

Founding the Future: The evolution of teams from founding to IPO*

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Abstract

We take an evolutionary approach to examine how teams evolve over time and with what consequence. We study the mechanisms through which founding team characteristics influence the rate an entrepreneurial firm obtains venture capital and completes an initial public offering. Using empirical techniques from the top management team demography literature, we find direct effects of the quality and composition of the founding team on these outcomes. We also demonstrate the indirect impact of the founding team by examining how it shapes the quality and characteristics of subsequent executive teams both directly through a process of homophily and indirectly by impacting the rate that the firm receives venture capital. Venture capital in turn amplifies the quality and experience of the team by attracting new and experienced executives. We develop an evolutionary theory of entrepreneurial top management teams highlighting that both founders and current executives shape firm outcomes. By examining the relative importance of founders and current executives we demonstrate that entrepreneurial team evolution follows a path dependent process.

Introduction

How important are founders to entrepreneurial success? The current academic literature offers seemingly contradictory answers. On the one hand, there is a body of evidence from entrepreneurship scholars indicating that the founding team powerfully influences the firm's future life chances. Overall, this research shows that firm performance is enhanced when founders have relevant skills, experiences, and relationships (Chandler and Jansen 1992; Cooper, Gimeno-Gascon and Woo 1994; Shane and Stuart 2002). For example, Delmar and Shane (2003) find that industry and start-up experience on the founding team predict new venture sales. This literature implies that the prior experiences and the overall quality of the founding team are positively associated with entrepreneurial success.

On the other hand, there is a large literature on top management teams arguing that current executives drive performance. Much of this research emanates from "upper echelons" theory (Hambrick and Mason 1984) and examines demographic characteristics of the top management team such as group size, variations in education, functional expertise, experience and tenure (Pfeffer 1983). This top-management team demography literature has proliferated at a furious pace producing evidence which links the demographic composition of the top management group to strategy and strategic change (Finkelstein and Hambrick 1990; Wiersema and Bantel 1992; Hambrick, Cho and Chen 1996), innovation (Bantel and Jackson 1989; Keck and Tushman 1993), and growth and organizational performance (Eisenhardt and Schoonhoven 1990; Hambrick and D'Aveni 1992; Ensley, Pearson and Amason 2002). A core inference from this literature is that current executives shape organizational outcomes.

Herein lies the puzzle – are founders important to entrepreneurial success, or are the subsequent executives who run the firm influencing firm outcomes? The question is more vexing in light of the pervasive recommendation that firms should replace founders with professional managers (Charan, Hofer and Mahon 1980; Flamholtz 1990; Willard, Krueger and Feeser 1992). Indeed, recent research suggests founders leave as firm size increases (Boeker and Karichalil 2002). Even when founders stay, founder CEOs do not necessarily improve venture performance (Baum and Silverman 2004). For example, Certo and colleagues (2001) find that founder CEOs are associated with IPO underpricing. Similarly, there is

ample evidence in the top management team literature that there is substantial turnover among top executives (Wagner, Pfeffer and O'Reilly 1984; Finkelstein and Hambrick 1990; Keck and Tushman 1993). This observed executive turnover further amplifies the question of whether the founding team or the current team determines organizational outcomes.

Unfortunately the extant research on teams, both entrepreneurial and otherwise, focuses on teams at one point in time. The existing empirical research tends to be ahistorical, not considering the antecedents of the top management team itself. Empirically, it is standard practice to build a random cross-sectional sample and construct longitudinal panels (e.g., Finkelstein and Hambrick 1990; Wiersema and Bantel 1992). Thus, by design the research begins with existing teams in existing organizations and embeds the biases associated with both right and left censoring of the data.

In this paper we incorporate an evolutionary perspective on top management teams and argue that both founding teams and current teams influence outcomes. An organizational theory that is sensitive to the dynamics of how the top management team evolves offers non-obvious, yet important insights into how management teams are shaped by founding teams and how both influence firm outcomes. There are three means by which founding teams may influence the subsequent success of their organization. First, the founders might continue to hold executive positions. This would reconcile the seeming contradiction between the founding team and the current team – they are one and the same. However, there are two other more intriguing possibilities: imprinting and path dependence. If the primary mechanism through which the founding team influences firm outcomes is through an initial imprint, then the initial decisions about the composition of the founding team and the allocation of responsibility among team members are, in reality, the initial decisions about the fundamental nature of the organization (Stinchcombe 1965). Thus, the founding team may imprint the organization in a way that shapes and constrains the composition and characteristics of all subsequent executives. This implies that the influence of the founders should be lasting. Alternatively, if the primary mechanism is path dependence, then early choices are institutionalized as the founding team begins to make decisions about subsequent executives who are attracted, selected and retained. Yet these new executives also exert influence and shape

subsequent choices. This implies that the direct impact of the founding team will be diluted over time. By taking both an evolutionary and a fundamentally structural approach, we explore these alternative processes and examine executive teams to understand where executive teams come from, how they evolve over time, and with what consequence.

Research on Founding Teams

There is ample evidence documenting the linkage between founding team human capital characteristics such as the type and amount of prior experience and entrepreneurial success (Aldrich and Zimmer 1986; Boeker 1988; Eisenhardt and Schoonhoven 1990; Chandler 1996; Jones-Evans 1996; Burton, Sorensen and Beckman 2002; Shane and Khurana 2003). For example, Boeker (1988) finds that the functional background of the founder influences whether the firm adopts a first-mover strategy. Shane and Stuart (2002) find that entrepreneurs with venture investor relationships are more likely to be funded and less likely to fail. The importance of founding teams is further demonstrated by evidence that venture capitalists use the quality of the founding team as a basis for investment decisions (Goslin and Barge 1986). While there is evidence that founding teams matter, there is little research explaining how and why they matter. One line of reasoning establishes imprinting as the primary mechanism by which founders shape firm outcomes (Schein 1983). The founding team acts as a key resource that shapes the structure of the firm and the ability of the firm to succeed (e.g., Baron, Burton and Hannan 1996; Hannan, Burton and Baron 1996; Burton, Sorensen et al. 2002; Shane and Stuart 2002).

Evolutionary theorists suggest a very different process – path dependence- as the means by which the founding team influences subsequent firm outcomes (Aldrich 1999). We know that people are the carriers of structure, bringing ideas and innovations with them when they move across organizations (Baty, Evan and Rothermel 1971; Sorensen 1999). Thus, as the initial team begins to add and subtract members the nature and character of their ideas begin to shift. Path dependence suggests that the founding team should enable and constrain the teams that follow the founding team through attracting new members, selecting the desirable traits and characteristics, and retaining particular types of individuals over time (Schneider 1987). To the extent that the experience of the founding team impacts

what we might typically consider independent variables for other dependent variables (e.g., the later team or VC funding), then the influence of the founding team is actually being understated because path dependencies are not being accounted for. Indirectly, the founding team may impact the firm long after the founders have left the firm through the founding team's impact on subsequent teams.

Obviously, the initial founding team evolves into a top management team; indeed, the experience and composition of the founding team has been linked to turnover in early teams (Boeker and Wilbank 2004). Furthermore, we know that high-performing firms make different choices about the expertise of managers that are brought into the firm (Virany and Tushman 1986). A detailed examination of team evolution can demonstrate the importance of initial conditions and also begin to explore the mechanisms by which these initial conditions matter. However, in order to determine whether the mechanism of founding team influence is imprinting or path dependence, we need to start at the beginning when neither the organization nor the team existed and trace team evolution over time.

Top Management Teams, Founding Teams, and Rate of IPO

The first step in demonstrating the importance of both founding and top management teams is showing the direct performance effects of each. A large number of studies of top management team (TMT) demography have shown the positive impact of both functional expertise and functional heterogeneity on firm performance (see Williams and O'Reilly 1998, for a review). This well developed body of research is best summarized by Hambrick and Mason (1984), who generated a set of propositions linking the age, background, and tenure of top management teams to a set of organizational outcomes, including the choice of strategy, the ability of the organization to learn and adapt to changes, and the impact of the composition of the team on the ability of the group to function effectively over time (see also Finkelstein and Hambrick 1996). This wealth of empirical research confirms the intriguing and sensible possibility that the composition of top management teams has consequences for understanding organizational strategy and performance.

The general argument made in this literature is that the management team's skills in running the company are reflected in the human capital characteristics of the managers; further, having diversity in

functional backgrounds ensures that the TMT has the full range of skills and abilities needed to manage the organization (e.g., Bantel and Jackson 1989). Teams with functional diversity have a range of relevant experiences to draw upon, are likely to be open to new ideas, are likely to communicate more frequently, and are likely to be more able to learn from each other and the environment (Glick, Miller and Huber 1993; Keck and Tushman 1993; Geletkanycz, Boyd and Finkelstein 2001).

The demographic argument has also been applied to founding teams. Founding teams, because they too are teams, should have a positive influence on the outcomes of the firm. For example, Roure and Keeley (1990) report that team “completeness”—or the degree to which members of the founding team held key positions is associated with success. Roure and Keeley (1990) also argued that more successful new ventures were more likely to have founding team members who had relevant experience managing high growth firms. Other entrepreneurial scholars have also argued that the quality of the team’s past experience benefits the firm (Chandler 1996; Jones-Evans 1996). Rather than, or perhaps in addition to, having a variety or diversity of past experience, founding teams need particular sets of skills. For example, Burton, Sorensen, and Beckman (2002) find the prior management experience of the founding team predicts the firm’s ability to attract external financing. Prior start-up experience also has demonstrated effects on new ventures (Delmar and Shane 2003). Thus, we suggest background diversity and the experience of the founding team will influence the success of the new venture and this direct influence results from imprinting or stability of the founding team.

Functional diversity comes both from the past experiences of the individual team members as well as the structure of the team assignments in the organization. Organizational decisions involve questions about how to allocate responsibility and the extent to which the team should distribute roles across a range of functions. The general argument is that the functional assignments of team members will have an impact on team processes and outcomes (Bunderson and Sutcliffe 2002), and functional assignment diversity has been tied to firm performance, the likelihood of strategic reorientation, and external communication (Ancona and Caldwell 1992; Lant, Milliken and Batra 1992; Keck 1997). The initial functional assignments set in place a template that molds the possibilities of future teams. We

expect the functional assignment diversity of both the founding team as well as the current top management team to influence new venture success.

New venture success can be measured in a myriad of ways, but we emphasize successfully completing an initial public offering. Recent studies have examined IPO as an outcome variable indicating firm success (Welbourne and Andrews 1996; Stuart, Hoang and Hybels 1999; Certo, Covin et al. 2001; Hannan, Baron, Hsu and Kocak 2001; Shane and Stuart 2002; Gulati and Higgins 2003). We argue that founding and top management teams with both the requisite skills and diversity of experience to function effectively will reach a critical milestone in the growth of a new company, the IPO, more quickly than other firms.

Hypothesis 1: Founding and top management teams with functional background diversity and prior experience will make an initial public offering more quickly than teams with less of such experiences.

Hypothesis 2: Founding and top management teams with functional assignment diversity will make an initial public offering more quickly than teams with less diversity.

Founding Teams Influences on Top Management Teams

What role does the founding team have in creating the top management team that develops, and thus indirectly the important firm outcomes influenced by the TMT? In addition to the direct effects of the founding team on IPO, the experience of the founding team may influence the TMT that evolves over time. Several mechanisms suggest experienced founding teams breed experienced top management teams, and these mechanisms may be operating simultaneously. The simplest mechanism is that the founders simply stay with the firm. Thus, before we can even consider imprinting or path dependence, we must examine whether teams change over time.

Assuming change, there are then several ways that that the founding team shapes subsequent teams. First, a robust finding in the psychological literature suggests that similarity results in interpersonal attraction (Byrne, Clore and Worchel 1966). Similar others are likely to have had similar experiences and thus share similar beliefs, and individuals prefer to interact and work with those like themselves. Thus, founders and managers alike should be attracted to one another to the extent that they

share common experiences and knowledge. Managers seek out organizations where existing personnel have similar characteristics, founders select managers like them, and managers that do not fit the existing organization will leave (Schneider 1987). This attraction-selection-attrition cycle results in founding teams and later top management teams that have similar characteristics. A larger literature on homophily both at the individual and organizational level supports this general framework in friendships and organizational settings (Rogers and Bhowmik 1971; Ibarra 1992; McPherson, Smith-Lovin and Cook 2001). In fact, the founding teams themselves are created based on homophily of ethnicity and gender (Ruef, Aldrich and Carter 2003).

A second mechanism by which experienced founding teams result in experienced TMTs is that quality teams attract quality teams. Highly experienced founding teams are likely to recognize, recruit and select the executive talent necessary for future success. Whereas homophily suggests that founding teams and TMT are similar due to the desire to interact with similar others, a quality argument suggests that founding teams would only seek out TMT characteristics that would be helpful for future firm success. For example, prior start-up experience may be less relevant for the team members that are brought into an established firm. Of course it is possible this process is driven by attraction and not selection, and TMTs are attracted to firms that have experienced teams. Regardless of the causality, and regardless of whether homophily or experience drives the results, there should be an association between founding team experience and top management team experience.

Hypothesis 3: *Experienced founding teams will have more experienced top management teams.*

A third mechanism is an indirect influence where experience of the founding team influences the TMT through an influence on important intermediate outcomes. For example, experienced founding teams obtain venture capital at higher rates which, in turn, significantly increases the likelihood of a firm going public because of the resources made available by the venture capital firm (Shane and Stuart 2002). In addition to providing financial capital, venture capitalists signal to external constituents that the firm is a quality investment (Spence 1974; Davila, Foster and Gupta 2003). This exposes the firm to a network of relationships which may manifest in recruiting top management team members, making initial contacts

with potential partners, or even strategic planning assistance (Gorman and Sahlman 1989). Obtaining venture capital funding thus has the impact of improving managerial capabilities (Hellmann and Puri 2002; Baum and Silverman 2004).

Hypothesis 4: *Experienced founding teams will receive venture capital more quickly than other firms; they will have more experienced top management teams and will demonstrate greater change in the team.*

In sum, we seek to demonstrate the effects of the founding team on critical milestones and future top management teams. Examining these teams longitudinally is critical to such an analysis. First, we examine the influence of the founding and top management team on rates of going public and obtaining venture capital. We then examine the direct influence the founding team has on the top management team as well as the indirect effects of the founding team through access to venture capital.

Data and Methods

Data for this study were drawn from the Stanford Project on Emerging Companies (SPEC), a longitudinal study of more than 170 young high-technology firms in California's Silicon Valley (for sampling details, see Burton 1995; Baron, Burton et al. 1996). The focus on firms within a single region allows us to hold constant key labor market and environmental conditions. Within the region, we focused on industries engaged in computer hardware and/or software, telecommunications (including networking equipment), medical and biological technologies, and semiconductors. A wide range of industries allows us to talk about top management and founding teams more generally. The SPEC research project examined firms with at least 10 employees and no more than 10 years old at the time of first contact in 1994-95.¹ About half of the firms were founded before 1989. Interview, survey, and archival data collections were used to gather data on the founding, evolution and growth of these companies. Trained MBA and doctoral students conducted semi-structured interviews with the current CEO and a founder of each firm. Data on the background and experience of the founding team was obtained as well as some data on the current management team. These data were supplemented with archival data on the firm.

¹ Certo et al. (2001) also use 10 years as their cutoff for new ventures.

From the interviews, it was learned that some firms were not in fact independent (e.g., wholly owned subsidiaries or joint ventures) or at risk of going public (e.g., non-profit research centers). Since the focus of this study was on time to initial public offering (IPO) and time to venture capital (VC) funding, only those firms at risk of going public or obtaining VC funding were included (161 firms). The firms were tracked until they ceased to be independent companies or until the end of 2000. Therefore, all histories are right-censored as of January 1, 2001. Accounts of mergers, acquisitions or disbanding were found through *Lexis/Nexis*, press releases and information on the internet. Five firms vanished without a trace; that is, they had neither an active telephone number nor web page, and the archival searches did not suggest they had moved or changed names. The exit dates for these firms is not known precisely, so the exit date was set as the midyear of the last year they were known to be operating. Altogether, 50 firms exited the risk set in the IPO analysis before the end of 2000 through acquisition, merger or death. For the venture capital analysis, 21 firms exited the risk set before December 2000 through IPO, acquisition, merger or death without receiving VC.

The key independent variables for this study are constructed from founding and top management team career histories. We hand collected career backgrounds for every founder and every executive who held the role of vice president or higher from a variety of sources including: interviews, internal company documents, *Lexis/Nexis* news searches, *Dow Jones Interactive*, *Edgar Archives*, *The San Jose Mercury News*, and extensive web searches. Over a four-year period we completed at least four complete searches for each person and spent thousands of person-hours searching for career data on team members. The detailed career histories we have obtained are not common in this type of research (Bunderson and Sutcliffe 2002). This intensive and difficult data collection for young privately held firms is one reason for the scarcity of studies on founding and early top management teams.

The SPEC study has several advantages that made this type of data collection feasible. First, the research team had access to the companies multiple times and so relied on them to gather data in many cases (and to check the accuracy of the data we had collected). After the initial interviews, we had additional contact with nearly 50% of the firms about the top manager and founder histories. Second, the

firms all operated primarily in the Silicon Valley. The Silicon Valley historically has had tremendous movement between firms (Rogers and Larson 1984; Saxenian 1994; Fallick, Fleischman and Rebitzer 2003), and the local paper, the *San Jose Mercury News*, follows these movements in a regular column on promotions, movements and resignations.²

We inevitably did not obtain complete career histories on all team members or find all team members. Often the chronology of careers was correct but the dates unclear. This data problem precludes us from using the method typically pursued by demography scholars studying career histories -- constructing duration variables such as years of experience in a particular function (Sutcliffe 1994). Another problem inherent in our data is that we cannot easily distinguish between missing data and no prior experience. For example, we confirmed that at least 38 founders started the company directly after school, so their prior employment experience was non-existent. Because some of our team data may be incomplete, we made a point to control for variables that may impact the completeness of the data (i.e., firm size) as well as the average amount of person data collected by firm.

Our final database contained information on 1,744 executives, beginning with the founding team through the time of IPO, acquisition, death or December 2000. We collected a mean of 2 positions for each person, including employer identity and job title, with a maximum of 6 positions. These executives worked for 1,948 distinct employers, resulting in 6643 person-positions. Of the 161 firms in the sample, we dropped three firms from the analysis because we had no team data giving us a final sample of 158 firms. For the analyses presented here, we collapse the data to yearly team-level observations; however, similar results are obtained when analyzed monthly, quarterly and bi-annually.

² We conducted numerous data checks to fill in missing data. For example, firms announce the arrival of executives in press releases, but tend not to acknowledge departures. In some cases we were able to identify an executive departure when a new (non-SPEC) firm announced a new hire. Similarly, when SPEC firms announce a new hire for a role in which we already had an executive, we were able to ascertain that there had been a departure. When the departure date of an executive was unknown, we inferred that the date was the month prior to the arrival of a replacement.

For the first four hypotheses, we conduct event-history analysis on annual observations and report Cox proportional hazards models using maximum likelihood estimation and robust estimates of standard error (Lin and Wei 1989).³ The founding year is represented as age=0 with all of the initial conditions represented as covariates that are updated for each subsequent year where appropriate. Firms remain in the sample until the event of interest (VC funding or an IPO) occurs, until they cease to exist as independent entities through failure, merger, or acquisition, or until December 2000.

In Table 3, where we examine Hypothesis 3, we conduct regression analysis on pooled time-series data. We regress measures of founding team experience on the relevant experience of the top management team using the Huber/White/sandwich estimator of error and clustered by firm to correct for repeated events by firm.⁴ We also report panel regressions where we look only at observations from a certain year in the firm's life.

Dependent Variables

For Hypotheses 1 and 2, we examined time to initial public offering (IPO). For Hypothesis 4 we examined time to receiving venture capital (VC). Obtaining VC funding and going public, together, represent the most significant milestones in the life of a young start-up firm (Shane and Stuart 2002). Especially during the period and in the region that we study, both dependent variables are important markers of firm success. This study was conducted during a time when there was tremendous attention paid to entrepreneurial companies and IPOs, and extraordinary wealth was being created in Silicon Valley as a result of this process. By choosing IPO as our dependent variable, we can compare the performance of firms across multiple industries -- a task that is quite difficult using accounting-based measures of profitability. Data on the occurrence of an IPO were obtained from many sources, including interviews,

³ We use Stata 7.0 (StataCorp 2001). The Cox proportional hazards model assumes that the hazard ratio is proportional over time, and we test the assumption for all of the covariates and globally for each model based on the generalization by Grambsch and Therneau (1994). We cannot reject the hypothesis that the log hazard ratio function is constant over time suggesting the Cox model is appropriate for our data.

⁴ Similar results are obtained with random-effects GLS regression for pooled time-series data.

press releases, and newspaper articles. About half of the IPOs occurred before 1995 and as early as 1987. When unclear, the exact date of the IPO was obtained from the CRSP US Stock database (Center for research in security prices. Us stock database 2000). Of the 161 firms in the study, 88 firms (55%) went public during our sampling period (the end of 2000). Although this is a high percentage of firms going public, the equity market was very favorable late in our period; in fact, more firms went public in 1996, 1999, and 2000 in the U.S. than at any other point in recent history (using data from Thomson Financial).

The second dependent variable is time to venture capital funding. Venture capital funding generated enormous media attention during this time period and in Silicon Valley in particular, and firms generally worked hard to gain access to the venture capital network. Information on the financing history of each of the SPEC firms was collected via a combination of public and proprietary databases, SEC filings and annual reports, internal company documents and a survey instrument that was sent to the most senior finance executive at each of the firms (see Hellmann and Puri 2002). We code both the first time that a firm receives venture capital funding regardless of the amount and each successive round of financing; thus, our variable is a measure of whether and when the founding team received any amount of money from a venture capitalist.⁵ Although firms did receive funding from other sources (e.g. angels), the vast majority of external investors in the SPEC sample were venture capitalists (71%). We concentrate on the substantial achievement of receiving investment from a professional investors. Of these 161 firms, 120 firms (75%) obtained VC funding during our sampling period (the end of 2000). At first glance this number seems unusually high; however, in the latter end of our time period (late 1990s) there was an explosion of venture capital deals and large sums of money being invested in entrepreneurial firms in the U.S. During 1996, there were over 50% more deals than in the prior year and the average from 1996-2000 was 250% higher than the average from 1982-1995 (using data from Thomson Financial).

⁵ We focus our event-history analysis on the time to first venture capital funding similar to past research because future rounds are based on more direct knowledge about the firm than the first VC financing (Shane and Stuart 2002).

Regardless of the prevalence of VC funding in our sample, by modeling time to first venture capital funding we are examining characteristics of the team that allowed the firm to obtain funding more quickly than other firms as well as whether firms actually received venture capital.

Our final variables are the experience and team composition measures for the founding and top management teams (finance, founding, and executive experience; functional background and assignment diversity). These variables, calculated annually, serve as both independent and dependent variables.

Independent Variables

We coded the career histories for each person in the sample including whether the team member had prior start-up experience (i.e., the person was a founder of a previous firm), prior senior management experience (i.e., vice-president or higher rank), or prior finance experience. Start-up experience and senior management experience are the most relevant experience variables from prior research on new ventures (Burton, Sorensen et al. 2002; Shane and Stuart 2002; Delmar and Shane 2003). We also examined experience in five different functional areas (sales and marketing, support functions, manufacturing, science/R&D/engineering, and finance) because past functional experience has been found to be important for firm strategy (Boeker 1988; Boeker 1997). In our context, high technology firms in the Silicon Valley, we find that finance experience is the differentiating function between teams. Finance experience has been noted as a background variable important to venture capitalists considering investments in a firm (Goslin and Barge 1986) and is likely to be helpful in managing the intricacies of going public as well. Prior functional experience was based on the team member's previous three jobs but we also examined the team members' most recent job and all available past positions and found similar results. We coded initial founding team experience and updated TMT experience each year. We also examined functional background diversity, a fine-grained measure of background diversity that focuses on the range of prior experiences and requires work histories of individuals (Bunderson and Sutcliffe 2002). Another common measure of team diversity, functional assignment diversity examines the range of functional categories represented by current positions in the firm (Bunderson and Sutcliffe 2002). At founding, this measure captures the diversity of organizational positions created in the firm. Whereas

functional background diversity examines past experiences of team members, functional assignment diversity is concerned with the current positions on the team. We examine functional assignment and functional assignment diversity using an entropy-based measure of heterogeneity appropriate for categorical variables (Ancona and Caldwell 1992). The measure of heterogeneity, sometimes referred to as the Shannon index, is $-\sum P_i(\ln P_i)$, for $i=1$ to x , where x is the number of categories and P_i is the proportion of team members with past experience in or in a position of category i . The index accounts for how team members are distributed across possible functional categories. We used five functional categories (see above).

Control Variables

Firm Level. We control for industry to capture differences in the ability of firms to obtain financing and go public. The medical-related industry (including medical devices and biotechnology) was the only significantly different industry. The omitted category consists of computer hardware and software companies, electronic component manufacturing companies, networking and telecommunications companies, semiconductor companies, and contract research and development firms. We also controlled for firm size, measured as the number of employees at the end of a given year. Size data was obtained from a survey as well as a variety of secondary sources including SEC filings, published news releases and corporate directories and was updated yearly. We also examined the cumulative number of rounds of venture capital funding that the firm had obtained.⁶ Firms with venture capital financing are more likely to go public (Lerner 1994; Gompers and Lerner 1999; Shane and Stuart 2002) and more likely to experience growth and increased sales (Lee, Lee and Pennings 2001; Davila, Foster et al. 2003). We controlled for whether the firm had an innovation strategy (Burton, Sorensen et al. 2002) In the interviews, founders were asked to describe the core competence of the firm at founding and this data was used to categorize each of the firms into one of four strategic archetypes: Innovators, Enhancers,

⁶ We obtain similar results with a simple dummy variable (equal to one when the firm obtains venture capital).

Marketers and Low-Cost Producers (see Hannan, Burton et al. 1996). Innovators are firms that seek to gain first-mover advantages by winning a technology race. The three latter strategies all revolve around extending existing products or services. We focus on the distinction between innovators and incrementalists. Finally, we controlled for firm age. We included year dummy variables for the first 10 years of the firm's life in the pooled time-series regressions.

Team Level. We control for the size of the founding and TMT. The size of the founding team was identified by the founder interviewed. We define the top management team as those individuals ranked as vice-president or above (e.g., senior vice president, CTO, CIO, COO) (e.g., Wagner, Pfeffer et al. 1984; Michel and Hambrick 1992; Keck and Tushman 1993). The top management team is the group that has “overall responsibility for the organization” (Mintzberg 1979), and the small mean size of the TMT in our sample (3.0) suggests the operational definition mirrors the conceptual one. We coded the initial founding team size and updated TMT size each year. We also controlled for the number of exits and entrances to the team each year. This controls for any “window-dressing” where individuals are joining and leaving the firm in an attempt to signal quality to the external market. We also controlled for the cumulative number of entrances and exits to the team, and the proportion of founders still with the firm.

Other Controls. We included the number of initial public offerings in each industry by year to control for industry-specific variation in rates of IPO. We also include the number of venture capital deals by year to control for financial resources available to firms (using data from Thomson Financial). Finally, we controlled for the amount of data collected for each firm by including the average number of prior positions collected for each person in the firm. This allowed us to control for the possibility that we may have more data on individuals in successful firms.

Results

Tables 1 and 2 report descriptive statistics and correlations for relevant subsets of firms.⁷ From Table 1(row 1), we see that TMTs are more experienced and diverse than the founding teams (FT) that

⁷ Descriptives and correlations for all variables are in the Appendix

preceded them. The average proportion of founders present at the end of the sample period is 73%. Despite the relative founder stability, there are firms that lose all founders. Table 2 (column 2) demonstrates that when firms lose all their founders (n=17), the founding team start-up and finance experience is still significantly correlated with the respective experience at the end of the sample period.

Insert Tables 1 and 2 about here

Table 2 also demonstrates that the founding team experience is significantly related to the experience of the top management team over time. Three panels are presented in Table 2 and all correlations are significant through Year 8. Prior management and founding experience is significant through year 10.⁸ The panels are chosen at the median firm age and one standard deviation above the median age. The median age of the second founder leaving is 7 years, so 8 years is well beyond the stable point for the founding team. Clearly, correlations decay over time but remain significant. The correlation between FT and TMT finance experience is the weakest, but all are significantly related through year eight. From Table 1 (row 2), we see firms that will eventually lose their founders are not significantly different than other teams on many dimensions, so it is not the case that these firms are of lesser quality than other firms. Firms that lose their founders do begin with a significantly smaller founding team, the TMT doesn't grow as big, and fewer people leave in the last year of the sample, but on all of the experience dimensions these firms are comparable to other firms. In fact, in additional analyses, we see that founders are more likely to leave when they have experience and are part of a diverse team. So, firms where founders leave completely are not significantly better or worse than other firms. Thus, even among firms where there are no founders, and for all firms over time, the initial conditions matter.

⁸ Prior management experience is significant through years 10 -14 but only a handful of firms are still in the dataset (10 firms in year 14).

One possibility is that firms with strong or weak founding teams are different than other firms. We created a dummy variable for a ‘weak’ firm: firms with no functional diversity, management experience or founding experience; and we created a dummy variable for a ‘strong’ team: firms with in the top quartile for functional diversity or management experience or founding experience. Perhaps, rather than experience increasing the ability of the firm to reach important milestones, experienced TMT members are drawn to firms that look like winners. Thus, the causality could go the other way: good firms attract good people rather than good people create good firms. Although this possibility cannot be ruled out completely, from Table 1 (rows 3 and 4) we see that strong and weak founding teams have similar levels of turnover. This suggests that good firms are not clearly observable. Clearly, weak founding teams have less experience both initially and over time. Further, ‘strong’ founding teams both begin and grow in their experience, but here too we see that these teams are not over time bringing in many more people than other firms. Thus, it appears as if change occurs on both strong and weak teams, and firm success is not abundantly clear. Further, the proportion of founders that remain in firms with strong founding teams is less, although not significantly so, than firms with weak founding teams. Thus, stability is similar despite differences in founding team quality. If anything, strong founding teams experience more turnover, and the correlations between FT and TMT are all significant for firms with strong founding teams (Table 2, column 7).

Table 1 demonstrates the overall turbulence on these teams. Each year an average of one person comes or goes, with an average of over four people joining the firm over the sample period. Despite the turbulence, Table 2 further demonstrates that these correlations are not due to the turbulence on the team. The partial correlations (column 8) between the FT and TMT variables are significant, controlling for firm age, proportion of founders present, VC, and all measures of team flux (entrances and exits). Thus these correlations are significant despite turnover on the teams. Evidence of path dependence seems clear from these descriptives but next we turn to more quantitative results.

Insert Table 3 about here

Table 3 reports the influence of the founding team and TMT on the hazard of IPO. This table presents the direct effects of the founding team and TMT on firm outcomes and serves two purposes. First, the table in some way measures the extent to which the founding team imprints the firm. Model 1 has the control variables and functional background diversity. Background diversity is not significant, but many of the control variables do predict the rate at which a firm reaches IPO. Clearly, window dressing is important. Firms that gain and lose many team members in that year are more likely to go public. Model 2 adds the experience measure and demonstrates that founding teams with prior management experience are likely to go public more quickly. Model 3 adds functional assignment diversity and finds that having initial assignments across a diverse array of positions increases the rate of IPO. Model 4 presents results once controlling for the amount of cumulative turnover on the team, and we see that cumulative turnover significantly predicts hazard of IPO where entrances increase and exits decrease the hazard of IPO and overwhelms the founding team variables. Models 5-8 examine the influence of the TMT on the rate of IPO. Model 5 demonstrates that TMT with functional background diversity reach IPO faster than other firms. Model 6 shows that prior management and finance experience, even more than diversity, increase rates of IPO. Model 7 reports that TMTs with functional assignment diversity also reach IPO faster than other firms, and Model 8 demonstrates that these effects hold accounting for cumulative entrances and exits into the firm. When founding and TMT variables are in the model simultaneously, the results are substantively the same. Thus, Table 3 presents evidence in support of Hypotheses 1 and 2. Founding teams with management experience and functional assignment diversity reach IPO more quickly before accounting for the cumulative turnover on the team, but these initial conditions are overwhelmed by turnover on the team. TMT clearly influences the rates of IPO.

Insert Table 4 about here

In addition to these direct effects on outcomes, the founding team directly influences the TMT. Supporting Hypothesis 3, Table 4 reports regressions of the founding team on TMT experience. Across the board, we see that initial founding team experience (whether it be background diversity, management experience, start-up experience, finance experience or team structure diversity) influences the extent to which the TMT has similar experience. This relationship between founding team experience and TMT experience holds controlling for the proportion of founders on the team, the entrances and exits in the given year as well as cumulative entrances and exits, and controlling for the age of the firm. We present two panel years as well as the pooled data to demonstrate that this influence persists over time. The initial founding team influences the team that comes after. Given that influence occurs across types of experience, the findings appear to be that of homophily rather than experience being necessary to hire a quality team. Models 7-9 of Table 4 suggest that founding teams with start-up experience predict having TMT with start-up experience despite less necessity for such experience and thus a process of homophily. Prior start-up experience, however, as demonstrated by Table 1, is more stable than other experience variables, however, so both mechanisms are likely to be operating.

Insert Table 5 about here

Hypothesis 4 suggests that founding teams should influence the ability to attract venture capital, and this influence should impact the composition of the TMT. Table 5 demonstrates that the founding team influences the hazard of obtaining venture capital. Model 1 reports that founding teams with background diversity obtain VC more quickly, and Models 2 and 3 suggest that this background diversity is more important than any particular expertise or team structure diversity. Model 4 shows these effects disappear when controlling for the cumulative entrances and exits on the team. Similar to the impact of the FT on IPO, this suggests that path dependence, rather than imprinting, is at work. Imprinting would suggest that the founding team matters regardless of the turnover on the team. Model 4 suggests that the founding team matters but the direct effects are overshadowed by the indirect effects of turnover.

Returning to Tables 1 and 2, we see that the relationship between founding team, venture capital and TMT supports Hypothesis 4. Table 2 shows that firms that never receive venture capital have higher correlations between the FT and TMT experience variables; however, the correlations are significant for those that begin with VC or that receive VC during the sample period. Firms that receive VC during the sample period have somewhat lower correlations for management finance and start-up experience, suggesting that VC does significantly alter the team composition. This possibility is further supported by Table 1 (row 5). Firms that never receive venture capital begin with less FT background diversity and management experience, and the TMT background diversity, management experience, and functional assignment diversity are significantly lower than other firms throughout the firm's life. Further, firms that never receive VC have fewer entrances to the firm (3.25 vs. 5.06 cumulative entrances). In contrast, firms that start with venture capital have a significantly larger TMT, more background and team structure TMT diversity, and management teams with more management experience. The founding teams begin with more experience and diversity as well, suggesting VCs are both attracted to and impact the composition of the team. The magnitude of the change, from founding to later TMT, is greater for firms that start with venture capital in particular for firm size, background diversity and management experience. Furthermore, firms that receive VC during the sample period also experience great change in their teams, growing on every dimension more than firms that never receive VC. These descriptives support the contention that venture capitalists play a significant role in the firms that they fund,⁹ and Table 5 offers strong support for Hypothesis 4. Indeed, the influence of VC on rate of IPO demonstrated by other scholars is largely due to the effects of VC on the composition of the TMT: the VC influence on IPO becomes insignificant when controlling for TMT.

Discussion

In conclusion, we find evidence of multiple reasons why founding teams impact firm performance. First, a majority of founders stay with the firm, at least in the firms that we study. Second,

⁹ We note this could also be the result of signaling rather than direct influence by the VC.

founding teams leave a lasting imprint that influence firm outcomes. Controlling for this relative stability among founders, the relationship between founding team experience and TMT experience is significant over time. We see this in the influence of the founding team on rates of IPO and VC. Third, we see that founding teams influence the firm through a process of path dependence. The amount of founding team experience and diversity significantly predicts the experience and diversity of the top management team both over time and at particular points in time. We see both that obtaining VC changes the team and that better teams get VC. Venture capitalists appear to increase the managerial capabilities of the firms they invest in. This is path dependence: firms need to start with an experienced founding team to increase the likelihood that they receive VC, then improve the team, then go public.

We have taken a first step in understanding the evolution of the top management team over time, and longitudinal data offers a unique opportunity to examine how the founding team impacts the quality of the subsequent TMT. This offers an important direction for further research. Of course we acknowledge the limitations of our study. First, we cannot distinguish between the mechanisms by which the founding team influences the top management team, although it appears that both homophily and quality attracting quality are at work. Second, the data is not as complete as data for more established firms, and we may have been unable to find data on TMT members that were not successful during their career. However, ours is the first study to our knowledge to attempt such a detailed look at the career histories of private firms and such an examination almost by definition involves some problems with missing data. Furthermore, we have controlled for the potential problem to the extent possible in all analysis. Third, like many other studies of demographic composition, we do not measure team process directly. Our results, however, inform and are informed by process studies. Despite these limitations, we are encouraged by the consistency of our results, how it contributes to and reflects current theories, and by the potential rewards of examining teams over time in this rich research setting of entrepreneurial firms.

We demonstrate that founding teams matter – both directly and indirectly – through imprinting, path dependence and stability. Our study contributes to the voluminous research on demography by

examining the evolution of teams. Little research in demography has examined change in teams over time, much less from founding. Clearly these teams are shaped by the teams that precede them. In the entrepreneurial literature, our research adds to the body of literature that founding teams matter, although often through a process of path dependence more than imprinting. This sociological and evolutionary approach demonstrates how initial teams have a lasting impact on the firm. We hope to have a similar impact on future research on founding and top management teams in that future research will similarly consider the evolutionary nature of entrepreneurial teams.

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Table 1: Founding Team and TMT Mean Descriptives for Subset of Firms *

	N	FT Size	TMT Size	FT FB Div	TMT FB Div	FT Mgt Exp	TMT Mgt Exp	FT Fndg Exp	TMT Fndg Exp	FT FA Div	TMT FA Div	TMT Year Gain	TMT Year Loss	TMT Cum Gain	TMT Cum Loss	Prop Fndr
1. All firms t _n	159	2.76	4.31	.34	.85	.48	2.11	.41	.42	.36	.70	.53	.50	4.60	1.14	.73
2. Firms w/ no FT	17	1.82	2.88	.39	.66	.35	1.47	.47	.29	.30	.58	.29	1.18	4.29	1.35	.74
3. FT with weak experience	37	2.16	3.30	0	.62	0	1.46	0	.27	0	.57	.43	.59	3.97	.92	.75
4. FT with strong experience	89	2.81	4.72	.52	.96	.87	2.53	.73	.56	.43	.77	.63	.51	4.87	1.22	.71
5. Firms that never get VC	40	2.45	2.55	.21	.42	.35	1.00	.40	.28	.31	.43	.22	.59	3.25	.98	.70
6. Firms that receive VC	119	2.87	4.91	.39	1.00	.53	2.48	.41	.47	.38	.79	.63	.48	5.06	1.19	.74
7. Firms founded with VC	43	2.77	5.02	.42	.99	.74	2.58	.37	.37	.51	.83	.56	.47	5.19	1.14	.75
8. Firms not founded w/VC	118	2.76	4.05	.31	.80	.39	1.93	.42	.44	.30	.65	.52	.52	4.38	1.14	.72

Table 2: Correlations between Founding Team and TMT Variables**

Correlations:	All (1198)	No FT (17)	Year 1 (159)	Year 4 (147)	Year 8 (69)	Year 10 (42)	Strong FT (635)	Partial Corr (154) *	Start VC (251)	Never VC (391)	Obtain VC (556)
FT and TMT BG Div.	.40*	.32	.52*	.47*	.38*	.20	.42*	.16*	.18*	.66*	.31*
FT and TMT Mgmt Exp.	.47*	.21	.72*	.51*	.44*	.46*	.46*	.37*	.50*	.68*	.32*
FT and TMT Fndg Exp.	.57*	.56*	.66*	.55*	.61*	.37*	.55*	.43*	.61*	.75*	.46*
FT and TMT Finance Exp	.14*	.23*	.29*	.16*	.34*	-.02	.23*	.28*	.14*	.12*	.11*
FT and TMT Team Div.	.48*	.03	.89*	.50*	.30*	.09	.47*	.07	.38*	.50*	.46*

* Bold significantly different; * p<.05; **Partial correlation, controlling for firm age, proportion of founders present, size, when obtained VC, cumulative TMT entrances and exits, TMT entrances and exits in last year

Table 3: Event History Analysis: Effect of Founding Team and TMT on IPO*

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8
Firm Size	1.00** (.00)	1.00** (.00)	1.00** (.00)	1.00 (.00)	1.00 (.00)	1.00 (.00)	1.00 (.00)	1.00 (.00)
Medical-related industry	2.39*** (.62)	2.51*** (.66)	2.74*** (.78)	5.70*** (1.74)	4.09*** (1.03)	4.66*** (1.20)	5.45*** (1.57)	5.36*** (1.69)
Industry IPOs	1.12*** (.02)	1.12*** (.02)	1.13 (.02)	1.12*** (.02)	1.10*** (.03)	1.09*** (.03)	1.09*** (.03)	1.09*** (.03)
Total VC Deals	1.00 (.00)	1.00 (.00)	1.00 (.00)	1.00 (.00)	1.00*** (.00)	1.00*** (.00)	1.00*** (.00)	1.00*** (.00)
Cumulative VC	1.25*** (.05)	1.25*** (.06)	1.26*** (.06)	1.10** (.05)	1.06 (.05)	1.07 (.05)	1.06 (.04)	1.06 (.04)
Innovation Strategy	1.00 (.21)	1.03 (.21)	.99 (.21)	.83 (.17)	1.05 (.20)	1.17 (.22)	1.25 (.24)	1.22 (.23)
Average number of person-positions	1.63*** (.20)	1.66*** (.20)	1.70*** (.21)	2.04*** (.29)	1.93*** (.24)	1.80*** (.21)	1.82*** (.23)	1.82*** (.25)
TMT entrances during year	1.53*** (.14)	1.51*** (.14)	1.48*** (.14)	1.36*** (.13)	.88 (.08)	.89 (.08)	.90 (.08)	.87 (.09)
TMT exits during year	.59** (.13)	.59** (.13)	.57** (.13)	.49*** (.10)	.80 (.13)	.73 (.12)	.71** (.12)	.72* (.13)
Team Size (Founding or TMT)	1.11** (.06)	1.12** (.07)	1.07 (.08)	.97 (.06)	1.61*** (.09)	1.49*** (.10)	1.44*** (.10)	1.49*** (.14)
FT with Functional Background Div.	1.04 (.24)	.82 (.22)	.65 (.18)	.72 (.20)				
FT with Prior Mgmt Experience		1.37** (.22)	1.30* (.32)	1.07 (.17)				
FT with Prior Founding Experience		1.18 (.17)	1.22 (.18)	.99 (.18)				
FT with Prior Finance Experience		1.28 (.51)	1.25 (.52)	1.24 (.49)				
FT with Functional Assignment Div.			1.95*** (.51)	1.65* (.43)				
TMT with Functional Background Div.					1.77* (.58)	1.01 (.36)	.81 (.29)	.85 (.31)
TMT with Prior Management Exp						1.19*** (.09)	1.17** (.09)	1.17** (.09)
TMT with Prior Founding Exp.						.87 (.13)	.87 (.13)	.88 (.13)
TMT with Prior Finance Experience						1.59*** (.27)	1.58*** (.28)	1.53** (.28)
TMT with Functional Assignment Diversity							4.06** (2.30)	4.04** (2.27)
Cumulative TMT Entrances				1.70*** (.13)				.95 (.09)
Cumulative TMT Exits				.64*** (.06)				1.13 (.13)
LR Chi-Square (degrees of freedom)	170.52 (10)	202.15 (13)	238.88 (14)	284.21 (16)	275.34 (10)	371.59 (13)	338.31 (14)	346.87 (16)

***p<.01; **p<.05; *p<.10; two-tailed test; • 158 firms and 84 events; 1127 obs.

Table 4: Regression Results with robust standard errors: Effect of Founding Team on TMT*

	Model 1: TMT Div. pooled	Model 2 TMT Div. at Y4	Model 3 TMT Div. at Y8	Model 4 TMT Exec Exp pooled	Model 5 TMT Exec Exp at Y4	Model 6 TMT Exec Exp at Y8	Model 7 TMT Fndg Exp pooled	Model 8 TMT Fndg Exp at Y4	Model 9 TMT Fndg Exp at Y8
Cumulative VC	.06*** (.01)	.09*** (.02)	.04** (.02)	.10*** (.02)	.10** (.05)	.05 (.06)	.01 (.02)	.00 (.03)	.02 (.03)
Medical Industry	.19** (.08)	.31*** (.09)	.07 (.11)	-.00 (.17)	.18 (.29)	-.26 (.25)	.12 (.13)	-.02 (.13)	.56* (.29)
Firm Size	.00* (.00)	.00 (.00)	-.00 (.00)	.00 (.00)	.00 (.00)	.00 (.00)	-.00 (.00)	-.00* (.00)	-.00 (.00)
Innovation Strategy	.02 (.05)	-.13* (.07)	-.05 (.11)	.08 (.11)	-.07 (.16)	-.08 (.28)	.11 (.07)	.03 (.10)	.04 (.18)
Average number of person- positions	.08*** (.02)	.05 (.03)	.19*** (.07)	.27*** (.05)	.22*** (.08)	.37*** (.14)	.14*** (.04)	.09* (.05)	.23*** (.09)
Team Size in Prior Year	.06* (.03)	.05 (.07)	.11 (.07)	.17** (.09)	.35* (.21)	.02 (.26)	.10 (.08)	.16 (.14)	.32* (.17)
FT with Functional Background Div	.29*** (.06)	.31*** (.08)	.24** (.12)						
FT with Prior Mgmt. Exp				.61*** (.07)	.65*** (.12)	.49*** (.17)			
FT with Prior Founding Exp							.46*** (.08)	.52*** (.09)	.53*** (.12)
Proportion of Founders (t-1)	-.17* (.08)	.01 (.21)	-.22 (.18)	-.27 (.21)	-.20 (.50)	.14 (.43)	-.09 (.12)	-.44 (.32)	.02 (.22)
TMT entrances during year	.07*** (.01)	.05 (.03)	.22** (.10)	.16*** (.04)	.25** (.10)	.17 (.27)	.01 (.02)	-.04 (.08)	.08 (.14)
TMT exits during year	-.01 (.03)	-.35* (.19)	-.19** (.08)	-.04 (.07)	-.54 (.70)	-.32 (.28)	-.00 (.05)	.31 (.61)	-.05 (.15)
Cumulative TMT Entrances	.08** (.04)	.09 (.07)	.05 (.08)	.12 (.09)	-.11 (.21)	.40 (.32)	-.02 (.08)	-.04 (.12)	-.27 (.18)
Cumulative TMT Exits	-.11*** (.04)	.18 (.19)	-.04 (.07)	-.11 (.10)	.65 (.72)	-.15 (.33)	-.00 (.07)	-.38 (.58)	.28* (.16)
Constant	-.18** (.09)	-.13 (.21)	-.22 (.19)	-.69*** (.25)	-.36 (.50)	-1.28** (.58)	-.40** (.16)	.20 (.32)	-.61** (.25)
F-Statistic (df)	72.32 (20)	29.01 (11)	32.24 (11)	26.62 (20)	19.32 (11)	13.64 (11)	5.37 (20)	5.78 (11)	5.97 (11)
Number of Obs.	1066	155	71	1066	155	71	1066	155	71

***p<.01; **p<.05; *p<.10

*With age dummy variables in pooled regressions

Table 4: Regression Results with robust standard errors: Effect of Founding Team on TMT*
(continued)

	Model 10 TMT Finance Exp (pooled)	Model 11 TMT Finance Exp at Y4	Model 12 TMT Finance Exp at Y8	Model 13 TMT Team Div (pooled)	Model 14 TMT Team Div at Y4	Model 15 TMT Team Div at Y8
Initial Venture Capital Investments	.03** (.01)	.07*** (.02)	.00 (.03)	.03*** (.01)	.05*** (.01)	.03 (.02)
Medical Industry	.10 (.08)	.21 (.13)	-.17 (.15)	.05 (.09)	.00 (.06)	.14 (.20)
Firm Size	-.00 (.00)	-.00 (.00)	.00 (.00)	.00 (.00)	.00 (.00)	.00 (.00)
Innovation Firm Strategy	-.03 (.05)	-.09 (.08)	.11 (.13)	.04 (.04)	-.05 (.05)	-.03 (.09)
Average number of person- positions	.04 (.03)	.07 (.05)	.08 (.07)	-.00 (.02)	-.02 (.03)	.05 (.04)
Team Size in Prior Year	.15*** (.04)	.07 (.09)	.10 (.14)	.07*** (.02)	.07** (.03)	.04 (.05)
Founding Team with Prior Finance Experience	.41*** (.14)	.38** (.19)	.24 (.21)			
Founding Team with Functional Assignment Diversity				.35*** (.05)	.21*** (.06)	.18** (.09)
Proportion of Founders in Prior Year	.10 (.07)	.25 (.21)	.14 (.17)	-.09 (.09)	.05 (.16)	-.11 (.16)
TMT entrances during year	.05*** (.02)	.07 (.05)	-.09 (.11)	.05*** (.01)	.07*** (.02)	.13** (.06)
TMT exits during year	-.03 (.03)	-.24 (.26)	-.01 (.12)	-.04 (.02)	-.33** (.15)	.04 (.05)
Cumulative TMT Entrances	-.08* (.04)	.02 (.10)	.02 (.18)	-.00 (.03)	-.02 (.04)	.03 (.06)
Cumulative TMT Exits	.05 (.05)	.07 (.28)	-.01 (.20)	-.06* (.03)	.28** (.13)	-.07 (.07)
Constant	-.26*** (.10)	-.46** (.21)	-.42* (.25)	.38*** (.13)	.27 (.17)	.24 (.19)
F-Statistic (degrees of freedom)	8.41 (20)	5.71 (11)	3.78 (11)	16.38 (20)	11.51 (11)	6.57 (11)
	N=1066	N=155	N=71	N=1066	N=155	N=71

Table 5: Event History Analysis: Effect of Founding Team on Venture Capital Financing Hazard Ratio and Standard Errors*

	Model 1	Model 2	Model 3	Model 4
Firm Size	1.01* (.00)	1.00* (.00)	1.00* (.00)	1.01* (.00)
Medical-related industry	1.54* (.35)	1.48* (.34)	1.53* (.34)	1.40 (.35)
Venture Capital Deals	1.00 (.00)	1.00 (.00)	1.00 (.00)	1.00 (.00)
Innovation Strategy	1.33* (.23)	1.36* (.23)	1.38* (.24)	1.41** (.25)
Average number of person-positions	1.13** (.07)	1.15* (.08)	1.15** (.08)	1.14* (.09)
Founding Team Size	.98 (.04)	.99 (.04)	.99 (.04)	.98 (.05)
TMT exits during year	.99 (.19)	.96 (.18)	.97 (.18)	.92 (.18)
TMT entrances during year	1.26*** (.06)	1.26*** (.06)	1.25*** (.06)	1.32*** (.10)
Founding Team with Functional Background Diversity	1.37* (.27)	1.41* (.27)	1.35* (.27)	1.37 (.29)
Founding Team with Prior Management Experience		1.14 (.14)	1.13 (.14)	1.16 (.15)
Founding Team with Prior Founding Experience		.84 (.11)	0.85 (.11)	.91 (.12)
Founding Team with Prior Finance Experience		.90 (.33)	.89 (.33)	.76 (.31)
Founding Team with Functional Assignment Diversity			1.18 (.30)	1.39 (.38)
Cumulative TMT				.86 (.09)
Cumulative TMT Exits				1.21 (.22)
LR Chi-Square (degrees of freedom)	50.57 (8)	53.89 (12)	52.77 (11)	53.98 (14)

***p<.01; **p<.05; *p<.10; two-tailed test

*Analysis of 156 firms, 116 events, 613 yearly observations

Appendix: Descriptive Statistics

Variable	Mean	SD	Min	Max	N
1. Firm Size (Number of Employees)	46.48	98.91	1	1750	1219
2. Medical Industry	0.11	0.32	0	1	1230
3. Innovation Strategy	0.43	0.50	0	1	1230
4. Total VC Deals	917.02	545.27	43	3367	1230
5. Total IPOs by industry	3.05	3.14	0	18	1214
6. Cumulative Rounds of Venture Capital	1.83	2.33	0	11	1230
7. Average number of prior person positions	2.01	0.94	0	6	1140
8. Cumulative entrances to TMT	3.00	2.33	0	18	1157
9. Cumulative exits to TMT	0.46	1.27	0	14	1198
10. TMT Exits in current year	0.21	0.59	0	5	1230
11. TMT Entrances in current year	0.66	1.03	0	7	1230
12. Size of Founding Team	2.73	1.64	0	10	1198
13. Founders with functional background diversity	0.32	0.45	0	1.39	1198
14. Founders with Prior Executive Experience	0.43	0.68	0	3	1198
15. Founders with Prior Start-Up Experience	0.37	0.63	0	3	1198
16. Founders with Prior Finance Experience	0.08	0.28	0	1	1198
17. Founders with Functional Assignment Diversity	0.34	0.38	0	1.10	1198
18. TMT Size	3.01	2.07	0	12	1175
19. TMT with functional background diversity	0.55	0.57	0	1.79	1198
20. TMT with Prior Executive Experience	1.12	1.29	0	8	1198
21. TMT with Prior Start-Up Experience	0.36	0.67	0	4	1198
22. TMT with Prior Finance Experience	0.24	0.47	0	2	1198
23. TMT with Functional Assignment Diversity	0.59	0.40	0	1.10	1190
24. Proportion of founders	0.87	0.25	0	1	1174

Appendix. Correlation Matrix

Variable	1	2	3	4	5	6	7	8	9	10	11
1. Firm Size (Number of Employees)	1.00										
2. Medical Industry	-0.06	1.00									
3. Innovation Strategy	-0.10	0.21	1.00								
4. Total VC deals	0.23	-0.06	-0.03	1.00							
5. Total IPO by industry	0.06	0.02	0.03	0.07	1.00						
6. Rounds of Venture Capital	0.21	-0.01	0.17	0.12	0.12	1.00					
7. Average number of prior person positions	0.02	0.04	0.11	-0.08	0.03	0.05	1.00				
8. Cumulative entrances to TMT	0.28	-0.19	0.17	0.11	0.11	0.50	-0.12	1.00			
9. Cumulative exits to TMT	0.21	-0.09	0.14	0.25	0.13	0.33	-0.11	0.70	1.00		
10. TMT Exits in current year	0.14	-0.07	0.11	0.12	0.09	0.21	-0.07	0.37	.29	1.00	
11. TMT Entrances in current year	-0.06	-0.01	0.15	-0.20	-0.03	0.06	0.06	0.12	0.01	0.20	1.00
12. FT Size	-0.00	0.08	0.07	-0.01	0.02	0.10	-0.22	0.25	0.14	0.11	0.10
13. FT with functional background diversity	0.05	-0.10	0.05	0.04	0.06	0.11	0.04	0.24	0.13	0.10	0.10
14. FT with Prior Executive Experience	0.06	-0.11	-0.02	0.00	-0.02	0.08	0.10	0.22	0.10	0.04	0.12
15. FT with Prior Start-Up Experience	-0.03	-0.07	0.08	-0.05	0.03	-0.05	0.21	0.09	0.06	0.05	0.11
16. FT with Prior Finance Experience	0.03	-0.04	0.04	0.03	0.00	-0.03	0.00	0.15	0.16	0.08	0.05
17. FT with Functional Assignment Diversity	0.08	-0.16	-0.08	-0.04	-0.02	0.07	-0.04	0.26	0.11	0.05	0.12
18. TMT Size	0.21	-0.12	0.15	-0.10	0.07	0.46	-0.01	0.76	0.23	0.19	0.35
19. TMT with functional background diversity	0.20	-0.00	0.18	-0.08	0.08	0.50	0.12	0.56	0.17	0.17	0.33
20. TMT with Prior Executive Experience	0.18	-0.10	0.14	-0.05	0.12	0.43	0.18	0.58	0.23	0.18	0.34
21. TMT with Prior Start-Up Experience	0.01	-0.00	0.17	-0.08	-0.02	0.07	0.24	0.22	0.06	0.09	0.18
22. TMT with Prior Finance Experience	0.09	0.00	0.08	-0.07	0.10	0.28	0.05	0.35	0.10	0.08	0.17
23. TMT with Functional Assignment Diversity	0.16	-0.07	0.08	-0.09	0.07	0.35	-0.03	0.45	0.11	0.11	0.27
24. Proportion of founders	-0.24	0.04	0.06	-0.32	-0.15	-0.14	0.13	-0.22	-0.38	-0.28	0.08

Appendix Correlation Matrix

(continued)

Variable	12	13	14	15	16	17	18	19	20	21	22	23
12. FT Team Size	1.00											
13. FT with functional background diversity	0.35	1.00										
14. FT with Prior Executive Experience	0.03	0.35	1.00									
15. FT with Prior Start-Up Experience	0.02	0.29	0.22	1.00								
16. FT with Prior Finance Experience	0.21	0.46	0.09	0.25	1.00							
17. FT with Functional Assignment Diversity	0.32	0.46	0.25	0.05	0.20	1.00						
18. TMT Size	0.24	0.25	0.23	0.11	0.10	0.27	1.00					
19. TMT with functional background diversity	0.19	0.39	0.27	0.17	0.14	0.21	0.74	1.00				
20. TMT with Prior Executive Experience	0.02	0.19	0.47	0.16	0.06	0.12	0.74	0.71	1.00			
21. TMT with Prior Start-Up Experience	0.04	0.16	0.13	0.58	0.06	0.01	0.30	0.30	0.36	1.00		
22. TMT with Prior Finance Experience	0.13	0.23	0.09	0.07	0.23	0.19	0.53	0.55	0.49	0.09	1.00	
23. TMT with Functional Assignment Diversity	0.16	0.27	0.21	0.03	0.11	0.47	0.61	0.59	0.50	0.18	0.32	1.00
24. Proportion of founders	-0.08	-0.14	-0.03	-0.05	-0.09	-0.07	0.01	-0.06	-0.07	0.04	0.01	-0.00

• Correlations greater than .05 are significant; based on 1127 observations