

Early teams: The impact of team demography on VC financing and going public

Christine M. Beckman, M. Diane Burton, Charles O'Reilly

Abstract

This study investigates how top management team (TMT) demographic characteristics affect firm outcomes for young high technology firms in Silicon Valley. We study how team composition and turnover shape an entrepreneurial firm's ability to attract venture capital and its ability to successfully complete an initial public offering. We find that broad access to information by virtue of having top management team members that have worked for many different employers (diverse prior company affiliations) and have diverse prior experiences (functional diversity) tend to be associated with positive outcomes. In addition, entrants to and founder exits from the TMT increase the likelihood that a firm achieves an IPO. TMT exits, in turn, reduce the likelihood of achieving an IPO. Results also suggest that prior human capital experience is consistently associated with positive firm outcomes. These findings suggest that team experiences, composition and turnover are all important for bringing new insights to the firm and are associated with the likelihood that an entrepreneurial firm will succeed.

1. Executive summary

In this paper, we extend our understanding of the relationship between entrepreneurial teams and firm outcomes. Using a sample of 161 high technology firms in Silicon Valley, we look at the impact of founding and early top management team (TMT) composition on important entrepreneurial milestones. We examine two specific measures of new venture success: the ability to attract venture capital (VC), and the ability to successfully complete an initial public offering (IPO). In developing our arguments, we go beyond human capital explanations of teams and also consider group composition and turnover on teams as important predictors of new venture success. The key independent variables (functional diversity, background affiliations, and turnover) capture a team's ability to gather new information and experience that will allow the firm to be successful. We look at these variables longitudinally to understand how the benefits of particular types of experience change over time. Although both founding teams and TMTs are important, rarely have they been examined together.

Consistent with prior research, we expect that both founding and early TMTs with diverse functional backgrounds and relevant human capital will be able to reach entrepreneurial milestones more quickly than less diverse and less experienced teams. We find that functional diversity and prior executive experience generally aids teams in securing venture capital and obtaining an IPO. Prior start-up experience, in contrast, has a negative relationship with firm outcomes in three of the four specifications.

In addition to examining traditional functional diversity, we develop the concept of background affiliation — a new kind of team demographic characteristic — that may be particularly relevant for the success of young firms. Managers bring a good deal of tacit knowledge with them from their prior firms about how to organize and manage work processes, and this knowledge is likely to differ even between two firms in a similar industry. We look at two aspects of a team's background affiliations based on prior company affiliations (that is, the companies in which the team member's worked before joining the firm). We examine affiliation diversity (i.e., how many unique companies the team members have worked for) and affiliation overlap (i.e., proportion of prior past company experiences at the same company). In general, we find that firms whose top management teams have affiliation diversity are more likely to be successful than firms with fewer company affiliations. Contrary to expectations, affiliation overlap only has a positive effect on going public for founding teams.

While traditional TMT demography examines tenure diversity, we are able to unpack tenure heterogeneity and conduct a fine-grained analysis of team entrances and exits. This decomposition of turnover allows us to understand the mechanisms by which turnover and tenure heterogeneity matter. We find that TMT departures are detrimental to a firm's

rate of IPO; whereas founder exits and team entrances increase the firm's likelihood of going public. This implies that in entrepreneurial firms, tenure heterogeneity which arises from additions to the team (i.e., growth) and founder departures may be beneficial.

In summary, our research suggests that both prior company affiliations and functional experience are important correlates of success. Firms with experienced team members from a range of companies will be successful more quickly than other firms. Replacing founders with experienced executives that have diverse functional backgrounds and affiliations is associated with firm success. These findings point to the importance of decomposing turnover to differentiate entrances from exits. They also highlight the need to understand both the "what" and the "where" of prior team experience. In sum, entrepreneurial teams are complex combinations of experiences and affiliations that have substantive effects on firm outcomes.

2. Introduction

There is a growing interest in studying entrepreneurial top management teams. This interest stems in part from the recognition that team founded ventures are often more successful than those founded by solo entrepreneurs (Chandler and Hanks, 1998; Roberts, 1991). Entrepreneurship scholars and theorists further acknowledge that the skills and capabilities required of the team members who lead entrepreneurial firms change over time; thus, new team members need to be brought in and founders whose skills have become outmoded need to be replaced (Rubenson and Gupta, 1996; Boeker and Wiltbank, 2005). This pervasive "firm life cycle" perspective on entrepreneurship — with its associated executive turnover — make understanding the impact of top management team (TMT) and founding team characteristics and composition on firm outcomes an important theoretical and empirical endeavor. In this paper we use and extend techniques from organizational demography to enhance our understanding of how team composition and turnover, in both the founding team and later TMTs, impact entrepreneurial firm performance. In contrast to the existing literature that examines either founding teams or TMTs at a fixed point in time, we examine both simultaneously and over time.

For more than 25 years, organizational demography has been the dominant paradigm for studying top management teams (Hambrick and Mason, 1984; Finkelstein and Hambrick, 1990). It is widely accepted that in order to successfully run a firm, the TMT must collectively possess the requisite knowledge and insight to make informed decisions about the strategic direction of the firm, and the team must coordinate and integrate to implement strategic decisions (Hitt et al., 2001). Organizational researchers increasingly use a demographic lens to link the structure and functioning of senior management groups to firm outcomes (e.g., Boone et al., 2004; Carpenter et al., 2004). In fact, the past two decades has seen an explosion in research exploring how the composition or demography of groups may affect group process and performance. As Williams and O'Reilly (1998) report, over 40 empirical studies have examined the effects of TMT demography on firm outcomes, team dynamics and firm.

Entrepreneurial research has begun to address how the compositional characteristics of founding teams affect performance (Amason et al., 2006; Eisenhardt and

Schoonhoven, 1990; Chandler et al., 2005; Chowdhury, 2005; Roure and Maidique, 1986; Watson et al., 2003). However, most scholars draw upon human capital theories and study characteristics such as the type and amount of prior experience present on a team (Aldrich and Zimmer, 1986; Cooper et al., 1994; Gimeno et al., 1997; Schefczyk and Gerpott, 2000; Burton et al., 2002; Baum and Silverman, 2004). Demographic arguments are importantly distinct from human capital arguments in that demography theorizes about team composition and diversity in addition to the existence of any particular experience.

An essential feature of the organizational demography approach is that it considers both the average characteristics of a collective as well as the differences across individuals. The theoretical underpinnings of organizational demography typically rely on one or two substantive traditions to explain the advantages and disadvantages of demographic heterogeneity. Some scholars draw upon classic social psychological theories and emphasize group dynamics and interpersonal processes (see Williams and O'Reilly, 1998, for a review). Others draw upon sociological theories and emphasize social network correlates of demography (see Hoang and Antoncic, 2003, for a review of networks and entrepreneurship). As Reagans et al. (2004) articulate, there are "optimistic" and "pessimistic" views of heterogeneity in both traditions. In the pessimistic psychological view heterogeneity is problematic because it disrupts group processes and produces interpersonal conflict. Similarly, in the pessimistic sociological view, there is a lack of social closure and trust. In contrast, optimists of both psychological and sociological persuasions emphasize the information advantages of heterogeneity. Demographic heterogeneity brings together people with different skills, experiences, and social ties and is advantageous because it expands network resources and provides more and better information.

Among the scholars who apply organizational demographic theories to entrepreneurial settings, most have focused on a group dynamics interpretation of heterogeneity hypothesizing (but then often failing to find) negative consequences of diversity (e.g., Ensley et al., 2002; Watson et al., 2003; Chowdhury, 2005; Chandler et al., 2005). We find this emphasis to be somewhat surprising. Given the voluntary nature of participation in an entrepreneurial venture, one might expect fewer problems associated with interpersonal relations or group dynamics. In large established firms, internal promotion systems and bureaucratic politics can influence who occupies an executive position leaving incumbent executives with minimal voice in the choice of and little influence over the actions of their executive counterparts. In contrast, entrepreneurial TMTs are often deeply involved in the choice of prospective team members. Because founders decide to band together and subsequent new TMT members both choose to join and are also chosen by their peer incumbents, the interpersonal chemistry should be much less problematic in entrepreneurial settings than in established firm settings.

The limited attention to the informational benefits of demographic heterogeneity — beyond human capital effects — in the current entrepreneurial demography literature is also somewhat surprising given the long standing recognition that access to information and resources is one of the key factors associated with entrepreneurial success (e.g., Birley, 1985; Aldrich and Zimmer, 1986). In this paper we follow Reagans et al. (2004) and recognize that both group processes and information access are important to firms, but we argue that in entrepreneurial teams the benefits of diversity likely outweigh the drawbacks.

In this longitudinal study of entrepreneurial team composition, we examine those compositional characteristics that allow firms to obtain information benefits (functional heterogeneity, background affiliations, and turnover). We examine which effects are most salient for the founding team and how the effects change as the new venture matures. Founding teams are important because founding team characteristics impact organizational structure and performance (Kimberly, 1979; Boeker, 1988; Eisenhardt and Schoonhoven, 1990; Baron et al., 1996). Furthermore, reports in the business press as well as academic research note that venture capital firms pay particular attention to the strengths and weaknesses of founding team when deciding whether to fund a new venture (Goslin and Barge, 1986; Heileman, 1997; Baum and Silverman, 2004). Yet, it is also often suggested that as entrepreneurial firms evolve and mature they need to attract people with different skills (Aldrich, 1999; Boeker and Karichalil, 2002). As firms grow and age, founders are likely to be replaced with experienced executives, particularly in VC backed firms (Hellmann and Puri, 2002). Thus, entrepreneurial teams are likely, as a matter of course, to experience compositional changes as new executive team members are added and as others are replaced. The importance of particular characteristics may change, and thus we examine both teams over time. Importantly, instead of relying on aggregate measures of tenure heterogeneity as is often the case, with a longitudinal research design it is possible to study both entrances and exits (Ucbasaran et al., 2003) and assess their relative impact (Chandler et al., 2005). Doing so begins to identify whether it is more advantageous to begin with a large, functionally diverse team or to add people and capabilities over time.

We examine a traditional team demographic characteristic, functional heterogeneity, as well as a new kind of demographic characteristic — background affiliation — that may be particularly relevant for the success of young firms. Managers bring a good deal of tacit knowledge with them from their prior firms, about how to organize and manage work processes, and this knowledge is likely to differ even between two firms in a similar industry. We examine these characteristics for founding teams and subsequent TMTs and estimate their impact on achieving important firm outcomes.

New venture success can be measured in a myriad of ways, but we emphasize two specific measures: the ability to attract venture capital (VC), and the ability to successfully complete an initial public offering (IPO). We argue that founding teams and TMTs with the requisite variety of skills and experience are more likely to capture the interest and attention of professional investors and go public. VC and IPO are important markers of success because ties to venture capital investors increase a firm's chances of survival (Shane and Stuart, 2002). The IPO is also crucial for investors since it represents an opportunity to earn a return on their investment, and venture capitalists encourage firms to quickly go public as soon as they anticipate favorable valuations (Freeman, 1999). Recent studies have treated both of these outcomes as measures of firm success (Welbourne and Cyr, 1999; Higgins and Gulati, 2003; Burton et al., 2002; Shane and Stuart, 2002). In addition, in our context — high technology firms in Silicon Valley during the 1990s — these were both salient and desirable outcomes for entrepreneurs to achieve as quickly as possible. In addition to being established in the literature and appropriate for our context, both VC financing and IPO attainment have the additional advantage of allowing us to examine outcomes across multiple high technology industries (e.g., semiconductors and

biotechnology), that have very different profiles on traditional financial metrics such as revenues and return on assets.

3. Top management team demography and organizational outcomes

We begin, building on the distinction offered by Foo et al. (2005), by exploring task-related diversity. It is relatively uncontroversial to claim that human capital, both in terms of education and experience, is associated with superior firm performance. Entrepreneurship scholars have demonstrated that the quality of the team's past experience benefits their firm (i.e., Burton et al., 2002; Chandler and Hanks, 1998; Schefczyk and Gerpott, 2000). Translating these insights into a demographic framework implies studying the variation in type of human capital experience on the team. We concentrate on functional experience.

3.1. Functional diversity

The general argument made for the positive impact of functional heterogeneity on firm performance is that having diversity in functional backgrounds ensures that the TMT has the full range of skills and abilities needed to manage the organization (e.g., Keck, 1997; Randel and Jaussi, 2003). This argument is also consistent with Rouse and Keeley's (1990) study of new ventures that reported team "completeness" (the degree to which key positions were staffed by members of the founding team—was associated with firm success. Having broad functional experience represented on the team also makes a firm more attractive to external stakeholders and to investors. It signals that the management team has the requisite skills and capabilities to make the firm successful, profitable, and thereby a worthwhile investment). Thus, we suggest the following hypothesis for both founding teams and TMT teams:

Hypothesis 1. Teams with higher levels of functional diversity are more likely to reach critical entrepreneurial firm milestones than teams with less functional diversity.

3.2. Background affiliation: prior company diversity and prior company overlap

Social capital refers to the benefits a firm can receive from its networks and memberships (Adler and Kwon, 2002). Many studies point to broad information access as an important determinant of firm success, and demonstrate that a team's social ties give a firm access to information and influence that can help it obtain important resources (Aldrich and Zimmer, 1986; Stuart et al., 1999). For instance, firms with direct or indirect ties to investors are more likely to receive VC funding (Shane and Stuart, 2002). This type of social capital is seen as a "bridge" because it focuses on the linkages of the team to external organizations and experiences (Adler and Kwon, 2002). Firms also benefit from "bonding" social capital where internal group ties facilitate cooperative relationships (Adler and Kwon, 2002). Thus, to succeed, entrepreneurial teams need both bridging and bonding social capital (Davidsson and Honig, 2003; Weisz et al., 2004).

We conceptualize career histories as an important vehicle by which individuals accrue the bonding and bridging social capital that is likely to enhance venture performance. Team members bring a set of experiences and contacts from prior jobs that can benefit the new firm (Burton et al., 2002). In particular, an affiliation with a previous employer (what we term background affiliation) is, like a network or membership, an important source of social capital. Research has examined the benefit of working together previously (Eisenhardt and Schoonhoven, 1990), and of having worked in a prominent company (Burton et al., 2002). Aggregated to the team-level, background affiliation is a type of demographic characteristic that has been rarely explored.

More than functional heterogeneity, a diverse set of prior affiliations (affiliation diversity) suggests access to different networks and contacts. In entrepreneurial settings, as in other settings, contacts with others in the industry and financial community are positively associated with a firm's valuation at IPO and access to VC (Burton et al., 2002; Higgins and Gulati, 2003; Stuart et al., 1999). The more affiliation diversity of the team, the greater its range of experience and contacts, and this should help firms be more successful in both attracting VC and achieving IPO. Affiliation diversity should both increase the direct and indirect contacts that can be utilized as well as increase the unique insights and knowledge of the firm about how to reach these milestones (Burt, 1992; Smith et al., 2005).

Although affiliation diversity may give a team access to unique knowledge and contacts, firms need access to internal or "bonding" social capital. Cohesive teams, an indicator of internal social capital, improve performance in new ventures (Ensley et al., 2002). We argue that teams who have affiliation overlap (i.e., having worked for the same firm) may be able to communicate effectively with each other and have a common frame of reference, especially since these individuals have chosen to work together in the new venture. Founding team members who worked together before appear to be more effective and have greater trust (Eisenhardt and Schoonhoven, 1990; Roure and Maidique, 1986), and trust is an important component of social capital (Coleman, 1988). These common work experiences may increase the likelihood that individuals have similar priorities and vocabularies and has been shown to affect the development of common beliefs and cultures (Chattopadhyay et al., 1999). With affiliation overlap, the internal network is likely to be stronger, with straightforward discussions and a clear sense of appropriate actions. This should signal competency to investors and allow the team to move quickly and efficiently. Thus affiliation diversity and affiliation overlap, in both the TMT and founding team, should aid firms in achieving their milestones, albeit for different reasons.

Hypothesis 2. Firms whose teams have affiliation diversity are more likely to reach critical entrepreneurial firm milestones than firms whose teams have fewer diverse affiliations.

Hypothesis 3. Firms whose team members have affiliation overlap are more likely to reach critical firm milestones than firms whose teams have fewer overlapping affiliations.

It is important to note that it is possible to have both affiliation diversity and overlap. A useful analogy is academic colleagues who have the same graduate training (overlap), pursue independent academic careers (diversity), and then collaborate on a project. Their collaboration is enhanced by the common training, but their broader career experiences bring new and more resources to the collaboration.

3.3. Tenure heterogeneity and TMT turnover

In the extant TMT demography literature, tenure heterogeneity is often treated as an important demographic characteristic. The logic of the theoretical arguments applied to this type of heterogeneity parallels the logic outlined above: people who enter organizations at different times bring different frames of reference, have few shared common experiences, and have ties to different people and thus access to different information. Some research suggests that when team members leave and new team members arrive, communication becomes more difficult (Zenger and Lawrence, 1989; Smith et al., 1994). Likewise, O'Reilly et al. (1993) reported increased team tenure homogeneity was associated with trust and cooperation. Other research suggests that TMT tenure heterogeneity is associated with a firm adapting and learning (Wiersema and Bantel, 1992). The effect of tenure heterogeneity is hypothesized to be negative when the potential conflict in group dynamics outweighs the information benefits from different perspectives. Interestingly, the relationship between tenure heterogeneity and outcomes has produced conflicting findings (Riordan, 2000; Williams and O'Reilly, 1998).

Understanding tenure heterogeneity is particularly important in entrepreneurial settings as it offers insight into one of the persistent problems of entrepreneurial firm development, namely, how the TMT should evolve as the firm evolves. The potential disadvantage of tenure heterogeneity has been shown to depend crucially on the environmental context (Hambrick and Mason, 1984). For instance, under stable conditions long-tenured teams might have an advantage because teams with experience together operate more effectively and easily, while in turbulent or changing conditions more tenure heterogeneity could be advantageous because firms can learn from new team members (Murray, 1989). Keck (1997), in a study of 74 TMTs in the cement and minicomputer industries, found that heterogeneity in the tenure of the senior team was positively associated with financial performance of firms during periods of turbulence and change, while homogeneity was associated with performance during periods of stability. This finding is echoed in other studies of TMT demography and change (Keck and Tushman, 1993; Tushman and Rosenkopf, 1996; Sorensen, 1999). Tenure heterogeneity may be an opportunity for learning in turbulent environments; yet, one of the challenges of studying tenure heterogeneity is that it is difficult to tell whether changes are due to additions to the team or departures from the team, or some combination.

Rather than focus on tenure heterogeneity per se, we first acknowledge that tenure heterogeneity is a consequence of TMT turnover. Thus, an examination of the actual contributions to tenure heterogeneity—entrances and exits—should illuminate the process and also enhance our ability to interpret the effects of tenure heterogeneity. While new members joining the TMT may disrupt group process and distract the team from their responsibilities as they socialize the newcomer (Chandler et al., 2005), we argue the potential benefits of new team members outweigh the potential problems. In an entrepreneurial setting the new hire is likely to be carefully vetted by the incumbents and also voluntarily joining a situation that he or she sees as compatible. Furthermore, additions to the TMT provide the primary vehicle for adding skills, capabilities, and

information. Thus, additions to the TMT should aid the firm by both signaling competence to underwriters and providing knowledge and insights that help the firm grow in appropriate ways (Higgins and Gulati, 2006).

In contrast, although a poorly performing team member is likely to cause disruption and have a negative impact, losing team members is likely to decrease rates of going public and receiving VC. Replacing a team member requires a significant amount of time in terms of deciding how to handle the situation and the potential operational loss of an executive without a ready replacement. Although it has been argued that it is often the worst performing executives that leave and thus their exit should help the firm, Chandler et al. (2005) do not find that exits increase performance. Instead, it is possible that high quality executive members move on to better opportunities and thus are significant losses for the firm. The loss may signal that the firm has some internal problems, and executive exit may cause disruptions to the group process that slow the firm's ability to meet its targets. We believe that the benefits of the new resources brought by an additional team member should outweigh any minor disruption; whereas losses should be problematic. This is consistent with a contingency argument where it is in turbulent environments (and entrepreneurial environments are often turbulent) that there are benefits for turnover because firms need to learn and adapt to change. Entrances are an important part of that ability to learn and adapt. Thus we hypothesize:

Hypothesis 4. Firms with TMT entrances are more likely to reach critical entrepreneurial firm milestones than firms with fewer executive entrances.

Hypothesis 5. Firms that lose team members will be less likely to reach critical entrepreneurial firm milestones than firms with fewer team losses.

4. Data and methods

Firms in this sample are part of a longitudinal study of 161 young high-technology firms at risk of going public (i.e., independent, private firms) in California's Silicon Valley. 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. Rather than focusing on a specific industry, as has often been the case (e.g., Eisenhardt and Schoonhoven, 1990), a wide range of industries allows us to talk about top management and founding teams more generally. The research project required firms in the study to have at least 10 employees when sampled and be no more than 10 years old (Certo et al., 2001, similarly use 10 years as their cutoff for new ventures). 18 firms were founded by solo entrepreneurs. These firms were included in the analysis; however, results are similar when these firms are dropped from the analysis. Firms were first interviewed in 1994–95, with about half of the firms founded before 1989. Interview, survey, and archival methods were used to gather data on these companies (For details, see Baron et al., 1999).

4.1. Dependent variables

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). From a variety of public and proprietary sources (see Hellmann and Puri, 2002), we coded whether and when the founding team received any amount of money from a venture capitalist. The firms were tracked until they ceased to be independent companies or until the end of 2000. Of these 161 firms, 87 firms (54%) went public and 118 firms (73%) obtained VC funding during our sampling period (the end of 2000). About half of the IPOs occurred before 1995 and as early as 1987. Altogether, 48 firms exited the risk set before the end of 2000 via acquisition, merger or death.

4.2. Independent variables

The key independent variables were derived from TMT member career histories. We constructed a database of every founder and every executive who ever held the role of vice president or higher (e.g., Wagner et al., 1984; Keck and Tushman, 1993). It is important to note that our definition of founders and managers is different from the traditional one employed in the entrepreneurship literature. We rely on the job title to determine whether a person is a member of a team. We do not know whether the person held equity in the venture. We used a variety of sources including business plans and promotional documents as well as *Lexis/Nexis*, *Dow Jones Interactive*, *Edgar Archives*, and *The San Jose Mercury News* archives. Because some of our team data may be incomplete, we control for variables that may impact the completeness of the data (i.e., firm size and amount of team data collected by firm). Our final database contains information on 1744 executives and provides reliable team level data for 149 firm founding teams and 151 firm top management teams. We collected a mean of 2.69 positions for each team member, including employer identity and job title which provide the input for our background affiliation and functional diversity measures. From these individual career histories, we created the team level measures described below.

4.2.1. Functional diversity

Prior functional experience is based on the team member's previous three jobs. We found similar results with the team members' most recent job and all available past positions. We used an entropy-based measure of heterogeneity appropriate for categorical variables (Ancona and Caldwell, 1992). The Shannon index is calculated as $-\sum P_i (\ln P_i)$, for $i=1$ to x , where x is the number of categories and P_i is the proportion of team members with experience in category i . The index accounts for how team members are distributed across possible functional categories. Diversity is maximized when all groups are present in equal proportions. We used five functional categories (sales and marketing, administrative support functions, manufacturing, science or engineering, and finance). We calculate functional diversity for each monthly spell for the TMT and use the founding team's initial functional diversity for the founding team. We set functional diversity equal to zero for teams of one.

4.2.2. Background affiliation

Affiliation diversity is measured as a count of unique prior companies for which the team has worked. We consider up to three prior firms for each team member and then sum across all team members. Some founders had no prior experience as they became entrepreneurs directly out of school. To calculate affiliation overlap, we coded up to three prior firms for which each team member had worked. We calculated the Herfindahl index (HHI) using the total number of unique firms for all team members; HHI is calculated as $\sum P_i^2$, for $i=1$ to x , where x is the number of unique firms and P_i is the proportion of team members that worked for firm i . The HHI gives us a measure of the extent to which team members had overlapping prior experience. It is important to note that two team members can share an affiliation even if they did not work in the organization at the same time. Both measures are calculated at founding and then updated monthly for the TMT.

4.2.3. Turnover

In constructing our longitudinal database of top managers we were careful to note both start and leave dates for each person who ever held a TMT position. Start dates are quite reliable since firms typically issued a press release when a new TMT member joined. Leave dates are a bit more problematic since they are rarely announced; however, when successors were announced we inferred the departure date of the predecessor to be the month prior to the arrival of a replacement. From this we calculate monthly counts of TMT entrances, TMT departures, and founder departures. We distinguish founders from later TMT members for two reasons. First, members of the founding team were not always TMT members; nevertheless, they are theoretically important. Second, we expect the departure of a founder to have a different impact on the firm than the departure of a later hire. Often founders would leave the day-to-day operations of the firm and remain on the board; however for the purposes of this study, we coded such changes as exits. TMT departures include founder exits when the founders held an executive title.

4.3. Control variables

4.3.1. Team controls

We control for team size, prior experience, and tenure. First, we calculate founding team size from the interviews and validated the information from archival sources. Second, from both the interviews and archival sources, we coded whether the team member had prior start-up experience (e.g., the person was a founder of a previous firm) and whether the team member had prior senior management experience (vice-president or higher rank). Both types of experience contribute to the team's human capital stock and should benefit the firms (Schefczyk and Gerpott, 2000; Burton et al., 2002). Third, the mean and standard deviation for team tenure — typical measures of tenure diversity in demographic research — were computed for the TMT for each team month, so the average TMT tenure was 40.3 months (3.4 years) and the average tenure heterogeneity was 11 months. The founding team variables are time-invariant, and TMT variables are updated.

4.3.2. Firm controls

We controlled for firm size, industry, VC funding, and the amount of team data collected for each firm. Intuitively, large firms may have more resources, improved access to venture capital networks, and a greater ability to go public. Firm size is measured as the number of employees at the end of a given year and is updated yearly. Second, we control for industry to capture differences in the ability of firms to obtain financing and go public (some industries are more likely to get funding and go public than others). We examined the effect of all the industry dummy variables and found the medical-related industry (including medical devices and biotechnology) to be the only significantly different industry. Third, it is well established that firms with venture capital financing are more likely to go public (Lerner, 1994; Gompers and Lerner, 1999; Shane and Stuart, 2002). In addition VC-backed firms are likely to have more and more diverse experience (Bruno and Tyebjee, 1985; Florin, 2005). Thus, we control for the presence of venture capital in all IPO analyses. In the results reported here, we control for the first VC investment but results are similar when including a counter variable for the number of VC rounds received. Finally, we control for the amount of team data collected by firm. Because we collect our career history data via archives, there is a potential for an inadvertent bias in our data where we have systematically less information about the career histories of executives who are from firms that receive less media coverage. In order to control for these firm-level effects on the quality of our career history data, we include a control variable that represents the average number of prior positions per person collected for each firm.

4.3.3. Industry level venture capital funding and IPOs

In order to control for differences in the macro environment we also include control variables that capture annual variations by industry in the amount of venture capital financing and the number of IPOs.

5. Analysis

Because we have both constant, yearly time-varying and monthly time-varying explanatory variables, we structured our data so that we have an observation (spell) for each month from the firm's birth. This is a standard method of spell splitting that allows covariate values to be updated (Blossfeld and Rohwer, 1995). Although this increases the number of spells to be analyzed, the underlying information (the number of events and total observation time) is the same. Firms remain in the sample until the event of interest, VC funding or an IPO, occurs. Firms that persist as private companies over the entire observation period (through December 2000) are considered censored. Firms drop out of the sample if they cease to exist as independent entities either through failure, merger or acquisition.

We use event-history analysis and report Cox proportional hazards models estimated by Stata 9.0 using maximum likelihood estimation with robust standard errors clustered by firm (Lin and Wei, 1989). We report exponentiated coefficients (hazard ratios); thus, coefficients greater than one suggest the variable increases the rate of IPO or VC, and

coefficients less than one suggest the variable decreases the rate of IPO or VC. 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.³

We first analyze the effect of founding team characteristics on our two outcomes of interest, obtaining venture capital (Table 2) and going public (Table 3). We then analyze the effect of TMT characteristics on the same outcomes (Tables 4 and 5). Consistent with prior empirical research, we examine founding and TMTs in separate analyses; however, comparing across the tables allows us to begin to examine the relative importance of founding teams versus subsequent TMTs and how the importance of experience changes over time. We conclude with an analysis of compositional change as the founding team evolves (Table 6).

6. Results

Table 1 reports the descriptive statistics and variable correlations.⁴ With the exception of firm industry and founding team demography, all vary over time. The correlations between several of the variables are quite high; therefore we enter each variable of interest into the analysis separately to assess its independent effect. We compare model fit across various models, and our results are consistent and robust with and without various control variables.

Tables 2 and 3 present the results for the founding team for both dependent variables. Table 2 presents event history analysis for the effects of founding team on rate of venture capital financing. Table 3 presents event history analysis for the effects of founding team on rate of going public. Model 1 is the baseline model. We find that large firms receive venture capital funding at higher rates. Firms in the medical industry, with large founding teams, and where we collected more team-level data have higher rates of both VC funding and going public. Rates of going public are also higher for firms in industries with more IPOs. Consistent with prior research, we also find that venture capital funding increases the hazard of going public by at least a factor of five (Gompers and Lerner, 1999; Shane and Stuart, 2002).

We find only limited support for Hypothesis 1; founding teams with high functional diversity have higher rates of receiving venture capital funding by 37% (Model 2, Table 2). This finding is consistent with the oft mentioned idea that venture capitalists pay attention to the quality of the team. However, this effect disappears with other experience measures in the model. Founding team functional diversity has no impact in a firm's ability to go

³ The proportionality assumption does not always hold for the individual control for firm size — particularly for the models where venture capital is the dependent variable. However, since firm size is not of substantive interest and is only included as a control, and since all models pass the global test of proportionality, we proceed with the Cox modeling approach because it allows for straightforward interpretation of the coefficients of interest.

⁴ Founding team size equals zero when all founders have exited the firm. TMT size equals zero when no one holds an executive title. Generally this occurs when founders do not assign executive titles in the early days of the firm.

Table 1
Variable descriptive statistics

Variable	Mean	SD	Min	Max	N
Firm size (number of employees)	55.59	111.54	1	1750	14,941
Medical industry	0.10	0.30	0	1	15,178
Venture capital (dummy variable)	0.49	0.50	0	1	14,919
Industry IPOs per year	2.87	3.16	0	39	14,809
Venture capital investment per industry/year	934.13	569.75	0	1	14,919
Average number of prior positions for team	2.00	.92	0	6	14,074
Size of founding team	2.84	1.72	0	12	14,731
Size of TMT	2.86	1.99	0	12	15,178
Founders with prior start-up experience	0.43	0.70	0	3	14,807
Founders with prior executive experience	0.45	0.68	0	4	14,807
FT functional diversity	0.33	0.45	0	1.39	13,783
TMT prior start-up experience	0.39	0.67	0	4	14,807
TMT prior executive experience	1.06	1.18	0	8	14,807
TMT functional diversity	0.58	0.54	0	1.79	14,044
Team entrances	3.40	2.64	0	18	14,807
Team exits	.70	1.59	0	15	14,807
Founder exits	.33	.78	0	7	14,807
FT diverse prior company affiliations	3.02	1.78	0	11	14,807
FT overlapping prior company affiliations	0.28	.28	0	1	14,540
TMT diverse prior company affiliations	4.50	3.04	0	19	14,540
TMT overlapping prior company affiliations	0.22	0.22	0	1	14,482
TMT mean tenure	40.35	34.39	0	225.00	14,186
TMT S.D. tenure	11.40	15.79	0	104.94	14,186

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	-0.08	1.00									
3. Industry IPOs	0.04	0.06	1.00								
4. Industry venture capital	0.21	-0.05	0.30	1.00							
5. Venture capital	0.08	0.07	-0.01	-0.03	1.00						
6. Average number of prior positions for team	0.03	0.03	-0.04	0.13	-0.08	1.00					
7. Founding team size	-0.01	0.06	0.00	-0.01	0.13	-0.23	1.00				
8. FT functional diversity	0.02	-0.13	0.03	0.08	0.16	-0.01	0.35	1.00			
9. Founders with prior start-up experience	0.09	-0.10	-0.01	0.00	-0.14	0.22	-0.08	0.21	1.00		
10. Founders with prior executive experience	0.10	-0.14	-0.05	0.00	0.15	0.10	0.07	0.33	0.20	1.00	
11. FT overlapping prior company affiliations	0.02	-0.10	-0.02	0.05	-0.07	-0.31	0.43	0.16	0.03	-0.11	1.00
12. FT diverse prior company affiliations	0.01	-0.08	0.00	0.04	0.14	0.31	0.16	0.50	0.20	0.37	-0.21
13. TMT size	0.24	-0.12	-0.04	-0.08	0.35	-0.05	0.28	0.21	0.06	0.21	0.09
14. TMT functional diversity	0.15	-0.04	-0.01	-0.07	0.43	0.08	0.21	0.43	0.09	0.21	-0.01

Table 1 (continued)

Correlation matrix											
Variable	1	2	3	4	5	6	7	8	9	10	11
15. TMT prior start-up experience	-0.05	0.00	-0.04	-0.06	0.06	0.26	-0.01	0.15	0.55	0.13	-0.06
16. TMT prior executive experience	0.18	-0.11	-0.02	-0.07	0.39	0.17	0.06	0.17	0.13	0.51	-0.11
17. TMT overlapping prior company affiliations	0.00	-0.06	-0.07	0.00	-0.12	-0.33	0.10	0.04	-0.09	0.03	0.38
18. TMT diverse prior company affiliations	0.16	-0.08	0.00	-0.07	0.41	0.27	0.12	0.17	0.05	0.13	-0.14
19. TMT mean tenure	0.20	-0.12	0.20	0.56	-0.16	-0.18	-0.11	-0.02	-0.10	-0.12	0.10
20. TMT S.D. tenure	0.28	-0.05	0.08	0.16	0.18	-0.04	0.01	0.01	0.00	0.10	-0.01
21. Team entrances	0.31	-0.14	0.05	0.10	0.32	-0.10	0.27	0.20	0.11	0.22	0.12
22. Team exits	0.30	-0.10	0.16	0.34	0.14	-0.10	0.15	0.13	0.10	0.14	0.10
23. Founder exits	0.18	-0.01	0.16	0.31	0.06	-0.11	0.25	0.19	0.08	0.05	0.07
Variable	12	13	14	15	16	17	18	19	20	21	22
12. FT diverse prior company affiliations	1.00										
13. TMT size	0.14	1.00									
14. TMT functional diversity	0.21	0.70	1.00								
15. TMT prior start-up experience	0.09	0.25	0.29	1.00							
16. TMT prior executive experience	0.19	0.70	0.66	0.33	1.00						
17. TMT overlapping prior company affiliations	-0.18	0.08	-0.06	-0.08	-0.13	1.00					
18. TMT diverse prior company affiliations	0.29	0.79	0.70	0.28	0.72	-0.28	1.00				
19. TMT mean tenure	-0.07	-0.17	-0.18	-0.15	-0.21	0.06	-0.20	1.00			
20. TMT S.D. tenure	0.02	0.39	0.27	0.01	0.32	0.04	0.36	0.17	1.00		
21. Team entrances	0.07	0.83	0.59	0.19	0.64	0.02	0.65	-0.04	0.41	1.00	
22. Team exits	0.00	0.22	0.16	0.01	0.23	-0.08	0.18	0.19	0.28	0.62	1.00
23. Founder exits	0.09	0.06	0.04	-0.03	0.09	-0.00	0.01	0.14	0.12	0.37	0.66

public (Model 2, Table 3), and with human capital controls (Model 5, Table 3) the effect is negative (functional diversity is associated with a 61% decrease in the hazard of IPO). Overall, in Tables 2 and 3 we see evidence that human capital explanations (executive and start-up experience) are a stronger predictor of the rate of going public and receiving VC funding for founding teams than functional diversity. We see that executive experience on the founding team increases the hazard of venture capital by 33% (Table 2) and the hazard of IPO by 43% (Table 3). In Model 5 we also see that start-up experience increases the hazard of IPO by 45% (Table 3) and decreases the hazard of VC by 25% (Table 2).

We examine Hypotheses 2 and 3 in Models 6–7 of Tables 2 and 3. We hypothesize that firms benefit from two different types of social capital: one that allows access to new

Table 2
Event history analysis: effect of founding team on venture capital financing

Hazard ratio and standard errors*							
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
Firm size	1.01** (.00)	1.01*** (.00)	1.01** (.00)	1.01** (.00)	1.01** (.00)	1.01** (.00)	1.01** (.00)
Medical-related industry	1.50* (.38)	1.63* (.41)	1.44* (.37)	1.68** (.42)	1.64** (.41)	1.50* (.38)	1.50* (.38)
Industry level VC financing	1.00 (.00)	1.00 (.00)	1.00 (.00)	1.00 (.00)	1.00 (.00)	1.00 (.00)	1.00 (.00)
Average number of prior positions for team	1.16** (.08)	1.16** (.08)	1.19** (.08)	1.12* (.09)	1.18** (.09)	1.16** (.09)	1.16** (.09)
Founding team size	1.06* (.05)	1.03 (.05)	1.06* (.05)	1.05 (.05)	1.03 (.05)	1.06 (.06)	1.06 (.06)
Functional diversity of prior experience		1.37* (.31)			1.35 (.34)		
Prior start-up experience			0.86 (.12)		.75** (.11)		
Prior senior management experience				1.34** (.21)	1.33** (.22)		
Diverse prior affiliations						1.01 (.05)	
Overlapping prior affiliations							1.00 (.52)
Wald chi-square (degrees of freedom)	13.74 (5)	15.85 (6)	16.24 (6)	19.73 (6)	27.50 (8)	13.76 (6)	13.89 (6)

One-tailed tests: *** $p < .01$; ** $p < .05$; * $p < .10$; *analysis of 5471 spells for 149 firms and 115 events.

knowledge and another that improves team cohesion. In Models 6 and 7, we add variables measuring affiliation diversity (Model 6) and affiliation overlap (Model 7) for the founding team. We find no support for Hypothesis 2 for founding teams (Model 6), and we see modest support for Hypothesis 3 (Table 3, Model 7). Founding teams with affiliation overlap have almost double the rate of going public but there is no effect on receiving VC. However, the improvement in fit from Model 1 to Model 7 is quite small, and the effect of affiliation overlap wipes out the otherwise robust effect of founding team size. Overall, we find weak support that founding team affiliation overlap shapes firm outcomes. However, we see strong human capital effects. Of course, these variables capture the background of the *original* founding team.

Next, we examine the early TMT, which often includes founders as well as others, to examine how TMT characteristics impact the firm's rate of VC funding (Table 4) and its hazard of going public (Table 5). Again, Model 1 is the baseline model. In support of Hypothesis 1 for the TMT, in Model 2 we find that TMT functional diversity increases the rate of receiving VC and going public (2.75 and 2.10 are the hazard ratios in Tables 4 and 5). Although functional diversity becomes insignificant when controlling for senior management and founder experiences in Table 5, Model 4, the direction is still positive and the overall improvement in model fit when this variable is included is significant. We also find, similar to our founding team results, that TMTs with more previous senior management experience receive VC funding and go public at higher rates in Models 3 and

Table 3
Event history analysis: effect of founding team on IPO

Hazard ratio and standard errors*							
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
Firm size	1.00 (.00)	1.00 (.00)	1.00 (.00)	1.00 (.00)	1.00 (.00)	1.00 (.00)	1.00 (.00)
Medical-related industry	1.85** (.55)	1.74** (.53)	1.93*** (.57)	2.16*** (.66)	1.99*** (.62)	1.93** (.55)	1.91*** (.56)
IPOs in industry	1.14*** (.03)	1.14*** (.03)	1.14*** (.03)	1.14*** (.03)	1.15*** (.03)	1.14*** (.03)	1.14*** (.03)
Venture capital	5.26*** (2.16)	5.37*** (2.19)	5.78*** (2.51)	5.05*** (2.08)	5.88*** (2.56)	5.25*** (2.17)	5.29*** (2.19)
Average number of prior positions for team	1.55*** (.21)	1.54*** (.21)	1.54*** (.20)	1.58*** (.22)	1.55*** (.21)	1.53*** (.21)	1.61*** (.22)
Founding team size	1.08** (.05)	1.10** (.06)	1.08** (.05)	1.08** (.05)	1.12** (.06)	1.07* (.05)	1.04 (.06)
Functional diversity of prior experience		0.83 (.23)			.61** (.18)		
Prior start-up experience			1.39** (.20)		1.45** (.25)		
Prior senior management experience				1.42** (.25)	1.43** (.23)		
Diverse prior affiliations						1.04 (.05)	
Overlapping prior affiliations							1.98* (.92)
Wald chi-square degrees of freedom)	104.65 (6)	104.20 (7)	103.20 (7)	96.09 (7)	92.92 (9)	108.79 (7)	106.86 (7)

*** $p < .01$; ** $p < .05$; * $p < .10$; *analysis of 11851 spells for 149 firms and 83 events.

4. TMT previous start-up experience reduces rates of VC and IPO by 25% and 22%, respectively. Interestingly the effect of VC funding is weakened when we include variables that account for TMT composition. This result may be due to VC funding being more likely for high quality teams (Baum and Silverman, 2004; Florin, 2005). Consistent with this idea, we see that TMT functional diversity is strongly associated with an increased hazard of VC funding (hazard ratio of 2.75 in Model 2 and 2.52 in Model 5, Table 4).

We consider the impact of prior background affiliation in Models 6–7 of Tables 4 and 5. We see that TMTs with diverse prior company affiliations receive venture capital financing and go public at higher rates (Model 6). The effects are consistent with Hypothesis 2, although their magnitude is modest indicating between a 7% and 13% increase in the hazard rate for each additional unique prior affiliation. Thus, it appears that top management teams benefit from extensive, diverse networks. We find no support for Hypothesis 3 (Model 7).

Considering the overall pattern revealed in Tables 2–5, we find that initial founding team characteristics and those of the current TMT have similar effects on firm outcomes (with a few exceptions). We find partial support for Hypothesis 1, TMT (but not founding team) functional diversity increases the rate of obtaining milestones. We find partial support for Hypotheses 2 and 3 as well. We find diverse prior company affiliations aid the

Table 4
Event history analysis results: effect of TMT demography on venture capital financing

Hazard ratio and standard errors*							
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
Firm size	1.01** (.00)	1.01** (.00)	1.01** (.00)	1.01** (.00)	1.01** (.00)	1.01** (.00)	1.01** (.00)
Medical-related industry	1.73** (.46)	1.73*** (.41)	1.72** (.46)	1.74** (.47)	1.64** (.41)	1.72* (.45)	1.72*** (.45)
Industry level VC financing	1.00 (.00)	1.00 (.00)	1.00 (.00)	1.00 (.00)	1.00 (.00)	1.00 (.00)	1.00 (.00)
Average number of prior positions for team	1.14* (.08)	1.11* (.08)	1.15* (.08)	1.05 (.08)	1.09 (.08)	1.05 (.09)	1.13* (.08)
Team size	1.13* (.10)	0.90 (.11)	1.14* (.11)	0.98 (.10)	0.87 (.10)	1.00 (.12)	1.13 (.12)
Functional diversity of prior experience		2.75*** (.73)			2.52*** (.71)		
Prior start-up experience			0.95 (.16)		.75** (.13)		
Prior senior management experience				1.53*** (.21)	1.37** (.22)		
Diverse prior affiliations						1.13** (.07)	
Overlapping prior affiliations							0.92 (.54)
Wald chi-square (degrees of freedom)	11.42 (5)	32.37 (6)	12.08 (6)	23.46 (6)	43.70 (8)	11.81 (6)	14.46 (6)

*** $p < .01$; ** $p < .05$; * $p < .10$; *analysis of 5223 spells for 146 firms and 111 events.

TMT in obtaining milestones, and overlapping prior company affiliation help the founding team go public. In general, the TMT appears to have more predictive power; however, the founding teams with affiliation overlap and prior executive experience have a lasting effect on the firm.

We next turn to an analysis of turnover on the TMT and how it influences firm outcomes (Hypotheses 4 and 5). Because most firms obtain venture capital financing relatively quickly (about half of the firms receive venture capital within the first two years of life), turnover is best examined in the IPO context. Model 1 is the baseline model that examines how turnover on the TMT and founding team impacts the rate at which firms go public. Because the extent of turnover depends on the size of the teams, we control for the size of the founding team in all models and find a weak positive impact on the rate of going public.

The underlying reasoning for tenure effects in the demography literature is that turnover brings in new experiences and insights, as well as disturbs group process. In order to assess the impact of turnover, above and beyond the changes that turnover brings to functional diversity on the team, we control for TMT functional diversity in all models.⁵ In Model 2 of Table 6, we mirror previous research and examine mean TMT tenure and

⁵ Our results hold without functional diversity in the model. They are also consistent if we use prior executive experience as the key human capital control.

Table 5
Event history analysis results: effect of TMT demography on IPO

Hazard ratio and standard errors*							
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
Firm size	1.00*	1.00*	1.00*	1.00*	1.00*	1.00*	1.00*
	(.00)	(.00)	(.00)	(.00)	(.00)	(.00)	(.00)
Medical-related industry	4.93***	4.76***	5.18***	5.49***	5.57***	5.15***	4.98***
	(1.45)	(1.39)	(1.45)	(1.61)	(1.56)	(1.47)	(1.42)
IPOs in Industry	1.18***	1.18***	1.17***	1.16***	1.16***	1.17***	1.17***
	(.03)	(.03)	(.03)	(.03)	(.03)	(.03)	(.03)
Venture capital	2.42***	1.88*	2.18**	2.26**	1.81*	2.27**	2.35**
	(1.07)	(.85)	(1.01)	(.94)	(.84)	(.99)	(1.03)
Average number of prior positions for team	2.38***	2.43***	2.46***	2.20***	2.32***	2.16***	2.28***
	(.34)	(.37)	(.33)	(.35)	(.35)	(.36)	(.37)
Team size	1.86***	1.74***	1.91***	1.63***	1.64***	1.71***	1.83***
	(.01)	(.12)	(.11)	(.12)	(.14)	(.15)	(.11)
Functional diversity of prior experience		2.10**			1.39		
		(.82)			(.57)		
Prior start-up experience			0.79*		.78*		
			(.13)		(.12)		
Prior senior management experience				1.29***	1.26***		
				(.11)	(.11)		
Diverse prior affiliations						1.07*	
						(.05)	
Overlapping prior affiliations							0.35
							(.53)
Wald chi-square (degrees of freedom)	192.39 (6)	211.62 (7)	196.13 (7)	236.16 (7)	260.69 (9)	212.26 (7)	202.15 (7)

*** $p < .01$; ** $p < .05$; * $p < .10$; *analyses based on 11977 spells for 151 firms and 84 events.

tenure heterogeneity. We see that firms go public faster when they have teams with shorter tenure and with more tenure heterogeneity. This is consistent with prior research in turbulent contexts. However, the precise meaning of these findings is quite difficult to interpret as both the mean and standard deviation are changed by both additions to and departures from the team.

Model 3 shows support for Hypothesis 4; TMT entrances increase the rate of going public by 32% for each entrant to the firm. In order to examine Hypothesis 5, we entered founder exits into the model in Model 4. Contrary to Hypothesis 5 but consistent with the expectation in Chandler et al. (2005), we find that founder turnover and TMT turnover increase the rate of going public. However, when TMT entrances are also included in the model, TMT exits decrease the rate of IPO. The increase in model fit suggests that once the effects of replacement are accounted for, TMT exits decrease the rate of going public by 34%, as expected in Hypothesis 5. Model 6 suggests that TMT entrances and founder exits increase the rate of going public by 69% and 25%, respectively, but TMT exits decrease the rate of going public by 34%. Rather than overall turnover being beneficial or detrimental to the firm, we see that entrances and founder exits assist firms in obtaining IPO faster and TMT exits are detrimental to the firm. We thus find support for Hypothesis 4 and partial support for Hypothesis 5 (TMT exits but not founder exits are detrimental to

Table 6
Event history analysis results: effect of team turnover on IPO*

Hazard ratio and standard errors								
	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	2.46*** (.71)	2.37*** (.64)	4.42*** (1.32)	2.57*** (.75)	2.76*** (.81)	5.90*** (1.81)	5.71*** (1.73)	5.59*** (1.68)
IPOs in Industry	1.15*** (.03)	1.15*** (.03)	1.15*** (.03)	1.15*** (.03)	1.15*** (.03)	1.15*** (.03)	1.14*** (.03)	1.16*** (.03)
Venture capital financing	1.91* (.78)	2.12** (.77)	1.82* (.74)	1.97* (.81)	1.91* (.77)	1.84* (.79)	1.76* (.76)	1.70* (.72)
Average number of prior positions for team	1.70*** (.27)	1.79*** (.28)	2.18*** (.36)	1.69*** (.27)	1.75*** (.28)	1.91*** (.37)	2.03*** (.38)	2.22*** (.40)
Founding team size	1.05* (.04)	1.06* (.05)	1.02* (.04)	1.02* (.05)	1.04* (.04)	0.99 (.05)	1.00 (.05)	0.98 (.05)
TMT functional diversity	11.59*** (4.02)	8.24*** (2.80)	5.03*** (1.84)	11.77** (4.08)	11.65*** (4.06)	1.77* (.73)	1.88* (.76)	2.29** (.88)
Mean TMT tenure		.98*** (.01)						
SD TMT tenure		1.03*** (.01)						
Total entrants			1.32*** (.06)			1.43*** (.142)	1.52*** (.12)	1.67*** (.11)
Founder exits				1.24** (.15)		1.318*** (.14)	1.22** (.14)	1.24** (.14)
Total exits					1.13*** (.05)	0.76*** (.07)	.71*** (.06)	.66*** (.07)
Diverse prior affiliations							1.10** (.05)	
Overlapping prior affiliations								0.39 (.61)
Wald chi-square (degrees of freedom)	147.73 (7)	141.56 (9)	209.20 (8)	146.99 (8)	152.19 (8)	245.60 (11)	238.46 (11)	230.53 (11)

*** $p < .01$; ** $p < .05$; * $p < .10$; *Analyses based on 11916 spells for 150 firms and 84 events.

the firm). We find that TMT entrance is the most important factor increasing the ability to attain IPO with the hazard rate increasing by 43–69% for each entrant.

In Models 7 and 8, we add the background affiliation measures. TMT turnover has independent effects on rate of IPO, over and above the effect of TMT functional diversity and background affiliation. The hazard ratios are consistent with Table 5 (supporting Hypothesis 1, 2, 4, and partial support for Hypothesis 5 for TMT effects on rate of IPO).

We also performed supplementary analyses to ensure that our models have causality correct: teams predict firm outcomes. It is also possible that firms change their teams in order to look more attractive to venture capitalists, or that firms change their teams in anticipation of going public. Certainly we expect some of this reverse causality to be true as well. However, we wanted to ensure that our results are not merely “window-dressing”

where firms are altering their teams only to increase the chances of reaching one of these important milestones. We conducted all of the analyses with the spells in the year prior to IPO or VC funding dropped from the models. We find substantively similar results even when the year prior is ignored, suggesting our results are not about anticipating venture capital funding or going public. We also looked at yearly spell files and found similar results.⁶ Taken together, these models give us confidence as to the causality and significance of our findings. The results are consistent across dependent variables, types of teams (founding and TMT), and alternative model specifications.

7. Discussion

Overall, we find team composition, human capital and social capital to have consistent and generally positive effects on the likelihood of entrepreneurial start-ups attracting venture capital and going public. In general, we find that adding knowledge and experience (functional heterogeneity, prior management experience, affiliation diversity, and team entrances) help the firm obtain VC and go public. These effects are stronger for the TMT than the founding team but we see generally consistent effects across the two teams. The major exception is that for founding teams, overlapping prior company affiliations are helpful for going public; but, for top management teams, diverse prior company affiliations are helpful.

Empirically, the study has two contributions. First, background affiliation has been rarely examined in the literature. Second, we are able to decompose turnover into entrances, founder exits, and team exits. We see that firms benefit from adding TMT members and founder exits, but general team exits slow the rate of IPO. This suggests that growth is an important issue for new ventures trying to go public. It is those firms that continued to grow and expand (with diverse team members) while losing some of their founders that were able to go public more quickly. There are costs to making poor choices in these new hires — since firms experience lower hazards of IPO when they have turnover among non-founder executives. Importantly, through our additional analyses, we confirmed that this effect is not simply a reflection of the fact that successful firms are more likely to add senior managers in preparation for going public.

In addition, prior executive experience increases the rate of both VC and going public, and prior start-up experience decreases the rate of both outcomes. The only exception is that start-up experience on the founding team increases the rate of IPO. This may be because, for those firms that do not receive venture capital, founders need more start-up experience.

Importantly, the compositional variables associated with skills and capabilities—functional diversity, prior senior management experience — are more important correlates of firm success than the social capital variables. There is a large difference in the size of the effects with the background affiliation variables contributing to a 10% increase in the hazard and TMT functional diversity more than doubling the hazard rate of VC and increasing the hazard of IPO no less than 77%. These findings extend and refine previous

⁶ Founder and TMT exits, however, are not significant in the yearly models.

research, confirming that the human capital of the founding team and TMT may usefully predict entrepreneurial success.

For entrepreneurship research, our work adds background affiliation as an experience that should be considered. We also contribute to the growing interest in understanding turnover in new ventures (Boeker and Karichalil, 2002; Chandler et al., 2005). The question of whether entrances and exits (founder and more generally) are helpful to the firm are answered with strong effects in our models. More research remains to be done examining the reasons for and skills of those leaving the firm. This will further elucidate whether it is indeed the benefits of information outweighing the costs of disrupted group dynamics that are driving these effects. Also, by examining both the founding and top management teams, we can see that it is the TMT that increases the rate of reaching milestones more than the founding team; however, this paper does not explore how the founding team also shapes the recruitment of later managers (Beckman and Burton, 2005). Thus we may understate the importance of the founding team.

For social network research, this paper offers background affiliation as a way to operationalize social capital that is both new and unique. Most social network research has focused on direct ties or structural equivalence (Burt, 1992). Here we focus on a “tie” that may not be a direct tie at all. A prior affiliation captures a set of norms and expectations about how to organize work, but two individuals from the same organization may share those expectations without having ever worked or even met each other. Social capital refers to the goodwill available as a result of the social structure and does not require direct social relations (Adler and Kwon, 2002). Shared prior affiliations can generate trust, and diverse prior affiliations can generate contacts and new insights. Thus, we point to another means by which bridging and bonding social capital can be developed and understood.

Much organizational ecology research rests on an assumption that senior management teams are resistant to change or lack the capabilities to adapt, although no measures of this construct are ever provided (Hannan and Freeman, 1984; Sorensen, 1999). The roots of this inertia are sometimes attributed to a process of “imprinting” that occurs at founding (Boeker, 1988). The results of the study reported here move one step closer to understanding how and why inertia may operate. Based on the demographic composition of the group, easily and objectively measured, it appears that characteristics of the founding team may affect both the relevant skills and experiences available to the firm as well as the ability of the group to access and use these capabilities. However, in contrast to ecological predictions, our research also indicates that a firm is not doomed to failure if the founding team does not have the relevant past experience. The TMT, which evolves over time, has a stronger impact on firm outcomes.

Although our results are remarkably consistent across teams and firm outcomes, several of our findings were contrary to our expectations. The consistency of these results leads us to believe these contrary effects are not anomalies but findings worth exploration and consideration. Three of these findings are notable and suggestive of future research. First, we find a counterintuitive result for the founder exit: it increases the rate of going public. This may be because it is those founders that exit are the poorest performers (Chandler et al., 2005). In examining the data in more detail, it appears that firms with venture capital backing are those that benefit from founder exit. Second, we find that the strong influence

of venture capital backing on the rate of going public is dampened when the demographic characteristics of the TMT are controlled which suggests venture capital may be critical because of how venture capitalists alter the team. Third, functional diversity on the founding team may depress the rates of going public but it increases the rates for the TMT. This may be because we are capturing those diverse founding teams that do not receive venture capital. All these findings suggest that the relationship between VC backing and team make-up should be examined.

We also find unexpected results in our social capital analyses. Contrary to Roure and Maidique (1986), we find limited evidence that founding teams with affiliation overlap go public faster. Instead, TMTs with more background and affiliation diversity go public faster. These findings are consistent with the idea that diverse knowledge benefits both firms and individuals (Burt, 1992). Entrepreneurial team members may share similar motivations for joining the team, so the deleterious effects of diversity on group process may be less problematic than previous research would suggest. The founders certainly, and to some extent the TMT, are volunteers who in many cases have chosen to work together; as a result, they may not face the group process difficulties captured in much of the demographic research. In addition, the rapid-fire nature of change among start-up companies may make unique and diverse insights more valuable.

One of the unique aspects of our data is the ability to look at teams longitudinally from founding. We are able to take important first steps in examining the relative impact of founders and TMTs. Our results confirm that team composition in the early years has dramatic effects on the firm's ability to reach milestones, and we see the benefits of diversity and change.

Of course we acknowledge the limitations of our study. The data are 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 or who have tended to work in firms that are media-shy. We control for the amount of data collected to address this issue, and it is the case that we have more data for firms that reach these milestones. Also, we are unfortunately not able to measure team process directly. Furthermore, the personality and power of team members has not been captured (Pitcher and Smith, 2001). Our results, however, inform and are informed by process studies. By examining these issues over time we can see whether functional diversity, for example, has similar benefits as the team changes. Finally, our results are from a specific time and place. Part of our time period includes the internet boom times of the late 1990s (although by and large these are not internet companies). This may influence our results. For example, we find TMT exits decrease rates of IPO but it may be that in other contexts, when outside opportunities are not as prevalent, exits are useful as a means of eliminating managers that are not performing. In our study, however, it appears that firms are losing high quality TMT members. Although we imagine the process is similar in various contexts, future research is needed to know how much we can generalize these results to other times and places.

For entrepreneurs, our study suggests that, when forming a team, diversity on multiple attributes should be considered (i.e., function, prior affiliation) as well as prior experience. Furthermore, teams should continue to grow and add experience if the firm desires to go public. Sustainable growth is difficult, and is not a task that can be done easily, but our results suggest there are pay-offs for firms that do it successfully.

In conclusion, we find both the “what” and “where” of team member experience are important and we find that team growth helps firms to reach their milestones. In entrepreneurial firms, teams benefit from affiliations, experiences and turnover, all of which bring new knowledge to the firm. We are encouraged by the consistency of our results, how our findings contribute to and reflect current theories, and by the potential rewards of examining teams over time in the rich research setting of entrepreneurial firms.

References

- Adler, P.S., Kwon, S., 2002. Social capital: prospects for a new concept. *Academy of Management Review* 27, 17–40.
- Aldrich, H.E., 1999. *Organizations Evolving*. Sage Publications, London.
- Aldrich, H., Zimmer, C., 1986. Entrepreneurship through social networks. In: Sexton, D.L., Smilor, R.W. (Eds.), *The Art and Science of Entrepreneurship*. Ballinger, Cambridge, MA, pp. 3–23.
- Amason, A., Shrader, R.C., Tompson, G.H., 2006. Newness and novelty: relating top management team composition to new venture performance. *Journal of Business Venturing* 21, 125–148.
- Ancona, D., Caldwell, D., 1992. Demography and design: predictors of new product team performance. *Organization Science* 3, 321–341.
- Baron, J.N., Burton, M.D., Hannan, M.T., 1996. The road taken: origins of employment systems in emerging companies. *Industrial and Corporate Change* 5, 239–275.
- Baron, J.N., Hannan, M.T., Burton, M.D., 1999. Building the iron cage: determinants of managerial intensity in the early years of organizations. *American Sociological Review* 64, 527–547.
- Baum, J.A.C., Silverman, B.S., 2004. Picking winners or building them? Alliance, intellectual, and human capital as selection criteria in venture financing and performance of biotechnology startups. *Journal of Business Venturing* 19, 411–436.
- Beckman, C.M., Burton, M.D., 2005. Founding the future: the evolution of top management teams from founding to IPO. Working Paper, UC Irvine, The Paul Merage School of Business.
- Birley, S., 1985. The role of networks in the entrepreneurial process. *Journal of Business Venturing* 1, 107–117.
- Blossfeld, H., Rohwer, G., 1995. *Techniques of Event-History Modeling: New Approaches to Causal Analysis*. Erlbaum, Mahwah, N.J.
- Boeker, W., 1988. Organizational origins: entrepreneurial and environmental imprinting at time of founding. In: Carroll, G. (Ed.), *Ecological Models of Organizations*. Ballinger, Cambridge, MA, pp. 33–51.
- Boeker, W., Karichalil, R., 2002. Entrepreneurial transitions: factors influencing founder departure. *Academy of Management Journal* 45, 818–826.
- Boeker, W., Wiltbank, R., 2005. New venture evolution and managerial capabilities. *Organization Science* 16, 123–133.
- Boone, C., Van Olfen, W., Van Witteloostuijn, A., De Brabander, B., 2004. The genesis of top management team diversity: selective turnover among top management teams in Dutch newspaper publishing, 1970–1994. *Academy of Management Journal* 47, 633–656.
- Bruno, A., Tyebjee, T., 1985. The entrepreneur’s search for capital. *Journal of Business Venturing* 1, 61–74.
- Burt, R.S., 1992. *Structural Holes*. Harvard University Press, Cambridge, MA.
- Burton, M.D., Sorensen, J.B., Beckman, C.M., 2002. Coming from good stock: career histories and new venture formation. In: Lounsbury, M., Ventresca, M. (Eds.), *Research in the Sociology of Organizations*, vol. 19. JAI Press, Greenwich, CT, pp. 229–262.
- Carpenter, M.A., Geletkanycz, M.A., Sanders, W.G., 2004. Upper echelons research revisited: antecedents, elements, and consequences of top management team composition. *Journal of Management* 30, 749–778.
- Certo, S.T., Covin, J.G., Daily, C.M., Dalton, D.R., 2001. Wealth and the effects of founder management among IPO-stage new ventures. *Strategic Management Journal* 22, 641–658.
- Chandler, G.N., Hanks, S.H., 1998. An examination of the substitutability of founders’ human and financial capital in emerging business ventures. *Journal of Business Venturing* 13, 353–369.

- Chandler, G.N., Honig, B., Wiklund, J., 2005. Antecedents, moderators, and performance consequences of membership change in new venture teams. *Journal of Business Venturing* 20, 705–725.
- Chattopadhyay, P., Glick, W., Miller, C., Huber, G., 1999. Determinants of executive beliefs: comparing functional conditioning and social influence. *Strategic Management Journal* 20, 763–789.
- Chowdhury, S., 2005. Demographic diversity for building an effective entrepreneurial team: is it important?. *Journal of Business Venturing* 20, 727–746.
- Coleman, J.S., 1988. Social capital in the creation of human capital. *American Journal of Sociology* 94, S95–S120 (Supplement).
- Cooper, A.C., Gimeno-Gascon, F.J., Woo, C.Y., 1994. Initial human and financial capital as predictors of new venture performance. *Journal of Business Venturing* 9, 371–395.
- Davidsson, P., Honig, B., 2003. The role of social and human capital among nascent entrepreneurs. *Journal of Business Venturing* 18, 301–331.
- Eisenhardt, K., Schoonhoven, C.B., 1990. Organizational growth: linking founding team strategy, environment, and growth among U.S. semiconductor ventures, 1978–1988. *Administrative Science Quarterly* 35, 504–529.
- Ensley, M., Pearson, A.W., Amason, A.C., 2002. Understanding the dynamics of new venture top management teams: cohesion, conflict and new venture performance. *Journal of Business Venturing* 17, 365–386.
- Finkelstein, S., Hambrick, D., 1990. Top management team tenure and organizational outcomes: the moderating role of discretion. *Administrative Science Quarterly* 35, 484–503.
- Florin, J., 2005. Is venture capital worth it? Effects on firm performance and founder returns. *Journal of Business Venturing* 20, 113–135.
- Foo, M.D., Wong, P.K., Ong, A., 2005. Do others think you have a viable business idea? Team diversity and judges' evaluation of ideas in a business plan competition. *Journal of Business Venturing* 20, 385–402.
- Freeman, J., 1999. Venture capital as an economy of time. In: Leenders, R., Gabbay, S.M. (Eds.), *Corporate Social Capital and Liability*. Kluwer Academic Publishers, Boston, pp. 460–479.
- Gimeno, J., Folta, T., Cooper, A., Woo, C., 1997. Survival of the fittest? Entrepreneurial human capital and the persistence of underperforming firms. *Administrative Science Quarterly* 42, 750–783.
- Gompers, P., Lerner, J., 1999. *The Venture Capital Cycle*. MIT Press, Cambridge, MA.
- Goslin, L., Barge, B., 1986. Entrepreneurial qualities considered in venture capital support. In: Ronstadt, R., Hornaday, J., A., Petersen, R., Vesper, K.H. (Eds.), *Frontiers in Entrepreneurship Research*. Babson College, Wellesley, MA, pp. 366–379.
- Grambsch, P.M., Therneau, T.M., 1994. Proportional hazards tests and diagnostics based on weighted residuals. *Biometrika* 81, 515–526.
- Hambrick, D., Mason, P., 1984. Upper echelons: the organization as a reflection of its top managers. *Academy of Management Review* 9, 193–206.
- Hannan, M.T., Freeman, J., 1984. Structural inertia and organizational change. *American Sociological Review* 49, 149–164.
- Heileman, J., 1997. The networker: John Doerr is revolutionizing the high-tech business, for the second time. *New Yorker*, 28–36 (August 11).
- Hellmann, T., Puri, M., 2002. Venture capital and the professionalization of start-up firms: empirical evidence. *Journal of Finance* 57, 169–197.
- Higgins, M.C., Gulati, R., 2003. Getting off to a good start: the effects of upper echelon affiliations on underwriter prestige. *Organization Science* 14 (3), 244–263.
- Higgins, M.C., Gulati, R., 2006. Stacking the deck: the effects of top management backgrounds on investor decisions. *Strategic Management Journal* 27 (1), 1–25.
- Hitt, M.A., Bierman, L., Shimizu, K., Kochhar, R., 2001. Direct and moderating effects of human capital on strategy and performance in professional service firms: a resource-based perspective. *Academy of Management Journal* 44, 13–28.
- Hoang, H., Antoncic, B., 2003. Network based research in entrepreneurship: a critical review. *Journal of Business Venturing* 18 (2), 165–187.
- Keck, S., 1997. Top management team structure: differential effects by environmental context. *Organization Science* 8, 143–156.
- Keck, S., Tushman, M., 1993. Environmental and organizational context and executive team structure. *Academy of Management Journal* 36, 1314–1344.

- Kimberly, J.R., 1979. Issues in the creation of organizations: initiation, innovation and institutionalization. *Academy of Management Journal* 22, 437–457.
- Lerner, J., 1994. Venture capitalists and the decision to go public. *Journal of Financial Economics* 35, 293–316.
- Lin, D.Y., Wei, L.J., 1989. The robust inference for the Cox proportional hazards model. *Journal of the American Statistical Association* 84, 1074–1078.
- Murray, A., 1989. Top management group heterogeneity and firm performance. *Strategic Management Journal* 10, 125–141.
- O'Reilly, C., Snyder, R., Boothe, J., 1993. Effects of executive team demography on organizational change. In: Huber, G., Glick, W. (Eds.), *Organizational Change and Redesign*. Oxford University Press, New York, pp. 147–175.
- Pitcher, P., Smith, A.D., 2001. Top management team heterogeneity: personality, power and proxies. *Organization Science* 12, 1–18.
- Randel, A.E., Jaussi, K.S., 2003. Functional background identity, diversity, and individual performance in cross-functional teams. *Academy of Management Journal* 46, 763–774.
- Reagans, R., Zuckerman, E., McEvily, B., 2004. How to make the team: social networks versus demography as criteria for designing effective teams. *Administrative Science Quarterly* 40 (1), 101–133.
- Riordan, C.M., 2000. Relational demography within groups. Past developments, contradictions, and new directions. In: Ferris, G.R., Rowland, K.M. (Eds.), *Research in Personnel and Human Resources Management*, vol. 19. JAI Press, Greenwich, CT, pp. 131–173.
- Roberts, E.B., 1991. *Entrepreneurs in High Technology: Lessons from MIT and Beyond*. Oxford University Press, New York.
- Roure, J., Keeley, R., 1990. Predictors of success in new technology based ventures. *Journal of Business Venturing* 5, 201–220.
- Roure, J., Maidique, M., 1986. Linking prefunding factors and high-technology venture success: an exploratory study. *Journal of Business Venturing* 1, 295–306.
- Rubenson, G.C., Gupta, A.K., 1996. The initial succession: a contingency model of founder tenure. *Entrepreneurship Theory and Practice* 21, 21–36.
- Schefczyk, M., Gerpott, T.J., 2000. Qualifications and turnover of managers and venture capital-financed firm performance: an empirical study of German venture capital-investments. *Journal of Business Venturing* 16, 145–163.
- Shane, S., Stuart, T., 2002. Organizational endowments and the performance of university start-ups. *Management Science* 48, 154–170.
- Smith, K., Smith, K., Olian, J., Sims, H., O'Bannon, D., Scully, J., 1994. Top management team demography and process: the role of social integration and communication. *Administrative Science Quarterly* 39, 412–438.
- Smith, K.G., Collins, C.J., Clark, K.D., 2005. Existing knowledge, knowledge creation capability, and the rate of new product introduction in high technology firms. *Academy of Management Journal* 48 (2), 346–357.
- Sorensen, J.B., 1999. The ecology of organizational demography: managerial tenure distributions and organizational competition. *Industrial and Corporate Change* 8, 713–743.
- Stuart, T., Hoang, H., Hybels, R., 1999. Interorganizational endorsements and the performance of entrepreneurial ventures. *Administrative Science Quarterly* 44, 315–349.
- Tushman, M., Rosenkopf, L., 1996. Executive succession, strategic reorientation and performance growth: a longitudinal study in the U.S. cement industry. *Management Science* 42, 939–953.
- Ucbasaran, D., Lockett, A., Wright, M., Westhead, P., 2003. Entrepreneurial founder teams: factors associated with member entry and exit. *Entrepreneurship Theory and Practice* 28 (2), 107–127.
- Watson, W., Steward, W., BarNir, A., 2003. The effects of human capital, organizational demography and interpersonal processes on venture partner perceptions of firm profit and growth. *Journal of Business Venturing* 18 (2), 145–164.
- Wagner, W., Pfeffer, J., O'Reilly, C., 1984. Organizational demography and turnover in top-management groups. *Administrative Science Quarterly* 29, 74–92.
- Weisz, N., Vassolo, R.S., Cooper, A.C., 2004. A theoretical and empirical assessment of the social capital of nascent entrepreneurial teams. *Academy of Management Best Paper Proceedings*.
- Welbourne, T., Cyr, L., 1999. The human resource executive effect in initial public offering firms. *Academy of Management Journal* 42, 616–629.

- Wiersema, M., Bantel, K., 1992. Top management team demography and corporate strategic change. *Academy of Management Journal* 35, 91–121.
- Williams, K., O'Reilly, C., 1998. Demography and diversity in organizations: a review of 40 years of research. *Research in Organizational Behavior* 20, 77–140.
- Zenger, T., Lawrence, B., 1989. Organizational demography: the differential effects of age and tenure distributions on technical communications. *Academy of Management Journal* 32, 353–376.