

THE THRONE VS. THE KINGDOM: FOUNDER CONTROL AND VALUE CREATION IN STARTUPS

NOAM WASSERMAN*

Harvard Business School, Boston, MA, U.S.A.

University of Southern California, Los Angeles, California, U.S.A.

Research summary: Does the degree to which founders keep control of their startups affect company value? I argue that founders face a “control dilemma” in which a startup’s resource dependence drives a wedge between the startup’s value and the founder’s ability to retain control of decision making. I develop hypotheses about this tradeoff and test the hypotheses on a unique dataset of 6,130 American startups. I find that startups in which the founder is still in control of the board of directors and/or the CEO position are significantly less valuable than those in which the founder has given up control. On average, each additional level of founder control (i.e., controlling the board and/or the CEO position) reduces the pre-money valuation of the startup by 17.1–22.0 percent.

Managerial summary: A founder’s vision and capabilities are key ingredients in the early success of a startup. During those early days, it is natural for the founder to have a powerful, central role. However, as the startup grows, founders who keep too much control of the startup and its most important decisions can harm the value of the startup. Both qualitative case studies and quantitative analyses of more than 6,000 private companies highlight that startups in which the founder has maintained control (by retaining a majority of the board of directors and/or by remaining as CEO) have significantly lower valuations than those where the founder has relinquished control. This is especially true when the startup is three years old or more. Copyright © 2015 John Wiley & Sons, Ltd.

INTRODUCTION

In a classic study of entrepreneurial growth, Eisenhardt and Schoonhoven (1990: 504) pose the question: “Some young firms become resounding successes. ... Others languish as small firms. ... Why do these differences in organizational growth arise?” I extend previous work by analyzing a factor that should have a powerful effect on whether value is created or the organization languishes: the degree to which the founder maintains control. I explore the possibility that the startup’s resource needs

drive a wedge between the growth of the startup and the founder’s ability to maintain control—a so-called “control dilemma.” Multiple steps along the entrepreneurial journey pose a tradeoff between attracting the resources required to build company value and being able to retain control of decision making.

The key resources founders can attract include human, social, and financial capital (Sapienza, Korsgaard, *et al.*, 2003) provided by cofounders, hires, and investors. However, attracting those resources often comes at the cost of ownership stakes and decision-making control. I develop hypotheses about this tradeoff, and test the hypotheses on a unique dataset of 6,130 American startups collected between 2005 and 2012. The analyses tap all respondents in the dataset and use

Keywords: entrepreneurship; CEO leadership; value creation; control and autonomy; managerial tradeoffs

*Correspondence to: Noam Wasserman, 150 Eliot Street, Chestnut Hill, MA. E-mail: nwasserman@mba1999.hbs.edu

fixed-effects with repeat respondents in order to control for unobserved time-invariant company characteristics.

This study adds insights to several literatures. Within the entrepreneurship literature, conceptual studies (e.g., Amit *et al.*, 2000; Evans and Jovanovic, 1989) have speculated that the desires for autonomy and control may affect the initial decision to *launch* a company, but have not broadened to include a fuller picture of company evolution. Likewise, analyses of entrepreneurial capital constraints have used bequests (e.g., Blanchflower and Oswald, 1998) and lottery winnings (e.g., Lindh and Ohlsson, 1998) to examine the propensity to *become* an entrepreneur. The entrepreneurial-finance literature (e.g., Hamilton, 2000; Moskowitz and Vissing-Jorgensen, 2002) has suggested that, on average, entrepreneurs receive fewer pecuniary benefits than they might receive in paid employment, but has not examined whether this is true for some types of entrepreneurs but not for others, and has not examined empirically whether those benefits might be affected by the degree of control retained by the founders.

In larger corporations, the economics literature has examined the private benefits of control in the securities of public companies (e.g., Barclay and Holderness, 1989; Grossman and Hart, 1988; Lease, McConnell, and Mikkelsen, 1983), but has not explored whether the private benefits of control extend to entrepreneurial decisions and outcomes. The corporate-finance literature on sustainable growth rates (e.g., Higgins, 1977, 1998) has highlighted the tension between growth objectives and financial policies, but its models ignore control considerations and it assumes stability in financial policies, reducing its applicability to our tension and to the types of companies examined here. In contrast to studies that focus on organizational relationships with *external* resource providers—such as corporate investment relationships, alliances, or joint ventures (e.g., Gulati and Sytch, 2007; Gulati and Wang, 2003; Katila, Rosenberger, and Eisenhardt, 2008; Ozcan and Eisenhardt, 2009)—this study focuses on resource providers who become part of the internal startup team, such as cofounders, hires, and investors who join the board of directors. Finally, resource-dependence theory has focused on the ways in which organizational uncertainty is *reduced* by attracting resources (Pfeffer and Salancik, 1978), but has largely neglected how another important uncertainty—“control uncertainty,” or

whether company leaders will lose control of decision making—may be *heightened* by the attraction of resources.

Thus, the current study develops the theoretical grounding for this control dilemma. I empirically test the hypothesized tradeoff using a large, unique dataset that includes direct measures of founder control. I also delve into alternative hypotheses and contingencies. The analyses use fixed effects to control for unobserved time-invariant characteristics of the startups, and test the hypotheses on different metrics of value creation. The analyses show that, *ceteris paribus*, startups in which the founder is still in control of the board of directors and/or the CEO position are significantly less valuable than those in which the founder has given up a level of control. On average, each additional level of founder control (i.e., keeping control of the CEO position or board) reduces the pre-money valuation of the startup by 17.1–22.0 percent.¹ The tradeoff is particularly strong in startups that are three years old or more. Because the analyses include a variety of resource providers (cofounders vs. hires vs. investors), I am also able to examine how different types of resources can differ in their impacts on the value that is built and on the founder’s retention of control.

THEORY AND HYPOTHESES

In 1997, when first-time founder Lew Cirne founded Wily Technology, an enterprise-application management company, he faced a wide variety of decisions about how to build his company. Over the next two years, he hired experienced executives, built a team of fifty employees, raised two large rounds of financing from top venture capitalists (VCs), and gave up three of five seats on the board of directors to those investors. When it came time to raise the next round of financing, the board decided that Wily needed a CEO who had stronger business skills than Cirne, who had a technical background (Wasserman and McCance, 2005). Their choice, “professional CEO” Richard Williams, replaced Cirne as CEO. For his part, Cirne was left with

¹ As described in “Data and Methods,” one of my two core metrics of company value is the pre-money valuation of the company at the most recent round of financing (e.g., Gompers *et al.*, 2010; Hsu, 2004), calculated as the price per share in the financing round times the number of shares outstanding prior to the round.

a very narrow technical-visionary role within the company. However, Williams was able to lead Wily to a big exit: a \$375 million sale to Computer Associates in early 2006. Cirne admits he could never have accomplished such value creation, but he nevertheless was left with painful regrets about his early decisions that had led to his being replaced.²

The founder of Steria, an information-technology systems and services company, faced similar decisions (Abetti, 2005). His desire “to remain independent and master of his own destiny” led him to resist cofounders, not to grant stock to potential employees, to refuse to accept capital from outside investors, and to maintain control of the company’s equity. As a result, he was able to remain chief executive officer, but the company’s growth was slowed markedly (Abetti, 2005).

I focus on a tradeoff that underlies the early founding decisions faced by the founders of Wily and Steria. Two decades ago, Stevenson and Jarillo (1990: 23) declared that “Entrepreneurship is a process by which individuals ... pursue opportunities without regard to the resources they currently control.” At first glance, this seems like an aspirational and optimistic definition. However, it has a dark side: When founding their businesses, entrepreneurs rarely control the key resources they will need to pursue the opportunity fully. In fact, it has been estimated that entrepreneurs are 60 times more likely to be resource constrained than to be unconstrained (Evans and Jovanovic, 1989).

Building on March and Simon (1958) and Pfeffer and Salancik (1978) state that an organization’s most critical activity is establishing a coalition large enough to ensure survival. Doing this requires the organization to provide inducements to get participants to contribute to the organization. Most centrally, in exchange for their resources, resource providers demand “the ability to control and direct organizational action” (Pfeffer and Salancik, 1978: 27). In the startup realm in particular, investors worry about hold-up by entrepreneurs, and control rights are the main form of protection that they demand in exchange for their investment (Hellmann, 1998). Entrepreneurs who refuse to give up control should find it harder to attract investors

² Soon after leaving Computer Associates, Cirne decided to found his next startup, New Relic. He solo founded New Relic and tapped his favorite Wily employees for his early hires. He cautiously self-funded New Relic for as long as he could, and made sure to keep control of his board of directors and to remain CEO, even at the expense of growing more value.

and thus fail to grow as much value. This “control dilemma” highlights how founders, despite their best intentions, can make decisions that limit the value of the companies they created, or else can risk losing control of their companies. In making resource decisions, founders thus trade off resource uncertainty for control uncertainty.

In this section, I develop hypotheses about the tradeoff between value and control, the contexts in which this tradeoff might not apply, and the resulting performance implications. In developing these hypotheses, I build on theoretical work and speculation in the entrepreneurship literature, and on multiple studies of large companies. Closest to home, prior studies (e.g., Amit *et al.*, 2000; Evans and Jovanovic, 1989) have examined conceptually how potential entrepreneurs’ motivations for control and financial gains might affect their initial decisions to *initiate* ventures. However, the tradeoff examined here applies throughout the early stages of company building, not only to the decision to initiate a venture, and has yet to be examined empirically among entrepreneurs.

In an empirical exploration of the decision to initiate a venture, Hamilton (2000) found that, on average, the earnings of self-employed entrepreneurs were lower, both initially and over time, than the earnings of those engaged in paid employment, despite the common assumption that it is the profit motive that attracts them to the challenge of building new organizations (e.g., Kirzner, 1973; Schumpeter, 1942).³ To explain why people decide to become entrepreneurs anyway, he speculated that “entrepreneurs may trade lower earnings for the nonpecuniary benefits of business ownership ... such as ‘being their own boss,’” (Hamilton, 2000: 605–606) but was not able to test this possibility empirically.⁴ (This speculation matches that of Carland *et al.* (1984), Amit *et al.* (2000), and Sapienza *et al.* (2003).) Below, I develop, enrich, and test this possibility.

This view of the tension between control and value creation contrasts with Berle and Means’s (1932) classical view of the separation

³ Similar empirical results were found by Moskowitz and Vissing-Jorgensen (2002) in small businesses and by Hall and Woodward (2010) in venture capital-backed startups.

⁴ Although Hamilton’s data sources may understate entrepreneurs’ earnings by a significant percentage (Hurst, Li, and Pugsley, 2010), even after adjusting for that underreporting, entrepreneurs still earn less than would be expected, though the difference is smaller than that reported in Hamilton (2000).

of ownership and control in large corporations, and with subsequent work on agency theory (e.g., Jensen and Meckling, 1976). When owners no longer manage the company, the managers' decisions often harm the value of the company because the managers' interests will diverge from those of the shareholders. (Regarding small companies in particular, Jensen and Meckling (1976: 312) state that the benefits derived by an owner-manager may involve "non-pecuniary aspects of entrepreneurial activities" such as being able to implement the founder's strategies.) In more modern terms, as founders give up equity to non-founders, agency costs should increase, reducing the value of the startup (e.g., Fama and Jensen, 1983; Jensen and Meckling, 1976). I propose a complementary resource-dependence effect that may counterbalance the increase in agency costs as founders give up control: Attracting key resources to the startup will help build its value.

When are founders more likely to surrender control?

Within high-potential startups, high rates of growth necessitate the attraction of a very high percentage of outside resources (Venkataraman, 1997), and the most valuable of those resources are usually in limited supply (Peteraf, 1993). Failure to attract missing resources can be particularly harmful because it can heighten the liability of newness, harm growth, and increase the chance of failure (Aldrich and Fiol, 1994; Stinchcombe, 1965). In fact, "Attracting resources into a fledgling venture is perhaps the greatest challenge faced by entrepreneurs." (Brush, Greene, and Hart, 2001: 71) The more resources that a new venture can gain control of, and the quicker it can do so, the better the venture's competitive position (Romanelli, 1989) and the more valuable the venture can become.

At inception, a startup might be missing resources in three major areas: human capital, social capital, and financial capital (Sapienza *et al.*, 2003). To fill those holes, "core founders" can attract cofounders, hires, and/or investors. (As described in more detail below, early on, resource-attraction decisions are in the hands of the *core founder*—the person who had the initial idea and initiated founding activities.⁵ As other

resource providers join the startup, they often gain a say in those decisions, either as terms of their ownership or through having a seat on the board of directors.) Cofounders and hires may bring new skills and industry knowledge, have contacts with customers or potential partners, and also contribute financial capital to help get the startup off the ground. Investors can contribute far more financial capital than the typical cofounder or hire but, as described below, may vary widely in the amount of other value they might add.

A core dilemma is that the startup's resource dependence drives a wedge between startup value and founder control. Each step of the entrepreneurial resource-attraction journey poses a tradeoff between attracting the resources required to build company value and being able to retain control of decision making. High-quality co-founders and non-founding hires should demand more equity and/or decision rights than will lesser co-founders and hires. The same is true of investors who can add the most value, compared to lower-value investors (for conceptual arguments, see Amit, Glosten, and Muller, 1990; for empirical evidence, see Hsu, 2004). Such investors want both to own a stake in the venture to gain from its growth in value and to protect their investments by having decision rights and influence through a board presence (Pfeffer and Salancik, 1978).

The more value that would be provided by the core founder, the more control s/he should be able to retain; the more value that would be provided by the other three resource providers, the less value that the core founder should be able to retain. On one side, *core founders* who have accumulated direct human capital in the form of prior founding experience (Sapienza *et al.*, 2003) and have developed the social capital necessary to attract employees to the startup, should be able to keep more control (Wasserman, 2003). The other resource providers should have the opposite effect on control of the startup; in order to attract value-added resource providers, founders should have to give up a share of the venture's control and its future rents (Coff, 1999). For instance, less studied than investors—but still very important from a resource-dependence perspective—is the way in which cofounders and hires might affect control of the startup. In young businesses, there is a close relationship between human capital and the success of the startup, especially for human capital developed through actual work experience

⁵ Although some startups have more than one core founder, a clear majority have a single one (Wasserman, 2012). Below, I will describe how I empirically identified the core founder.

(Unger *et al.*, 2011). Thus, the more *cofounders* who join the team, and the more experienced those cofounders, the more decision-making control the core founder should have to give up when attracting them.⁶ As the startup evolves, “the further into the start-up process one gets, the more specific and idiosyncratic will be the resources and information needed for further successful completion of the process” (Davidsson and Honig, 2003: 302). Such human capital improves strategic planning, resource acquisition, and operational effectiveness (e.g., Brush *et al.*, 2001; Shane and Venkataraman, 2000; Unger *et al.*, 2011). Thus, the more experienced the *non-founding hires*, the more control the core founder should have to give up to attract them, too.

Finally, as a condition of investing capital in the company, *outside investors* will often require one or more board seats, in addition to receiving an ownership stake (Gorman and Sahlman, 1989).⁷ Outside investors need voting rights because of contractual incompleteness; they want to ensure that decisions and actions will maximize their financial returns. More specifically, investors need to protect themselves from problems caused by the fact that the entrepreneur can derive non-pecuniary benefits “from control, access, and other non-contractible aspects of managing the venture” (Kirilenko, 2001: 566). In essence, the interests of the entrepreneur and of the investor can diverge because the investor cares about financial returns while the entrepreneur also enjoys private benefits of control (Aghion and Bolton, 1992; Grossman and Hart, 1988; Kaplan and Stromberg, 2003). Whenever founders and their resource providers disagree with each other, control rights become critical. Control comes in both *ex ante* form and *ex post* form, with *ex ante* control driven by board representation and *ex post* control indicated by whether the founder has been replaced as CEO (Hellmann, 1998). First, the board

of directors controls the most important high-level decisions within the venture (Lerner, 1995). For instance, the board typically decides whether to make important changes in strategy, when and how to raise new rounds of financing, and whether to partner or merge with other corporations (Bagley and Dauchy, 2003). The board also controls who will be CEO of the company (Wasserman, 2003).

As founders give up equity and board seats in order to attract investors, the founders’ percentage of board seats progressively decreases, until the point where the founders are a minority of board members and there is no longer “dominance of inside over outside directors on the board” (Morck, Shleifer, and Vishny, 1988: 301).⁸ Founders are more willing to take weaker investment terms—most centrally, terms that affect these control rights—from venture capitalists than from other investors, such as angel investors (Hsu, 2004). For their part, angel investors provide much less capital than do venture capitalists (Gompers and Lerner, 1999; Wong, 2002), take smaller equity stakes than do VCs (Clercq *et al.*, 2006), and rely on more informal methods of control than do VCs (Wong, Bhatia, and Freeman, 2009). Therefore, in startups that raise capital from venture capitalists, the core founder should retain less control than in startups that raise capital from angel investors.⁹

This leads to the following hypotheses about the degree of control retained by the founder.

Hypothesis 1a (H1a) (core founder): If the core founder has prior founding experience and if the core founder taps personal networks to attract employees, the founder will retain more control.

Hypothesis 1b (H1b) (cofounders): The larger the founding team and the more experienced the cofounders, the less control the founder will retain.

⁶ Some founders may try—but fail—to attract cofounders before deciding either to go solo or to defer founding the startup (Ruef, 2010). However, the resource-dependence implications should be the same regardless of whether the founder decided *ex ante* to solo found vs. cofound or decided to do so after failing to find cofounders. In addition, to the extent that some founders aren’t able to choose from the full range of control vs. value-creation options, it should be harder to find such tradeoffs across the full dataset, making the empirical tests more conservative.

⁷ Startups in the high-tech and life-sciences industries rarely have the collateral and fixed assets necessary to secure bank loans (e.g., Sherman, 2005), so outside capital almost always comes in the form of equity instead.

⁸ In the midst of building the startup, founders can sometimes sell some of their equity and receive cash to use for personal purposes—also known as partial founder buyouts or secondary transactions. Within the industries studied here, such transactions happen much less frequently than do the standard financing rounds analyzed above. Furthermore, even when a partial-founder buyout occurs, the amount of equity that changes hands is much smaller than in standard financing rounds, and thus has a much smaller impact on the outcomes that are of interest here.

⁹ These arguments contrast with the positive view of the effects of raising capital from venture capitalists (e.g., Stuart, Hoang, and Hybels, 1999), highlighting the control-related downside to attracting capital from those sought-after investors.

Hypothesis 1c (H1c) (non-founding executives): The more experienced the non-founding executives, the less control the founder will retain.

Hypothesis 1d (H1d) (investors): Founders who raise capital from venture capitalists will retain less control. Founders who raise capital from angel investors will retain more control.

Performance implications: Is there a tradeoff between autonomy and value creation?

The CEO position exerts significant control over company decisions. This is particularly true for new ventures, which are just beginning to form and evolve, and in which every CEO decision seems to bear more pronounced weight (Aldrich and Fiol 1994). From a resource-dependence perspective, a board chooses the CEO who is most “capable of coping with the critical problems facing the organization” (Pfeffer and Salancik, 1978: 236). During the early days of the startup, a founder is often the best person to cope with those challenges: s/he came up with the idea, which was often based on the founder’s expertise or sparked by the founder’s prior employment experience (Bhide, 2000), and the managerial challenges are at the level of a technical project team rather than a multi-function company.

However, as the startup grows and changes, the founder often lacks the skills to address the next set of challenges. For instance, after product development has been completed and the product has to be marketed and sold to customers, the challenges shift from technical issues to building a multi-function company (Wasserman, 2003). At that point, a new CEO will often be more qualified to address the company’s challenges and should be more effective at growing the value of the company, as was the case with Richard Williams at Wily (described above). In other words, a new CEO will be able to do things that the founder *can’t* do. In addition, a new CEO might be able to do things that the founder *won’t* do. For instance, founders might be constrained by their attachment to their initial ideas and strategies (Adomdza, 2008) or to their early employees (e.g., Wasserman and Fynn, 2007). They might fall prey to managerial conceit (March and Shapira, 1987), to the temptation to escalate their commitment (Schmidt and Calantone, 2002; Staw, 1981), or to overconfidence and complacency fostered by prior success (Miller, 1991). In such situations, a new CEO would be more effective at

adjusting strategies or at changing the employee base to fit the company’s new challenges.

As decisions accumulate, they can lead to very different outcomes. At the control extreme, the founder consistently foregoes attracting resources, maximizing control but sacrificing value. The reasons why founders may make such choices include heterogeneous preferences for control or differing expectations about their ventures’ prospects.¹⁰ At the value-creation extreme, founders consistently attract valuable outside resources but risk losing control.¹¹ In between these two extremes, founders may be able to keep a measure of control while building some value, but typically have to sacrifice some of each, and possibly large amounts of both.

Companies use boards of directors to gain resources and minimize dependence (Pfeffer, 1972). Outside directors bring four major benefits: “advice and counsel,” access to external channels of information, access to resources, and legitimacy (Hillman, Withers, and Collins, 2009; Pfeffer and Salancik, 1978). Founders who haven’t raised capital from outside investors will control the entire board of directors and thus all board decisions, but will lack the “board capital” (Hillman and Dalziel, 2003) that directors could contribute, and also lack the discipline that can come from their monitoring (Garg, 2013).

Some investors add few resources beyond their financial capital. Other investors, such as VCs, are known for “providing value-added services to their portfolio companies” (Baker and Gompers, 2003: 571). More specifically, “their involvement includes service on the boards of firms in their portfolios, frequent informal visits, meetings with customers and suppliers, and active involvement in key personnel and strategic decisions.” (Lerner, 1995: 302) As a result, VC backing can help grow larger companies (Baker and Gompers, 1999) and help improve long-term outcomes (Baker and Gompers, 2003). In one study, VC-backed companies went public more than four years sooner than did companies not backed by VCs (Baker and Gompers,

¹⁰ Rather than deciding to forego attracting resources, founders may also try to attract them but fail to do so, thus ending up with a high control/low value venture. To account for this possibility, in the empirical analyses I use fixed-effects methods, propensity scoring, and other approaches.

¹¹ It should be noted that attracting *too many* resources may also harm startup performance (George, 2005). Similarly, within multinational corporations, although slack resources can foster greater experimentation, they can also reduce discipline regarding innovative projects (Nohria and Gulati, 1996).

1999). Because the best VCs can add value—and board capital—founders are willing to take from them investment terms that are less founder-friendly (Hsu, 2004).

Although less studied, similar arguments suggest that there is a spectrum of value that can be added by the other types of resource providers attracted to startup coalitions. For instance, the larger the founding team, the higher the startup's growth (Eisenhardt and Schoonhoven, 1990) and the greater the company's revenues (Cooper and Bruno, 1977). Up to the point where an increase in team size can compromise outcomes (e.g., Horwitz and Horwitz, 2007), attracting cofounders and non-founding hires should help grow the value of the startup, but at the cost of imperiling control.¹²

As a result, controlling for company age and other differences across startups, there should be a tradeoff between control and company value.

Hypothesis 2 (H2): For a given startup, the value of the startup varies inversely with the degree of control retained by founders.

Does the tradeoff apply across the board, or to only some contingencies?

On the one hand, these resource-dependence challenges may be stronger for different types of companies and in different contexts. Thus, it's possible that the tradeoff only applies to a subset of companies and that that subset is driving the results, rather than being significant across all situations. On the other hand, the tradeoff may be more universal, in that it applies across contingencies. To test these "contingent vs. universal" possibilities, I assess contingencies regarding what type of startup was founded and its evolution over time. First, the tradeoff may differ according to the degree to which the company's industry segment is capital intensive. Second, the

¹² Two other factors may reinforce this tradeoff. Even though—from a resource-dependence perspective—we would expect to see that the attraction of resources helps build the value of the company, the effect may also be effective in the other direction: A potential resource provider's confidence that the company can become valuable may enable the core founder to attract that resource provider. (My empirical tests do not assume that the causality runs in one direction or the other.) Furthermore, some early choices may constrain or reinforce later choices. For instance, choosing to self-fund may constrain the startup's later hiring (because it doesn't have enough money to attract the best hires) and thus value creation. Thus, such path dependence may strengthen the tradeoff.

tradeoff may differ between younger and older startups.

The more capital-intensive the company, the more critical it may be to attract resources in order to grow value, and the more control the company should have to give up to attract those resources (Pfeffer and Salancik, 1978). Within larger companies, at both the corporate and business-segment levels, high capital intensity can have a negative impact on performance (Misangyi *et al.*, 2006). For instance, high capital intensity can constrain strategic choices, leading companies to choose short-term solutions over longer-term investments (Qu, Pinsonneault, and Oh, 2011). Startups in capital-intensive businesses have to invest more capital in product development and make other substantial investments in order to build the company. Such startups should have greater resource needs and thus may have to give up more control in order to attract those resources. Conversely, startups in low-capital-intensity businesses should be able to grow more value without having to give up a lot of control. This leads to the following contingent hypothesis:

Hypothesis 3 (H3): The inverse relationship between company value and founder control will be strong in startups in more capital-intensive industry segments but not in startups in less capital-intensive industry segments.

During the early stages of founding, founders' skills are often better suited to the challenges faced by the young startup than to the challenges faced down the road. For instance, founders with technical or scientific backgrounds are well-suited to lead the initial product-development effort. However, as the startup's needs broaden beyond technical or scientific challenges, the founders' skills are often less suited to those new challenges. In essence, these founder-CEOs have succeeded at achieving the key operating milestone of completing initial product development, but that very success has increased the divergence between founder abilities and startup needs (Wasserman, 2003).¹³ Thus, the need for—and potential impact of—attracting

¹³ This "paradox of entrepreneurial success" (Wasserman, 2003) suggests that a startup's pre-succession performance could be high, yet we could still see replacement of the founder due to the resource-dependence challenges examined here.

new skills should increase as the startup evolves. At the same time, attracting financial resources heightens the likelihood that the founder-CEO will be replaced by the board of directors (Boeker and Karichalil, 2002; Hellmann, 1998; Wasserman, 2003). Thus, the tradeoff may get stronger as the startup ages. This leads to the following contingent hypothesis:

Hypothesis 4 (H4): The inverse relationship between company value and founder control will get stronger as startups age.

DATA AND METHODS

One hurdle to the rigorous study of entrepreneurship is that “data are difficult to obtain” (Shane and Venkataraman, 2000: 219). For this reason, much of the relevant work on the issues described above has been based on theoretical models (e.g., Aghion and Bolton, 1992; Hellmann, 1998; Kirilenko, 2001) or field-based interviews (e.g., Amit *et al.*, 2000). Interviews can be invaluable for finding out entrepreneurs’ *stated* motives (Amit *et al.*, 2000), especially as a complement to the “coarse grained” methodologies used to study relatively mature theories (Edmondson and McManus, 2007; Harrigan, 1983). However, “we do not have, and it would be very difficult (if not impossible) to specify, the ‘true’ beliefs” of interviewed entrepreneurs (Amit *et al.*, 2000: 139). Instead, strategies may best be inferred by observing “realized strategies” (Mintzberg and Waters, 1982: 466) and observable, concrete decisions (Hambrick and Mason, 1984). Thus, in my data collection, I focus on the actual decisions made during the founding process—e.g., how many founders there were, which non-founders were on the executive team, whether the startup raised outside capital and from whom, etc.

My data come from the annual CompStudy survey of private American ventures. The first CompStudy survey was conducted in 2000 and focused on private information-technology ventures (broadly defined, including telecommunications). Two years later a parallel survey of life-sciences ventures was added, and since then, annual surveys of both industries have been conducted. In 2005, the section about founders was enhanced, and I use all data collected between 2005 and 2012. The full dataset includes 6,130 startups that were founded by a total of 16,500 founders. On the one hand, the dataset is

limited to a single country, to two industries within that country, and to a specific time period, and therefore may not apply in other contexts. On the other hand, the technology and life-sciences industries are by far the largest industries for American high-potential startups, accounting for more than two-thirds of the angel capital and venture capital invested during the time period, and accounting for nearly half of the initial public offerings (with no other industry accounting for more than 12% of the IPOs).¹⁴ In addition, the survey time period includes startups that were founded across all stages of two major business cycles, with the vast majority of startups in the dataset founded across the boom of the late 1990s, the bust of the early 2000s, the subsequent uptick in the mid-2000s, and then the deep recession from 2009 onwards, giving us the ability to assess whether the tradeoff I examine pertains to only parts of the business cycle or across it.

Invitations to participate in the survey are sent to the membership lists of local technology and life-sciences associations (e.g., the Massachusetts High-Technology Council), the list of private companies from the VentureXpert database, and similar databases. The invitations are sent to the CEOs and CFOs, who are offered a free copy of a detailed “CompStudy Compensation Report” based on the survey results and available only to participants.¹⁵ Because the market for executive talent

¹⁴ According to Renaissance Capital, of the initial public offerings (IPOs) over the last decade, 48 percent came from those two industries, and no other industry accounted for more than 12 percent. According to Center for Venture Research at the University of New Hampshire and the National Venture Capital Association, of the angel capital invested during the decade, 74 percent went to those two industries, as did 71 percent of venture capital. According to Thomson’s Venture Expert Database, technology investments (including Internet, computer software and services, communications and media, semiconductors and other electronics, and computer hardware) were 56 percent of venture capital investments from 2000 to 2009 and life sciences investments (medical/health and biotechnology) were an additional 15 percent.

¹⁵ The report includes position-by-position breakdowns of compensation (salaries, bonuses, and equity holdings) for the eleven most common C-level and VP-level positions in private ventures. The breakdowns provide compensation benchmarks by company size and age, industry segment, geographic location, financing rounds, founder versus non-founder status, and other dimensions. The reports were published by three professional-services firms with which I partnered in collecting the data: accounting firm Ernst & Young, law firm Hale & Dorr (now WilmerHale), and executive-search firm J. Robert Scott (now ParkSquare). In 2009, we replaced the Compensation Reports with an online data-analysis tool, at compstudy.com, that is also only available to participants. To preclude any conflicts of interest, I have never received any compensation from these firms, nor do I have any ownership stake in CompStudy.

varies over time, companies usually want current data on executive compensation, so they have an incentive to participate even if they have already participated in the past. Over the last decade, CompStudy's annual compensation reports have become a standard reference for executive teams in private American ventures and for board members and investors involved in those ventures. Each year, survey response rates vary between 10 and 20 percent, higher than the typical response rates for surveys targeting similar levels of executives (e.g., Graham and Harvey, 2001) and for the sensitivity of the questions asked (e.g., about private-company financing history and performance, and about executive compensation and equity stakes). The surveys are conducted online and fields are validated as data are entered. When possible, data are cross-checked with publicly-available information to check accuracy and representativeness.

For comparison, VentureXpert (formerly Venture Economics) is one of the most commonly used sources of data for research on high-potential startups (e.g., Gompers, 1995; Lerner, 1995; Sorenson and Stuart, 2008).¹⁶ VentureXpert is compiled by Thomson Economics and provides data on venture capital and other early-stage funding for companies. It provides each company's financing history, location, and related information. However, it does not provide many of the data points needed for the current study—e.g., founder and non-founder backgrounds, executive compensation and equity holdings, and levels of control retained by the founders—and focuses on a more limited set of startups (those that have raised institutional capital, in contrast to CompStudy, which also includes pre-funding ventures). It is instructive to compare the distributions of companies within the two datasets. I compared the CompStudy sample to the VentureXpert sample on the three dimensions on which they can be compared: geographic distribution, industry, and founding year. First, the two datasets almost match regarding the percentage of startups from each state in the country, with the exception that CompStudy has a few more firms in Massachusetts and fewer in California. (Further details are available from the author.) Regarding industry breakdown, CompStudy is more balanced, with 65.2 percent of the CompStudy firms coming from high technology compared to 79.1 percent of

the VentureXpert firms. Regarding founding year, VentureXpert has a higher proportion of companies from before 2000, and is much more influenced by companies founded in 1999 than is CompStudy. Otherwise their distributions are similar.¹⁷

For two of the metrics within the founding team, we can compare CompStudy to the data from another study. Although more targeted, in that it focused on MIT startups alone, Hsu, Roberts, and Eesley (2007) also surveyed high-potential startups. They reported an average of 2.86 founders per team. My dataset has 2.70 founders per team. In Hsu *et al.* (2007), 46 percent of the entrepreneurial teams had no prior startup experience. In my sample, 53 percent of the core founders had no prior startup experience.

The CompStudy survey design enables us to get data on companies at a very early stage in their development. The data should thus be less susceptible to survivor bias than samples of public companies, or even than samples of venture capital-backed companies (e.g., VentureXpert). Even so, because the surveys ask questions about decisions that occurred months or years earlier, they may be susceptible to retrospective bias. The first way I reduced this bias was by asking relatively objective questions whenever possible; e.g., instead of asking, "How much leverage did the founders have when raising their first round of outside capital?" I asked "How many board seats did the founders retain after raising their first round of outside capital?" Second, many companies participated in multiple years, enabling comparison of initial submissions to later surveys. As described below, I also used the multiple responses from repeat respondents to perform fixed-effects analyses that control for unobserved time-invariant company characteristics.

Dependent and independent variables

The initial hypotheses (H1a–d) examine the degree of control retained by founders. Following Hellmann (1998), I measure *control* at two levels:

¹⁷ Thus, overall the CompStudy dataset looks similar but not identical to the VentureXpert dataset. To check if my results would change if the composition of the CompStudy sample matched the VentureXpert distribution on these three dimensions, I reran all of the core models reweighting the observations using propensity scores (e.g., Rosenbaum and Rubin, 1983). The core results did not change, in both the models using all responses and in the fixed-effects models, and for both the company-valuation and capital-raised dependent variables.

¹⁶ For an analysis of this database, also see Kaplan, Stromberg, *et al.* (2002).

control of the CEO position (is the founder still the CEO?) and control of the board of directors (do the founders and inside executives have more than half of the seats on the board of directors?). In the core models, I used a discrete ordinal “control index” that ranges from 0 to 2: 0 if the founders control neither the CEO position nor the board of directors, 1 if they control one but not the other, and 2 if they control both the CEO position and the board of directors. In robustness tests, and to examine whether either of the two arenas of control is the real driver of the results, I also reran the models using separate binary variables for each of those two arenas of control. The core results were the same as in the models using the control index. I also reran those models using the percentage of the board controlled by the founders, rather than using the binary metric of board control that was used to calculate the control-index variable. Again, the results were the same as in the core models.

Hypotheses 2–4 focus on the tradeoff between the value of the company and the degree of founder control. I use two different metrics to estimate the *value of the company*: most recent company valuation and total amount of capital raised. My core metric is pre-money valuation of the company at the most recent round of financing (e.g., Gompers *et al.*, 2010; Hsu, 2004), calculated as the price per share in the financing round times the number of shares outstanding prior to the round. The second metric for company value is the total amount of capital raised by the startup since founding, including all rounds of financing through the time of the survey.¹⁸ Both variables were log-normally distributed, so I use the natural log of each variable. To allow for the companies that had not raised any capital as of the time of the survey, I added 1 to the capital-raised metric before taking its natural logarithm. To account for missing data in the survey, I used multiple-imputation methods (Rubin, 1987).

Regarding independent variables, the models include an indicator of whether the *core founder*

had prior founding experience and whether the core founder tapped social networks to attract executive hires, while controlling for the core founder’s years of prior work experience.¹⁹ For the *founding team*, the models include the size of the founding team and the founding team’s total years of prior work experience. Value may also be affected by the founders’ initial capital investments in the startup, which I aggregate across the founding team. I include three aspects for *non-founding executives*: their years of prior work experience, the number of executives who in prior work were the senior-most executives within their functions, and the average compensation of the executives (as another metric of the quality of the executives). I also control for the executives’ equity stakes.²⁰ The amount of capital raised may be affected by the *source of financing*—the founders themselves, angel investors, or venture capitalists—so I include dummy variables for each of those three sources. Larger boards of directors can add more resources, but can also be less effective because of diffused responsibility, because of increased agency problems (e.g., free riding by directors), or because the board becomes more symbolic than effective (e.g., Eisenberg, Sundgren, and Wells, 1998; Jensen, 1993; Yermack, 1996). Therefore, I also controlled for the size of the board, allowing for curvilinear effects on value creation. Regarding the startup’s *location*, more valuable ventures may be created in startup “hubs” that have plentiful startup resources, so I controlled for whether the startup is located in a hub (i.e., CA or MA, the hubs of the American startup scene), a secondary market (IL, NJ, NY, or TX), or in smaller markets. To assess *capital intensity*, I categorized each startup’s business segment into the three segments with the highest capital intensity and the three segments with the lowest capital intensity, based on the capital-intensity ratings published in the IBISWorld industry reports.²¹

¹⁸ The most common round of financing is one in which the investors’ capital goes into the company, sparks the creation of new shares of equity, and is used for organizational purposes. Although rare, some rounds of financing also include capital that is being used to buy existing equity (from the founders or other insiders), does not increase the number of shares, and goes to the equity sellers for their own purposes. The “total capital raised” variable includes the former equity sales but not the latter, because the latter does not provide resources that will help grow the value of the company itself.

¹⁹ I used five criteria to assess whether a founder was the “core founder”: Which founder was the initial CEO, which founder had the initial idea, which founder held the largest equity stake, which founder contributed the most seed capital, and whether the founder was a full-time employee at time of founding.

²⁰ Startups give equity stakes in order to attract executive hires, align their incentives, and heighten the sense of ownership (see Rousseau and Shperling, 2003). In addition, because they typically must conserve their cash, they often include equity stakes in the compensation package in order to be able to pay lower salaries.

²¹ Higher capital intensity segments included Biopharma, Clean-Tech, and Hardware/Semiconductors/Communications. Lower

To assess the *macroeconomic conditions at time of founding*, I categorized each startup's year of founding into boom, middling (neither boom nor bust), or bust eras.²²

Methods

In the multivariate models testing Hypotheses 2–4, the core analyses use fixed-effects models with (log of) company valuation as the dependent variable. Of the 6,130 companies that participated in the survey, 49 percent participated more than one time, enabling me to use their responses in the fixed-effects analyses; using company-level fixed effects reduces the risk of omitted-variable bias by allowing us to control for the unobservable time-invariant characteristics of each firm. Robustness tests included fixed-effects models with (log of) capital raised as an alternate metric of value creation, and ordinary-least-squares models (without fixed effects) using all surveys (not just those that were repeat respondents), inversely weighting each survey by the number of surveys submitted by that company. Standard errors were clustered at the firm level. I also performed robustness tests of the functional forms of several variables (e.g., company age, number of founders, macroeconomic conditions, capital intensity) in which I replaced the variable of interest with dummy variables capturing each possible level of the variable or with the raw underlying levels (for composite variables). In all robustness tests, the core results were the same as in the models shown.

I compared the initial responses of repeat respondents to the initial (sole) responses of non-repeaters to see if there were significant differences. The 95 percent confidence intervals overlapped regarding company valuation, number of employees, company age, the founder's prior years of work experience, whether the core founder had prior founding experience, and how much seed capital the founders invested. The biggest differences were in the degree of control the founders had retained (in repeat respondents, the founders had a little less control when the company's initial survey was

completed) and in the size of the founding team (in repeat respondents, the founding teams were a little bigger). Despite these differences, as described below, the core results regarding my hypotheses were the same across both the all-companies and fixed-effects (i.e., repeat respondent only) models.

To test Hypothesis 3, I wanted to see whether firms with differing levels of capital intensity face different tradeoffs between control and value created. I interacted dummy variables indicating whether the firm had low capital intensity or high capital intensity. This yielded equivalent regression coefficients to estimating the core model twice—once restricting the sample to firms with low capital intensity and once to firms with high capital intensity—while still being able to use all data points in the model (instead, the separate restricted models would each have about one-half the observations). Combining these regressions into one regression also enables us to test the difference between the coefficient on control for the different types of firms. Two questions are of particular interest in these analyses: (1) Is the control index still significant? (2) Are the new interaction terms significant, suggesting support for the contingency-specific hypothesis? (If the interaction terms are not significant, we cannot reject the null hypothesis that the tradeoff applies across contingencies.) I performed similar analyses to test Hypothesis 4 about startup age.

RESULTS

Table 1 shows summary statistics and a correlation matrix. On average the 6,130 companies were founded by 2.7 founders. The median number of full-time-equivalent employees was 26. The companies had raised a median of \$7 million in capital and were a median of 5.9 years old. The core founders averaged 17 years of prior work experience and 47 percent had prior founding experience. Of the prior rounds of financing, 17 percent included founder capital, 28 percent included angel investors, and 71 percent included venture capitalists. Regarding control of the company, in 49 percent of the companies a founder was still CEO, in 21 percent of the companies the insiders controlled more than half of the seats on the board of directors, and in 41 percent of the companies the founders owned more than half of the company's

capital intensity segments included Digital Media/Content, Software, and Medical devices. (The remaining segments—23% of the total—were categorized as Other.)

²² The boom eras included 1997–1999 and 2006–2008, the middling eras included 2004–2005 and 2012, and the bust eras included 2000–2003 and 2009–2011.

Table 1. Summary statistics and correlation matrix

Independent variable	Mean	St-dev	Median	Independent variable	Mean	St-dev	Median
Control index	0.7006	0.6935	1	Hires who had prior executive experience	1.047	1.575	0
Company age	6.93	5.147	5.9	Executive hires' mean compensation	201	96.43	202
Founder: prior founding experience?	0.4716	0.4992	0	Executive hires' mean equity stake	2.34	4.425	1.5
Founder: prior years of work experience	17.04	9.469	17	Founders invested in last round	0.174	0.3791	0
Number of founders	2.699	1.532	2	Angels invested in last round	0.275	0.4465	0
Cofounders' prior years of work experience	36.79	32.48	30	VCS invested in last round	0.7134	0.4522	1
Seed capital invested by founders	97.19	212.9	3	Number of board members	4.099	2.472	4
Founder attracted exec hires	0.5289	0.4992	1	Segment's capital intensity (IBIS)	2.056	0.7168	2
Angel/VC on board attracted execs	0.1955	0.3966	0	State of economy at founding	1.235	0.6946	1
Exec hires' prior years of work experience	64.74	45.08	60	Company location (hub/tier)	1.128	0.922	1

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
(1) Total capital raised	1						
(2) Most recent valuation	0.716***	1					
(3) Control index	-0.153***	-0.119***	1				
(4) Company age	0.195***	0.148***	-0.308***	1			
(5) Founder's prior years of work experience	0.132***	0.0633***	-0.0810***	0.0141	1		
(6) Founder had prior founding experience	0.032	0.0199	0.0850***	-0.0926***	0.251***	1	
(7) Number of founders	0.0345	0.0246	-0.0349	-0.0141	0.116***	-0.0105	1
(8) Cofounders' prior years of work experience	0.150***	0.0833***	-0.0755***	-0.0102	0.811***	0.192***	-0.0112
(9) Seed capital invested by founders	-0.000137	0.0417*	0.0155	-0.0125	0.0831***	0.138***	0.0598**
(10) Founder attracted exec hires	0.0288	0.00235	-0.00798	-0.0613**	0.0416*	0.0402*	0.0643***
(11) Angel/VC on board attracted exec hires	0.0295	0.0212	-0.208***	0.0469*	0.0464*	-0.0256	0.00161
(12) Exec hires' prior years of work experience	0.0694***	0.0274	-0.199***	0.0405*	0.307***	-0.00337	0.0890***
(13) Hires had prior executive experience	-0.00532	0.0102	-0.0276	0.0391	0.0375	-0.0101	0.0039
(14) Exec hires' mean compensation	0.251***	0.241***	-0.269***	0.237***	0.0525**	-0.0153	0.0479**
(15) Exec hires' mean equity stake	-0.101***	-0.119***	0.00408	-0.0377	-0.0643***	-0.0849***	-0.0802***
(16) Founders invested in last round of financing	-0.0423*	-0.0838***	0.196***	-0.0539**	0.0981***	0.127***	-0.039
(17) Angels invested in last round of financing	-0.0948***	-0.120***	0.139***	-0.0933***	0.0155	0.0276	-0.0251
(18) VCS invested in last round of financing	0.0847***	0.0893***	-0.196***	0.0334	0.0105	-0.0352	0.0502**
(19) Board size	0.159***	0.140***	-0.400***	0.156***	0.125***	0.0241	0.0907***
(20) Segment's capital intensity	0.123***	0.0760***	-0.0945***	-0.00731	0.185***	-0.0271	0.0967***
(21) State of economy at founding	0.0328	-0.00338	-0.0295	0.184***	-0.0167	-0.0400*	-0.0264
(22) Location of company	0.0460*	0.0334	-0.0207	-0.0968***	-0.0268	-0.0378	0.0342

	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
(9)	0.101***	1							
(10)	-0.0121	0.019	1						
(11)	0.0229	-0.0391	0.289***	1					
(12)	0.321***	-0.0209	0.0185	0.0355	1				
(13)	0.0309	-0.0153	-0.0751***	0.0932***	0.287***	1			
(14)	0.0527**	0.0118	-0.0620**	0.0697***	0.132***	0.0925***	1		
(15)	-0.0744***	-0.0714***	-0.0597**	0.00823	-0.0294	-0.00713	-0.0606**	1	
(16)	0.102***	0.173***	0.017	-0.0122	-0.0146	-0.0257	-0.0977***	0.0233	1
(17)	0.0215	0.00234	-0.00453	-0.0528**	-0.0349	-0.0144	-0.211***	0.124***	0.246***
(18)	-0.0334	-0.0690***	0.0527**	0.0751***	0.0685***	-0.0183	0.202***	-0.229***	-0.139***
(19)	0.109***	0.0173	0.241***	0.144***	0.130***	-0.0448*	0.151***	-0.113***	-0.0599**
(20)	0.223***	0.0205	0.0263	-0.0046	0.246***	0.0147	0.0668***	-0.0644***	-0.0233
(21)	-0.0175	0.0252	-0.0314	-0.0123	-0.0384	0.0179	0.0151	0.0212	0.00495
(22)	-0.0363	-0.0102	-0.019	0.00318	-0.00172	0.0251	0.0932***	-0.0359	-0.0492**

	(17)	(18)	(19)	(20)	(21)	(22)
(18)	-0.331***	1				
(19)	-0.0594**	0.195***	1			
(20)	0.0164	0.0146	0.131***	1		
(21)	0.0747***	-0.0680***	0.00568	-0.00277	1	
(22)	-0.0747***	0.0874***	-0.0446*	-0.0134	0.00164	1

***p < 0.01; **p < 0.05; *p < 0.1
 Histograms of independent variables available from author.

equity.²³ Geographically, 32 percent of the startups were located in California, 18 percent in Massachusetts, and 13 percent in the four “secondary” states.

Table 2 analyzes the degree of control retained by founders. Tables 3 and 4 test Hypothesis 2, and Tables 5 and 6 examine Hypotheses 3 and 4 about whether the tradeoff is driven by contingencies.

Table 2 highlights variables that are significantly associated with control, using three metrics of control. Models 1–3 show the analyses using the control index (which combines CEO control and board control) as the dependent variable and Models 4–5 compare those results to separate analyses using each of CEO control and Board control. Most centrally, the results in Models 1–3 suggest that founder control is affected by decisions made throughout the evolution of the startup, including the prior experience accumulated by the core founder, cofounder decisions, hiring decisions, and financing decisions. In particular, founders retain more control when they have prior founding experience ($p < 0.05$) and when they attracted executive hires themselves ($p < 0.01$). These results support Hypothesis 1a. Founders have less control when there were more cofounders ($p < 0.05$), but the years of prior work experience of the cofounders does not affect control, providing only mixed support for Hypothesis 1b. Founders have less control when their hires have more years of work experience ($p < 0.01$), supporting Hypothesis 1c. Finally, founders have less control when the last round of investment included venture capitalists ($p < 0.01$) and more control when their last round of financing included angel investors ($p < 0.01$), supporting Hypothesis 1d. In summary, three of the hypotheses about founder control were strongly supported, and the fourth was partially supported. The additional analyses in Models 4–5 suggest that there is one significant divergence between the CEO-control and board-control models (the mean equity stake of executive hires has a significant negative impact on CEO control but a significant positive impact on board control) but that otherwise the two metrics of control are relatively aligned with each other.

²³ To assess whether these three metrics were relatively synonymous with each other, I calculated the correlations between them. Of the three correlations, only CEO control and board control were significantly correlated ($r = 0.105$, $p < 0.01$); there was no significant relationship between CEO control and equity-ownership control ($r = 0.0109$, $p > 0.10$) or board control and equity-ownership control ($r = -0.00877$, $p > 0.10$).

Table 3 shows the core models of the tradeoff between value and control, using pre-money valuation as the dependent variable. Models 1–5 use fixed effects for all repeat respondents and Model 6 uses all surveys from each participating company (inversely weighted by number of surveys per company). In Models 1–5, the relationship between control index and valuation is consistently negative and highly significant (all $p < 0.01$), even with the fixed effects accounting for time-invariant characteristics and control variables accounting for firm age and varying employee and investor characteristics. In the full fixed-effects model, each one-unit increase in the control index (i.e., from no control to control of either the CEO position or the board, or from control of the CEO position or the board to control of both) decreases company value by 17.1 percent.²⁴ In Model 6, the control index is once again significant at the $p < 0.01$ level in each model; each one-unit increase in the control index decreases company value by 22.0 percent.²⁵ As a whole, these results provide strong support for Hypothesis 2.

Table 4 shows the auxiliary models of the tradeoff between value and control, using capital raised as the dependent variable. Once again, Models 1–5 use fixed-effects for all repeat respondents and Model 6 shows the all-responses (inversely weighted) models. In the fixed-effects models, the relationship between control and value creation is consistently negative at the $p < 0.01$ level. In the full fixed-effects model (Model 5), each one-unit increase in the control index decreases capital raised by 35.8 percent.²⁶ In Model 6, the relationship between control and capital raised is again consistently negative and highly significant (all $p < 0.01$); each one-unit increase in the control index decreases company value by 51.4 percent.²⁷

²⁴ In the models, a one-unit increase in control index decreases the natural logarithm of (one plus) company value by 0.158, which is equivalent to a decrease in (one plus) company value by 17.1 percent.

²⁵ In the models, a one-unit increase in control index decreases the natural logarithm of (one plus) company value by 0.199, which is equivalent to a decrease in (one plus) company value by 22.0 percent.

²⁶ In the models, a one-unit increase in control index decreases the natural logarithm of (one plus) capital raised by 0.306, which is equivalent to a decrease in (one plus) capital raised by 35.8 percent.

²⁷ In the models, a one-unit increase in control index decreases the natural logarithm of (one plus) capital raised by 0.415, which is equivalent to a decrease in (one plus) capital raised by 51.4 percent.

Table 2. Analyses of control metrics as dependent variables

	1	2	3	4	5
	DV: control index			DV: control CEO	DV: control board
Company age (log)	-0.308*** (0.015)	-0.265*** (0.016)	-0.229*** (0.014)	-0.219*** (0.0103)	-0.00986 (0.00933)
Founder had prior founding experience	0.0766** (0.035)	0.0704** (0.030)	0.0676** (0.026)	-0.00161 (0.0168)	0.0084 (0.0134)
Founder's prior years of work experience (log)	0.0148 (0.028)	0.0294 (0.025)	0.0068 (0.022)	0.0777*** (0.0144)	-0.0101 (0.0171)
Number of founders (log)	-0.169*** (0.030)	-0.109*** (0.029)	-0.0586** (0.026)	-0.0518*** (0.0188)	-0.00676 (0.0172)
Cofounders' prior years of work experience (log)	-0.0497 (0.034)	-0.0172 (0.033)	0.0285 (0.028)	0.0345* (0.0195)	-0.00601 (0.0153)
Seed capital invested by founders (log)	0.0312*** (0.008)	0.0138* (0.007)	0.0133** (0.006)	0.00821 (0.00566)	0.00509** (0.00217)
Founder attracted exec hires		0.0499*** (0.019)	0.129*** (0.017)	0.127*** (0.0122)	0.00271 (0.0113)
Angel or VC on board attracted exec hires		-0.225*** (0.021)	-0.201*** (0.021)	-0.162*** (0.0136)	-0.0395*** (0.014)
Exec hires' prior years of work experience (log)		-0.127*** (0.019)	-0.0970*** (0.017)	-0.0549*** (0.0103)	-0.0420*** (0.0118)
Hires had prior executive experience		0.0702*** (0.025)	0.0172 (0.025)	0.0357* (0.0148)	-0.0185 (0.0219)
Exec hires' mean compensation (log)		-0.0321*** (0.011)	-0.0180** (0.009)	0.00458 (0.00677)	-0.0226*** (0.00413)
Exec hires' mean equity stake (log)		-0.0446 (0.028)	-0.0756*** (0.025)	-0.130*** (0.0135)	0.0546*** (0.0144)
Founders invested in last round of financing		0.149*** (0.026)	0.119*** (0.023)	0.0972*** (0.0192)	0.0222 (0.0158)
Angels invested in last round of financing		0.0900*** (0.025)	0.0805*** (0.021)	0.0786*** (0.0179)	0.0019 (0.0138)
VCs invested in last round of financing		-0.350*** (0.022)	-0.238*** (0.020)	-0.0532*** (0.0138)	-0.185*** (0.0137)
Board size			-0.104*** (0.016)	-0.0168* (0.00919)	-0.0872*** (0.0106)
Board size (squared)			0.00104 (0.002)	-0.00144 (0.00109)	0.00248** (0.00125)
Segment: high capital intensity			-0.0741*** (0.018)	-0.0221* (0.013)	-0.0520*** (0.0126)
Founded during weak economic conditions			-0.0512** (0.026)	-0.0417** (0.019)	-0.00953 (0.0177)
Founded during strong economic conditions			-0.0431* (0.026)	-0.0523*** (0.0186)	0.00925 (0.0178)
Located in mid-tier state			0.0594* (0.031)	0.0378* (0.0212)	0.0217 (0.0214)
Located in top-tier state			-0.0561*** (0.020)	-0.0449*** (0.0144)	-0.0112 (0.0133)
Constant	1.701*** (0.066)	2.199*** (0.089)	2.263*** (0.072)	1.203*** (0.0432)	1.060*** (0.0561)
Observations	12,594	12,594	12,594	12,594	12,594
R ²	0.081	0.201	0.290	0.225	0.246

***p < 0.01; **p < 0.05; *p < 0.1
Standard errors in parentheses.

These results further reinforce the support for Hypothesis 2.

Tables 5 and 6 show the results of testing Hypothesis 3 (about capital intensity) and Hypothesis 4 (startup age). Regarding Hypothesis 3,

across both dependent variables, the control index remains highly significant ($p < 0.01$), but none of the interaction terms is statistically significant. Thus, we fail to reject the null hypothesis that the tradeoff exists regardless of capital intensity.

Table 3. Models of tradeoff between value and control index (dependent variable: Log of valuation)

	1	2	3	4	5	6
	Fixed-effects models (using repeat respondents)					All responses (weighted)
Control index	-0.227*** (0.050)	-0.229*** (0.050)	-0.213*** (0.049)	-0.198*** (0.047)	-0.158*** (0.046)	-0.199*** (0.030)
Company age (log)	0.326*** (0.039)	0.327*** (0.041)	0.305*** (0.041)	0.299*** (0.040)	0.296*** (0.039)	0.154*** (0.037)
Founder had prior founding experience						0.140** (0.066)
Founder's prior years of work experience (log)						-0.0452 (0.039)
Number of founders (log)						0.157*** (0.052)
Cofounders' prior years of work experience (log)						0.0868** (0.043)
Seed capital invested by founders (log)						-0.00733 (0.007)
Founder attracted exec hires		-0.0213 (0.031)	-0.0157 (0.033)	-0.0168 (0.034)	-0.0391 (0.032)	0.161*** (0.035)
Angel or VC on board attracted exec hires		-0.0146 (0.025)	-0.0348 (0.024)	-0.0405* (0.024)	-0.0484** (0.024)	-0.100** (0.045)
Exec hires' prior years of work experience (log)			0.0329 (0.024)	0.0258 (0.024)	0.0232 (0.024)	-0.029 (0.031)
Hires had prior executive experience			0.173*** (0.044)	0.176*** (0.042)	0.179*** (0.046)	0.254*** (0.039)
Exec hires' mean compensation (log)			0.0464*** (0.008)	0.0443*** (0.008)	0.0429*** (0.008)	0.183*** (0.015)
Exec hires' mean equity stake (log)			-0.0929*** (0.031)	-0.0797*** (0.030)	-0.0765** (0.032)	-0.265*** (0.027)
Founders invested in last round of financing				-0.165** (0.073)	-0.163** (0.072)	-0.140* (0.072)
Angels invested in last round of financing				-0.0778* (0.046)	-0.0758* (0.045)	-0.114*** (0.038)
VCS invested in last round of financing				0.233** (0.093)	0.223** (0.089)	0.592*** (0.064)
Board size					-0.0272 (0.027)	-0.108*** (0.031)
Board size (squared)					0.00781** (0.003)	0.0249*** (0.004)
Segment: high capital intensity						0.256*** (0.039)
Founded during weak economic conditions						-0.00731 (0.051)
Founded during strong economic conditions						0.026 (0.048)
Located in mid-tier state						-0.0194 (0.058)
Located in top-tier state						0.185*** (0.040)
Constant	2.300*** (0.091)	2.313*** (0.096)	2.062*** (0.111)	1.977*** (0.153)	1.917*** (0.171)	0.947*** (0.212)
Observations	9,158	9,158	9,158	9,158	9,158	12,594
R ²	0.055	0.055	0.087	0.111	0.124	0.393

***p < 0.01; **p < 0.05; *p < 0.1
Standard errors in parentheses.

Table 4. Models of tradeoff between value and control index (dependent variable: Log of capital raised)

	1	2	3	4	5	6
	Fixed-effects models (using repeat respondents)					All responses (weighted)
Control index	-0.366*** (0.066)	-0.366*** (0.066)	-0.356*** (0.066)	-0.336*** (0.063)	-0.306*** (0.061)	-0.418*** (0.037)
Company age (log)	0.434*** (0.051)	0.426*** (0.051)	0.409*** (0.053)	0.412*** (0.050)	0.403*** (0.048)	0.195*** (0.041)
Founder had prior founding experience						0.104 (0.084)
Founder's prior years of work experience (log)						-0.0546 (0.052)
Number of founders (log)						0.144** (0.065)
Cofounders' prior years of work experience (log)						0.151*** (0.057)
Seed capital invested by founders (log)						-0.0210** (0.010)
Founder attracted exec hires		-0.0541 (0.036)	-0.0482 (0.034)	-0.0504 (0.033)	-0.0662** (0.032)	0.193*** (0.044)
Angel or VC on board attracted exec hires		0.0061 (0.027)	-0.00866 (0.026)	-0.0201 (0.025)	-0.026 (0.025)	-0.0372 (0.050)
Exec hires' prior years of work experience (log)			0.00183 (0.021)	-0.0132 (0.021)	-0.0136 (0.022)	-0.033 (0.037)
Hires had prior executive experience			0.131*** (0.040)	0.138*** (0.038)	0.136*** (0.039)	0.191*** (0.048)
Exec hires' mean compensation (log)			0.0366*** (0.009)	0.0345*** (0.010)	0.0333*** (0.011)	0.205*** (0.022)
Exec hires' mean equity stake (log)			-0.0684*** (0.023)	-0.0551** (0.023)	-0.0530** (0.024)	-0.287*** (0.033)
Founders invested in last round of financing				-0.0125 (0.064)	-0.0104 (0.063)	0.0407 (0.062)
Angels invested in last round of financing				-0.0744 (0.053)	-0.0706 (0.052)	-0.078 (0.048)
VCs invested in last round of financing				0.357*** (0.080)	0.353*** (0.075)	1.017*** (0.065)
Board size					-0.0835** (0.035)	-0.122*** (0.038)
Board size (squared)					0.0139*** (0.004)	0.0283*** (0.004)
Segment: high capital intensity						0.317*** (0.049)
Founded during weak economic conditions						0.00629 (0.063)
Founded during strong economic conditions						0.119* (0.063)
Located in mid-tier state						-0.102 (0.077)
Located in top-tier state						0.164*** (0.051)
Constant	1.499*** (0.120)	1.542*** (0.121)	1.408*** (0.133)	1.217*** (0.136)	1.253*** (0.152)	-0.191 (0.206)
Observations	9,158	9,158	9,158	9,158	9,158	12,594
R ²	0.098	0.099	0.113	0.144	0.158	0.436

***p < 0.01; **p < 0.05; *p < 0.1
Standard errors in parentheses.

Table 5. Models of tradeoff for low-capital-intensity vs. high-capital-intensity industry segments

	1 Dependent variable: company valuation (log)	2 Dependent variable: total capital raised (log)
Segment: high capital intensity	0.304 (0.247)	0.401 (0.334)
Control index	-0.187*** (0.0252)	-0.403*** (0.0315)
Segment: high capital intensity × control index	-0.0369 (0.0449)	-0.0412 (0.0565)
Company age (log)	0.0858*** (0.0261)	0.129*** (0.0330)
<i>(Rest of variables from Table 3 included in models but not shown)</i>		
Constant	0.969*** (0.241)	-0.202 (0.227)
Observations	12,594	12,594
R ²	0.439	0.395

***p < 0.01; **p < 0.05; *p < 0.1

Standard errors in parentheses.

Only main effects and interactions with control index are shown; other interactions included in model but not shown.

Table 6. Models of tradeoff for younger half vs. older half of startups

	1 Dependent variable: company valuation (log)	2 Dependent variable: total capital raised (log)
Control index	-0.163*** (0.0443)	-0.301*** (0.0586)
Company age × control index	-0.0289*** (0.00864)	-0.0294*** (0.0113)
<i>(11 Company age group dummies)</i>		
<i>(Rest of variables from Table 3 included in models but not shown)</i>		
Constant	2.216*** (0.237)	1.507*** (0.308)
Observations	12,594	12,594
R ²	0.442	0.398

***p < 0.01; **p < 0.05; *p < 0.1

Standard errors in parentheses.

Only main effects and interactions with control index are shown; other interactions included in model but not shown.

Regarding Hypothesis 4, the interaction term is highly significant ($p < 0.01$), supporting the contingent hypothesis that the tradeoff grows stronger as startups age.²⁸ Delving further into this result, we find that the tradeoff was not significantly different from zero for firms two years old or younger, then became highly significant ($p < 0.01$) from three years onward.

The fixed-effect models control for the ex-ante “quality” of each startup. By focusing on changes within each firm over time, the empirical results are driven by firm decisions about control and resource attraction rather than initial firm quality. As an

additional robustness check, to see if similar empirical results are found when making comparisons across firms, I used inverse-probability weighting (IPW) and regression adjustment (RA) analyses (e.g., Imbens and Wooldridge, 2009; Rubin, 1973). IPW estimators use estimated probability weights to assess what the mean outcome would have been if every firm in the population received a particular treatment. The RA estimators take a more fine-grained approach, comparing outcome predictions for each firm under all treatment assignments (Cattaneo, 2010; StataCorp, 2013).²⁹

²⁸ At the suggestion of an anonymous reviewer, I performed further analyses of the age effects, adding an age-squared interaction term to assess nonlinearity. For the company-valuation dependent variable, the age-squared interaction term was positive and significant ($p < 0.05$), suggesting that tradeoff gets stronger each year at a diminishing rate. (For the capital-raised dependent variable, the age-squared interaction term was not significant.)

²⁹ For the matching, I used all of the founding-era variables in my core models that might indicate higher or lower quality: most centrally, the prior work experience and prior founding experience of the founders, size of founding team, and capital invested by the founders, but also at the firm level, the industry segment, state of the economy at time of founding, and geographic location. I performed IPW and RA analyses on both dependent variables (company valuation and capital raised) and for each change in

I performed these analyses for both the valuation and capital-raised dependent variables, and for control-index gradations of moving from no control to one measure of control (CEO or board), and from one measure of control to full control. Table 7 compares the core fixed-effects results to the IPW and RA estimates. Seven of the eight IPW and RA estimates are within two standard errors of the fixed-effects estimates, suggesting further support for the core results. (The eighth estimate is 2.03 standard errors away.)

Comparing the coefficients from Table 2 (control) and Table 3 (value creation) helps us highlight resources that have very different effects on the tradeoff between control and value creation. First, involving venture capitalists in the startup has an extreme impact on each DV, in conflicting ways: It has a very significant *negative* relationship with founder control (Table 2) but a very significant *positive* relationship with company valuation (Table 3). The opposite pattern is seen with angel capital and founder capital: They both have a significant *positive* relationship with control (Table 2) but a significant *negative* relationship with company valuation (Table 3). In this sense, these very different types of resource providers are microcosms of the overall control dilemma examined here. Interestingly, the core founder's characteristics is one area where the control dilemma does not seem to apply: By accumulating prior founding experience and tapping social networks to find executive hires, the founder has *higher* control but the company's valuation is *higher*, too. The "dilemma profiles" of these very different resource providers are thus summarized in Table 8.

DISCUSSION

Entrepreneurs embarking on a founding journey face a wide range of early decisions. The effects of these early founding decisions can have powerful, long-term imprinting effects on the subsequent evolution of their organizations (Bettis and Prahalad, 1995; Boeker, 1989). I have delved into how one specific type of decision—regarding the resources they attract to their companies—can have a powerful effect on the growth of the company and on the founders' ability to maintain control of it. At the

the graduation of control (control index = 0 vs. control index = 1, control index = 1 vs. control index = 2).

beginning of the founding journey, the vast majority of entrepreneurs are missing key resources (Evans and Jovanovic, 1989) in the form of financial capital, human capital, and/or social capital. By attracting those resources, founders have a better chance of growing a more valuable company. For instance, by attracting cofounders, hires, or investors, founders can access skills, contacts, and money they were lacking. However, attracting those resources can come at a stiff cost: the imperiling of the founders' control of the company they created, introducing a difficult "control dilemma" for founders.

The results of this study suggest that, within high-potential startups, the tension between resource attraction and the maintenance of control is real and significant, and that early founding decisions can lead to very different outcomes regarding both value creation and control. These results are robust across two different forms of value creation and across econometric approaches that both (1) use fixed effects to account for unobserved time-invariant company differences and (2) control for individual- and company-level differences. Not only are these results statistically significant, but from a practical perspective, a one-step change in control (from controlling both the CEO position and the board, to controlling only one, or from that to controlling neither) is associated with a 17.1–22.0 percent change in company valuation (and an even bigger change in capital raised). In short, Lew Cirne of Wily Technology is not alone in facing a tradeoff between "remaining parent of my baby" and having others raise the child more successfully, or between maintaining control versus growing the value of the startup he founded. The tradeoff seems to apply regardless of capital intensity and to get stronger as the startup ages, reinforcing the powerful tradeoff founders face at each step of the founding journey.³⁰

These results have implications not only for founders, but also for potential resource providers, such as hires and investors considering involvement in a young company. These potential resource providers would not enjoy the fruits of the entrepreneur's private benefits of control. Instead, the resource providers—especially

³⁰ Outside of these decisions about which people to attract, we can also see this tradeoff in such strategic issues as whether to form a joint venture or to go it alone (e.g., Gulati and Wang, 2003; Kogut, 1988), or whether to outsource or to keep everything in-house (e.g., Qu *et al.*, 2011; Shy and Stenbacka, 2003).

Table 7. Comparing IPW and RA results to the core fixed-effects estimates

Dependent variable	1		2		3		4	
	Log of valuation				Log of capital			
Control-index values	0 vs 1		1 vs 2		0 vs 1		1 vs 2	
Fixed-effects estimates	0.185	(0.071)	0.125	(0.068)	0.362	(0.090)	0.244	(0.078)
Inverse probability weighting (IPW) estimates	0.149	(0.042)	0.142	(0.090)	0.374	(0.052)	0.366	(0.184)
Regression adjustment (RA) estimates	0.203	(0.028)	0.180	(0.063)	0.426	(0.035)	0.402	(0.080)

Standard errors in parentheses.

Table 8. Tradeoffs between founder control and company value

	Company value	
	-	+
Founder control	-	Venture capitalists
	+	Angel investors Founder capital Founder has prior founding experience Founder taps network for exec hires

return-maximizing investors—are likely to be more interested in value creation, and thus be much more aligned with founders who are similarly driven. Such resource providers need to do due diligence on founders in order to understand their motivations and how they might influence the decisions they make when facing a tradeoff between control and value creation. Amit *et al.* (2000: 139) report that, “Two of our subjects volunteered information that they had problems obtaining financing because the venture capitalists felt they were not focused enough on potential monetary gains from the venture.” Hires and investors who pay attention to the founder’s likely decisions only *after* they have become involved will face deeper (and more costly) misalignment with control-oriented founders than if they had filtered out such founders from the beginning and instead selected founders focused on value creation.

The control dilemma examined here can shed new light on past results in the entrepreneurship literature. For one, the results help us resolve the “puzzle” posed by Moskowitz and Vissing-Jorgensen (2002)—and a similar finding by Hamilton (2000)—regarding their “missing private-equity premium.” For instance, Hamilton (2000) found that entrepreneurs make less from their startups than they could make in

paid employment. I find that companies in which founders remain in control are likely to be less valuable, as suggested by the overall results in Hamilton (2000) and Moskowitz and Vissing-Jorgensen (2002), but that the opposite is true in other companies, a fact that is lost amidst the inability of those studies to measure founder control. Entrepreneurs whose founding decisions prioritize maintaining control of the startup should indeed grow less value than the entrepreneurs whose founding decisions prioritize the attraction of value-added resources. In fact, for the latter group of entrepreneurs, it’s possible that we might find the *opposite* result as the one found when analyzing entrepreneurs as a whole: They may indeed make more from their startups than they could in paid employment. Rather than looking broadly at all entrepreneurs, we should take a more nuanced view of the population of entrepreneurs, examining how different founding decisions can lead to very different outcomes, not only regarding value created but also regarding whether the founder remains in control.

This study focuses on the company level of analysis, assessing how control affects *company* value. Resource-attraction decisions may also have an effect at the founder level of analysis—i.e., on the value of the *founder’s* ownership stake in the company, a level of analysis that deserves

attention in future research. This study also focuses on founders' revealed preferences: their actual decisions that should affect the value they create and the control they maintain. However, the values and motivations of an organization's most powerful actors can have a strong impact on its strategic choices, particularly regarding the attraction and allocation of resources (Hambrick and Mason, 1984; Tagiuri, 1965). Future research—possibly using “finer grained” qualitative methodologies to complement the quantitative methods used here (Harrigan, 1983)—could delve into how a founder's motivations affect founding decisions, thus influencing control vs. value-creation outcomes. Power and economic motivations often dominate executive decision making (e.g., Tagiuri, 1965). For entrepreneurs in particular, Sapienza *et al.* (2003: 106) argue that “wealth maximization and self-determination are the two primary motives driving entrepreneurial financing choices.” However, not all entrepreneurs start ventures to get wealthy (Amit *et al.*, 2000: 120); among MIT alumni initiating high-technology ventures, independence (“being own boss”) and challenge were more important motivators than financial gain (Roberts, 1988, 1991). Instead, researchers argue, such entrepreneurs are motivated by the chance to play a central role in driving and controlling the growth of the company they founded (e.g., Begley and Boyd, 1987; Carland *et al.*, 1984). The key for this study isn't the particular ordering of the control and value-creation motivations, but that they can conflict and might lead to very different outcomes. Furthermore, for founders who are clearly motivated by either independence or financial gains, the decisions they should make are much clearer than for founders with mixed motivations.

Risk is another important factor in these founder decisions. On the one hand, resource scarcity increases the firm's risk (Keats and Hitt, 1988) and should exacerbate the liability of newness (Stinchcombe, 1965). However, firm demise is not the only risk faced by founders; many founders may also worry about the risk of losing control of the idea they conceived and the company they birthed, leading them to avoid attracting resources.³¹ Future research could examine the risk profiles of each of

these paths and how they should affect resource decisions. Risk also affects the value of capital investments via its impact on option values (Abel *et al.*, 1996; McDonald and Siegel, 1986), which can be a substantial portion of the value of an entrepreneurial venture (Dixit and Pindyck, 1995). Furthermore, although attracting outside resources may increase company survival, bringing investors into the startup can increase the pressure to “swing for the fences”—to ratchet up the growth, usually increasing the risk of complete failure. Replacing a founder-CEO—especially one unhappy with losing control—may also heighten risks for the company. For these reasons, a founder's refusal to attract outside resources and to remain CEO may instead *reduce* risks for the company. Research that examines these competing types of risk can help shed further light on this tradeoff.

ACKNOWLEDGEMENTS

Thank you to Ben Esty, Teresa Amabile, Lynda Applegate, Matt Marx, Tom Eisenmann, Bill Kerr, Sam Garg, Magnus Torfason, Tom Nicholas, and seminar participants at Hong Kong University of Science and Technology and at the University of Southern California for their invaluable comments on early drafts of the paper. Fifteen years of deep appreciation to Aaron Lapat, Bill Holodnak, Mike Dipierro, Furqan Nazeeri, and Evan Brown for their support and assistance with data collection. Thank you also to Andrew Marder for his multi-pronged and dedicated research assistance and to Bill Simpson and Xiang Ao for their input throughout the analysis phase.

REFERENCES

- Abel AB, Dixit AK, Eberly JC, Pindyck RC. 1996. Options, the value of capital, and investment. *Quarterly Journal of Economics* **111**(3): 753–777.
- Abetti PA. 2005. The creative evolution of Steria. *Creativity and Innovation Management* **14**(2): 191–204.
- Adomdza GK. 2008. The role of affect in commercializing new ideas. Unpublished PhD diss., University of Waterloo, Ontario, Canada.
- Aghion P, Bolton P. 1992. An incomplete contracts approach to financial contracting. *Review of Economic Studies* **59**: 473–494.
- Aldrich HE, Fiol CM. 1994. Fools rush in? The institutional context of industry creation. *Academy of Management Review* **19**(4): 645–670.

³¹ Connecting risk to the private benefits of control, Shaobo (2007) argues that “the private benefits of control actually are ... the risk premium of control.”

- Amit R, Glosten L, Muller E. 1990. Entrepreneurial ability, venture investments, and risk sharing. *Management Science* **36**(10): 1232–1245.
- Amit R, MacCrimmon KR, Zietsma C, Oesch J. 2000. Does money matter? Wealth attainment as the motive for initiating growth-oriented technology ventures. *Journal of Business Venturing* **16**: 119–143.
- Bagley CE, Dauchy CE. 2003. *The Entrepreneur's Guide to Business Law*. Thomson Learning: Ontario.
- Baker M, Gompers PA. 1999. Executive ownership and control in newly public firms: the role of venture capitalists. November 1999 (First draft in 1998.).
- Baker M, Gompers PA. 2003. The determinants of board structure at the initial public offering. *Journal of Law and Economics* **46**(2): 569–598.
- Barclay MJ, Holderness CG. 1989. Private benefits from control of public corporations. *Journal of Financial Economics* **25**: 371–395.
- Begley TM, Boyd DP. 1987. Psychological characteristics associated with performance in entrepreneurial firms and smaller businesses. *Journal of Business Venturing* **2**: 79–93.
- Berle A, Means GC. 1932. *The Modern Corporation and Public Property*. Macmillan: New York.
- Bettis RA, Prahalad CK. 1995. The dominant logic: retrospective and extension. *Strategic Management Journal* **16**(1): 5–14.
- Bhide A. 2000. *The Origin and Evolution of New Businesses*. Oxford University Press: New York, NY.
- Blanchflower DG, Oswald AJ. 1998. What makes an entrepreneur? *Journal of Labor Economics* **16**(1), pp. 26–60.
- Boeker W. 1989. Strategic change: the effects of founding and history. *Academy of Management Journal* **32**: 489–515.
- Boeker W, Karichalil R. 2002. Entrepreneurial transitions: factors influencing founder departure. *Academy of Management Journal* **45**(3): 818–826.
- Brush CG, Greene PG, Hart MM, Haller HS. 2001. From initial idea to unique advantage: the entrepreneurial challenge of constructing a resource base. *Academy of Management Executive* **15**(1): 64–80.
- Carland JW, Hoy F, Boulton WR, Carland JC. 1984. Differentiating entrepreneurs from small business owners: a conceptualization. *Academy of Management Review* **9**: 354–359.
- Cattaneo MD. 2010. Efficient semiparametric estimation of multi-valued treatment effects under ignorability. *Journal of Econometrics* **155**(2): 138–154.
- Clercq DD, Fried VH, Lehtonen O, Sapienza HJ. 2006. An entrepreneur's guide to the venture capital galaxy. *Academy of Management Perspectives* **20**(3): 90–112.
- Coff RW. 1999. When competitive advantage doesn't lead to performance: the resource-based view and stakeholder bargaining power. *Organization Science* **10**(2): 119–133.
- Cooper AC, Bruno AV. 1977. Success among high-technology firms. *Business Horizons* **20**(2): 16–22.
- Davidsson P, Honig B. 2003. The role of social and human capital among nascent entrepreneurs. *Journal of Business Venturing* **18**: 301–331.
- Dixit AK, Pindyck RS. 1995. The options approach to capital investment. *Harvard Business Review* **73**(3): 105–115.
- Edmondson AC, McManus SE. 2007. Methodological fit in management field research. *Academy of Management Review* **32**(4): 1155–1179.
- Eisenberg T, Sundgren S, Wells MT. 1998. Large board size and decreasing firm value in small firms. *Journal of Financial Economics* **48**: 35–54.
- Eisenhardt KM, Schoonhoven CB. 1990. Organizational growth: linking founding team, strategy, environment, and growth among U.S. semiconductor ventures, 1978–1988. *Administrative Science Quarterly* **35**: 504–529.
- Evans DS, Jovanovic B. 1989. An estimated model of entrepreneurial choice under liquidity constraints. *Journal of Political Economy* **97**(4): 808–827.
- Fama EF, Jensen ML. 1983. Separation of ownership and control. *Journal of Law and Economics* **26**: 301–325.
- Garg S. 2013. Venture boards: distinctive monitoring and implications for firm performance. *Academy of Management Review* **38**(1): 90–108.
- George G. 2005. Slack resources and the performance of privately held firms. *Academy of Management Journal* **48**(4): 661–676.
- Gompers P. 1995. Optimal investment, monitoring, and the staging of venture capital. *Journal of Finance* **50**: 1461–1489.
- Gompers P, Lerner J. 1999. *The Venture Capital Cycle*. MIT Press: Boston, MA.
- Gompers P, Lerner J, Scharfstein D, Kovner AR. 2010. Performance persistence in entrepreneurship and venture capital. *Journal of Financial Economics* **96**(1): 18–32.
- Gorman M, Sahlman WA. 1989. What do venture capitalists do? *Journal of Business Venturing* **4**(4): 231–248.
- Graham J, Harvey C. 2001. The theory and practice of corporate finance: evidence from the field. *Journal of Financial Economics* **60**: 187–243.
- Grossman SJ, Hart OD. 1988. One share-one vote and the market for corporate control. *Journal of Financial Economics* **20**: 175–202.
- Gulati R, Sytch M. 2007. Dependence asymmetry and joint dependence in interorganizational relationships: effects of embeddedness on a manufacturer's performance in procurement relationships. *Administrative Science Quarterly* **52**(1): 32–69.
- Gulati R, Wang L. 2003. Size of the pie and share of the pie: implications of structural embeddedness for value creation and value appropriation in joint ventures. *Research in the Sociology of Organizations* **20**: 209–242.
- Hall RE, Woodward SE. 2010. The burden of the nondiversifiable risk of entrepreneurship. *American Economic Review* **100**(June): 1163–1194.
- Hambrick DC, Mason PA. 1984. Upper echelons: the organization as a reflection of its top managers. *Academy of Management Review* **9**: 193–206.
- Hamilton BH. 2000. Does entrepreneurship pay? An empirical analysis of the returns to self-employment. *Journal of Political Economy* **108**(3): 604–631.

- Harrigan KR. 1983. Research methodologies for contingency approaches to business strategy. *Academy of Management Review* **8**(3): 398–405.
- Hellmann T. 1998. The allocation of control rights in venture capital contracts. *RAND Journal of Economics* **29**: 57–76.
- Higgins RC. 1977. How much growth can a firm afford? *Financial Management* **6**(3): 7–16.
- Higgins RC. 1998. *Analysis for Financial Management*. Irwin/McGraw-Hill: Boston, MA.
- Hillman A, Dalziel T. 2003. Board of directors and firm performance: integrating and resource dependence perspectives. *Academy of Management Review* **28**(3): 383–396.
- Hillman AJ, Withers MC, Collins BJ. 2009. Resource dependence theory: a review. *Journal of Management* **35**: 1404–1427.
- Horwitz SK, Horwitz IB. 2007. The effects of team diversity on team outcomes: a meta-analytic review of team demography. *Journal of Management* **33**(6): 987–1015.
- Hsu D. 2004. What do entrepreneurs pay for venture capital affiliation? *Journal of Finance* **59**(4): 1805–1844.
- Hsu D, Roberts DR, Eesley D. 2007. Entrepreneurs from technology-based universities: evidence from MIT. *Organization Science* **6**(3): 768–788.
- Hurst E, Li G, Pugsley B. 2010. Using expenditures to estimate missing self employed income. Working paper, University of Chicago, IL.
- Imbens GW, Wooldridge JM. 2009. Recent developments in the econometrics of program evaluation. *Journal of Economic Literature* **47**(1): 5–86.
- Jensen M. 1993. The modern industrial revolution, exit, and the failure of internal control systems. *Journal of Finance* **48**: 831–880.
- Jensen M, Meckling W. 1976. Theory of the firm: managerial behavior, agency costs and ownership structure. *Journal of Financial Economics* **3**: 305–360.
- Kaplan SN, Stromberg P. 2003. Financial contracting theory meets the real world: an empirical analysis of venture capital contracts. *Review of Economic Studies* **70**: 281–315.
- Kaplan SN, Strömberg P., Sensoy BA. 2002. How well do venture capital databases reflect actual investments? Available at: SSRN 939073.
- Katila R, Rosenberger JD, Eisenhardt K. 2008. Swimming with sharks: technology ventures, defense mechanisms and corporate relationships. *Administrative Science Quarterly* **53**: 295–332.
- Keats BW, Hitt MA. 1988. A causal model of linkages among environmental dimensions, macro organizational characteristics, and performance. *Academy of Management Journal* **31**: 570–598.
- Kirilenko AA. 2001. Valuation and control in venture finance. *Journal of Finance* **56**(2): 565–587.
- Kirzner IM. 1973. *Competition and Entrepreneurship*. University of Chicago Press: Chicago, IL.
- Kogut B. 1988. Joint ventures: theoretical and empirical perspectives. *Strategic Management Journal* **9**(4): 319–332.
- Lease RC, McConnell JJ, Mikkelsen W. 1983. The market value of control in publicly-traded corporations. *Journal of Financial Economics* **11**: 439–471.
- Lerner J. 1995. Venture capitalists and the oversight of private firms. *Journal of Finance* **50**: 301–318.
- Lindh T, Ohlsson H. 1998. Self-employment and wealth inequality. *Review of Income and Wealth* **44**(1): 25–42.
- March JG, Shapira Z. 1987. Managerial perspectives on risk and risk taking. *Management Science* **33**(11): 1404–1418.
- March JG, Simon HA. 1958. *Organizations*. Wiley: New York.
- McDonald R, Siegel D. 1986. The value of waiting to invest. *Quarterly Journal of Economics* **101**(4): 707–728.
- Miller D. 1991. *The Icarus Paradox: How Exceptional Companies Bring About Their Own Downfall*. Harper-Business: New York.
- Mintzberg H, Waters JA. 1982. Tracking strategy in an entrepreneurial firm. *Academy of Management Journal* **25**(3): 465–499.
- Misangyi VF, Elms H, Greckhamer T, Lepine JA. 2006. A new perspective on a fundamental debate: a multilevel approach to industry, corporate, and business unit effects. *Strategic Management Journal* **27**(6): 571–590.
- Morck R, Shleifer A, Vishny R. 1988. Management ownership and market valuation: an empirical analysis. *Journal of Financial Economics* **20**: 293–315.
- Moskowitz TJ, Vissing-Jorgensen A. 2002. The returns to entrepreneurial investment: a private equity premium puzzle? *American Economic Review* **92**(4): 745–778.
- Nohria N, Gulati R. 1996. Is slack good or bad for innovation? *Academy of Management Journal* **39**(5): 1245–1264.
- Ozcan P, Eisenhardt KM. 2009. Origin of alliance portfolios: entrepreneurs, network strategies, and firm performance. *Academy of Management Journal* **52**(2): 246–279.
- Peteraf MA. 1993. The cornerstones of competitive advantage: a resource-based view. *Strategic Management Journal* **14**(3): 179–191.
- Pfeffer J. 1972. Size and composition of corporate boards of directors. *Administrative Science Quarterly* **17**: 218–229.
- Pfeffer J, Salancik GR. 1978. *The External Control of Organizations: A Resource Dependence Perspective*. Harper and Row: New York, NY.
- Qu WG, Pinsonneault A, Oh W. 2011. Influence of industry characteristics on information technology outsourcing. *Journal of Management Information Systems* **27**(4): 99–127.
- Roberts EB. 1988. The personality and motivations of technological entrepreneurs. Working paper #2078–88, M.I.T. Sloan: Boston, MA.
- Roberts EB. 1991. *Entrepreneurs in High-Technology*. Oxford University Press: New York.
- Romanelli E. 1989. Environments and strategies of organization start-up: effect on early survival. *Administrative Science Quarterly* **34**(3): 369–387.

- Rosenbaum PR, Rubin DB. 1983. The central role of the propensity score in observational studies for causal effects. *Biometrika* **70**(1): 41–55.
- Rousseau DM, Shperling Z. 2003. Pieces of the action: ownership and the changing employment relationship. *Academy of Management Review* **28**(4): 553–570.
- Rubin DB. 1973. The use of matched sampling and regression adjustment to remove bias in observational studies. *Biometrics* **29**(1): 185–203.
- Rubin DB. 1987. *Multiple Imputation for Nonresponse in Surveys*. Wiley: New York.
- Ruef M. 2010. *The Entrepreneurial Group: Social Identities, Relations, and Collective Action*. Princeton, NJ: Princeton University Press.
- Sapienza HJ, Korsgaard MA, Forbes DP. 2003. The self-determination motive and entrepreneurs' choice of financing. In *Cognitive Approaches to Entrepreneurship Research* (Volume 6), Katz JA, Shepherd D (eds). Elsevier Science & Technology Books: Burlington, MA; 105–138.
- Schmidt JB, Calantone RJ. 2002. Escalation of commitment during new product development. *Journal of the Academy of Marketing Science* **30**(2): 103–118.
- Schumpeter J. 1942. *Capitalist, Socialism, and Democracy*. Harper & Brothers: New York.
- Shane S, Venkataraman S. 2000. The promise of entrepreneurship as a field of research. *Academy of Management Review* **25**: 217–226.
- Shaobo L. 2007. The paradox of private benefits of control and excessive benefits of control: a new theoretical explanation of large shareholders' expropriation of small ones. *Economic Research Journal* **2**: 85–96.
- Sherman A. 2005. *Raising Capital* (2nd edn). New York: Amacom.
- Shy O, Stenbacka R. 2003. Strategic outsourcing. *Journal of Economic Behavior & Organization* **50**(2): 203–224.
- Sorenson O, Stuart TE. 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.
- StataCorp. 2013. *Stata 13 Base Reference Manual*. Stata Press: College Station, TX.
- Staw BM. 1981. The escalation of commitment to a course of action. *Academy of Management Review* **6**(4): 577–587.
- Stevenson HH, Jarillo JC. 1990. A paradigm of entrepreneurship: entrepreneurial management. *Strategic Management Journal* **11**(1): 17–27.
- Stinchcombe AL. 1965. Organizations and social structure. In *Handbook of Organizations*, March JG (ed). Rand McNally: Chicago, IL; 153–193.
- Stuart T, Hoang H, Hybels RC. 1999. Interorganizational endorsements and the performance of entrepreneurial ventures. *Administrative Science Quarterly* **44**: 315–349.
- Tagiuri R. 1965. Value orientations and the relationship of managers and scientists. *Administrative Science Quarterly* **10**(1): 39–51.
- Unger JM, Rauch A, Frese M, Rosenbusch N. 2011. Human capital and entrepreneurial success: a meta-analytical review. *Journal of Business Venturing* **26**: 341–358.
- Venkataraman S. 1997. The distinctive domain of entrepreneurship research. In *Advances in Entrepreneurship, Firm Emergence, and Growth* (Volume 3). JAI Press: Greenwich, CT; 119–138.
- Wasserman N. 2003. Founder-CEO succession and the paradox of entrepreneurial success. *Organization Science* **14**(2): 149–172.
- Wasserman N. 2012. *The Founder's Dilemmas: Anticipating and Avoiding the Pitfalls That Can Sink a Startup*. Princeton, NJ: Princeton University Press.
- Wasserman NT, Fynn R. 2007. Les is more, times four. Harvard Business School Case 807-173.
- Wasserman N, McCance H. 2005. Founder-CEO succession at Wily technology. Harvard Business School Case 805-150.
- Wong A. 2002. Angel finance: the other venture capital. Graduate school of business. Unpublished PhD diss., University of Chicago, IL.
- Wong A, Bhatia M, Freeman Z. 2009. Angel finance: the other venture capital. *Strategic Change* **18** (Special Issue: Entrepreneurial Finance): 221–230.
- Yermack D. 1996. Higher market evaluation of companies with a small board of directors. *Journal of Financial Economics* **40**: 185–211.