The Founder's Resource-Dependence Challenge

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Abstract

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 a degree of control. On average,

each additional degree of founder control (i.e., controlling the board and/or the CEO position) reduces

the value of the startup by 23.0%-58.1%.

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?" In this paper, I extend previous work on this issue 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's maintenance of control can harm company value. I explore the possibility that the startup's resource dependence (e.g., Pfeffer and Salancik 1978) drives a wedge between the growth of the startup and the founder's ability to maintain control – a so-called "control dilemma." As we will see, key 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.

I argue that founders face stark resource-dependence tradeoffs that necessitate choices between the degree of control kept by the founders and the value of the startup. The key resources founders can attract to their startups include the human capital, social capital, 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 2005-2012. The analyses both tap all respondents in the dataset and use fixed-effects with repeat respondents in order to control for unobserved time-invariant company characteristics that might drive the difference in outcomes.

This study adds insights to several literatures. Within the entrepreneurship literature, conceptual studies (e.g., Evans and Jovanovic 1989; Amit, MacCrimmon et al. 2000) 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, nor have they tested their propositions empirically.

The economics literature has examined the private benefits of control in the securities of public companies (e.g., Lease, McConnell *et al.* 1983; Grossman and Hart 1988), but has not explored how the private benefits of control might extend to entrepreneurial decisions and outcomes. 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. Finally, resource-dependence theory has focused on the ways in which organizational uncertainty is *reduced* by attracting needed resources (Pfeffer and Salancik 1978), but has largely neglected how another important uncertainty – "control uncertainty," or whether organizational leaders will lose control of the decision making within their company – may be *heightened* by the attraction of resources.

Thus, the current study develops the theoretical grounding for this control dilemma – in particular, for why founders' resource-dependence challenges should cause a tradeoff between control and value creation across multiple stages of startup evolution. I empirically test the hypothesized tradeoff using a large, unique dataset that includes direct measures of founder control. I also delve into several alternative hypotheses and contingencies. The analyses use fixed effects to control for unobserved time-invariant characteristics of the startups, and test the hypotheses on multiple 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 degree of control. More specifically, on average, each additional degree of founder control reduces the value of the startup by 23.0%-58.1%, depending on the dependent variable used and the analytical approach. In addition, because the analyses include a variety of resource

providers (e.g., cofounders vs. hires vs. investors), I am able to examine how the 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 Greylock Partners and other top venture capitalists (VCs), and gave up three of

five seats on the board of directors to those outsiders. 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 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 (relying instead on founder capital and bank loans), 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).

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[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.

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 fully pursue the opportunity. In fact, it has been estimated that entrepreneurs are sixty times more likely to be resource constrained than to be unconstrained (Evans and Jovanovic 1989). As they launch and grow their startups, founders make decisions that influence the types and amount of resources they will or will not be able to acquire for their startups (Romanelli 1989). Entrepreneurs who "take an aggressive posture toward resource acquisition" (Romanelli 1989:375) and succeed at attracting resources should be able to grow more-valuable startups (Eisenhardt and Schoonhoven 1990).

Building on March and Simon (1958), 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, assembling resources often comes at the expense of giving up control of the company, because 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 the entrepreneurs in whom they have invested, 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 indeed keep more control, but should find it harder to attract investors and thus fail to grow as much value. In contrast to an optimistic view of entrepreneurship, this tradeoff 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. Founders thus face a "control dilemma" caused by their resource dependence. This dilemma highlights an underappreciated

downside of resource attraction. Resource dependence focuses on how organizations decrease their

uncertainty by forming ties to acquire needed resources from external resource providers (Pfeffer and

Salancik 1978). I focus on how attracting resources *increases* an important type of uncertainty: control

uncertainty. In making resource decisions, founders 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., Evans and Jovanovic 1989;

Amit, MacCrimmon *et al.* 2000) 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., Schumpeter 1942; Kirzner

1973).[3] In an effort 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 empirically test this possibility.[4]

[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
et al. 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).

(This speculation matches that of Carland, Hoy *et al.* (1984); Amit, MacCrimmon *et al.* (2000); and

Sapienza, Korsgaard *et al.* (2003).) Below, I develop, enrich, and test this possibility.

Within large companies, upper echelons theory (Hambrick and Mason 1984) suggests that

resource-acquisition decisions should have important implications for the organization and for the

financial value that can be built. The finance literature has looked at the "private benefits of control"

within large, public companies by examining differences in the prices of securities that are identical

except for their voting rights, and found that security owners are willing to give up economic gains to

gain control or voting rights (Lease, McConnell *et al.* 1983; Grossman and Hart 1988). More broadly, this

view of the tension between control and value creation contrasts with Berle and Means' (1932) classical

view of the separation 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' (and board of directors') 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., Jensen and Meckling 1976; Fama and Jensen

1983). 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?
Any organization faces a struggle to get resources from outside resource providers (Pfeffer and Salancik

1978). As a result of that struggle, the organization has to give up autonomy and cannot be fully self-

directed. This is particularly true of entrepreneurs pursuing new opportunities (Starr and MacMillan

1990). 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 (Stinchcombe 1965; Aldrich and Fiol 1994). In fact, "Attracting resources into a fledgling venture is perhaps the greatest challenge faced by entrepreneurs." (Brush, Greene *et al.* 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 any or all of three major areas: human capital, social capital, and financial capital (Sapienza, Korsgaard *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, may have contacts with customers or potential partners, and may 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. The attraction of investors poses the clearest example of the tradeoff I examine, but it also should exist regarding the attraction of the resources provided by cofounders and hires.

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

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[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.

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 *et al.* 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 more human capital (both general human capital and the human capital that is more specific to founding), and have developed the social capital necessary to attract employees to the startup, should be able to keep more control than less-experienced core founders (Wasserman 2003). Of particular relevance to entrepreneurs, human and social capital can be developed through prior work experience, including both the years of prior overall work experience, which can affect strategic decisions (Hambrick and Mason 1984) and can proxy for general human capital (Gimeno, Folta *et al.* 1997), and prior founding experience – i.e., whether the founder is a serial entrepreneur whose experiences might shape decisions differently than for a first-time founder (Sapienza, Korsgaard *et al.* 2003).

The other types of 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. The more *cofounders* who join the team, the more decision-making

control the core founder should have to give up.[6] Likewise, mirroring the arguments about the core

founder's value addition, the more experienced the cofounders, the more control the core founder

should have to give up when attracting them. Similar arguments hold for the startup's *non-founding*

executive hires: the more experienced the non-founding hires, the more control the core founder should

have to give up.

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). 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

(Grossman and Hart 1988; Aghion and Bolton 1992; 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

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[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.

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 *et al.* 1988:301). 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). 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.[7]

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

Hypothesis 1a (core founder): The more experienced the core founder and the more
the core founder taps personal networks to attract employees, the *more* control
the founder will retain.

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

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

Hypothesis 1d (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 1994:287). 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

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

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 broad-based, 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), and a new CEO would be more effective at achieving strategic change or at adjusting the employee base to fit the company's new challenges.

It is important to note that these founder-CEOs have succeeded at achieving the key operating milestone of completing initial product development and have succeeded at attracting resources from outside investors, but that those very successes have increased the impetus to replace the founder with a new CEO. 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.

If, instead, an entrepreneur refuses to surrender some control and autonomy to resource providers, s/he will fail to attract the best resource providers and thus should build less value. As these decisions accumulate, they can lead to very different outcomes. At the autonomy extreme – in which the founder consistently foregoes attracting resources – the founder will be most likely to keep full

control of the startup but to sacrifice value. For instance, founders can self-fund the venture, tapping personal savings or internally-generated funds, and retain control of the venture (Baker and Gompers 2003). However, among large, public, Fortune 500 companies, "corporate assets can be less valuable when managed by an individual free from checks on his control" (Morck, Shleifer *et al.* 1988:294), a tradeoff that may extend to small private startups. At the value-creation extreme, founders consistently attract valuable outside resources but risk losing control of the startup.[8] Offering investors more-favorable control terms heightens the likelihood that the founder-CEO will be replaced by the board of directors (Hellmann 1998; Boeker and Karichalil 2002; Wasserman 2003), the most direct and central way in which founders lose control of the startup. Along the spectrum 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.

From a resource-dependence perspective, companies use boards to gain resources and minimize dependence (Pfeffer 1972). Outside directors bring four major benefits to a company: "advice and counsel," access to external channels of information, access to resources, and legitimacy (Pfeffer and Salancik 1978; Hillman, Withers *et al.* 2009). More recently, these human-capital and social-capital contributions from directors have been encapsulated as "board capital" (Hillman and Dalziel 2003). Founders who haven't raised capital from outside investors will control the entire board of directors and thus all board decisions, but will also lack the board capital that directors could contribute, and also lack the additional discipline that can come from their monitoring (Garg 2013).

Regarding value-added resources, some investors add few resources beyond their financial capital, but other investors, such as venture capitalists, are known for "providing value-added services to their portfolio companies" (Baker and Gompers 2003:571). More specifically, "their involvement

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[8] 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).

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 1999). Because the best VCs can add value – and board capital – in these ways, founders are willing to take weaker investment terms from them than from other investors (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). Attracting cofounders and non-founding hires should therefore help grow the value of the startup, but at cost of imperiling control.

Thus, *ceteris paribus*, founders who attract resources to their startups should grow more valuable startups than founders who do not attract resources, but will be more likely to give up control of the board and/or CEO position. 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.

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

> **Hypothesis 2**: The value of a 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 when the startup was founded, what type of startup was founded, and evolution over time. First, the tradeoff may differ by whether the economy is booming or whether it is in a downturn. Second, resource dependence may differ according to the degree to which the company's industry segment is capital intensive. Third, younger startups may be more susceptible to the tradeoff than are older startups.

For any organization, "the resources required for organizational survival are the most relevant focus in defining organizational environments" (Dess and Beard 1984:52). For startups in particular, the external environment can have a powerful effect on growth (Eisenhardt and Schoonhoven 1990). A particularly powerful element of the environment is the availability of resources (Romanelli 1989; Katila and Shane 2005) or environmental munificence – "the level of resources in a particular environment" (Park and Mezias 2005:987). When needed resources are more scarce, companies should have to give up more control in order to access those resources; in times of plentiful resources, those resources should be easier to access (Pfeffer and Salancik 1978). Indeed, for technology companies, the munificent funding available during the late-1990s "dot-com boom" had a significant positive impact on performance, followed by the significant negative impact of the "bust" that followed (Park and Mezias 2005).

We would thus expect the tradeoff to be stronger during times of resource scarcity

(macroeconomic downturns) than during times of resource munificence (macroeconomic upturns).

During the period covered by my dataset, startups experienced two full macroeconomic cycles: The

boom of the late 1990s followed by the bust of the early 2000s, and then the boom of the mid-2000s

and the bust of 2008 onwards. We might expect the startups founded during the "busts" to have to give

up more control in order to attract the resources necessary to grow value, and startups founded during

the "booms" to be able to give up less control while attracting resources. At the same time, founders

may be able to take advantage of downturns, in that some resources may be easier to acquire than

during booming markets. For instance, it may be less costly to lure high-quality hires when those hires

have fewer alternative job opportunities, as might be the case during downturns. Thus, there may be

countervailing forces that smooth out the resource-dependence challenges across the ups and downs of

the business cycle.

This leads to the following two competing hypotheses, the first of which posits that the tradeoff is

contingent, and the second of which posits that the tradeoff is more universal.

> **Hypothesis 3a**: The inverse relationship between company value and founder control
> will be strong in startups founded during macroeconomic downturns but not in
> startups founded during macroeconomic upturns.

> **Hypothesis 3b**: The inverse relationship between company value and founder control
> will be strong both in startups founded during macroeconomic downturns and in
> startups founded during strong macroeconomic years.

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.

Within larger companies, at both the corporate and business-segment levels, high capital intensity can

have a negative impact on performance (Misangyi, Elms *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 *et al.* 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 competing hypotheses (once again, "contingent" vs. "universal"):

> **Hypothesis 4a**: 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.

> **Hypothesis 4b**: The inverse relationship between company value and founder control will be strong both in startups in more capital-intensive industry segments and in startups in less capital-intensive industry segments.

During the early stages of founding, founders control few resources beyond their own human, social, and financial capital (Stevenson and Jarillo 1990). The early resource challenges posed by the liability of newness may be particularly steep at this point (Stinchcombe 1965), making it costly for founders to attract the initial resource providers to a startup that lacks legitimacy and a track record. Furthermore, the resource-provision role of the board of directors may be particularly relevant during the earliest stages of the company life cycle (Lynall, Golden *et al.* 2003), suggesting that the founder's resource-dependence challenge may be acute in the youngest of startups. As the startup evolves and begins attracting resource providers, it may get easier – and less costly, regarding the control and ownership that has to be given up – to attract later resource providers. Thus, the tradeoff may be stronger in younger startups than in older startups. This leads to the following competing (contingent vs. universal) hypotheses:

> **Hypothesis 5a**: The inverse relationship between company value and founder control will be strong in younger startups but not in older startups.

> **Hypothesis 5b**: The inverse relationship between company value and founder control will be strong both in younger startups and in older startups.

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, MacCrimmon *et al.* 2000). Interviews can be invaluable for finding out

entrepreneurs' *stated* motives (Amit, MacCrimmon *et al.* 2000). Even so, "we do not have, and it would

be very difficult (if not impossible) to specify, the 'true' beliefs" of interviewed entrepreneurs (Amit,

MacCrimmon *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).[9] In addition, the survey time period includes startups that were founded across all stages of two

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[9] According to Renaissance Capital, of the initial public offerings (IPOs) over the last decade, 48% came from those
two industries, and no other industry accounted for more than 12%. 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% went to those two industries, as did 71% of venture capital. According to Thomson's

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.[10] Because the market for executive talent 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%-20%, 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 financing history and performance of private companies). The surveys are conducted online and fields

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Venture Expert Database, technology investments (including Internet, computer software and services, communications and media, semiconductors and other electronics, and computer hardware) were 56% of venture capital investments from 2000 to 2009 and life sciences investments (medical/health and biotechnology) were an additional 15%.

[10] 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.

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).[11]   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 datapoints needed for the current study – e.g., founder and non-founder backgrounds, executive compensation, 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).   However, it is instructive to compare the distributions of companies within the two datasets.   The Appendix compares the CompStudy sample to the VentureXpert sample on the three dimensions on which they can be compared: geographic distribution, industry breakdown, and founding year.   Regarding geographic distribution, the two datasets almost match each other regarding the percentage of startups from each state in the United States (i.e., their datapoints lie along the 45-degree line in the figure in the Appendix) with the exception that compared to VentureXpert, CompStudy has more firms in Massachusetts and fewer firms in California. Regarding industry breakdown, CompStudy is a little more balanced than VentureXpert, with 65.2% of the CompStudy firms coming from high technology while 79.1% of the VentureXpert firms come from high technology. Regarding founding year, as shown in the Appendix, VentureXpert has a higher proportion of companies from before 2000, and is much more influenced by companies founded in 1999, than is CompStudy, but that otherwise their distributions are similar.[12]

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

[12] 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

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, a recent study (Hsu, Roberts *et al.* 2007) also surveyed high-potential startups. Hsu *et al.* (2007) reported an average of 2.86 founders per team. My dataset has 2.70 founders per team. In Hsu *et al.* (2007), 46% of the entrepreneurial teams had no prior startup experience. In my sample, 53% of the core founders had no prior startup experience.

It should be noted that 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 would ask, "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 early 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-H1d) examine the degree of control retained by founders. Following Hellmann (1998), I measure *control* at two levels: 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 "index of control"

(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.

that ranges from 0-2: zero for if the founders control neither the CEO position nor the board of directors, one for if they control one but not the other, and two 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 2-5 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 company valuation at the most recent round of financing. In particular, I use the pre-money valuation (e.g., Hsu 2004; Gompers, Lerner *et al.* 2010) calculated as the price paid per share in the financing round times the number of shares outstanding prior to the financing 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. Both variables were log-normally distributed, so in my models I use the natural log of the 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).

The independent variables include the core founder's background, characteristics of the founding team, the founders' initial capital invested in the venture, characteristics of the non-founding executives hired by the startup, the sources of capital, the age of the startup, the startup's location and capital intensity, and the macroeconomic conditions at time of founding. A *core founder* with more prior work experience may be able to create more value, as may a founder with prior founding experience.

Therefore, I include in the models the core founder's years of prior work experience and an indicator of whether the founder had prior founding experience.[13] Regarding the *founding team*, as described above, the larger the founding team, the more valuable should be the startup, but the less control the core founder should retain. Value creation may also be affected by the broader founding team's abilities, so I include 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. *Non-founding executives* who are more skilled may also be able to help grow more value, so 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). 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. Regarding the startup's *location*, more valuable ventures may be created in startup "hubs" that have plentiful startup resources (including human, social, and financial capitals), so I controlled for whether the startup is located in a hub (i.e., California or Massachusetts, which are the largest states in the American startup scene), a secondary market (Illinois, New Jersey, New York, or Texas), 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. Higher capital intensity segments included Biopharma, CleanTech, and Hardware / Semiconductors / Communications. Lower capital intensity segments included Digital Media / Content, Software, and Medical devices. (The remaining segments – 23% of the total – were categorized as Other.) To assess the *macroeconomic conditions at time of*

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[13] 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.

founding, I categorized each startup's year of founding into boom, middling (neither boom not bust), or

bust eras. The boom eras included pre-2000 and 2004-2007, the middling eras included 2003 and 2008,

and the bust eras included 2000-2002 and 2009-2012.

Methods

In the multivariate models testing Hypotheses 2 through 5, the 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% participated more than one time, enabling me to use their responses in the fixed-effects

analyses. Robustness tests used fixed-effects models with (log of) capital raised as an alternate metric

of value creation. The models include company-level fixed effects, reducing the risk of omitted-variable

bias by allowing us to control for the unobservable time-invariant characteristics of each firm. In order

to be able to include all companies in the analyses (not just those that were repeat respondents), I also

used ordinary-least-squares models (without fixed effects) with all surveys, inversely weighting each

survey by the number of surveys submitted by that company. The tables present both forms of analysis

for each dependent variable, with standard errors 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 between them. The 95% 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 latter 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 Hypotheses 3a and 3b, I want to see whether firms that were founded at different points in the macroeconomic cycle – when we would expect very different levels of resource munificence – face different tradeoffs between control and value created. I interact dummy variables indicating whether the firm was founded during a downturn, a middling market, or an upturn with all the variables in our core model. This yields equivalent regression coefficients to estimating the core model three times – once restricting the sample to firms founded during downturns, once to firms founded during middling markets, and once to firms founded during upturns – while still being able to use all data points in the model (instead, the three restricted models would each have about one-third the observations). Combining these three regressions into one regression also allows us to quickly test the difference between the coefficient on control for the three types of firms. Two results 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 (the first of each pair), or insignificant (in which case we have to inspect the confidence interval for each interaction term to see if we have support for the "universal tradeoff" hypothesis – the second of each pair)? I performed similar analyses to test Hypotheses 4a and 4b (about capital intensity, interacting two levels of capital intensity) and Hypotheses 5a and 5b (about startup age, interacting two median-split age groupings).

Results

Table 1 shows summary statistics and a correlation matrix for the dependent and independent variables. The data include 6,130 companies. On average the 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% had prior founding experience. Of the prior rounds of financing, 17% included

founder capital, 28% included angel investors, and 71% included venture capitalists. Regarding control

of the company, in 49% of the companies a founder was still CEO and in 21% of the companies the

insiders controlled more than half of the seats on the board of directors. Geographically, 28% of the

startups were located in California, 16% in Massachusetts, and 12% in the four "secondary" states

(Illinois, New Jersey, New York, or Texas).

[INSERT TABLES 1-7 ABOUT HERE]

Table 2 analyzes the degree of control retained by founders. Tables 3 and 4 test Hypotheses 2a

and 2b, and Tables 5-7 examine Hypotheses 3a-5b about whether the tradeoff is driven by some

contingencies or applies consistently across contingencies.

Table 2 highlights variables that are very significantly associated with control, several of which are

consistent with prior research on founder-CEO succession (e.g., Boeker and Karichalil 2002; Wasserman

2003) but others that go beyond that research. Across all of the models in this table, company age has a

significant negative relationship with control-index (p<.01). When first added to the model (in Model 2),

the founder's years of prior work experience has a significant negative relationship with control-index

(p<.05), but when the rest of the variables are added (Models 3-6), it becomes positive and significant

(p<.05 in Models 4-6). The results for the rest of the independent variables are more consistent across

the models. Most centrally, the results in the full model (Model 6) suggest that whether the founder

retains control is associated with decisions that are 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 more years of work

experience and have prior founding experience (both p<.05). In addition, if the founder tapped personal

networks to find executives, the founder retains more control (p<.01). These results support Hypothesis

1a. Founders have less control when there were more cofounders (p<.01), 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<.01), supporting Hypothesis 1c. Providing further support, founders have less control when their hires are more highly compensated (also p<.01), suggested that the higher-quality their hires, the less likely they are to retain control. Finally, founders have less control when the last round of investment included venture capitalists (p<.01) and more control when their last round of financing included angel investors (p<.01), supporting Hypothesis 1d. In the model that uses fixed effects for the repeat respondents (Model 7), we cannot assess Hypotheses 1a and 1b (because the core founder and cofounder variables are invariant), but once again the more experienced the hires, the less control retained (p<.01), and raising capital from venture capitalists was associated with retaining less control (p<.05). In summary, three of these hypotheses about founder control were strongly supported, and the fourth was partially supported.

Table 3 shows the core models of the tradeoff between value and control, using pre-money valuation as the dependent variable. Panel A shows models that use all surveys from each participating company (inversely weighted by number of surveys per company) and Panel B shows models that use fixed effects for all repeat respondents. In Panel A's models, the relationship between control-index and valuation is consistently negative and highly significant (all p<.01), even when adding controls for firm age, founder and non-founder characteristics, industry and macroeconomic characteristics, and geography. (I delve into the role of company age in the analyses of Hypotheses 5a and 5b.) In the full model (Model 7), 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 31.8%.[14] In the fixed-effects models in Panel B, the control-index is once

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[14] In the models, a one-unit increase in control-index decreases the natural logarithm of (one plus) company value by .276, which is equivalent to a decrease in (one plus) company value by 31.8%.

again significant at the p<.01 level in each model. In the full fixed-effects model (Model 5), each one-unit increase in the control index decreases company value by 23.0%.[15] 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. Panel A shows the all-responses (inversely weighted) models and Panel B shows models that use fixed-effects for all repeat respondents. In the all-responses models, the relationship between control and capital-raised is consistently negative and highly significant (all p<.01). In the full model (Model 7), 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 58.1%.[16] In the fixed-effects models in Panel B, the relationship between control and value creation is again consistently negative at the p<.01 level. In the full fixed-effects model (Model 5), each one-unit increase in the control index decreases capital raised by 37.6%.[17] These results further reinforce the support for Hypothesis 2.

Tables 5-7 show the results of testing whether the core tradeoff applies depending on macroeconomic environment, capital intensity, and startup age. The pattern is the same in all three tables: Across both dependent variables (company valuation and capital raised), the control-index remains highly significant (p<.01), but none of the interaction terms is statistically significant. These results support Hypothesis 3b over Hypothesis 3a (that the tradeoff applies regardless of macroeconomic founding conditions), Hypothesis 4b over Hypothesis 4a (that the tradeoff applies

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[15] In the models, a one-unit increase in control-index decreases the natural logarithm of (one plus) company value by .207, which is equivalent to a decrease in (one plus) company value by 23.0%.

[16] In the models, a one-unit increase in control-index decreases the natural logarithm of (one plus) capital raised by .458, which is equivalent to a decrease in (one plus) capital raised by 58.1%.

[17] In the models, a one-unit increase in control-index decreases the natural logarithm of (one plus) capital raised by .319, which is equivalent to a decrease in (one plus) capital raised by 37.6%.

regardless of capital intensity), and Hypothesis 5b over Hypothesis 5a (that the tradeoff applies in both younger and older startups).

[INSERT FIGURES 1 AND 2 ABOUT HERE]

To help highlight patterns across both the control and value-creation dimensions of the tradeoff, Figures 1 and 2 graph the coefficients and 95% confidence intervals from the core models in Tables 2 and 3. Data points to the left of each "0-value" vertical line are variables that have a negative relationship with control (Figure 1) or value creation (Figure 2), and coefficients to the right of the vertical line have a positive relationship with control or value creation, respectively. The patterns across the two graphs highlight resources that have very different effects on those two dependent variables. 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 (Figure 1) but a very significant *positive* relationship with company valuation (Figure 2). The opposite pattern is seen with angel capital and founder capital: They both have a significant *positive* relationship with control (Figure 1) but a significant *negative* relationship with company valuation (Figure 2). In this sense, these very different types of resource providers are microcosms of the overall control dilemma examined here. (Note that capital intensity also embodies the tradeoff, with a negative relationship with control but a positive relationship with company value.) Interestingly, the core founder's characteristics are one area where the control dilemma does not seem to apply: As shown in the figures, the more founding experience accumulated by the core founder and the more the founder-CEO can tap his or her social network to find executive hires, the *higher* the founder's control (Figure 1), but the *higher* the company's valuation, too (Figure 2). The "dilemma profiles" of these very different resource providers are thus summarized in the table below:

Company Value

Founder Control		−	+
	−		Venture capitalists
	+	Angel investors Founder capital	Founder has prior founding experience Founder taps network for exec hires

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 (Boeker 1989; Bettis and Prahalad 1995). I have delved into how one specific type of decision – regarding the resources that 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 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 to the company, 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, as examined in this study, attracting those resources can come at a stiff cost: the imperiling of the founders' control of the company they created. In exchange for their resources, resource providers demand "the ability to control and direct organizational action" (Pfeffer and Salancik 1978:27). Thus, assembling resources can come at the expense of giving up control, 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 the value that is created and the control that is maintained. These results are robust across two different forms of value creation and across econometric

approaches that both (1.) control for individual- and company-level differences and (2.) use fixed effects to account for unobserved time-invariant company 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 23.0%-58.1% change in value creation. In short, Lew Cirne of Wily Technology is not alone in facing a tradeoff between "remaining parent of my baby" and having his baby grow up to be as big as possible, or between maintaining control versus growing the value of the startup he founded. The tradeoff also seems to apply regardless of macroeconomic founding conditions, capital intensity, and age of startup, reinforcing the powerful tradeoff that founders face at each step when deciding whether and how to attract resource providers to their startups. This study also brings resource dependence "inside the organizational black box": In contrast to studies that focus on organizational relationships with <u>external</u> resource providers – such as corporate investment relationships, alliances, or joint ventures (e.g., Gulati and Wang 2003; Gulati and Sytch 2007; Katila, Rosenberger et al. 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 are likely to join the board of directors, and shows how they can affect both control and value creation once they are aboard.

These results not only have implications 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 the investors – are likely to be more interested in value creation, and thus be much more aligned with founders who are similarly driven. For instance, return-maximizing investors should want to invest in founders who are focused on value creation. Such resource providers need to do due diligence on founders in order to understand their motivations and how they might affect the decisions they make when facing a tradeoff between control and value creation. Amit,

MacCrimmon *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.

This view of the resource-dependence challenge can shed new light on past results in the entrepreneurship literature. For one, the results help us answer and enrich 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 the 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 autonomy. 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 be taking a more nuanced view of the population of entrepreneurs, examining how different founding decisions can lead to very different outcomes, both regarding value created and regarding whether the founder remains in control of the company.

At the other end of the founder life cycle, the tension explored in this study can provide a new lens on founder-CEO succession (e.g., Boeker and Karichalil 2002; Wasserman 2003; Burton and

Beckman 2007). At the point where the founder-CEO's skills no longer fit the startup's core challenges,

the founder faces the choice between remaining in control vs. attracting a successor who could build

more value, much as Lew Cirne did at Wily Technology. In between these bookends of venture initiation

and founder-CEO succession, we can see echoes of this tradeoff whenever founders face decisions in

which they have to choose between keeping control (solo founding, hiring inexperienced and

inexpensive non-founders, and self financing) and attracting resources (attracting the best cofounders,

hires, and investors to help the startup reach its full potential). 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., Kogut 1988; Gulati and Wang 2003), or whether to outsource or to keep

everything in-house (e.g., Shy and Stenbacka 2003; Qu, Pinsonneault *et al.* 2011). Thus, the founder's

resource-dependence challenge can help bring a more cohesive conceptualization to heretofore-

disparate parts of the literature.

One limitation of this study is its focus 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. Another limitation is this study's focus on founders' revealed

preferences: their actual decisions that should affect the value they create and the control they

maintain. 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 (Tagiuri

1965; Hambrick and Mason 1984). Future research could delve into how a founder's motivations affect

those founding decisions, thus influencing autonomy vs. value-creation outcomes. Some studies have

found that power and economic motivations dominate executive decision making (e.g., Tagiuri 1965).

For entrepreneurs in particular, Sapienza, Korsgaard *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, MacCrimmon *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; Roberts 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., Carland, Hoy *et al.* 1984; Begley and Boyd 1987). This "self-determination" is often an end in itself rather than a means to economic ends (Sapienza, Korsgaard *et al.* 2003). The key for this study isn't the particular ordering of the control and value-creation motivations, but that they can conflict with each 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 whose motivations are more mixed.

Another important factor in these resource-attraction decisions is that of risk. 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 their founding decisions to shun attracting resources and thus giving up control of key decisions within the startup. Future research could examine the risk profiles of each of these paths and how they should affect resource decisions. In addition, 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 autonomy – 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.

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Table 1: Summary statistics and correlation matrix

Panel A: Histograms of Dependent Variables (Log of Valuation and Log of Capital raised)

Left column: Young half of companies; Right column: Older half of companies

First row: Control-index=0 (don't control board, no longer CEO)
Second row: Control-index=1 (control board or CEO, but not both)
Third row: Control-index=2 (control both board and CEO)

Graphs by age_above_median and control

Graphs by age and control
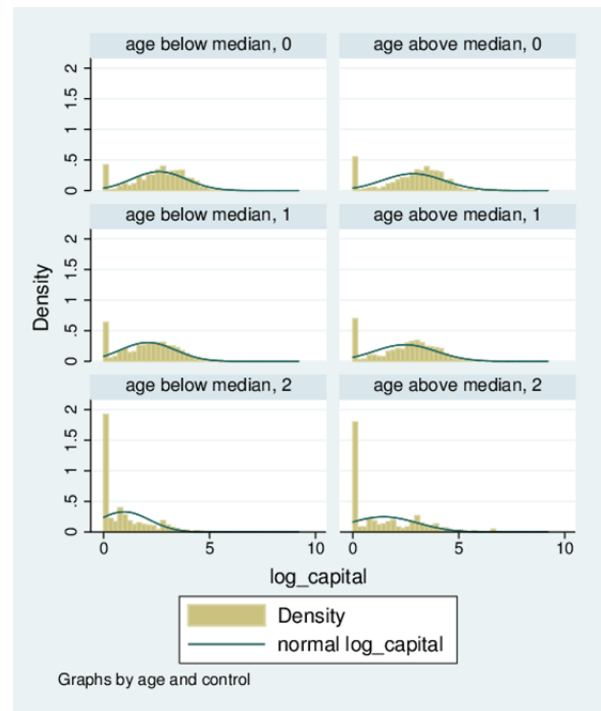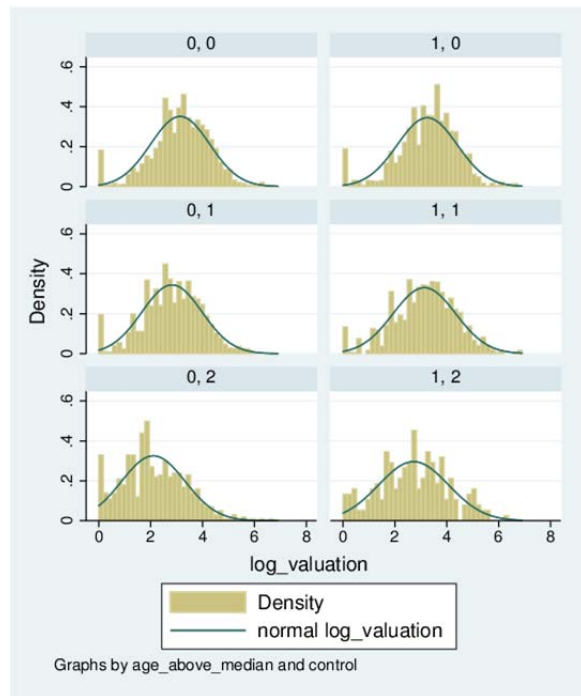
Panel B: Summary Statistics for Independent Variables

Variable	Mean	St-dev	Median	Variable	Mean	St-dev	Median
Control-index	0.7006	0.6935	1	Hires who had prior executive exp'c	1.047	1.575	0
Company age	6.93	5.147	5.9	Exec hires' mean compensation	201	96.43	202
Founder: prior years of work exp'c	17.04	9.469	17	Founders invested in last round of financing	0.174	0.3791	0
Founder: prior founding exp'c?	0.4716	0.4992	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
				Segment's capital intensity (IBIS)	2.056	0.7168	2
Seed capital invested by founders	97.19	212.9	3	State of economy at founding	1.798	0.8347	2
Founder attracted exec hires	0.5289	0.4992	1	Company location (hub/tier)	1.128	0.922	1
Angel or VC on board attracted exec hires	0.1955	0.3966	0				
Exec hires' prior years of work exp'c	64.74	45.08	60				

Panel C: Correlation Matrix

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
(1) Total capital raised	1								
(2) Most recent valuation	0.675*	1							
(3) Control-index	-0.101*	-0.0497*	1						
(4) Company age	0.0967*	0.0527*	-0.241*	1					
(5) Founder's prior years of work exp'c	0.0897*	0.0243	-0.0508*	-0.0926*	1				
(6) Founder had prior founding exp'c	-0.00561	-0.00640	0.0791*	-0.148*	0.275*	1			
(7) Number of founders	0.0224	0.0259	-0.0334	-0.0827*	0.0836*	0.0331	1		
(8) Cofounders' prior years of work exp'c	0.0863*	0.0551*	-0.0355	-0.122*	0.557*	0.141*	0.646*	1	
(9) Seed capital invested by founders	-0.00136	0.0376	0.0172	0.00923	0.0887*	0.116*	0.0747*	0.142*	1
(10) Founder attracted exec hires	0.00948	-0.00717	0.0191	-0.0562**	0.0363	0.0529*	0.0643**	0.0521*	0.00291
(11) Angel or VC on board attracted exec hires	0.0315	0.0265	-0.192*	0.0108	0.0307	-0.00211	-0.00685	-0.00255	-0.0415
(12) Exec hires' prior years of work exp'c	0.153*	0.130*	-0.358*	0.208*	0.165*	0.0369	-0.0413	0.0785*	0.0438*
(13) Hires had prior executive exp'c	0.0904*	0.0791*	-0.227*	0.124*	0.0551*	0.0190	-0.0469*	-0.00286	0.0182
(14) Exec hires' mean compensation	0.195*	0.158*	-0.229*	0.161*	0.0604**	-0.0127	0.0422	0.0319	0.0427*
(15) Founders invested in last round of fin'g	-0.0539*	-0.060**	0.172*	-0.0203	0.0960*	0.120*	-0.0255	0.0627**	0.131*
(16) Angels invested in last round of fin'g	-0.0738*	-0.0949*	0.132*	-0.126*	0.0256	0.00941	0.00342	0.0431*	-0.0009
(17) VCs invested in last round of fin'g	0.0354	0.0218	-0.177*	0.00653	-0.00502	-0.0111	0.0472*	0.0213	-0.0417
(18) Segment's capital intensity	0.0644**	0.0570**	-0.066**	-0.0102	0.117*	-0.0517*	0.0428*	0.130*	-0.0255
(19) State of economy at founding	-0.0341	-0.0403	-0.0497*	-0.0183	0.0199	0.0199	-0.0446*	-0.0442*	-0.0194
(20) Location of company: Top-tier, mid-tier, low-tier	0.00812	0.0120	-0.00495	-0.109*	-0.0383	-0.0378	0.0421	0.0146	-0.0159

	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)
(10)	1										
(11)	0.261*	1									
(12)	0.0479*	0.154*	1								
(13)	-0.0212	0.203*	0.630*	1							
(14)	-0.077*	0.0699**	0.154*	0.141*	1						
(15)	0.0329	0.000357	-0.070**	-0.0396	-0.090*	1					
(16)	-0.0094	-0.0515*	-0.141*	-0.104*	-0.215*	0.246*	1				
(17)	0.0538*	0.0983*	0.182*	0.121*	0.171*	-0.133*	-0.296*	1			
(18)	0.0340	0.0268	0.0330	0.0175	0.0478*	-0.0157	-0.0121	0.00997	1		
(19)	0.171*	0.161*	0.0241	0.0912*	0.0156	-0.0168	-0.0590**	0.0403	0.00875	1	
(20)	-0.0171	0.00621	-0.0243	0.0199	0.0901*	-0.050*	-0.0527*	0.0745*	-0.0167	-0.024	1

Table 2: *Analyses of Control-index as dependent variable*

	1	2	3	4	5	6	7 (Fixed Effects)
Company age (log)	-0.298***	-0.292***	-0.310***	-0.217***	-0.216***	-0.238***	-0.0661***
	(0.0146)	(0.0150)	(0.0150)	(0.0151)	(0.0148)	(0.0170)	(0.0250)
Founder's years of prior work exp'c (log)		-0.0212**	0.0522*	0.0533**	0.0543**	0.0507**	
		(0.00884)	(0.0277)	(0.0225)	(0.0218)	(0.0215)	
Founder had prior founding exp'c		0.0926***	0.0716***	0.0568***	0.0523**	0.0471**	
		(0.0241)	(0.0243)	(0.0217)	(0.0212)	(0.0207)	
Number of founders (log)			-0.0650	-0.104***	-0.0834**	-0.0723**	
			(0.0396)	(0.0352)	(0.0333)	(0.0332)	
Cofounders' years of work exp'c (log)			-0.0783***	-0.0141	-0.0113	-0.00273	
			(0.0238)	(0.0196)	(0.0187)	(0.0185)	
Seed capital contributed by founders (log)			0.0316***	0.0293***	0.0191***	0.0167***	
			(0.00492)	(0.00425)	(0.00413)	(0.00396)	
Founder attracted exec hires				0.0550***	0.0678***	0.0692***	-5.71e-05
				(0.0206)	(0.0200)	(0.0194)	(0.0208)
Angel or VC on board attracted exec hires				-0.223***	-0.188***	-0.182***	-0.040**
				(0.0223)	(0.0222)	(0.0218)	(0.0168)
Exec hires' years of prior work exp'c (log)				-0.156***	-0.136***	-0.130***	-0.0223***
				(0.00879)	(0.00858)	(0.00845)	(0.00754)
Hires had prior executive exp'c				-0.000946	-0.00261	-0.00411	-0.0091*
				(0.00639)	(0.00606)	(0.00592)	(0.00538)
Exec hires' mean compensation (log)				-0.0639***	-0.0412***	-0.0401***	-0.00601
				(0.00957)	(0.00985)	(0.00967)	(0.00462)
Founders invested in last round of fin'g					0.132***	0.128***	0.0230
					(0.0248)	(0.0248)	(0.0322)
Angels invested in last round of fin'g					0.0795***	0.0739***	0.00679
					(0.0229)	(0.0225)	(0.0271)
VCs invested in last round of fin'g					-0.258***	-0.235***	-0.053**
					(0.0253)	(0.0243)	(0.0230)
Segment: Low capital intensity						-0.135***	-0.25***
						(0.0245)	(0.0677)
Segment: High capital intensity						-0.246***	-0.150*
						(0.0271)	(0.0841)
Founded during weak economic conditions						-0.0535*	0.0275
						(0.0304)	(0.163)
Founded during strong econ'c conditions						-0.0595**	-0.107
						(0.0283)	(0.143)
Located in mid-tier state						0.0550*	0.158
						(0.0298)	(0.148)
Located in top-tier state						-0.0563***	-0.0955
						(0.0205)	(0.164)
Constant	1.497***	1.494***	1.607***	2.171***	2.080***	2.258***	1.418***
	(0.0278)	(0.0367)	(0.0569)	(0.0665)	(0.0643)	(0.0719)	(0.178)
Observations	12,567	12,567	12,567	12,567	12,567	12,567	9,149

*** p<0.01, ** p<0.05, * p<0.1

Table 3: *Models of tradeoff between value and Control-index (dependent variable: <u>Log of Valuation</u>)*

Panel A: Models with all responses (weighted)

	1	2	3	4	5	6	7
Control-index	-0.671***	-0.673***	-0.648***	-0.634***	-0.423***	-0.305***	-0.276***
	(0.0264)	(0.0262)	(0.0262)	(0.0265)	(0.0277)	(0.0270)	(0.0269)
Company age (log)	-0.00816	0.0845***	0.120***	0.117***	0.0334	0.0917***	0.0851***
	(0.0325)	(0.0321)	(0.0322)	(0.0321)	(0.0318)	(0.0301)	(0.0295)
Founder's years of prior work exp'c (log)		0.219***	-0.0906*	-0.0932*	-0.114**	-0.128***	-0.143***
		(0.0201)	(0.0501)	(0.0507)	(0.0572)	(0.0477)	(0.0476)
Founder had prior founding exp'c		0.180***	0.198***	0.182***	0.193***	0.184***	0.201***
		(0.0507)	(0.0517)	(0.0522)	(0.0434)	(0.0387)	(0.0389)
Number of founders (log)			0.0497	0.0346	0.0645	0.0257	-0.0142
			(0.0733)	(0.0727)	(0.0682)	(0.0625)	(0.0624)
Cofounders' years of work exp'c (log)			0.286***	0.266***	0.205***	0.193***	0.195***
			(0.0444)	(0.0450)	(0.0473)	(0.0395)	(0.0385)
Seed capital contributed by founders (log)			-0.0108	-0.0110	-0.0139	0.00281	0.00441
			(0.0123)	(0.0120)	(0.0104)	(0.0104)	(0.0103)
Founder attracted exec hires				0.351***	0.254***	0.199***	0.207***
				(0.0394)	(0.0381)	(0.0370)	(0.0358)
Angel or VC on board attracted exec hires				0.0537	-0.0865**	-0.171***	-0.159***
				(0.0444)	(0.0439)	(0.0400)	(0.0404)
Exec hires' years of prior work exp'c (log)					0.168***	0.123***	0.125***
					(0.0191)	(0.0195)	(0.0193)
Hires had prior executive exp'c					0.0655***	0.0721***	0.0771***
					(0.0110)	(0.0112)	(0.0112)
Exec hires' mean compensation (log)					0.294***	0.235***	0.242***
					(0.0178)	(0.0190)	(0.0181)
Founders invested in last round of fin'g						-0.140***	-0.136***
						(0.0431)	(0.0429)
Angels invested in last round of fin'g						-0.0528	-0.0418
						(0.0399)	(0.0404)
VCs invested in last round of fin'g						0.894***	0.882***
						(0.0475)	(0.0480)
Segment: High capital intensity							0.345***
							(0.0359)
Founded during middling economic conditions							0.0269
							(0.0521)
Founded during strong economic conditions							0.0890**
							(0.0384)
Located in mid-tier state							0.0568
							(0.0537)
Located in top-tier state							0.167***
							(0.0376)
Constant	3.072***	2.332***	2.074***	1.969***	0.109	-0.0738	-0.343**
	(0.0697)	(0.0887)	(0.118)	(0.117)	(0.130)	(0.144)	(0.141)

	1	2	3	4	5	6	7
Observations	12,567	12,567	12,567	12,567	12,567	12,567	12,567

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Panel B: Fixed-effects models (using repeat respondents)

	1	2	3	4	5
Control-index	-0.276***	-0.276***	-0.232***	-0.209***	-0.207***
	(0.0669)	(0.0667)	(0.0637)	(0.0612)	(0.0597)
Company age (log)	0.458***	0.464***	0.433***	0.441***	0.443***
	(0.0532)	(0.0559)	(0.0545)	(0.0539)	(0.0538)
Founder attracted exec hires		0.0224	0.00631	0.00187	0.00149
		(0.0453)	(0.0457)	(0.0443)	(0.0443)
Angel or VC on board attracted exec hires		-0.0115	-0.0454	-0.0577	-0.0581
		(0.0354)	(0.0359)	(0.0357)	(0.0358)
Exec hires' years of prior work exp'c (log)			0.0595***	0.0509***	0.0505***
			(0.0162)	(0.0155)	(0.0154)
Hires had prior executive exp'c			0.0466***	0.0483***	0.0490***
			(0.0115)	(0.0113)	(0.0111)
Exec hires' mean compensation (log)			0.0555***	0.0493***	0.0492***
			(0.0122)	(0.0127)	(0.0127)
Founders invested in last round of fin'g				-0.120	-0.122
				(0.0797)	(0.0796)
Angels invested in last round of fin'g				0.00185	0.000336
				(0.0655)	(0.0653)
VCs invested in last round of fin'g				0.437***	0.438***
				(0.0722)	(0.0721)
Segment: High capital intensity					0.0515
					(0.0557)
Founded during middling economic conditions					0.000503
					(0.129)
Founded during strong economic conditions					-0.0529
					(0.0863)
Located in mid-tier state					0.624**
					(0.311)
Located in top-tier state					0.532**
					(0.236)
Constant	1.825***	1.804***	1.310***	1.069***	0.731***
	(0.125)	(0.130)	(0.148)	(0.158)	(0.204)
Observations	9,149	9,149	9,149	9,149	9,149

Standard errors in parentheses; standard errors clustered at firm level.

*** p<0.01, ** p<0.05, * p<0.1

Table 4*: Models of tradeoff between value and Control-index (dependent variable: <u>Log of Capital raised</u>)*

Panel A: Models with all responses (weighted)

	1	2	3	4	5	6	7
Control-index	-0.876***	-0.876***	-0.847***	-0.830***	-0.619***	-0.496***	-0.458***
	(0.0282)	(0.0281)	(0.0283)	(0.0285)	(0.0298)	(0.0284)	(0.0279)
Company age (log)	0.0534	0.138***	0.179***	0.175***	0.0926***	0.152***	0.127***
	(0.0331)	(0.0330)	(0.0330)	(0.0329)	(0.0312)	(0.0297)	(0.0292)
Founder's years of prior work exp'c (log)		0.206***	-0.0442	-0.0471	-0.0668	-0.0867	-0.108*
		(0.0228)	(0.0672)	(0.0683)	(0.0732)	(0.0624)	(0.0626)
Founder had prior founding exp'c		0.150***	0.176***	0.158***	0.176***	0.159***	0.184***
		(0.0505)	(0.0497)	(0.0499)	(0.0432)	(0.0412)	(0.0410)
Number of founders (log)			0.114	0.0986	0.130	0.0804	0.0289
			(0.0868)	(0.0862)	(0.0813)	(0.0744)	(0.0738)
Cofounders' years of work exp'c (log)			0.239***	0.218***	0.154***	0.146***	0.151***
			(0.0548)	(0.0554)	(0.0573)	(0.0482)	(0.0475)
Seed capital contributed by founders (log)			-0.0304***	-0.0304***	-0.0337***	-0.0184*	-0.0168
			(0.0113)	(0.0109)	(0.00994)	(0.0109)	(0.0112)
Founder attracted exec hires				0.367***	0.255***	0.199***	0.204***
				(0.0404)	(0.0411)	(0.0395)	(0.0382)
Angel or VC on board attracted exec hires				0.0860*	-0.0321	-0.122***	-0.101**
				(0.0473)	(0.0477)	(0.0427)	(0.0427)
Exec hires' years of prior work exp'c (log)					0.183***	0.135***	0.137***
					(0.0198)	(0.0195)	(0.0192)
Hires had prior executive exp'c					0.0302**	0.0384***	0.0458***
					(0.0131)	(0.0127)	(0.0125)
Exec hires' mean compensation (log)					0.288***	0.224***	0.236***
					(0.0132)	(0.0136)	(0.0128)
Founders invested in last round of fin'g						-0.0236	-0.0173
						(0.0508)	(0.0499)
Angels invested in last round of fin'g						-0.168***	-0.158***
						(0.0394)	(0.0394)
VCs invested in last round of fin'g						0.938***	0.927***
						(0.0505)	(0.0508)
Segment: High capital intensity							0.438***
							(0.0381)
Founded during middling economic conditions							-0.000738
							(0.0518)
Founded during strong economic conditions							0.181***
							(0.0403)
Located in mid-tier state							-0.0230
							(0.0604)
Located in top-tier state							0.160***
							(0.0416)
Constant	2.656***	1.972***	1.661***	1.548***	-0.297**	-0.449***	-0.758***

	1	2	3	4	5	6	7
	(0.0715)	(0.0932)	(0.132)	(0.131)	(0.135)	(0.133)	(0.134)
Observations	12,567	12,567	12,567	12,567	12,567	12,567	12,567

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Panel B: Fixed-effects models (using repeat respondents)

	1	2	3	4	5
Control-index	-0.366***	-0.367***	-0.337***	-0.320***	-0.319***
	(0.0662)	(0.0662)	(0.0640)	(0.0615)	(0.0599)
Company age (log)	0.435***	0.429***	0.409***	0.413***	0.412***
	(0.0481)	(0.0503)	(0.0495)	(0.0485)	(0.0481)
Founder attracted exec hires		-0.0440	-0.0541	-0.0569	-0.0585*
		(0.0354)	(0.0361)	(0.0351)	(0.0350)
Angel or VC on board attracted exec hires		0.00190	-0.0220	-0.0315	-0.0318
		(0.0270)	(0.0278)	(0.0270)	(0.0271)
Exec hires' years of prior work exp'c (log)			0.0397***	0.0332***	0.0330***
			(0.0130)	(0.0126)	(0.0125)
Hires had prior executive exp'c			0.0346***	0.0358***	0.0365***
			(0.0102)	(0.00993)	(0.00992)
Exec hires' mean compensation (log)			0.0328***	0.0276***	0.0275***
			(0.00779)	(0.00804)	(0.00790)
Founders invested in last round of fin'g				-0.0425	-0.0432
				(0.0648)	(0.0642)
Angels invested in last round of fin'g				-0.0762	-0.0789
				(0.0562)	(0.0560)
VCs invested in last round of fin'g				0.331***	0.331***
				(0.0630)	(0.0625)
Segment: High capital intensity					0.0354
					(0.0391)
Founded during middling economic conditions					0.0423
					(0.0903)
Founded during strong economic conditions					-0.0110
					(0.0663)
Located in mid-tier state					0.760**
					(0.296)
Located in top-tier state					0.532**
					(0.222)
Constant	1.497***	1.533***	1.221***	1.057***	0.686***
	(0.117)	(0.122)	(0.131)	(0.135)	(0.182)
Observations	9,149	9,149	9,149	9,149	9,149

Standard errors in parentheses; standard errors clustered at firm level.
*** p<0.01, ** p<0.05, * p<0.1

Table 5*: Models of tradeoff for boom vs. bust macroeconomic environments*

	1	2
	Dependent variable: Total capital raised (log)	Dependent variable: Company valuation(log)
Founded during weak economic conditions	0.0700 (0.383)	0.110 (0.356)
Founded during strong economic conditions	0.208 (0.284)	0.202 (0.278)
Control-index	-0.438*** (0.0480)	-0.288*** (0.0450)
Founded during weak economic conditions X Control-index	-0.0333 (0.0799)	0.00982 (0.0735)
Founded during strong economic conditions X Control-index	-0.0270 (0.0659)	0.0215 (0.0589)
Company age (log)	0.124*** (0.0456)	0.118*** (0.0448)
(Rest of variables from Table 3 included in models but not shown)		
Constant	-0.773*** (0.199)	-0.411** (0.206)
Observations	12,567	12,567

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

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

Table 6*: Models of tradeoff for low-capital-intensity vs. high-capital-intensity industry segments*

|	1	2
	Dependent variable: Total capital raised (log)	Dependent variable: Company valuation(log)
Segment: High capital intensity	0.144 (0.283)	0.255 (0.264)
Control-index	-0.454*** (0.0328)	-0.264*** (0.0316)
Segment: High capital intensity X Control-index	-0.0123 (0.0590)	-0.0314 (0.0543)
Company age (log)	0.104*** (0.0346)	0.0756** (0.0338)
(Rest of variables from Table 3 included in models but not shown)		
Constant	-0.650*** (0.156)	-0.312* (0.169)
Observations	12,567	12,567

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

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

Table 7*: Models of tradeoff for younger half vs. older half of startups*

	1	2
	Dependent variable: Total capital raised (log)	Dependent variable: Company valuation(log)
Company age above median	-0.229 (0.198)	-0.112 (0.181)
Control-index	-0.459*** (0.0304)	-0.306*** (0.0298)
Company age above median X Control-index	-0.00932 (0.0490)	0.0402 (0.0454)
(Rest of variables from Table 3 included in models but not shown)		
Constant	-0.419*** (0.131)	-0.123 (0.147)
Observations	12,567	12,567

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

Note: Only main effects and interactions with control-index are shown; other interactions included in model but not shown.
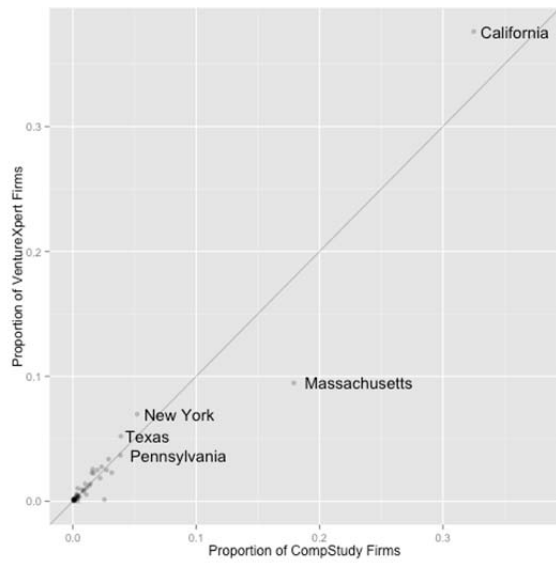
Figure 1: *Coefficients from Control analyses (Table 2)*
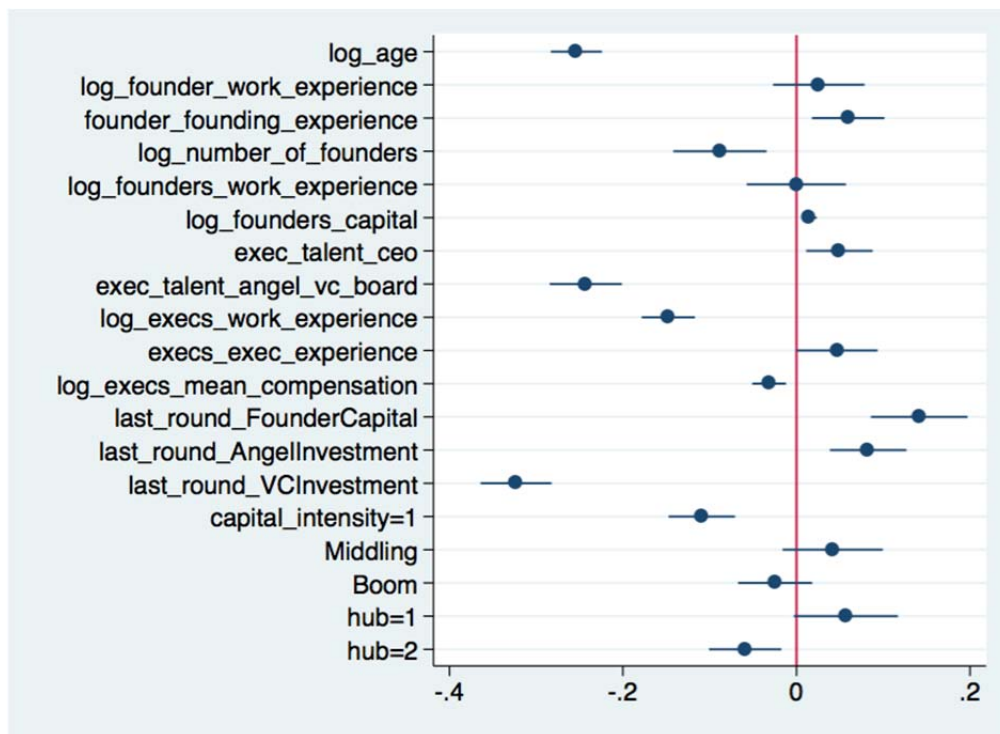
Figure 2: *Coefficients from Company Valuation analyses (Table 3)*
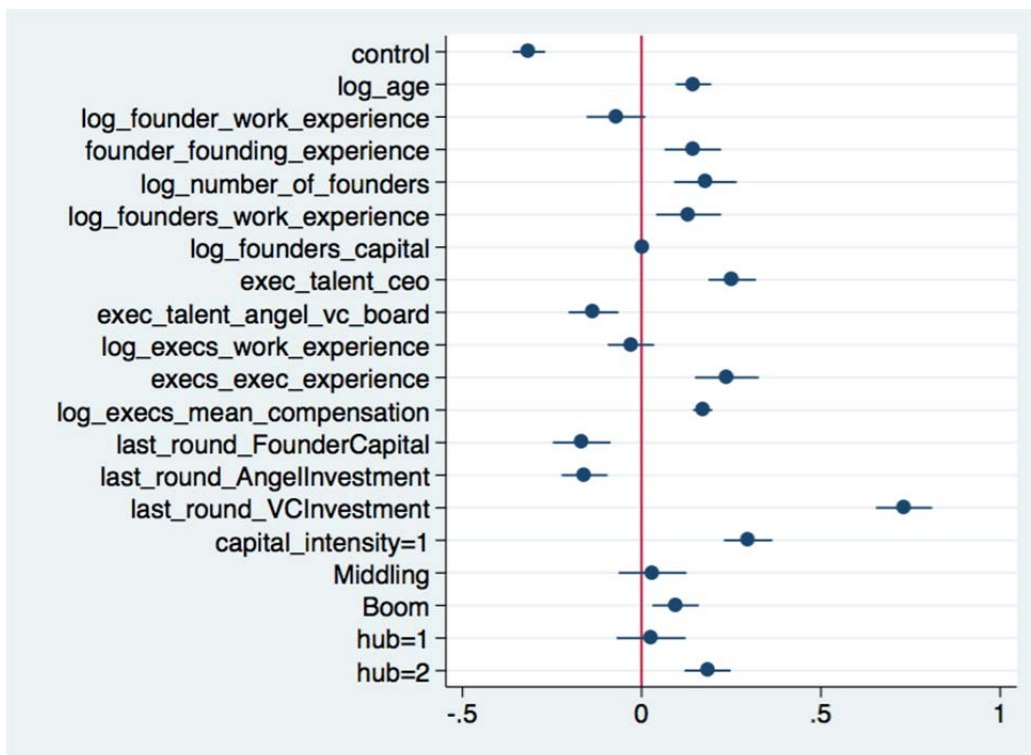
Appendix: Comparing the CompStudy sample to the VentureXpert sample
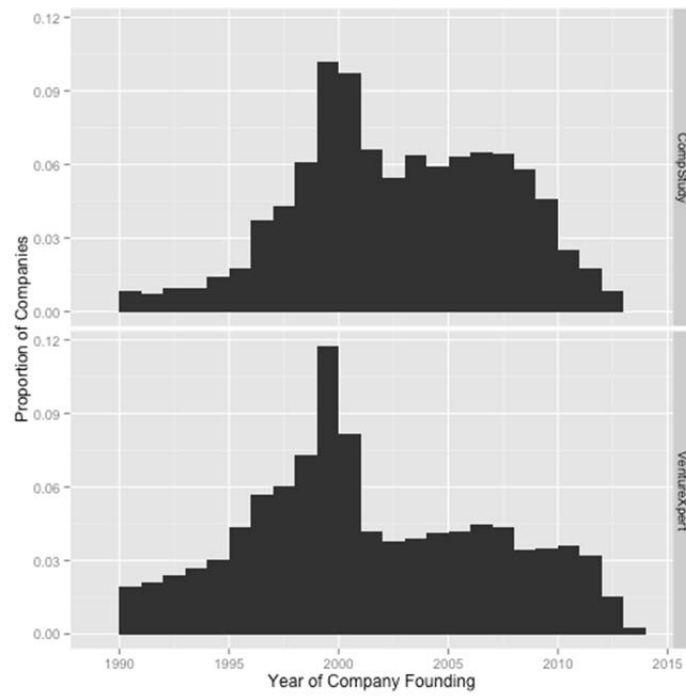
1. Geographic distribution:

2. Industry breakdown: Percentage of high-technology companies in sample:

CompStudy: 65.2% high-technology
VentureXpert: 79.1% high-technology

3. Year of company founding:

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