



DANCE WITH THE ONE THAT BROUGHT YOU? VENTURE CAPITAL FIRMS AND THE RETENTION OF FOUNDER-CEOS

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We consider how a venture capital firm's perceived uncertainty in new and uncertain industry environments affects its decisions to retain founder-CEOs at companies they take public. We further consider how the human capital of the founder-CEO, the overall experience of the venture capital firm (VCF), and the VCF's specific experience with the new industry moderate the relationship between industry-based uncertainty and founder-CEO retention. We explore these issues in the context of 340 venture capital firm investments in Internet sector start-ups that went public from 1995 to 2000. We find evidence that industry-based uncertainty decreases the likelihood of founder-CEO retention, that founder-CEO human capital and VCF Internet-sector experience decreases the effects of these uncertainties on founder-CEO retention for business-to-business (B2B) firms, but increases them for business-to consumer (B2C) firms, and that VCF age further decreases the likelihood that the founder-CEOs of B2C firms will be retained. Copyright © 2009 Strategic Management Society.

INTRODUCTION

Two key assumptions underlying research on upper echelons and corporate governance are that who leads a company matters greatly, and that changes in leadership can have significant consequences for a firm's strategy and performance (e.g., Bebchuk and Fried, 2004; Hambrick and Mason, 1984; Shen and Cannella, 2002; Westphal and Fredrickson, 2001). In the context of entrepreneurial start-ups, these leaders are generally the individuals who have

founded and grown their new companies (Boeker and Karichalil, 2002; Flamholtz and Randle, 2000; Nelson, 2003; Wasserman, 2003). An equally key assumption that has received far less scholarly attention is that owners somehow know whether and how to use their ability to replace firms' leaders in ways that will enhance firm performance. However, the general assumption that owners are skilled in their performance of governance activities has been challenged (see Bebchuk and Fried [2004] for a review of this literature), and research on the effects of founder-CEO replacement on firm performance has been mixed (e.g., Beckman, Burton and O'Reilly, 2007; Certo, *et al.*, 2001; Daily and Dalton, 1992; He, 2008; Jayaraman, *et al.*, 2000; Nelson, 2003; Willard, Krueger, and Feeser, 1992).

Further, little research has considered what happens to owners' attempts to shape firm

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leadership during upheavals in the organizational landscape around the creation of major new industries and the promulgation of new technologies. The novelty and uncertainty of such developments creates new ambiguities, conflicting interests, different means of success, and alternative ways for the conflicting interests and preferences to play out (Santos and Eisenhardt, 2009; Sine, Mitsuhashi, and Kirsch, 2006), all of which can challenge existing understandings of who is appropriate to lead a firm.

We attempt to address this issue by studying how owners' perceptions of industry-based uncertainty influence decisions to retain or replace founder-CEOs in companies preparing to conduct initial public offerings (IPOs). Prior research has considered the important role that governance and executive recruiting plays in managing uncertainties as firms prepare for their IPOs (Beatty and Zajac, 1994; Certo, *et al.*, 2003; Chen, Hambrick, and Pollock, 2008). In this study, we consider how one particular set of active and powerful owners—venture capital firms (VCFs)—influenced the leadership of start-ups they invested in during the Internet bubble of the mid- to late-1990s (Hendershott, 2004; Sine, *et al.*, 2006). Both academics and practitioners have noted that replacing founder-CEOs with outside executives is one of the most significant ways that venture capital firms shape their portfolio companies (Boeker and Karichalil, 2002; Flamholtz and Randle, 2000; Levensohn, 2006; Nelson, 2003; Wasserman, 2003). Indeed, as one experienced venture capitalist recently wrote, 'Executing that task [managing the founder-CEO transition] is arguably the single most important value a VC board will add in the company's lifetime' (Levensohn, 2006: 5). And while prior research has explored how factors such as stock ownership, founder characteristics, and life cycle factors (such as hitting milestones) influence this decision (e.g., Boeker and Karichalil, 2002; Jain and Tabak, 2008; Wasserman, 2003), questions regarding the role played by VCFs' perceptions of the industry uncertainties they face, and how these perceptions influence whether a founder-CEO is retained or replaced, have been left largely unaddressed.

We draw on cognitive theories of perception and decision making (Carpenter, Pollock, and Leary, 2003; Cyert and March, 1963; Haunschild and Miner, 1997; Sitkin and Pablo, 1992) and theories of symbolic action (DiMaggio and Powell, 1983; Meyer and Rowan, 1977; Pfeffer and Salancik, 1978) to examine how perceived uncertainty influences whether VCFs retain or replace founder-CEOs

in an emerging and fast-changing industry. In addition, we consider how founder-CEOs' human capital and different types of VCF experience shape the extent to which industry-based uncertainty influences founder-CEO retention decisions.

We test our hypotheses using a sample of 340 VCF investments in Internet firms that went public from 1995 to 2000. VCFs play a critical role in shaping young firms' leadership and governance structures as they attempt to deal with major issues of uncertainty and incentive alignment between sources and users of risk capital, especially in promising new industries (Sahlman, 1988; Sapienza and Gupta, 1994). The infusion of venture capital into a young firm is a fundamental step in the process of separating ownership from control (Berle and Means, 1932; Wasserman, 2003), and the leadership decisions made at this early stage in an organization's life can have significant, ongoing consequences for the firm (Baron, Hannan, and Burton, 1999; Fischer and Pollock, 2004; He, 2008).

We contribute to the entrepreneurship literature by exploring the important role that VCFs' perceived uncertainty plays in shaping the founder-CEO retention decision in an emerging industry. Our study contributes to the governance literature by showing how differing experiences influence owners' perceptions of uncertainty, thereby shaping fundamental governance decisions.

THEORY AND HYPOTHESES

The benefits and costs of founder-CEO retention and replacement

Deciding whether or not to retain the founding CEOs of promising firms in their investment portfolios is a key strategic decision made by VCFs, second in importance only to their decisions about which investments to make (Hellmann and Puri, 2002; Kaplan and Stromberg, 2004; Wasserman, 2003). This decision can have substantial consequences for the structure of the firm (Baron, Burton, and Hannan, 1999) and its ability to retain key employees (Baron, Hannan, and Burton, 2001; Beckman, *et al.*, 2007), acquire financial resources (Boeker and Karichalil, 2002; Certo, *et al.*, 2001; Nelson, 2003) and even survive (Fischer and Pollock, 2004; He, 2008). Evidence regarding the performance benefits of founder-CEO retention remains quite mixed. Some studies find that replacing a founder-CEO enhances performance outcomes (Beckman *et al.*, 2007; Certo *et al.*,

2001; Hambrick and Crozier, 1985), while others find no significant performance differences (Daily and Dalton, 1992; Willard, *et al.*, 1992), and yet others find benefits to founder-CEO retention (Fischer and Pollock, 2004; Forbes, Korsgaard, and Sapienza, Forthcoming; He, 2008; Jayaraman *et al.*, 2000; Kor, 2003; Nelson, 2003).

The relationship between founder-CEO retention or replacement and firm performance is complicated. The presence of a founder-CEO who retains substantial ownership power and, thus, greater control over the practices and strategic direction of the company increases the probability the firm will survive during the five years following its IPO (Fischer and Pollock 2004). Similarly, recent research has shown that founder-CEO replacements resulting in changes to the *organizational blueprint* (i.e., the norms and culture of the organization) toward more bureaucratic forms of organizing (Baron *et al.*, 2001) and filling key jobs with successors who do not fit the local definitions of jobs established by their original holders (Burton and Beckman, 2007), increase employee turnover rates, exacerbating the loss of key scientific and other human capital. This loss of talent and the organizational disruptions it engenders can threaten firm performance and survival (Aldrich, 1999; Baron *et al.*, 2001). In another intriguing study, Beckman, Burton, and O'Reilly (2007) discovered that while founder exit from a company increased the probability the firm would eventually go public (VCFs' generally preferred form of exit) by 25 percent, top management team (TMT) exits had an even greater *negative* effect (34%) on the likelihood of going public. This finding, combined with the insight from Baron and colleagues' earlier study (Baron *et al.*, 2001) that founder-CEO replacement increases TMT turnover, suggests that while the direct effects of founder exit increase the likelihood of an IPO, the indirect effects, via their influence on TMT turnover, reduce the likelihood of an IPO.

Finally, in exploring the effects of founder-CEO presence on board dynamics and conflict, Forbes and colleagues (Forbes, *et al.*, Forthcoming) found that, contrary to their expectations, when a firm was going through a *down round* (i.e., accepting VC investment at a lower valuation than in the previous round) the presence of a founder-CEO led to about the same amount of relationship conflict among directors as a nonfounder CEO. However, during normal financing rounds, where the valuation increases over the prior round, the presence of a founder-CEO led to

substantially *less* relationship conflict among board members.

Mixed effects are also found when studying the relationship between founder-CEO presence and initial financial market reactions at IPO. Nelson (2003) found that firms going public with founder-CEOs receive a higher price premium over the book value of the company, suggesting investors may place a higher value on the intangible benefits associated with the founder's presence. In contrast, other scholars (Certo *et al.*, 2001) found that founder-CEO presence results in a greater run-up in stock price on the first day of trading—that is, greater underpricing—which may signal that there is greater uncertainty about the firm's future prospects among investors when the founder-CEO continues to lead the firm.

Given the complicated relationship between founder-CEO presence and various organizational outcomes, it is perhaps unsurprising that research finds substantial variance across deals in whether founder-CEOs are retained. A recent survey of VCFs suggests founder-CEOs are replaced about 67 percent of the time (Adams, 2005); academic studies typically put the number between 40 and 60 percent¹ (Boeker and Karichalil, 2002; Certo *et al.*, 2001; Fischer and Pollock, 2004; Jain and Tabak, 2008; Nelson, 2003; Wasserman, 2003). Although in practice founder-CEOs are retained almost as often as they are replaced, when going into deals VCFs frequently adopt as their starting position the institutionalized assumption that founding executives *may* need to be replaced by more professional managers with different kinds of experience (e.g., Flamholz and Randle, 2000; Rubenson and Gupta, 1996; Wasserman, 2003). Illustrating this pattern, Wasserman (2003: 154–5) quotes a partner of one venture capital firm he studied as noting that, 'Our default assumption when we first look at a company is that the founder-CEO can't lead this company going forward.' When pushed for an explanation of how the VC 'had arrived at this rule of thumb,' the partner 'admitted that it was a widely held belief within the venture capital industry and one that he had not questioned (Wasserman, 2003: 167).' Similarly, another VC said that one of his criteria when deciding whether to invest in a firm is whether or

¹ Whereas the Adams (2005) survey focuses only on VC-backed start-ups, some of the other studies include mixed samples of VC and non-VC backed companies. Founder-CEOs may be less likely to be replaced in non-VC backed firms.

not there is likely to be a fight if he decides to replace the founder as CEO. He asks founders, 'Are you the guy (or woman) to take this company all the way?' If they insist that they are, he becomes less inclined to invest in the company. Thus, what drives the decision to ultimately retain or replace a founder-CEO becomes an important question.²

The first and most obvious answer would be poor performance. However, this assumption is problematic. Given the early stage of both market and company development at which many VCF investments are made, CEO performance may sometimes be difficult to judge, especially during periods between major milestones. More importantly, in empirically testing the assumption that founder replacements occur in response to poor performance, Wasserman (2003) found just the opposite: founder-CEOs were more likely to be replaced when the company was performing *well*. Wasserman's study showed that founders who led their firms to successfully develop their initial product, complete more rounds of financing, and successfully raise larger amounts of financing were more likely to be replaced. In Wasserman's interpretation, VCFs do not see the founder-CEO's skills in dealing with the firm's critical contingencies at one stage as evidence that the founder-CEO's skills will continue to be a good match for firm needs in the future. He also suggested that VCFs make these judgments proactively, making 'CEO changes before a mismatch would cause problems' (Wasserman, 2003: 165). Thus, poor prior performance does not appear to be the primary driver of the founder retention or replacement decision, as is often the case in large public corporations (see Finkelstein, *et al.*, 2009, for a recent review).

Instead, we argue that VCFs' perceived uncertainty about future performance may strongly influence whether the founder-CEO is retained.³ Across

²In addition to the benefits of founder-CEO retention discussed earlier, prior research has suggested that founders who retain high levels of ownership increase their likelihood of maintaining the CEO position (Boeker and Karichalil, 2002; Wasserman, 2003). We acknowledge that there are additional factors such as CEO ownership power that influence the founder-CEO retention outcome, and attempt to control for these additional influences in our analysis.

³We differentiate in this study between sources of uncertainty and perceptions of uncertainty. This distinction is important, because we are making no theoretical claims about whether or not particular actions VCFs may take—or indicators VCFs may rely on in their decision making—affect actual levels of uncertainty. Rather, our theoretical and analytical approach is to explore how different indicators may affect the extent to which a VCF perceives more or less uncertainty (regardless of whether

their investment portfolios, VCFs face high levels and multiple sources of uncertainty—including technological, product market, financial market, and regulatory issues—over which they have little or no control. Further, as we've already noted, VCFs frequently enter a relationship with substantial uncertainty about whether the founder will be the right individual to lead the company all the way to and through an IPO. Perceptions of uncertainty about a firm's leadership, however, are a potential source of perceived uncertainty⁴ that VCFs *can* address.

Prior research suggests organizations frequently draw on their existing repertoires of routines when responding to new and uncertain situations (Baker and Nelson, 2005; March and Olsen, 1976; Weick, Sutcliffe, and Obstfeld, 1999), even if the action or routines were developed to deal with a different environmental context or set of issues. This is because existing routines provide a useful starting place from which organizations can begin enacting their environments (Weick, 1995), as they allow the organization to engage in concrete behaviors over which it has some control. Research has also demonstrated that in uncertain conditions organizations are more likely to take what they believe are safe courses of action (Haunschild and Miner, 1997) that are accepted as a reasonable and legitimate means for responding to uncertainty within their industry (Cyert and March, 1963; DiMaggio and Powell, 1983; Haunschild, 1994). Retaining a founder-CEO is a potentially uncertainty-increasing gamble that the current leadership will be able to continue to meet future demands, while replacing a founder-CEO with a proven professional whose leadership capabilities are better known reduces a specific source of leadership uncertainty (Flamholtz and Randle, 2000; Rubenson and Gupta, 1996).

The notion that founding entrepreneurs are not necessarily the right individuals to take a company through all stages of its life cycle not only has

or not these perceptions are accurate), and through their effects on a VCF's perceived uncertainty, influence the likelihood that a founder-CEO will be retained. Our empirical analysis tests the relationships between these indicators and the likelihood of founder-CEO retention.

⁴It is important to recognize that we are not claiming this is the only, or even the primary, source of uncertainty. Rather, we are arguing that it is the potential source of uncertainty over which the VCF is likely to have the most direct control and, thus, is the source of uncertainty VCFs will be most likely to attempt to influence if they feel the need to act, regardless of its role in the overall level of uncertainty perceived.

currency among venture capitalists (Wasserman, 2003), it is also widely perceived outside the VC industry as a legitimate belief (e.g., Flamholtz and Randle, 2000; Hambrick and Crozier, 1985) and has been used to justify the actions of other institutional actors, such as investment banks (Certo *et al.*, 2001). Replacing the founder-CEO is a concrete action VCFs can take that is widely perceived as legitimate, is associated with uncertainty reduction, and is seen as an important signal of good and active governance by other stakeholders (Shen and Cannella, 2002). Thus, replacing the founder-CEO may not only yield instrumental benefits because it replaces an unproven leader with an individual who has experience dealing with the myriad sources of uncertainty the firm will face as it moves forward, it can also yield symbolic benefits (Meyer and Rowan, 1977; Pfeffer and Salancik, 1978). Meyer and Rowan (1977: 355) note that, ‘activity has ritual significance . . . it maintains appearances and validates an organization’ even if its substantive effects on actual organizational efficiency are unclear. Replacing the CEO is often employed as a ritual means of moving an organization in a new strategic direction or distinguishing between past and future organizational events (Boeker, 1992; Finkelstein *et al.*, 2009; Wiesenfeld, Wurthmann, and Hambrick, 2008). Further, professionalization can play an important symbolic as well as substantive role because it is an activity that absorbs perceived uncertainty (Meyer and Rowan, 1977). Therefore, we expect that high levels of perceived uncertainty—whatever its source—will make founder-CEO retention less likely (Boeker and Karichalil, 2002) and that lower VCF perceptions of uncertainty increase the likelihood the founder-CEO will be retained.

Founder-CEO retention decisions in a new industry context

An important source of uncontrollable uncertainty is the nature and stage of development of the start-up firm’s industry. Although VCFs specialize in making investments in highly promising but highly uncertain growth industries, even for these firms the early days of Internet commercialization were extraordinarily novel (Aldrich and Baker, 2001). While all IPOs are uncertain (Pollock and Rindova, 2003; Pollock, Rindova and Maggitti, 2008; Ritter and Welch, 2002), the level of uncertainty surrounding an IPO was magnified for Internet sector firms, especially during the mid- to late-1990s when firms were

going public at an unprecedented rate and at a younger age than had previously been typical. Many firms were going public with untried business models and limited revenue streams. In addition, although the Internet has existed since 1969, the technologies underlying the development of commercializable Internet-related business applications were still in their infancy in the mid- to late-1990s, and it was not clear how much sustained demand there was going to be for the products and services being offered (Santos and Eisenhardt, 2009; Sine *et al.*, 2006). As a consequence, the purpose and nature of the firms themselves changed rapidly (Rindova and Kotha, 2001), dot com founder-CEOs were popularly characterized⁵ as young and unproven (Kuemmerle, 2002), investment analysts were creating new metrics to justify sky-high firm valuations that could not be justified using traditional indicators, and management gurus were publishing books with titles like *Blown to Bits*, arguing that the skills and capabilities needed to run *old economy* bricks and mortar companies had been rendered moot.

Facing these considerable uncertainties as unprecedented amounts of investment dollars poured into their coffers, VCFs that invested in Internet companies were under considerable pressure to make good leadership decisions in order to influence the performance of their portfolios. However, it is also important to note that not all subsegments of the emerging Internet industry were likely to be equally unfamiliar to VCFs. Indeed, consideration of the different types of firms identified as ‘Internet companies’ reveals significant differences in their similarity to non-Internet technology firms. *Infrastructure companies* such as UUNet, Cobalt Networks, Netzero, and AboveNet Communications had business models and assets that were the most similar to other non-Internet related technology companies. *Business-to-business* (B2B) firms such as AdForce, Doubleclick, Ariba, and Marimba often pursued business models that were similar to traditional companies selling to other businesses, but introduced products and services (e.g., those related to Internet advertising) that were quite novel. Finally, *Business to consumer* (B2C) firms such as Amazon, eBay, WebVan, Peapod, Pets.com, and others put many traditional

⁵ Although the assumption that most dot coms were founded by individuals in their twenties has become a popular myth, in our sample the average founder-CEO was 41 (S.D. 7.5) at the time of the IPO, and ages ranged from 24 to 65.

consumer sales processes on the Web, but also introduced some of the most novel and untried business models seen during this period.

Thus, the level of industry-based uncertainty a VCF perceived was likely to vary based on the industry subsegment in which a portfolio firm competed. Whether B2B or B2C industries were perceived as more uncertain is largely an empirical question that we will explore in our analysis; however, as a group, B2B and B2C companies introduced new and untried products, strategies, and technologies that likely made them less familiar and more uncertain than infrastructure companies. We, thus, expect that VCFs were less likely to retain a firm's founder-CEO in B2B and B2C companies than in infrastructure companies and hypothesize:

Hypothesis 1: The more uncertainty associated with an IPO firm's Internet industry subsegment, the less likely a VCF will be to retain the founder-CEO.

Moderators of industry uncertainty

Hypothesis 1 represents our baseline argument. However, we also anticipate that different kinds of experience can influence the extent to which industry uncertainty affects VCFs' overall perceptions of uncertainty and decreases the likelihood a founder-CEO will be retained. We consider three types of experience that may reduce a VCF's perceived uncertainty and increase the likelihood of founder-CEO retention: (1) the prior experience of the founder-CEO; (2) the VCF's experience with Internet companies; and (3) the VCF's general experience with emerging industries.

As noted previously, a major concern leading to the replacement of founder-CEOs is that they do not have the requisite skills and experience to run a company as it grows and develops (Flamholtz and Randle, 2000; Rubenson and Gupta, 1996). However, individual entrepreneurs vary significantly in the amount of knowledge and experience they bring to their new venture. Many entrepreneurs have substantial experience working in new start-ups (Wasserman, 2003) and have served as CEOs (Dimov and Shepherd, 2005; Jain and Tabak, 2008; Wasserman, 2003). In addition, prior research has shown that possession of an MBA degree is also viewed positively by venture capitalists and other investors (Dimov and Shepherd, 2005). Thus, to the extent that a founder-CEO has the training and

experience—or *human capital*—perceived as necessary to successfully run a fast-growing enterprise, VCFs may be more confident in the CEO's ability to deal effectively with industry uncertainty. This reduces their perceptions of the risks associated with industry uncertainty, thus reducing the effects of industry subsegment on founder retention decisions. Thus, we hypothesize:

Hypothesis 2: The founder-CEO's human capital will reduce the negative effects of Internet industry subsegment uncertainty on founder-CEO retention.

Prior research suggests that simply having prior experience with an activity or situation can reduce associated perceptions of uncertainty (Carpenter *et al.*, 2003; Sitkin and Pablo, 1992). Both the VCF's experience with Internet companies generally, and the VCF's overall experience with emerging industries are types of VCF experience that may reduce its perceived uncertainty about the B2B and B2C industry subsegments and, therefore, increase the likelihood that a founder-CEO will be retained.

Research suggests that VCFs learn important industry lessons by paying attention to their experiences with portfolio firms (De Clercq and Sapienza, 2005). Thus, a VCF's prior experience in the Internet industry could provide it with the opportunity to develop the skills and deal access necessary to locate, choose, and manage investments in this challenging context, thereby affecting its perceptions of industry uncertainty. Consistent with these expectations, in a recent study of VC experience on portfolio firms' strategic decision making in the medical device industry, Carpenter and his colleagues (2003: 806) suggested that, 'perceptions can be driven by the expectation that particular experiences will lead to an actual decrease in the risks being faced.' They found that if a venture capitalist sitting on the firm's board did not have prior international experience, the firm was less likely to pursue an internationalization strategy; but if the VC had prior experience the effect was reversed, and the firm became *more* likely to pursue this strategy. They argued this was because the VC's prior experience and exposure to international issues and markets reduced his/her perceived uncertainties of the risks associated with these actions. Following this same logic, we expect that VCFs with greater experience guiding Internet firms to IPOs will perceive lower levels of uncertainty than will VCFs with less experience in successfully developing Internet companies.

Similar arguments can be made about a VCF's experience with emerging industries, more generally. Over the last 40 years, VCFs have participated in the genesis and development of other new and unfamiliar industries, including semiconductors, personal computing, and biotechnology. Each of these industries offered substantial uncertainties regarding the nature of the technology, its market potential, and the business models necessary to realize the new technology's value. Since older VCFs are more likely to have been involved at the beginning of a variety of emerging industries and, therefore, have had more experience and opportunities to develop routines for dealing with the types of uncertainties they are likely to face in the current context (Nelson and Winter, 1982), they may perceive less uncertainty in dealing with Internet companies than newer venture capital firms that have not had similar experiences. Recent research suggests that a large number of new venture capital firms were founded during the 1990s as investment capital poured into the industry and the IPO market heated up (Lee and Wahal, 2004). Thus, to the extent that a firm is older and has developed the experience and routines necessary to invest in and develop firms in emerging industries, the less likely perceived industry uncertainty is to result in replacing the founder-CEO. Therefore, we hypothesize:

Hypothesis 3: The experience of the VCF with taking IPO firms public will reduce the negative effects of Internet industry subsegment uncertainty on founder-CEO retention.

Hypothesis 4: The age of the VCF will reduce the negative effects of Internet industry subsegment uncertainty on founder-CEO retention.

DATA AND METHODS

We collected data on 389 U.S. Internet-related firms that went public between 1995 and 2000. Our unit of analysis was the VCF/IPO combination. Of our original sample, 320 companies received venture financing. We eliminated firms where no founder data were available—because all founders had left the organization prior to registering for the IPO—and all observations where VCFs participated in only one IPO (since VCFs needed to participate in at least two IPOs for us to be able to calculate our lagged and cumulative variables). We also

eliminated observations where founder-CEO replacements occurred more than 60 days before the close of the first investment round in which the VCF participated. We used a 60-day buffer because it is possible that replacing the founder-CEO could have been a condition for the VCF's investment.⁶ Our final sample yielded 340 VCF/IPO observations, reflecting the participation of 114 venture capital firms in 193 IPOs. The number of IPOs a VCF participated in ranged from two to 23. Except where otherwise noted, the data used to create the variables described below were obtained from the IPO firms' offering prospectuses.

Dependent variable

Founder-CEO retention. This was a dummy variable coded 1 if a company's CEO at the time of its IPO was a founder and 0 otherwise, even if the founder continued to hold another executive position within the company and/or serve on the board of directors. We cannot directly measure whether founder-CEO replacements were initiated by VCFs. However both the practitioner (e.g., Gordon, 2002; Levensohn, 2006) and academic literatures (e.g., Boeker and Karichalil, 2002) suggest that founder-CEO replacements at highly promising ventures are generally instigated by VCFs and outside board members.

Independent variables

Subindustry categories. Following Pollock and Gulati (2007) we initially created dummy variables for each of the following Internet subindustry classifications:

1. **e-Infrastructure:** Data, voice and video carriers, Web hosts, hardware suppliers
2. **e-Services/solutions:** Consultants, software/applications, back office services
3. **e-Advertising/marketing/media:** Internet advertising and research
4. **e-Retail:** Consumer products and services
5. **e-Finance:** Banks, brokers, and credit companies
6. **e-New media:** Advertising/subscription-supported communities

⁶We also experimented with a 30-day buffer. The results were substantively the same.

7. **e-Internet service providers:** Toll-supported access providers
8. **Infomediaries:** Firms that act as liaisons between buyers and sellers and do not carry a significant amount of inventory; we further restrict the definition to include only firms that have a consumer on at least one side of the deal (i.e., business-to-consumer and consumer-to-consumer middlemen)
9. **Business-to-business:** Firms involved in business-to-business e-commerce

We then collapsed these dummy variables into three broad categories: (1) *B2B* companies (subindustry categories 2, 3, and 9) that had businesses on both sides of business transactions; (2) *B2C* companies (subindustry categories 4, 5, 6, and 8) that had consumers on at least one side of the transaction; and (3) *infrastructure* companies (subindustry categories 1 and 7) that provided Internet access and other infrastructure products and services. Using these broader classifications captures the major differences within the industry and avoids problems with increased collinearity and certain industry categories perfectly predicting the outcome. We created dummy variables, coded 1 if a firm was in the B2B or B2C subindustry segment, respectively, and 0 otherwise. We treated infrastructure companies as the excluded category.

Moderators

Founder-CEO human capital index. This measure was an index comprised of three dimensions of a founder-CEO's human capital: whether or not the founder-CEO had previous experience in a start-up, whether or not the founder-CEO had previous experience as a CEO, and whether or not the founder-CEO possessed an MBA. Thus, the index ranged in value from zero to three. In developing the index we also considered founder-CEO age, but unlike the other three measures founder-CEO age did not have a significant main or moderating effect when used in the models individually, so we excluded it from our analysis. Employing an index of these three dimensions was a parsimonious way to test our second hypothesis. Further, combining these three indicators into single index avoided collinearity problems associated with the high correlation between prior CEO and prior start-up experience. Our approach was also consistent with recent calls for greater use of indices in strategy and governance

research to operationalize multidimensional constructs (Boyd, Gove, and Hitt, 2005).

Number of prior Internet-industry deals. This measure equaled the total number of Internet IPOs in which the VCF had participated prior to the current IPO.

VCF age. Consistent with prior research (e.g., Gompers, 1996; Lee and Wahal, 2004), this measure was calculated as the difference between the year the VCF raised its first fund and the year of the IPO. Because the effects of VCF age are likely to be nonlinear (e.g., the difference between a one-year-old VCF and a six-year-old VCF is likely to be greater than between a 35-year-old VCF and a 40-year-old VCF), and VC firms in our sample range from zero to 54 years in age at the time of the IPOs, we transformed this measure into its natural logarithm.⁷ Data on the year each VCF raised its first fund were obtained from the *VentureXpert* database.

Control Variables

Perceived market uncertainty. We operationalized VCFs' perceived market uncertainty as the absolute value of the amount of underpricing a VCF experienced on its prior Internet-sector IPO. Underpricing, defined as the percentage change in stock price between the initial price set for an IPO firm's shares and the closing price at the end of the first day of trading, is one of the most studied phenomena within the extensive finance literature on IPOs (Benveniste and Spindt, 1989; Loughran and Ritter, 2004; Ritter and Welch, 2002; Rock, 1986). Although average levels of underpricing have varied during different eras (Loughran and Ritter, 2004), there is generally a significant jump in price the day a company goes public. The larger this jump, the more the firm is said to have been *underpriced* relative to its market value.

Although a variety of factors have been identified over the last 30 years that influence underpricing (see Loughran and Ritter, 2004 and Ritter and Welch, 2002 for reviews), a common assumption underlying all of these studies is that underpricing reflects investor uncertainty about a firm's likely future performance. These uncertainties can be driven by lack of information about specific aspects of the company

⁷Because there were zero values, a 1 was added to all observations before transforming the measure.

and also by more general concerns about the industry in which the firm competes and the general market conditions it faces (Gulati and Higgins, 2003). On average, high levels of underpricing relative to the norms of the period reflects greater dissensus and higher levels of perceived uncertainty about the value and future potential of the company's stock; the less the perceived uncertainty, the greater the consensus regarding the value of the company and the lower the underpricing the IPO experiences.

We are unable to measure VCFs' perceived uncertainty directly. However, given the rapidly changing conditions during the late-1990s, we expect that VCFs would treat the level of underpricing experienced on their most recent Internet IPO as an important source of timely and relevant information about the market uncertainties present in this new industry. Recent experience with underpricing, therefore, serves as a useful proxy for levels of perceived market uncertainty that a VCF faces. This proxy is likely to have been particularly salient given the many sources of uncertainty that VCFs faced during the Internet bubble. Indeed, underpricing averaged approximately 7.4 percent during the 1980s and 12 percent during the early-1990s, but averaged 65 percent in 1999 and 2000. During these two years, underpricing varied widely, demonstrating the substantial levels of uncertainty during this period. Although the vast majority of IPOs experience positive changes in market value on the first day of trading, some IPOs experience declines in price, which also reflects dissensus and higher levels of perceived uncertainty. Thus, we used the absolute value of underpricing (scaled as a decimal percentage) to capture the general amount of uncertainty.

VCF's prior Internet-sector investment performance. This measure was operationalized as the average six-month post-IPO performance of all Internet-sector IPOs in which the VCF participated prior to the current IPO. We chose the six-month time period because stock ownership lockup provisions that restrict a VCF's sale of its stock typically expire after six months of trading (Field and Hanka, 2001; Levin, 2001). Thus, the six-month time frame may be of particular relevance to venture capitalists. This measure was calculated as the percentage change in stock price between the price at the end of the first day of trading and the price of the stock at the close of the 180th day of trading. We removed the change in stock price on the first day of trading

(the amount of underpricing the stock experiences) from this measure since it is captured as a separate independent variable. The data used to calculate this measure were collected from the *Center for Research on Securities Pricing (CRSP)* database.

VCF ownership power. We measured VCF ownership power as the pre-IPO percentage of the firm's equity owned by the focal VCF.⁸ Overall, VCF ownership in a firm may be concentrated in the hands of one or two VCFs, but is often spread across several different VCFs (Lerner, 1995). Prior research suggests that ownership concentration may affect governance in important ways, and it is often argued that more concentrated ownership adds to a VCF's power (Boeker and Karichalil, 2002; Flamholtz and Randle, 2000).

Time since last Internet IPO. The time that elapsed between a VCF's prior Internet IPO and the current IPO can influence its ability to infer meaning from its experience and make behavioral adjustments that can influence the current IPO (Hayward, 2002). This measure was operationalized as the number of days between the previous Internet IPO in which the VCF participated and the current IPO. IPO dates were obtained from the *SDC New Issues* database.

Total number of VCFs invested in the IPO. This variable equaled the total number of VCFs that owned equity in an IPO firm at the time it went public. More than one VCF is usually involved in the funding of IPO firms (the average in our sample was 3.35 and ranged from one to seven). The number of VCFs involved in an IPO can affect the influence of any one VCF on the founder-CEO retention decision.

California dummy. This location variable was included to account for the fact that Internet firms located in California may have been geographically closer to many of the VCFs that specialize in technology companies and, thus, may have been subject to greater supervision and VCF involvement in the company's affairs.

Bubble year dummy. The Internet market bubble hit its peak in 1999 and 2000 and burst in the latter half of 2000. Thus, we coded this measure equal to 1 if a company went public in 1999 or 2000 and 0 otherwise to control for a variety of factors that

⁸We also considered the focal VCF's ownership as a percentage of the total portion of the firm's equity owned by all VCFs and the number of board seats a VCF controlled, but these measures were not significant in any of our models.

could be associated with the year in which the company went public.

CEO ownership. This variable equaled the percentage of a company's outstanding shares owned by the CEO prior to the IPO. This variable was included to control for the CEO's ownership power. Prior research suggests that the greater the retained ownership, the less likely a founder is to be replaced as CEO (Boeker and Karichalil, 2002).

IPO firm age. Firm age at IPO was calculated as the months since the firm's incorporation date. Older firms may have gone through more rounds of pre-IPO financing, putting the founder-CEO at greater risk of being replaced (Wasserman, 2003). Because firms ranged in age from three to 217 months in our sample, this variable was log transformed to reduce the effect of extreme values on the analysis.

Offer value. This measure equaled the total number of shares offered during the IPO multiplied by the offering price. The size of the offering can send signals to the market about the relative quality and stability of the offering and is frequently used as a control by finance scholars conducting IPO-related research (Ibbotson and Ritter, 1995). Because the offer values in our sample ranged from \$14.4 million to \$375 million, this variable was log transformed to reduce the effect of extreme values.

Board size. This measure equaled the number of individuals listed in the offering prospectus who are identified as members of the board of directors. This measure was used to control for the fact that the larger the board, the more difficult it is for the CEO or any one director to dominate its decision making (Pearce and Zahra, 1992).

Prone to IPO. In addition to funding IPO firms, VCFs also funded firms that did not go public during our period of study. To the extent these companies did not go public for reasons associated with the retention or replacement of the founder-CEO, this could result in an over- or under-representation of founder-CEO retentions among venture-backed companies that ultimately went public, creating a potential source of bias in our sample. In order to address this issue, we followed previous research (e.g., Higgins and Gulati, 2003; Stuart, Hoang, and Hybels, 1999) and created an instrumental variable that captured the likelihood a company would go public between 1995 and 2000.

First, we identified 222 companies listed in the *VentureXpert* database that were in the Internet sector, received at least one round of venture capital financing from 1995 to 1999, did not receive any venture

financing after 2000⁹, and were still private at the end of 2000. We combined these companies with the 193 IPO firms included in our sample on which *VentureXpert* also had data. We collected the following variables for each firm: (1) the number of rounds of venture financing received; (2) the total venture funding raised; (3) the number of VCFs invested in the company; (4) its subindustry category within the Internet sector; and (5) the year founded, which was used to create two founding dummy variables (one indicated the firm was founded before 1995 and the other indicated the firm was founded between 1995 and 1997). Firms founded after 1997 were treated as the excluded category. These variables were used in a probit regression to predict whether or not a company went public during our period of study. The overall model was highly predictive, with all three VCF-related variables and two of the industry dummies significantly predicting the likelihood a firm would go public. This regression was then used to create the selectivity instrument that was included in our logistic regressions predicting founder-CEO retention (Higgins and Gulati, 2003).

Method of analysis

Our hypotheses were tested using logistic regressions. Because the same VCFs were included in the sample multiple times, the observations are not independent. In order to correct for this, we calculated standard errors using the *robust* and *cluster* commands in Stata 9.0. These commands calculated Huber-White-Sandwich estimates for the standard errors and correct for nonindependence of observations within VC clusters.¹⁰

RESULTS

Table 1 presents descriptive statistics and correlations for all the variables used in our analysis. To

⁹Because we are controlling for the probability that a firm went public during our period of study, which ended in 2000, it is important to make sure the data only reflects VCF financing activities during the period a firm is at risk in our analysis. Since *VentureXpert* only reports this information cumulatively (i.e., as of the date the data were collected), we had to exclude firms whose data reflected financing activities that occurred after 2000, as we were unable to separate pre- and post-2000 activities.

¹⁰In analyses not reported here we also clustered based on company, rather than VC firm, since some IPO firms are also represented in our sample multiple times. The results were the same as those presented here.

Table 1. Descriptive statistics and correlations

Variable	ID	Mean	SD	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Founder-CEO retention	1	0.60	0.49	1.00																
IPO firm age	2	51.09	32.21	0.00	1.00															
Offer value	3	82.04	54.45	0.00	-0.29	1.00														
Bubble years dummy	4	0.90	0.30	0.03	0.18	0.23	1.00													
CA dummy	5	0.48	0.50	-0.13	-0.03	0.07	-0.05	1.00												
Total VCFs	6	3.39	1.49	0.07	0.06	0.01	0.05	-0.11	1.00											
Time since last IPO	7	194.10	277.77	-0.01	-0.05	-0.09	-0.27	-0.05	-0.03	1.00										
Board size	8	6.74	1.57	-0.14	0.01	0.13	-0.04	-0.06	0.12	-0.03	1.00									
Selection instrument	9	0.78	0.23	0.23	-0.02	0.26	0.21	0.20	0.31	-0.15	0.23	1.00								
CEO stock ownership	10	11.41	11.93	0.47	-0.03	-0.10	-0.03	-0.08	-0.29	0.01	-0.18	-0.33	1.00							
VCF stock ownership	11	15.25	9.94	-0.03	0.02	-0.08	0.00	-0.15	-0.35	0.00	-0.15	-0.24	-0.03	1.00						
Avg. prior post-IPO perf.	12	165.12	170.64	-0.08	-0.04	0.00	0.13	0.15	-0.07	-0.25	-0.06	0.08	0.01	-0.01	1.00					
Abs val. prior underpricing	13	0.94	1.00	-0.06	-0.01	0.10	0.18	0.07	-0.06	-0.26	0.03	0.03	0.03	0.03	0.25	1.00				
Number of prior deals	14	4.14	3.94	-0.12	0.01	0.21	0.14	0.10	-0.08	-0.33	0.10	0.16	-0.04	0.04	0.09	0.11	1.00			
VCF age	15	16.46	9.99	0.00	0.10	-0.01	-0.13	0.03	-0.08	-0.02	0.05	-0.06	0.00	0.09	-0.05	0.01	0.31	1.00		
Founder-CEO HC index	16	1.82	0.91	0.57	-0.01	0.09	0.08	0.07	0.12	0.01	-0.01	0.20	0.19	-0.03	-0.05	-0.02	-0.01	-0.02	1.00	
B2B	17	0.56	0.50	0.01	0.22	-0.21	0.05	-0.02	-0.05	0.07	-0.11	-0.23	0.11	0.09	0.03	-0.02	0.01	0.07	-0.06	1.00
B2C	18	0.28	0.45	-0.04	-0.12	-0.06	-0.06	0.02	0.05	-0.09	0.06	0.12	-0.01	-0.04	-0.08	0.05	0.00	-0.04	0.04	-0.06

Correlations > 0.09 significant at p < 0.05, correlations > 0.12 significant at p < 0.01. All means and standard deviations are based on untransformed measures; correlations are based on log-transformed measures, where appropriate.

ease interpretation, the means and standard deviations reported in Table 1 were calculated using untransformed variables.

Table 2 presents the results of logistic regressions predicting retention of the founder-CEO. In logistic regression, the unstandardized regression coefficients represent the logarithm of the odds of the focal event occurring (i.e., the odds ratio, which equals the probability of the event occurring divided by the probability the event will not occur). To ease interpretation in Table 2, we exponentiated the coefficients and present the odds ratios. Thus, the values in our regression table represent the multiplicative impact of the predictor on the probability of the focal event—in our models, retention of the founder-CEO—occurring divided by the probability the event will not occur. An odds ratio above 1 indicates that a one-unit increase in the independent variable increases the odds of retention, while an odds ratio below 1 indicates that a one-unit increase in the independent variable reduces the odds of retention.

In order to reduce nonessential collinearity in our models (Cohen *et al.*, 2003), the variables used in our interactions were mean centered. Collinearity diagnostics show that while the overall condition index is relatively high (approximately 23–24) for our models, it is still well below the recommended cutoff level of 30 (Belsley, Kuhn, and Welsch, 1980) in all but one instance, which is when the interactions between founder-CEO human capital and the B2B and B2C dummy variables are included in the model at the same time (condition index = 35). Therefore, we present each of our interactions testing the hypotheses separately.¹¹ Model 1 in Table 2 includes the control variables. Model 2 adds the main effects of B2B and B2C and tests Hypothesis 1. Models 3 and 4 add the interactions testing Hypothesis 2, Models 5 and 6 add the interactions testing Hypothesis 3, and Models 7 and 8 add the interactions testing Hypothesis 4.

Model 1 reveals that a number of our control variables have significant relationships with the likelihood of CEO retention and that the overall model fit is very good. In particular, IPO firm age, the number of VCs invested in the company, the percentage of stock owned by the founder-CEO, and

¹¹The pattern of interactions for prior deals and VCF age are the same when the respective interactions between these variables and the B2B and B2C dummies are included in the models together.

Table 2. Predicting founder-CEO retention

Variable	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8
Ln firm age	2.584* (1.088)	3.183** (1.427)	3.701* (1.954)	3.709* (2.041)	3.724* (1.950)	3.740* (1.944)	3.184** (1.409)	3.315* (1.569)
Ln offer value	2.139† (0.931)	1.317 (0.652)	1.427 (0.684)	1.628 (0.802)	1.523 (0.794)	1.702 (1.004)	1.404 (0.658)	1.569 (0.743)
Bubble years dummy	0.292† (0.214)	0.428 (0.290)	0.272* (0.178)	0.385 (0.266)	0.411 (0.272)	0.357 (0.244)	0.451 (0.298)	0.475 (0.320)
CA dummy	0.304* (0.176)	0.372† (0.213)	0.311* (0.181)	0.327† (0.200)	0.327† (0.188)	0.353† (0.194)	0.406† (0.222)	0.391† (0.215)
Total VCFs	1.303† (0.190)	1.313† (0.216)	1.379† (0.228)	1.426* (0.246)	1.268 (0.212)	1.272 (0.213)	1.366* (0.207)	1.390* (0.215)
Time since last IPO	0.998* (0.001)	0.998* (0.001)	0.998* (0.001)	0.998* (0.001)	0.998* (0.001)	0.998* (0.001)	0.998* (0.001)	0.998** (0.001)
Board size	0.950 (0.133)	1.078 (0.135)	1.026 (0.127)	1.026 (0.134)	1.090 (0.151)	1.087 (0.146)	1.051 (0.136)	1.063 (0.135)
Selection instrument	14.308* (15.502)	9.970* (9.451)	9.451* (9.234)	8.904* (9.494)	13.866** (13.406)	13.918** (13.346)	9.357* (8.990)	9.909* (9.076)
CEO stock ownership	1.715** (0.168)	1.885** (0.231)	1.914** (0.246)	1.912** (0.244)	1.949** (0.270)	1.930** (0.261)	1.912** (0.246)	1.929** (0.244)
VCF stock ownership	1.021 (0.018)	1.035* (0.018)	1.035† (0.019)	1.037† (0.019)	1.033† (0.018)	1.035* (0.017)	1.035* (0.018)	1.030† (0.017)
Avg. prior post-IPO perf.	0.999 (0.001)	0.998 (0.001)	0.999 (0.001)	0.999 (0.001)	0.998 (0.001)	0.999 (0.001)	0.998 (0.001)	0.999 (0.001)
Abs. val. prior underpricing	0.634† (0.161)	0.685 (0.170)	0.650 (0.174)	0.635† (0.168)	0.741 (0.189)	0.748 (0.195)	0.681 (0.166)	0.649† (0.153)
Number of prior deals	0.891** (0.038)	0.879** (0.044)	0.884** (0.042)	0.879* (0.046)	0.793** (0.060)	0.946 (0.045)	0.882* (0.043)	0.884* (0.047)
Ln VCF age	1.548 (0.566)	1.665 (0.635)	1.777 (0.655)	1.863† (0.687)	1.670 (0.655)	1.617 (0.613)	0.853 (0.589)	2.406** (0.792)
Founder-CEO HC index	7.232** (2.275)	8.619** (3.099)	5.093** (2.213)	18.922** (8.566)	9.248** (3.473)	8.839** (3.255)	9.524** (3.711)	9.973** (4.132)
B2B		0.115** (0.052)	0.087** (0.042)	0.101** (0.050)	0.094** (0.049)	0.119** (0.055)	0.098** (0.056)	0.116** (0.054)
B2C		0.194** (0.108)	0.227** (0.119)	0.335* (0.162)	0.195** (0.114)	0.255* (0.164)	0.199** (0.110)	0.261* (0.137)
B2B × founder-CEO HC index			3.276* (1.985)					
B2C × founder-CEO HC index				0.160** (0.092)				
B2B × prior deals					1.218* (0.105)			
B2C × prior deals						0.815† (0.096)		
B2B × VCF age							3.056 (2.268)	
B2C × VCF age								0.170† (0.162)
Log-likelihood	-84.119	-78.838	-77.162	-74.756	-76.925	-77.136	-77.369	-76.381
Wald chi-square	83.75	85.66	76.073	75.91	87.64	87.24	80.39	77.88
Pseudo-R ²	0.6330	0.6561	0.6634	0.6739	0.6644	0.6635	0.6625	0.6668
Observations	340	340	340	340	340	340	340	340

Effects reported as odds ratios. Robust standard errors in parentheses.

†significant at 10%; *significant at 5%; **significant at 1%.

the founder-CEO's human capital are all significant and increase the likelihood the founder-CEO will be retained. In addition, once the industry measures are added to the model, VCF percentage stock ownership also becomes significant and has a positive effect on founder-CEO retention. On the other hand, going public in 1999 or 2000, being located in California, the amount of time since the VCF last took an Internet company public, and the number of prior Internet-company IPOs the VCF has done are all significant and decrease the likelihood a founder-CEO will be retained.

Hypothesis 1 suggested that greater levels of industry uncertainty would decrease the likelihood a founder-CEO would be retained. This hypothesis was supported. Both B2B and B2C had significant effects with odds ratios less than 1 in Models 2 to 8. Model 2 indicates that the odds ratio for being in the B2B industry subsegment was 0.115, and the odds ratio for the B2C industry subsegment was 0.194, both in comparison to firms in the infrastructure segment. We employed the *lincom* command in STATA to determine whether the difference between being in the B2B and B2C industry subsegments was significant; results of this analysis showed no statistically significant difference between the effects of B2B and B2C.

Hypothesis 2 suggested that higher levels of founder-CEO human capital would reduce the negative effects of industry uncertainty on the likelihood of retention. This hypothesis was partially supported. When the B2B \times founder-CEO human capital index interaction was added in Model 3 the main effect odds ratio remained significant and less than 1, while the interaction term odds ratio was significant and greater than 1. Interpretation of the interaction odds ratio indicates that a one-unit increase in the founder-CEO human capital index reduced the negative effect of B2B on the odds of retention by 3.276 times. To interpret the effect of CEO characteristics on the perceived uncertainty associated with B2B, we employed the *lincom* command in STATA to calculate the odds ratio for B2B when the founder-CEO human capital index was equal to 1 versus when it was equal to 0. The resulting odds ratio (0.287) was significant at $p < 0.07$. Thus, although the overall effects of B2B on the likelihood of retention was still negative, the odds ratio was roughly tripled by a one-unit increase in the CEO index. A different pattern of results was obtained, however, when the founder-CEO human capital index was interacted with the B2C indicator. Model 4 shows

that when this interaction is included in the model, the main effect odds ratio of B2C remained significant and was less than 1 and the interaction odds ratio was significant; however, it was also less than 1 (OR = 0.16). Interpretation of the interaction using *lincom* suggests that a one-unit increase in the founder-CEO human capital index resulted in an odds ratio of 0.053 ($p < 0.001$); that is, the odds ratio was approximately cut in half by a one-unit increase in founder-CEO human capital index.

Hypothesis 3 suggested that the number of prior Internet IPO firms a VCF had taken public would reduce the effects of Internet industry subsegment uncertainty on the likelihood of founder-CEO retention. The results in Models 5 and 6 provide mixed support for this hypothesis. Consistent with the hypothesis, the B2B \times prior Internet IPOs interaction odds ratio was significant and resulted in an odds ratio of 0.115 ($p < 0.001$), suggesting that each additional prior IPO reduced the negative effect of B2B by approximately 21 percent. However, the B2C \times prior Internet IPOs interaction had a significant odds ratio less than 1, and the comparison odds ratio was 0.208. Thus, a one-unit change in the number of prior deals *increased* the negative effect of B2C on retention by approximately 19 percent. Therefore, Hypothesis 3 was supported for B2B firms, but not for B2C firms.

Hypothesis 4 suggested that VCF age would reduce the effects of industry uncertainty on the likelihood of founder-CEO retention. This hypothesis was not supported. The B2B \times VCF age interaction odds ratio was greater than 1, but it was not significant. The B2C \times VCF age interaction odds ratio was significant, but it was less than 1. Because the moderator is a continuous measure, in order to interpret the interaction we had to assign a value to VC age. Using the mean value for VC age in our sample, the resulting comparative odds ratio was 0.002 ($p < 0.02$), suggesting an average-aged VC firm further reduced the odds ratio to nearly 0.

DISCUSSION

In this study, we explored whether and how owners' perceptions of uncertainty in a novel industry context influenced their decisions to retain or replace founder-CEOs. We developed and tested theoretical arguments that—in the context of a highly uncertain and rapidly changing new industry—venture capital firms' decisions to retain founder-CEOs would be

influenced by their perceived uncertainty about the industry subsegment and that the effects of this perceived uncertainty would be moderated by the founder-CEO's experience and education and by the VCF's relevant prior experience in the Internet industry and in prior emerging industries.

Our results showed that VCFs adapted their decisions based on perceived industry sector uncertainty. Founder-CEOs in Internet firms providing infrastructure products and services were more likely to keep their jobs than were founder-CEOs in the more uncertain B2B and B2C sectors. We did not theorize specific differences between B2B and B2C, but the results of our moderating hypotheses showed distinctly different patterns. For B2B, our first two moderating hypotheses were supported. Founder-CEO and prior VCF experience successfully taking Internet companies public both reduced the likelihood that industry uncertainty would lead to founder-CEO replacement. The VCF's prior experience in other industries had no significant effect. For the B2C sector, all three moderators *increased* the likelihood that the founder-CEO would be replaced, which is the opposite of what we hypothesized. Below, we speculate about possible explanations for the distinctive patterns of findings between the B2B and B2C sectors. We also discuss an interesting pattern we had not hypothesized but noted for one of our control variables.

Theoretical contributions

The results support our most general argument that uncertainty plays an important role in shaping what may be the most important governance decision facing young firms. Our findings suggest that VCFs display a level of subtlety and nuance in their governance decisions, fitting founder retention and replacement to levels of subsector uncertainty, their own relevant industry experience, and to the characteristics of the founder-CEO. But they also suggest that in the face of high levels of perceived uncertainty, important governance decisions may be a little bit blunter, and aimed simply at reducing perceived uncertainty through whatever tools may be available. Further, at very high levels of perceived uncertainty or with particular sorts of uncertainty—as we suggest below may have characterized the B2C sector—VCFs may have been still trying to figure out how to govern their portfolio firms rather than simply or confidently applying approaches that had worked before. This provides an additional

challenge to the common assumption that owners somehow know whether and how to effectively use their ability to replace firms' leaders and suggests that—especially in the face of high levels of perceived novelty—important governance decisions may be characterized fundamentally as attempts to reduce perceived uncertainty.

Further, our study contributes to the literature suggesting that venture capital firms may make key decisions for symbolic reasons (e.g., Gompers, 1996; Lee and Wahal, 2004). For example, scholars have suggested that newer VCFs will *grandstand* by taking companies public earlier and with more underpricing to signal their capabilities to current and potential investors in their venture funds, thus enhancing their ability to raise larger venture funds in the future. Our findings are consistent with the idea that VCFs may also replace founder-CEOs for at least partially symbolic reasons, since such replacements can be a means of managing investors' perceptions of uncertainty even if they have no substantive impact on the firm's performance. Thus, our theory and findings may begin to provide an explanation why the literature on the effects of founder-CEO replacement on firm performance has found such mixed findings. Future research should continue to explore the symbolic, as well as substantive, motivations that may underlie VCFs' governance, investment, and other activities, and how the factors motivating a founder-CEO retention or replacement decision relate to subsequent firm performance.

Our study also contributes to the literature on corporate governance more generally. Our primary contribution here is to begin developing and testing theory that does not assume governance skills are automatic, general, or stable. For the important and perhaps increasingly prevalent condition of environmental uncertainty and change, our results demonstrate how owners are likely to adjust their governance decisions based on perceptions of environmental uncertainty, and also suggest that prior experience can alter perceived uncertainty and shape owners' interpretations in ways that lead to different governance decisions. Thus, in unstable and highly uncertain environments, we should not expect to observe the rapid emergence of a consistent pattern of strategic governance actions. Instead, idiosyncratic patterns are likely to emerge, creating the possibility for substantial industry-level trial and error learning (Miner and Haunschild, 1995).

We are intrigued by our findings of support for most of our moderating hypotheses for firms

providing products and services to other businesses and the contradiction to most of our moderating hypotheses for firms providing products and services to consumers. We had noted earlier that the levels and sources of uncertainty might differ between these sectors, but we did not hypothesize and are unable to fully explain the observed differences between them. Given the pattern of results, we speculate that the notion *everything is different* or *blown to bits* that was rampant in popular characterizations of the early Internet industry as a whole may have had more relevance for VCFs when investing in B2C firms than when investing in other sectors. While infrastructure and B2B business models were often directly analogous to those of more traditional firms, B2C business models were often characterized by difficulty answering fundamental questions, such as how to turn *eyeballs* (the number of people estimated to see a Web page) into cash flow, and other fundamental issues about how to *monetize* Web site activity. We speculate that in the face of very novel and uncertain B2C business models, VCFs may have discounted the ability of traditional indicators of human capital to predict success, and that the more they knew or learned about the uncertainty of this sector, the less confident they became in the wisdom of retaining founder-CEOs. As these interpretations are purely speculative, future research should continue to explore this issue.

Finally, we were struck by the consistent pattern of results for our control variable measuring the VCF's pre-IPO percentage ownership of the firm. We included this measure to control for differences among VCFs in the ability to assert preferences regarding whether to retain a founder-CEO. Although we had not developed a hypothesis in this regard, we expected that this proxy for VCF power might be associated with a greater likelihood of replacement, as powerful owners took action to make governance changes. Instead, our results suggest that this proxy for individual VCF power is associated with a greater likelihood of founder-CEO retention.

To the extent that future research supports our somewhat counterintuitive finding that greater VCF power can increase the likelihood of founder-CEO retention, it may point to the importance of the relationship between power and an owner's prior investment decisions. The perceived quality of the management team is often described as an important driver of VCF investment decisions (Zacharakis and Meyer, 1998; Zacharakis and Shepherd, 2005). Our

individual VCF ownership control variable is also an indirect measure of how much a VCF has chosen to invest in a particular firm and, therefore, may indirectly indicate how much they liked the management team, including the founder-CEO. If the VCF is betting heavily on *the jockey*, then it stands to reason it may use its power to keep this individual in place.

This interpretation is consistent with a folk theory related to us by one of the venture capitalists we interviewed informally. He claimed that when a VCF has a high ownership stake there is a tendency—in the VC's words—to 'go native' and identify more heavily with the founder. Similarly, as a general partner from another VCF put it, 'Once you've really gotten into a firm (financially) . . . you may have fallen in love with the CEO.' Perhaps when VCFs have made large investments in firms they believe to be endowed with good management, they tend to exhibit a degree of consistency and commitment (Cialdini, 2004), using their power to encourage retention. Beyond such speculation and VC folk theories, our findings regarding VCF ownership and power point to the usefulness of further research exploring the effects of the relationship between structural sources of power and owners' perceptions on governance.

Practical implications

We believe that our study also has significant implications for practitioners. Our overall models were highly predictive of the founder-CEO retention decision; thus, we believe we have captured many of the key factors that influence this decision. Some of these, such as founder-CEO stock ownership, are fairly obvious. But others, such as our theoretical variables, offer an interesting and nuanced set of factors entrepreneurs should consider when pursuing venture capital investments. Our findings show that VCFs' industry familiarity can have a significant effect on whether or not founders will be retained as CEOs, and that their own personal qualifications and experience—as well as the age and experience of the venture capital firm—can dramatically reduce or enhance these effects. To the extent entrepreneurs have the option to choose among different venture capital firms, they may want to consider these characteristics as additional criteria when deciding whose money to accept. Further, the findings for VCF ownership control suggest that (once he/she has decided to take on venture capital

at all) if an entrepreneur wants to increase the likelihood he/she will maintain control of his/her company, higher levels of ownership by individual VCFs may improve the odds.

Future research directions

Like all studies, this one has limitations that provide opportunities for further research. One set of future research directions arises from the fact that we do not directly ascertain VCFs' perceptions of uncertainty, but rather infer them based on more indirect external indicators we expect will influence their perceptions. Although our measures may be somewhat crude proxies, our results suggest the assumption we make appears to be reasonable. Nonetheless, future research conducted in real time as VCFs make these decisions is necessary to further validate our assumption and to continue exploring the important issue of how VCF perceptions influence founder-CEO retention and replacement.

A second future research direction results from the fact that we are unable to capture a VCF's prior experience in other industry contexts. However, it may be reasonable to assume that a VCF's initial behaviors will tend to reflect their prior experience. Further, the extent to which there are other, unmeasured factors influencing the founder-CEO retention decision serves to make ours a conservative test of our hypotheses. A related limitation is that in situations where there are multiple VCFs invested in a company, we have no way of knowing for sure which VCF was most responsible for replacing or retaining a founder-CEO. Although a VCF does not have to be the primary decision maker for its experience on a deal to influence its subsequent actions, our VCF ownership measure, as well as our control for the number of VCFs invested in the company, address many of the potential variations in VCF influence. Nonetheless, future research should continue to conduct finer-grained analyses on the dynamics of VCF syndicates and how they shape key strategic governance decisions. A second related limitation is that the infrastructure industry segment that we use as our baseline for comparison may still generate relatively high levels of uncertainty, compared to other industries. However, this would serve only to reduce variance between our industry sub-segments, again making this a conservative test of our hypotheses.

A third opportunity arises from the fact that we do not consider the specific role a founder moves

into once he/she steps down as CEO. There may be significant differences associated with whether the founder is retained in another operational role, remains involved in the company in a nonoperational role—such as director or chairman of the board—or ceases involvement with the company altogether. Future research should explore how different factors influence the specific forms that founder-CEO replacements take and the consequences they have for the firm.

A final set of opportunities arises from the fact that we cannot determine with certainty whether a VCF initiated replacement or the founder-CEO stepped aside voluntarily. While we recognize that founders may and do voluntarily step down as CEOs, there are many reasons to expect that this does not occur in the majority of cases. Both the empirical and practitioner literatures indicate that founders generally prefer to stay at the helms of the companies they started, and that it often takes a board vote to remove them (e.g., Boeker and Karichalil, 2002; Gordon, 2002; Levensohn, 2006; Wasserman, 2003). Indeed, one of the most significant indicators that a founder is likely to remain CEO of his/her company—in our study and others—is the percentage of stock ownership he/she retains, which gives him/her some power to resist replacement. If he/she were more likely than not to step aside voluntarily, then this would not be the case, and we would also be unlikely to observe the VCF-based effects we find in our study. Further, the extent to which there are instances in our sample where the founder-CEOs step aside voluntarily adds error variance to our models, making ours a conservative test of our arguments. Future research, using more fine-grained approaches (such as surveys or qualitative methods) should continue to explore this issue.

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