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Abstract

The purpose of this study is twofold. First, I formulate and then test a theory that considers the interaction between three main facets of founders' backgrounds, namely human capital or demographic features, social capital and status. Second, I investigate whether founders' backgrounds change as an industry evolves.

The argument is tested on a sample of 125 biotechnology firms located in the Boston and San Francisco Bay areas. Results show that there is an interaction between the status, human capital and diversity of the founding team's prior affiliations. On average, high status firms tend to perform better than their low and middle status counterparts. Increasing diversity of prior affiliations, and the presence of additional demographic features, provide differential value to the three groups. How they vary also differs from one outcome to the next.

Finally, who becomes involved in the founding process changes significantly, both over time as well as across regions. As venture capitalists become less involved in the founding process, those with industry experience become more involved. Academics remain crucial to the founding process throughout the industry's thirty year history. At the regional level, a greater concentration of firms is founded by elite academics in Boston, and by industry veterans in the San Francisco Bay area.
YOU CAN'T LEAVE YOUR PAST BEHIND: THE INFLUENCE OF FOUNDERS' CAREER HISTORIES ON THEIR FIRMS

Kauffman Dissertation Fellowship Executive Summary
Kelley A. Porter, Stanford University

"Organizations need founders. But organizations cannot recruit them, because organizations don't exist until founders construct them." (Aldrich 1999: 77)

Introduction

This is a study about how the past can influence the present. I tackle the question of how peoples' prior work experiences, affiliations and their status may help or hinder them in subsequent career decisions. I analyze organizational foundings, which require the gathering of people and resources to create a new legal entity. Originally blank slates, the early identities of these startup firms are molded by their founders’ decisions and abilities to acquire resources. What resources organizations obtain—and how quickly they obtain them—will depend in part on the combined characteristics of their founding teams’ backgrounds.

Entrepreneurs can have a profound effect on their firms because in the beginning the founders are the firm. When Baron, Hannan and colleagues (e.g. Baron, Burton, and Hannan 1996; Burton 1995) interviewed founders in Silicon Valley about the type of culture they had envisioned for their firms, the researchers discovered that founders’ ideas either emulated past positive experiences or sought to correct previous negative ones. Nevertheless, although key past events may have a significant influence on certain decisions, everyday life in a nascent firm is more often shaped by the interplay of the biographical features of the founding team. Where entrepreneurs went to school, what they studied, where they worked previously and the types of jobs they held, all influence the range of options available to their firms.

The argument

Why do some organizational founders receive resources when others do not, particularly when those that do may have less real world experience in running an actual company? One answer lies in the ability of entrepreneurs to establish their legitimacy in one key domain, thereby lessening the likelihood of substantial scrutiny when they enter other domains. For example, prestigious scientific researchers transpose their academic renown into the commercial world, implying that ability in one field is equated with expected achievement in another (Owen-Smith and Powell 2003; Powell and Owen-Smith 1998). In other words, faced with incomplete information, potential investors and partners will choose to provide resources to the founding team or firm which has the greatest perceived chance of success in the skill critical for profiting in the industry. I classify teams with the highest expectation for success as high status.

The unquestioned legitimacy of high status teams implies that they are able to draw on their prior reputations, while those lacking this benefit must either capitalize on different features of their group or demonstrate their abilities anew. Low status firms are deemed illegitimate from the outset and therefore have difficulty securing resources. Freed from expectations, however, low status groups may choose novel or unconventional strategies, or depend on references to speak of their abilities (Boxman, de Graaf, and Flap 1991). In addition to low and high status
firms, some organizations are neither part of the “in” nor “out” group. Phillips and Zuckerman (2001) suggest that these actors are “middling in status” because they are located in a zone where competition is fierce and legitimacy cannot be taken for granted.

Figure 1 highlights the likelihood of firms obtaining resources based on the characteristics of their founding team. In this stylized version, decisions are black and white. If the founding team meets the criteria they obtain their desired goods, if they do not, then they also do not secure sufficient funds. In reality of course, this is not the case; characteristics of the founding team are only one element that must be evaluated when considering the likelihood of a firm receiving an investment. Therefore, I argue that landing in the “invest / partner” box does not guarantee resource obtainment, but it does make a firm significantly more likely to receive the desired resources as compared to those teams who end up in the “don’t invest / partner” box.

To add flesh to this stylized portrait, I draw on several founding stories that illustrate the abilities of different types founding teams to obtain resources. In the first scenario, a prestigious university professor, with no experience running a corporation, was approached by a venture capitalist to start a firm. The venture capitalist sought out the academic based solely on his scientific reputation. The two, in conjunction with several other academics and venture capitalists eventually formed a firm, although they did not have a particular product in mind that they wanted to develop.1 Mapping this scenario onto Figure 1, the founding team met the hurdle of having a high level of the industry critical skill, which in biotechnology is perceived scientific ability. Therefore, the decision to invest and collaborate was clear.

In contrast, Lisa Conte, the founder of Shaman Pharmaceuticals, lacked an established track record of scientific achievements. She did, however, have close ties to venture capital and biotechnology consulting firms with whom she had worked previously. In Figure 1 she failed the first checkpoint, but was able to capitalize on her former relations to secure early financing for her firm (Conte 1997; Glater and Barnum 1992).

Finally, there are those who are middling in status. In biotechnology this means that while scientific ability is present, the legitimacy of the individuals involved is not unquestioned and the perceived quality of their past scientific accomplishments is difficult to determine. As a result, these groups are scrutinized on the extent to which they conform to the features of generically successful founding teams; the more features they have that are thought to be correlated with firm success, the more likely they are to obtain resources. These generally desirable features include having multiple team members, a diverse skill set, and prior industry, management, founding, and joint work experience.

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1 Example taken from a June 2003 interview that I conducted with an academic founder in the Boston area. As per Stanford University’s human subject committee, the identity of the interviewee and his/her firm must remain anonymous.
To that end, it is not surprising that a career scientist attempting to found a firm on his own experienced substantial difficulty in searching for funds.

"I spent the later half of ’98 and the first part of ’99 developing the idea, writing a business plan, filing patent applications, and then going out and talking to investors in the traditional sense. ...I had one consultant who was helping me with a business plan, with investor introductions, and presentations. I did that through the first quarter of ’99. At that point, we had no success with the investors. So, I
decided to back off from raising money, and basically did consulting work through [the firm he had founded]...[In early 2002 I] finished going through 30 or 40 venture firms, ...who I identified as probably being interested in this kind of stuff. Unfortunately, again, no investors came out at the other end.”

This middle status founder met the minimum threshold for scientific ability (he holds a PhD degree), but his abilities were not taken for granted. Furthermore, he lacked many of the aforementioned demographic features thought to be associated with winning founding teams. Therefore, he was unsuccessful in his initial attempts to secure resources for his firm.

The argument is, broadly speaking, consistent with the theory of middle status conformity, which suggests that there is an inverted u-shaped relationship between status and conformity (Phillips and Zuckerman 2001). The institutions at the top of the hierarchy are secure in their positions and therefore are given the freedom to bend or break the rules from time-to-time. At the other end of the spectrum, the lowest status individuals are unconstrained because of their positions as outsiders. Those in the middle, however, must work the hardest to conform to the industry’s ideal if they wish to reap the rewards.

Although similar in some ways, my argument differs from traditional tests of middle status conformity in that it considers attributes instead of actions. Furthermore, these attributes are fixed by the founding team and they are compared against a checklist of attributes thought to be correlated to firm achievement. Thus, I regard conformity as not about how much do these firms act like they are supposed to, but rather how much do they look like they have the raw material that will enable them to perform in a way that is expected to lead to success. Additionally, the theory of middle status conformity has suggested that low status actors are largely out of luck. In contrast, I argue that all is not lost for firms that begin life with a low status label, provided that they have former affiliations upon whom they can call to obtain resources.

Methodology

To test this theory of the interactive effects of various characteristics of founding team backgrounds, I used data collected on the career histories of 146 dedicated biotechnology firm (DBF) founding teams from the Boston and San Francisco Bay areas. The analysis was restricted to DBFs, which are defined as independently held, profit-seeking firms involved in human therapeutic and diagnostic applications of biotechnology. I thus focus on the developers of new biological products and eliminate from the sample the firms that provide support in the form of supplying equipment, reagents, test facilities, etc. Large pharmaceuticals and subsidiaries are excluded because biotechnology activity is often only a small portion of activity in large diversified firms, and subsidiaries do not appropriate their funds autonomously.

Biotechnology was chosen as the sample industry for several reasons. First, biotechnology is a relatively young industry. Most researchers credit the discovery of

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2 Example taken from a June 2002 interview that I conducted with a career scientist in the San Francisco Bay area. As per Stanford University’s human subject committee, the identity of the interviewee and his/her firm must remain anonymous.
recombinant DNA methods in 1973, and the development of cell fusion technology to create monoclonal antibodies in 1974, as the two major technical breakthroughs that led the way for the development of the biotechnology industry. The relative youth of the industry provides the benefit of having an industry that is small enough to collect a reasonably complete sample, but large enough to allow an analysis of the quantifiable differences in firm structures and outcomes, as related to the experiences of entrepreneurs. Second, most firms remain rather small and therefore I expect that individuals who work at the same firm are aware of one another and that founders who remain with their companies continue to influence the corporation’s activities. Of course, there are a few firms that have grown quite large as is the case with Amgen, Genzyme, and Genentech, and another handful that have not grown beyond the initial team, but for the most part firms in this industry remain relatively small. Finally, and most important for the analyses, for the most part biotechnology firms excel at early stage drug development, but are dependent on universities for basic research, financiers for financial support, and others such as pharmaceutical firms and hospitals for down-stream support. This reliance on others means that from the beginning, founders, and therefore their companies, are being judged as to their value as partners.

**Key Results**

In addition to testing the influence of founding team features on key milestones, the study also considers the changes in the composition of the founding team over time, and the role of regional culture in shaping the growth of an industry at the level of who becomes involved. The results of each of these analyses are briefly summarized.

**Founding teams’ influence on future milestones**

Logit and robust regression models were used to test the relationship between founding teams and three key milestones in a firm’s life, namely the presence and characteristics of first investment, initial public offering, and exit. Separate models were used for each event, although the dependent variables for earlier events served as controls in later events. For example, the presence of a first investment was used as a control in the test for the presence of an IPO. The results of each group of analyses follow.

First, high status firms are the most likely of the three groups to receive an investment, and on average have the most favorable (although not significantly so) outcome on each of the investment characteristics measured (age at investment, value of first investment, total value of investments in first two years of life). Furthermore, for the most part neither the presence of additional demographic features of a more diverse background of affiliations has a substantial influence on any of the investment characteristics. Therefore, with respect to initial funding, high status founding teams act in ways that support the three propositions.

Well-skilled middle status firms are more likely than their less-skilled counterparts to receive an investment, but the presence of multiple demographic features does little to speed up the time that it takes for them to get that money. Perhaps, having met the minimum bar of legitimacy, founding teams are not scrutinized as to how much human capital they have. Among those firms that eventually do receive funding, the process of finding funds takes on average significantly longer, with increasingly diverse networks providing greater benefits, to middle as compared to high status teams. When middle status firms finally do receive an investment the
actual dollar value is not significantly different than the value that comparable high status firms have received. More rapid access to initial funds, however, may be more beneficial than the actual value as the money will allow firms to jump-start their development process, renting lab space, buying equipment and hiring scientists to work on the product full-time. Surprisingly, among low status firms, it is those with few demographic features that receive an investment. Therefore, decisions to invest in these firms are likely made on criteria different from that of other groups. Nevertheless, the number of demographic features—perhaps because they have not yet reached the minimum bar of legitimacy—has a significant influence on both how long it takes low status firms to receive an investment, as well as how much funding is acquired in the first two years.

When characteristics of the initial public offering are analyzed what emerges is a slightly different pattern of influence as compared to the influence of founding team features on the initial investment. As with the first investment, on average high status firms have the greatest probability of the event occurring. The size of their offering is also significantly greater than the middle status firms who go public at roughly the same age. Furthermore, for the most part high status firms do not secure much benefit from either increasing demographics or diversity. In contrast, among middle status firms the odds of going public are increased significantly for those with increasing demographic features and hurt somewhat by increasing diversity of a team’s prior affiliations. As with the first investment, the two low status firms with diversity continue to fare better than the other firms in the sample.

Finally, when a founding team is formed some guess about its ultimate survival, or type of exit, can be determined by its initial status. For example, among firms that exit high status firms are the most likely of the three groups to have a positive exit (acquisition versus bankruptcy). Interestingly, although not significant many of the results for demographic features are in the opposite than hypothesized direction. One possibility for this result is that firms with founding teams that have few demographic features and few former affiliations never really get off the ground or become known by others. In order for a firm to be acquired others must be aware of the firm.

Changing compositions of founding teams

The career backgrounds of founders did change over the three industry eras studied. Founding teams of elite academics and venture capitalists dominated the early period of the industry. As the first generation of biotechnology firms aged they produced a new kind of entrepreneur, one who had grown up in the industry and was now ready to strike out on his own. Creating a new company, for the most part however, still meant finding a key discovery around which to build the firm, and thus academics remained critical to the founding team. In contrast venture capitalists became increasingly less important, stepping back from the responsibility that the role of founder entailed and providing guidance in the more typical role for a venture capitalist, namely that of board member.

Regional differences

Who became involved in the founding process, was shaped as much by regional culture, as it was by the industry itself. The most common, or second most common, combination of founders in both regions was that of academics pairing with others who had biotechnology
experience. The regions however differed substantially both in the type of person who held that experience (career scientist vs. board member), as well as if the firm only had one kind of experience, which of the two types was present. The most common form of founding team in the Boston area was the all academic founding team; in the San Francisco Bay area, as equally common as the biotechnology/university combination, was the team that only had experience in the biotechnology industry. Furthermore, the involvement of founders was much more likely to be part-time in the Boston area as compared to full-time in the San Francisco Bay area. In short, these results reflect a much greater emphasis on academic status in Boston, more evidence of entrepreneurial experience in the San Francisco Bay area, and a hedging strategy in Boston (don’t quit day job) as compared to fluid labor markets in the Bay area.

Conclusion

Entrepreneurs in general command research attention for several reasons. First, in the spring of 2002 an estimated 460 million individuals worldwide, or about 12 percent of adults 18 to 64 years old, were actively engaged in the start-up process, or managed a business less than 3½ years old (Reynolds, Bygrave, Autio, Cox, and Hay 2002). In the United States, this number is an estimated 18 million people, or a little more than ten percent of the labor force. Second, founders have the potential to create wealth. Among the entrepreneurs surveyed by Reynolds and his colleagues (2002), approximately seven percent expected their firms to provide 20 or more jobs in five years and have exports outside their own country. Of those seven percent a very small proportion are create a significant new market niche or economic sector. Third, because people found organizations, the entrepreneurs past will supply the genetic markers that provide information about the firm’s future possibilities.

My dissertation merges traditional sociological views on human capital, social capital and status with the world of entrepreneurship. Specifically, I incorporate into the discussion salient facts of founders’ backgrounds to emphasize the relevance of these entrepreneurs to organizational outcomes. In particular, much of what we call experience, when we talk of founders’ backgrounds, constitutes a complicated interweaving of human capital, social capital and status. One often hears the phrase, “Mike has experience in the pharmaceutical industry.” Behind the word “experience” lays knowledge of how the industry works, specific scientific, financial and/or business skills, contacts with other firms and individuals in the industry, and finally the reputation of having been affiliated with a specific organization. Yet rarely are these varied factors sorted out; and in the rare instances where the information is categorized, it tends to be correlated with future individual outcomes. I contend that not only is experience multifaceted, those multiple facets can be correlated to firm level outcomes. Furthermore, it is the combination of the three main factors (human capital, social capital and status) that is important. My focus on different types of factors as partial substitutes for one another differs from prior work that, with few exceptions (e.g. Boxman et al. 1991), studies one feature at the expense of others, or presumes different factors are additive. For example, much research assumes that the highest status, most types of relevant experience, and the greatest number of prior connections lead to the best outcomes. Instead, I propose that high levels of one factor (e.g. status) are associated with little incremental value from additional amounts of another factor (e.g. human capital). Founding teams that figure out the expectations for their industries and then play to their strengths will increase their probability of obtaining resources.
Reference List


