0.0253***	-0.0349***
	(-10.36)	(-9.38)	(-9.70)	(-9.67)	(-9.83)	(-8.56)	(-5.00)	(-9.67)
Follower fund count	-0.0227***	-0.0229***	-0.0227***	-0.0226***	-0.0225***	-0.00744	-0.0390***	-0.0226***
	(-6.15)	(-6.22)	(-6.14)	(-6.12)	(-6.09)	(-1.48)	(-7.16)	(-6.11)
Follower age	-0.0172***	-0.0164***	-0.0162***	-0.0161***	-0.0160***	-0.0136***	-0.0195***	-0.0164***
	(-6.34)	(-6.03)	(-5.97)	(-5.94)	(-5.92)	(-3.48)	(-5.17)	(-6.05)
Follower industry specialization	-0.0609***	-0.0633***	-0.0632***	-0.0630***	-0.0630***	-0.0690***	-0.0669***	-0.0634***
	(-5.68)	(-5.90)	(-5.90)	(-5.88)	(-5.88)	(-4.63)	(-4.33)	(-5.91)
Follower state specialization	-0.0862***	-0.0914***	-0.0929***	-0.0928***	-0.0936***	-0.0963***	-0.0904***	-0.0941***
	(-8.47)	(-8.98)	(-9.15)	(-9.14)	(-9.23)	(-7.26)	(-5.75)	(-9.28)
Follower distance to company	-0.00574***	-0.00583***	-0.00580***	-0.00581***	-0.00580***	-0.00573***	-0.00594***	-0.00582***
	(-5.10)	(-5.19)	(-5.18)	(-5.18)	(-5.17)	(-3.84)	(-3.51)	(-5.20)
Industry overlap between lead and follower	-0.0241*	-0.0207	-0.0218	-0.0233*	-0.0234*	-0.0428**	-0.000597	-0.0246*
	(-2.09)	(-1.79)	(-1.89)	(-2.01)	(-2.03)	(-2.75)	(-0.03)	(-2.13)
State overlap between lead and follower	0.0474***	0.0543***	0.0552***	0.0551***	0.0555***	0.0769***	0.0303	0.0559***
	(3.81)	(4.36)	(4.44)	(4.44)	(4.48)	(4.55)	(1.66)	(4.51)
Distance between lead and follower	-0.00219*	-0.00196*	-0.00183*	-0.00188*	-0.00180*	-0.00321**	-0.000190	-0.00182*
	(-2.44)	(-2.20)	(-2.05)	(-2.11)	(-2.02)	(-2.65)	(-0.14)	(-2.04)
Direct ties between lead and follower	0.0655***	0.0655***	0.0647***	0.0642***	0.0640***	0.0589***	0.0699***	0.0644***
	(16.77)	(16.61)	(16.41)	(16.28)	(16.23)	(11.57)	(11.20)	(16.33)
Indirect ties between lead and follower	0.0350***	0.0521***	0.0527***	0.0524***	0.0528***	0.0578***	0.0485***	0.0529***
	(8.08)	(11.08)	(11.23)	(11.16)	(11.24)	(8.79)	(7.16)	(11.22)
Assortative matching (superior follower)	-0.0892***	-0.0870**	-0.0568*	-0.0495	-0.0374	-0.0534	-0.0285	-0.0400
	(-3.66)	(-3.28)	(-2.12)	(-1.83)	(-1.37)	(-1.56)	(-0.64)	(-1.45)
Assortative matching (superior company)	0.0934***	0.0281	0.0268	0.0212	0.0222	0.0436	0.0121	0.0246
	(6.28)	(1.36)	(1.30)	(1.03)	(1.07)	(1.53)	(0.40)	(1.18)
Upward-status asymmetry (A)		-0.0265	-0.0860***	-0.0348	-0.0772***	-0.0630*	-0.110**	-0.0846***
		(-1.38)	(-4.17)	(-1.81)	(-3.76)	(-2.32)	(-3.18)	(-4.01)
Downward-status asymmetry (B)		0.143***	0.143***	0.174***	0.166***	0.161***	0.153***	0.172***
		(8.00)	(8.01)	(9.34)	(8.88)	(6.40)	(5.16)	(9.13)
A × Valuation trend			0.0986***		0.0743***	0.0202	0.116***	0.0366*
			(7.67)		(5.52)	(1.08)	(5.05)	(2.19)
B × Valuation trend				-0.0500***	-0.0358***	-0.0272**	-0.0305*	-0.0287***
				(-7.10)	(-4.88)	(-2.70)	(-2.25)	(-3.30)
A × Market heat								-0.0107
								(-0.47)
B × Market heat								-0.0114
								(-0.84)
A × Market heat × Valuation trend								0.0722***
								(3.74)
B × Market heat × Valuation trend								-0.0136
								(-1.37)
Sample	Full	Full	Full	Full	Full	Cold market	Hot market	Full
Observations	45377	45377	45377	45377	45377	25384	19993	45377
Adj. R-square (within groups)	0.0314	0.0336	0.0352	0.0351	0.0359	0.0416	0.0333	0.0366

Note: Robust standard errors clustered around factual-counterfactual groups; t-statistics in parentheses.

*p < .05
**p < .01
***p < .001

Pavel I. Zhelyazkov is an Assistant Professor of Management at the Hong Kong University of Science and Technology in Clear Water Bay, Kowloon, Hong Kong (e-mail: pzhelyazkov@ust.hk). His research focuses on the dynamics of tie formation and dissolution in interorganizational networks, especially in the context of venture capital syndication and fundraising. He received his Ph.D. in organizational behavior from Harvard University.

Adam Tatarynowicz is an Associate Professor of Strategic Management at the Lee Kong Chian School of Business, Singapore Management University (e-mail: adam@smu.edu.sg). He studies how interorganizational networks form and how they affect firms' actions and outcomes. He is currently engaged in several research projects investigating the dynamics of networks in the venture capital industry, biotechnology, and ICT. Adam received his Ph.D. from the University of St. Gallen and was a visiting scholar at Northwestern University. Prior to joining SMU, he worked as an Associate Professor of Strategy & Organization at Tilburg University.