THE ROLE OF TEAM COMPOSITION IN START-UPS' SURVIVAL AND SUCCESS IN THE U.S 2005-2008

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Abstract

Tiantian Yang: The Role of Team Composition in Start-ups' Survival and Success in the U.S 2005-2008

(Under the direction of Howard Aldrich)

The emergence of new businesses has become a salient feature of modern society. Although millions of people are engaged in business creation every year, only a small portion of them can successfully create profitable firms while most start-up efforts end in failure. In this paper, I investigate how entrepreneurial teams differ in creating new ventures. I draw ideas from several theoretical perspectives and synthesize them into my theoretical framing to explain how entrepreneurial teams' characteristics, team members' relationships, and start-up activities influence new ventures' survival and performance. The data for my analysis are derived from the Panel Study of Entrepreneurial Dynamics II, a longitudinal study on a nationally representative sample of business founders who started business ventures around 2005.

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INTRODUCTION

The emergence of new businesses has become a salient feature of modern society. Although millions of people are engaged in business creation every year, only a small portion of them can successfully create profitable firms while most start-up efforts end in failure. To increase their survival chances and create profitable businesses, entrepreneurs acquire resources and obtain support from spouses, kin, and friends. Although scholars have made tremendous strides in understanding the assembly of entrepreneurial teams, scant research has fully explored under what conditions entrepreneurs make efforts and how the start-ups transform into fledgling firms given the composed teams. I investigate how entrepreneurial teams differ in creating new ventures. The data for my analysis are derived from the Panel Study of Entrepreneurial Dynamics II (PSED II), a longitudinal study on a nationally representative sample of business founders who started business ventures around 2005. It follows the entire process of start-up activities and allows me to track these nascent entrepreneurs from the very early period of business creation until they abandoned their start-up efforts. The method of survival modeling will be adopted in my paper. This method is ideal for describing changing processes, and for discovering the causal relationship among important events.

In this paper, I build a process-event model to explain business creation. I draw ideas from several theoretical perspectives and synthesize them into my theoretical framing to explain how entrepreneurial teams' characteristics, team members' relationships, and start-up activities influence new ventures' survival and performance. I argue that research on the business outcomes of emerging organizations should be wary of confusing survival and success. Statistical results on organizational performance might be biased without appropriately controlling for early death of businesses. I propose that a survival model can well address this problem by appropriately addressing right-censoring.

THEORETICAL ISSUE AND LITERATURE REVIEW

After more than two decades of studies, scholars have reached the agreement that new venture creation is a process of recognizing opportunities, mobilizing resources, and organizing start-up activities, but in most situations, may be neither creative nor productive(Shane 2008). Contradictory to Schumpeter's portrayal of entrepreneurs, nascent entrepreneurs are ordinary people who attempt to found new ventures in an industry in which they previously worked without any intention of revolution. Being consistent with the conceptual "demystification of entrepreneurs" (Aldrich and Martinez 2001) in literature, empirical studies show evidence that both survival and success chances for new ventures are fairly small, which is substantially different than the stereotypical image of successful start-ups. For example, Brӧderl, Preisendórfer and Ziegler(1992) reported a life table in which 25 percent of all businesses failed within two years after founding and 37 percent failed within five years after founding. Romanelli (1989) demonstrated that 59.3 percent of 108 start-up minicomputer producers failed. More recently, PSED I and PSED II both indicate that 21% of start-ups reported termination in the first yearly follow-up interviews (Reynolds and Curtin 2009).

The possibility of achieving good performance is even lower. Only a small number of surviving start-ups successfully transform into profitable firms while most of them persist while underperforming (Aldrich and Martinez 2001; Audretsch 1994; Reynolds and White 1997). Brüderl and Preisendőrfer (1998)summarized that less than one third of lucky survivors actually increase profits. In PSED I, the percentage of start-ups which reported stable positive cash flow in the first yearly follow-up interview is 22.8%; and the corresponding percentages in PSED II are only 11.8% (Reynolds and Curtin 2009). Although there has been a long tradition of exploring the "liability of newness" which highlights the lower survival chances of emerging organizations relative to established organizations, we have less understanding of why new ventures differ in their chances of success.

In this paper, I develop the research on new ventures' survival and success, both theoretically and empirically. A common explanation of new ventures' failure in survival and success is the lack of needed resources. With a resource-based view, the mobilization of resource is taken for granted and proponents of this view assert that better resource profile leads to higher chances of survival and performance for new ventures. Although scholars have conducted abundant research to categorize different types of resources and examined

how these resources affect new ventures' profitability, less systematically problematized is to what extent nascent entrepreneurs invest resources given what they previously obtained. The willingness to become a co-owner and the attempts to join in the founding process may indicate the propensity to invest resources but do not guarantee real resource investment and making efforts. Revealing the gap between "what entrepreneurs have" and "what entrepreneurs invest" has important implications for new ventures' survival and success. Rather than simply taking entrepreneurs' human capital and economic status that they obtained in previous occupation as predictors of survival and success, I pay more attention to the entrepreneurs' involvement in start- up activities and evaluate a variety of resources invested by entrepreneurs.

Also importantly, to examine how new ventures' outcomes evolve from the process of resource mobilization and investment, I intend to explore the social conditions which facilitate cooperation in team work and the social sources from which entrepreneurial teams maintain their persistence. Although the extant literature has suggested that social relations of individuals influence their cooperation, the mechanisms of how particularistic social relations facilitate cooperation in economic activities are not specified. The well-known strength of

family ties in business creation is identified as bounded solidarity which captures the mutual trust and obligation between family members. However, there are several confounding mechanisms implied in the argument of bounded solidarity. Does it work through providing instrumental supports or reducing conflict, or enhancing cooperation between team members? The more specific functions of particularistic social relations in venture creation need to be differentiated. In my analysis, I unpack the effects of social relations between team members by identifying the impact of social relations on both new ventures' performance and survival.

Besides theoretical framing, a systematic study of new ventures' survival and success needs an appropriate method. Two important methodological issues involved in organizational studies are that most data on organizations are collected after certain period of the creation of organizations, and some subjects drop out from the study non-informatively. The two issues, termed as left-truncation and right-censoring, influence the estimation of new ventures' survival and success. In my analysis, I used Panel Study of Entrepreneurial Dynamics (PSED II), which followed new ventures from very early period and identified their birth dates and the dates of the latest interview. It allows me to use survival analysis to

estimate transition rate of termination and propensity of success with effective controlling for left-truncation and right censoring problems.

Theoretical Background

Resources are key elements for organizations' performance and survival. Taking new ventures as would-be organizations, scholars explain new ventures' outcomes by either resource constrains or the capabilities of obtaining resources. With both arguments, the motivation of making efforts and the propensity of investing resources are taken for granted. However, the common assumption about resource investment for established organizations might be implausible for new ventures. Unlike established organizations, new ventures are in the process of conception and gestation. In most situations, nascent entrepreneurs attempt to found new ventures by taking advantages of their previous work experiences. Aldrich (2005)emphasized that new ventures are "attempt start-ups" since people were thinking about founding a new business and were just trying to undertake few activities. Most would-be new firms are terminated without the formation of an economic entity. Previous studies have suggested that on average nascent entrepreneurs spent about a year to undertake two start-up activities(Carter, Gartner, and Reynolds 1996). These views and findings question the extent of entrepreneurs' involvement in start-up activities and suggest the chaotic and complex

properties of start-up process. Although previous research has emphasized that the initial resource stock consisting of human capital and financial capital plays an important role in organizations' longevity and performance, it is necessary to explore the extent of entrepreneurs' involvement and the magnitude of invested resources in start-up process. Rather than simply listing the reasons of making efforts, I first examine the factors which restrict nascent entrepreneurs from investing resources, and then I explore the social conditions which facilitate cooperation and exchanges among team members.

Following the rational choice perspective, rational individuals would like to avoid risk rather than confront risk. With a less restricted assumption, individuals intend to reduce cost in a situation which does not necessarily involve risk but has uncertain outcomes. Several facts of entrepreneurship confirm this logic. For example, most entrepreneurs maintain alternative income source by retaining full-time jobs, part-time jobs, and managing other businesses at the same time when they are working on the new ventures; most entrepreneurs recruit family members and friends into teams and start without hiring any employees. The main source of financial capital is entrepreneurs' personal savings and the amount of initial capital invested in start-ups is very small. Although previous work has

shown that nascent entrepreneurs are overoptimistic about their new ventures, it seems more plausible that the overconfidence in opinion and the timidity in behavior coexist.

From a different lane, McAdam(1986) illustrated the factors which constrain individuals' participation in high risk/cost activism. Unlike low risk/cost activism, high risk/cost activism involves the expenditures of time, energy, financial resources, and the potential dangers or negative outcomes. McAdam argued that micro-structural contexts, such as affiliated organizations, marital status, adult responsibilities, and interpersonal contacts, serve as structural constrains that withdraw individuals from participation in high risk/cost activities. Previous literature of entrepreneurship has suggested the multiple social contexts of business creation. A typical entrepreneur is a forty years old white man, employed, married with a working spouse, obtaining income to support his family(Aldrich and Martinez 2001). Under the multi-dimensions of social contexts, the multiple tasks that entrepreneurs undertake may constrain their energy, time and resources that could be invested in new ventures.

In the setting of collective activities, the conditions restricting entrepreneurs from investing resources are even more complicated. In his pioneering book on the "logic of

collective action", Olson examined the "free rider" problem, which posits that a rational actor will abstain from making contributions to collective goods when individual contributions have negligible effects(Olsen 1965). The "free rider" problem is rarely addressed in business cases probably because formal organizations have strict rules to control and sanction workers, and the salary system assigns rewards to individuals according to their individual contributions. However, new ventures are more like collective productions in which rewards are uncertain and shirking is more likely to happen. One can argue that Olsen's "free rider" problem occurs more when team size is large, but most entrepreneurial teams are actually of a small size. However, I maintain that the risky aspects of start-up activities and inseparable contributions of individuals make some founders reluctant or unwilling to invest resources. As Ruef notes, the "free rider" problem exists in entrepreneurial teams especially when ownership is determined beforehand, without strict guidelines for investing money, time and other resources(Ruef 2010). Following this argument, there might be certain discount in resource investment when nascent entrepreneurs are reluctant to invest their income.

Given the rational nature of individuals and the collective properties of entrepreneurial teams, the question on how nascent entrepreneurs' human capital and

economic status affect new ventures' survival and success needs to be examined with controlling for the magnitude and invested resources and the extent of efforts made by entrepreneurs. By controlling for the magnitude of invested resources and the extent of efforts made by entrepreneurs, people may argue that the effects of human capital and income on new ventures' outcomes are mediating through the magnitude of resources invested by entrepreneurs. If it were true, there would be certain association between entrepreneurs achieved characteristics and new ventures' outcomes, and the correlation between the two would disappear if we control for invested resources and efforts. Rather than taking such a strong perspective, I assert that the magnitude of invested resources and the efforts made by nascent entrepreneur play moderating effects. It means that the extent of making start-up efforts and the magnitude of invested resources serve as conditions constraining the effects of nascent entrepreneurs' achieved characteristics on new ventures' survival and success.

Following this argument, I propose that:

Proposition 1. The magnitude of invested resources and the extent of efforts made by entrepreneurs are important for new ventures' survival and success.

I then develop the hypothesis:

Hypothesis 1. The effects of founders' human capital and economic attainment upon new ventures' survival and success are moderated by the magnitude of invested resources and the extent of efforts made by entrepreneurs.

In above analysis, I have pointed out the three factors that constrain nascent entrepreneurs' investment in new ventures: individual choices, micro social structures, and the lack of strict rules and sanctions. Revealing the fact that nascent entrepreneurs are reluctant rather than being highly motivated to invest resources has an implication to the explanation of new ventures' survival and success. The social conditions which facilitate nascent entrepreneurs' active involvement in start-up activities need to be explained. I suggest there are three aspects from which social relations of team members affect new ventures' performance and survival: providing instrumental resources, the embeddedness of new ventures in family unit, and reducing conflict.

Social Relations and Resource Investment

Following Granovetter's idea of "embeddedness" (1985), sociologists have made tremendous progress in exploring how social ties influence job mobility (Mouw and Entwisle

2006; Podolny and Baron 1997), status attainment (Lin, Guthrie, and Frazao 1999), entry into self-employment(Portes and Sensenbrenner 1993; Stuart and Ding 2006), organizational emergence (Nicolaou and Birley 2003), organizational performance (Uzzi 1996; 1999), resource allocation in non-routine situation (Hurlbert, Haines, and Beggs 2000), and so on. Research on self-employment and emerging organizations emphasizes how entrepreneurs identify opportunities, obtain social supports and mobilize material resources through social contacts.

My analysis of social capital in new business creation is based on Lin's framework of social capital. In Lin's framing, he differentiated the use of social capital from the access of social capital (Lin 2001). To address the question that how social relations of entrepreneurial team members influence startups' outcomes, I examine a variety of resources invested by entrepreneurial teams and the magnitude of efforts made by team members. To be clear, I focus on how the activated social capital and mobilized resources rather than access to contacts and potential benefits embedded in social networks impact entrepreneurial teams' outcomes.

On the instrumental properties of mobilized resources, Lin's framing implied two aspects which are crucial to new ventures' survival and success: the extent that entrepreneurs invest resources and the effectiveness of their resources. Agreeing on Portes' idea that a systematic analysis of social capital should addresses the sources of social capital and the resources themselves(Portes 1998), I examine whether the social relation among team members affects the investment of resources and the quality of invested resources, both. I argue that the survival and success of a new venture depend on the extent of entrepreneurial efforts and the effectiveness of invested resources.

So far scholars have conducted extensive research to examine the effects of social support in business creation. However, few of them have effectively separated the social capital affects from other potential affects. I argue that the scholars should be wary of the confounding of social capital and ownership in entrepreneurial studies, especially when they are examining the social relations among people who make most important contributions to new ventures but also share the ownership of the new ventures. In extant literature of social networks, the unit of analysis is individual. The classic examples are job seekers in Granovetters' work and Lin's work, senior managers in Burt's research, Black urban poor in

Susan Smith's article. In the exploration of individuals' job search and status attainment, the differentiation of ego and contacts and the identification of recipients and providers are well defined. More importantly, although some scholars such as Lin emphasizes that the exchange of resources is mutual and the return of investment is expected, most studies focus on the usage of social capital by an ego. In other words, scholars focus on the flow of benefits from providers to the ego. However, while the unit of analysis is a team which consists of several people, it is misleading to treat one of the owners, a respondent in most situations, as the ego and take his co-owners as contacts. In the case of business creation, the social capital mechanism is easily to be cofounded with the ownership mechanism, given that each owner will get benefits according to their ownership.

The tricking part on entrepreneurial ownership is that for most new ventures owners equally share the ownership and they only have informal agreement on the ownership. There is neither strict rule nor guideline for the investment of resources and the way of dividing benefits. So the influence of the ownership is not from the control side. It generates the uncertainty for team members' cooperation. It leaves the freedom for nascent entrepreneurs to decide how much resource they need to invest and how much effort they want to make.

Given the sharing of benefits, I do not draw the conclusion that an owner invests resources to support his co-owners because of their social relations. I assert that the influence of social capital is implied in the fact that a particularistic social relation facilitates the cooperation between team members. In other words, although a new venture's outcome is not insured and there is no strict rule of investing resources, entrepreneurs still would like to make efforts given their particular relations. Since most entrepreneurial team consist of friends, kin and spouse, one of my goals is to examine whether a particularistic social relation substantively facilitate team members' cooperation and involvement relative to others.

Sanders and Nee emphasized "household communism" and argued that family-based social capital provides immigrants with a back-up labor force, financial capital and mutual obligations which highly facilitate cooperation among family members (Sanders and Nee 1996). Similarly, Peng's research on Chinese entrepreneurs suggests that kin solidarity and enforced trust are crucial in protecting enterprises under economy transformation(Peng 2004). Aldrich and Cliff (2003) emphasized the embeddedness of businesses in family contexts plays an important role in both emergence and development of small businesses. Other proponents of this view also support the positive effects of kinship on businesses (Aldrich

and Waldinger 1990; Nee and Sanders 1985; Winter, Danes, Koh, Fredericks, and Paul 2004). This line of literature suggests that family ties are more motivated to provide valuable resources, such as labor force, financial capital, physical capital, and so on. The implied mechanism is termed as bounded solidarity (Portes and Sassen-Koob 1987; Portes and Sensenbrenner 1993). It is the sense of "we-ness" among family members that let family members to be obligated to achieve the maximum household income.

Following this logic, I draw ideas from social exchange theory to justify the argument that the material resources invested by family members are especially important to the survival and success of new ventures. Schaefer provides excellent analysis of how resources characteristics constrain exchange process and the outcomes actors encounter (Schaefer 2009). She identified two resource dimensions: duplicability, which is whether a resource's provider retains control of the resource after exchange; and transferability, which is whether a resource's recipient can exchange the resource in another relation. Investment of transferable and duplicable resources is less costly and risky. It is well-known that start-up owners contribute five types of resources: information, introduction, training, physical, and financial resources. While information, introduction and training are transferable and

duplicable, financial resources and physical resources are more likely to be non-transferable and non-duplicable. An example is that once a start-up fails, owners who provided technical assistance still possess those skills and would be able to make use of those skills again in a future endeavor, while owners who had invested monetary resources would not be able to salvage the total investment. The positive effect of certain particularistic social relations is manifested as the enforced norm which emphasizes the maximum benefit of a group with less consideration of individually financial cost. Under these circumstances, family members are the main source that provides material resources and the altruism of family members facilitates the investment of resource without seeking maximized individual benefits.

The bounded solidarity argument on family members' advantages is challenged by other perspectives. The first one is the "strength of weak ties" perspective. Proponents of the strength of weak ties argued that friends are more likely to identify diverse information while family ties mostly provide redundant information. For example, in a study of the effects of social networks on entrepreneurial outcomes, Renzulli, Aldrich and Moody show that a large proportion of kin in networks has disadvantages because kin ties share a highly homogeneous pool and are more likely to provide redundant information (Renzulli, Aldrich, and Moody

2000). Similarly, Luo maintains that family relationship provide little diverse information which leads to the disadvantages of family businesses in making strategic decision (Luo and Chung 2005).

However, I argue that this logic is not consistent with redundant information argument in Granovetter's work. As Granovetter put, "acquaintances, as compared to close friends, are more prone to move in different circle than one's self. Those to whom one is closest are likely to have the greatest overlap in contact with those one already knows, so that the information to which they are privy is likely to be much the same as that which one already has." (Granovetter 1974) Most start-up teams are developed with face-to-face interaction and intensive communication between team members, including both friends and kin. Both friends and kin are strong ties in Granovetter's terming, thus it is not necessary that information provided by friends is more useful than that provided by kin. Additionally, Granovetter focuses on the spreading of information and the benefits of having access to diverse information. In his examples, a large proportion of "job seekers" are "definitely not searching for a new job, but are keeping their ears open for possibilities." He also emphasized that the interaction of providing information and getting information is likely to

happen when the purposes of passing and getting information are both missing. It is very different than interaction involving passing information and processing information in business creation since scholars have emphasized that intentionality is one of important properties of emerging organizations. Thus, we can't conclude that entrepreneurial teams consisting of family members are disadvantaged in obtaining diverse information from owners from the strength of weak ties argument.

The other perspective shows there are alternative sources of motivation of making efforts in collective action. Marwell et al. argue that individuals will contribute as much as they can to maximize the collective goods and thus their share of the returns (Marwell, Oliver, and Prahl 1988). This implies that an entrepreneur will work hard to get maximum benefits, regardless of the social ties between him and his co-founders. Also based on the rational choice assumption, Macy further argues that whether individuals make contributions and the significance of their contributions are dependent on their prediction of collective outcomes. Rational individuals will shirk if they observe negative outcomes or if they predict negative outcomes will occur in the future. This reveals that whether and how individuals make contributions are contingent on the expected collective outcomes (Macy 1991). However,

with this argument, an important condition for entrepreneurs to make efforts and invest resources is the promising outcome and the observable contributions made by others. With the chain rule, there should be at least one person who would like to invest resources before others do, and he has to create observable positive outcomes to motivate other people to invest more resources. Nonetheless, it takes longer time and it is more difficult for one person to create substantive performance. I argue that the cooperation between team members and the common investment made by team members lead to higher survival and success chances for new ventures.

Based on the above discussion, I develop the second hypothesis:

Hypothesis 2. New ventures founded by teams having family members benefit from financial resources provided by family members and then have comparative advantages in survival and success.

Social Relations and Team Cooperation

In above analysis, I have emphasized that individuals' rational choice and the collective properties of entrepreneurial teams constrain the investment of resources and the family ties of team members facilitate the investment of resources in new ventures. Besides

examining the resources invested by entrepreneurs, I take a further step to explore how teams of family members and teams of non-family members differ in cooperation. Some scholars called for a family embeddedness perspective in entrepreneurial studies which emphasizes the interface of family and work in new ventures (Aldrich and Cliff 2003). The similar idea implied in literature of family businesses on 'familiness'. In developing a resource-based framework on family firms, Habbershon and Williams(1999) define 'familiness' as the unique bundle of resources a particular firm has because of the systems interaction between the family, its individual members, and the business". With this framework, a lot of works have been produced to examine the 'familiness' of family firms. However, most research is theoretical discussion and little empirical evidence has been presented. Furthermore, the dilemma in these works is that scholars solely focus on the resources profile, capabilities, and social capital of family businesses without a systematic comparison between family businesses and non-family businesses. What is missing is the elaborated comparison of family owned business and non-family owned business at multiple aspects. Besides resources investment that I analyzed above, I also examine the cooperation between team members.

Despite most entrepreneurial teams are very small, the cooperation and exchange in teams are complicated that team members need to coordinate in multiple tasks, processing information, assigning responsibilities, negotiating for individual benefits, and so on. In dealing with the multiple tasks, entrepreneurs get involved in venture creation in different ways. While some people invest financial capital, physical resources or provide suggestions, others tend to make efforts by spending time, managing tasks, making marketing and other activities, which demand the personal involvement rather than just investing resources. With exchange theory, the collective properties of group cooperation in business creation can be described as the productive exchange since it is the most group-oriented form of exchange (Lawler, Thye, and Yoon 2000). In their definition, productive exchange involves two or more individuals who generate a single, socially produced object, and also importantly, there is a single source of benefit that all share in some way. I insist that an examination of group cooperation in new ventures should pay attention to team members' alternative income sources and the status of team members' sharing of other incomes.

Some scholars have suggested that the uniqueness of family businesses is the integration of family and business life. As Chrisman and his colleagues pointed out, the

combination of family and business contexts generate special capabilities of ‘familiness’ that allow family business to survive and grow (Chrisman, Chua, and Steier 2003).

More specifically, the uniqueness is manifested in the fact that family members also share the incomes from other sources while non family members only share the revenue of a new venture together. To some extent, a non-family owned business is created in an exchange process but a family owned business is generated by “household communism” in which family members commonly share family wealth. In a new venture started by non-family members, with the norm of reciprocity and fairness team members invest more resources when they are not available to be physically involved in start-up activities, especially when they have other jobs. At the same time, when an individual has stable income from alternative occupation, he is less likely to become personally involved in start-up activities. However, the joint and shared interests build stronger interdependency between family members stimulate family members’ active involvement in creating new ventures.

Hypothesis 3. New ventures owned by family benefit from active involvement of family members, given the invested resources.

Social Relations and Start-up Activities

In discussion of family firms' social capital, Pearson summarized four dimensions which create family firms' comparative capabilities, (1) stability; (2) closure; (3) interdependency; and (4) interaction. The first dimension, stability, indicates the long-standing relationship between family members which is built over time and then relatively durable. As Pearson put, the shared history among family members generate relatively durable and persistent relationship, which help nascent entrepreneurs to develop stability, which is an incredibly valued asset for new ventures (Pearson, Carr, and Shaw 2008). The fourth dimension, interaction, means the interface of family and workplace aid the deep communication between family members. I connect the two dimensions to two conditions which have been suggested by entrepreneurship studies to be effective in facilitating the undertaking of start-up activities.

In his book on entrepreneurial teams, Ensley demonstrates that team members' discussion on important issues reduces the chances of making wrong decisions. The more a team is tolerant of conflict in opinions the better the performance. With social exchange theory, scholars emphasized that the frequent communication between individuals enhances group cohesion and correspondingly improve a team's performance. These ideas suggest that

given the amount of resources invested to new ventures, the pace that team members efficiently develop group cohesion and the extent that effectively coordinate in a variety of start-up activities play important roles in new ventures' performance and survival. To link the family institution and business institution, Luo and Chung (2005) argued that the existing authority in a family also exists in family businesses and the similarity of authorities in family and firms allows family owned firms quickly make decision and solve problems. Based on these findings and ideas, I assert that entrepreneurial teams consisting of family members can better organize multiple tasks and more effectively undertake start-up activities. Thus:

Hypothesis 4. New ventures owned by family benefit from a variety of start-up activities undertook by family members.

DATA AND METHODS

Data

I use the data from Panel Study of Entrepreneurial Dynamics II (PSED II) to analyze how team composition influences start-ups' outcomes: substantive profitability or termination. PSED II started in 2005 with the selection of 1214 nascent entrepreneurs based on screening a representative sample of 31, 845 adults. Respondents were selected as nascent entrepreneurs if they were working on start-ups but had not ever achieved stable positive cash flow for more than six months. With the sample of 1214 nascent entrepreneurs, PSED II conducted four-wave interviews: the initial detailed interview and three annual follow-up interviews. We track these 1214 nascent entrepreneurs until they cease their business ventures.

It is important to point out that PSED II has monthly information on start-up activities and important events such as termination and obtaining stable positive cash flow but the data were collected in yearly interviews. There are 129 respondents only answering questions in interview A. Correspondingly, the date of interview A is coded as the censored time for those

129 start-ups. The same rule of coding censoring date is the same for other start-ups. For example, 287 respondents answered interview A and interview B but did not answer interview C or interview D. We either followed them until the date of termination or recode them as right censored at the date of last interview. There are 138 (35+25+27+51) cases that either missed interview B or interview C but answered questions in later interviews. PSED II asked the date when a start-up activity was conducted at the first time so we could be able to use the retrospective interview to identify the first date of any activity.

The data are ideally suited for research on survival and later development of emerging organizations for two reasons. First, Aldrich has pointed out that a study on emerging organizations should follow nascent entrepreneurs from a very early stage; otherwise a sample would be biased by excluding those that quit in an early period (Aldrich 2001). This biased sample would be seriously problematic if the dependent variable were survival because those of low likelihood of survival would not be included. Carroll described the selection of samples from a population of established firms as an act which ignores "a sizable majority" and "winnows heterogeneity" of ever-existed businesses (Carroll 1993) . In PSED II, all respondents had started creating a new business and had not gotten stable

positive cash flow at the point of screening. Unlike studies of registration data, PSED follows nascent entrepreneurs from a very early stage and largely reduces the selection bias. Second, research on business creation needs information on the development of businesses and on their founders over time (Kim, Dissertation 2007). So far, studies on emerging organizations have been largely restricted by lacking information on the detail of start-up processes. PSED II has information about nearly 31 types of business activities. For example, earning the first revenue, earning positive cash flow, abandoning a start-up venture, , are included. Respondents were asked a set of two questions about these important events. The first one is about whether an event occurred. The second is about the concrete time when the event happened, not only the year but also the month. Given the scarcity of datasets on initial endowments and later development of emerging organizations, PSED II is very valuable to examining dynamic processes of business creation.

Variables

Dependent Variable

I include two dependent variables in this paper. The first one is the survival time (in months) of the start-up businesses as reported by the respondents. If a firm is still alive at the

time of a respondent's last interview, it is coded as a right-censored observation at the time point of the respondent's last interview. To determine the survival time of a business, I first look at the answer to the question: "do you consider yourself to be actively involved with the new business (start-up) or disengaged from it?" If the answer is "disengaged", I then look at the follow-up question "In what month and year did you end your active role in working on this business start-up?" It is possible that a business was still alive although the respondent was no longer working on it. I further use the question of, "are there any other people still involved?" to differentiate terminated businesses from surviving businesses from which experienced individuals exit. If there are other people still involved in a business although a respondent quit, the business is still coded as surviving. Meanwhile, it is also treated as a right-censored observation at the point of individual exit because the respondent who provides information on the business is no longer in the sample after his individual exit.

The second dependent variable is the time (in months) that a start-up has been earning stable positive cash flow. A start-up business is coded as earning stable positive cash flow when a respondent gives positive answers to these three questions: (1):"Has this new business received any money, income, or fees from the sale of goods or services for more than six of the past twelve months (before your involvement ended)?" (2): "has monthly

revenue been more than the monthly expenses for more than six of the past twelve months (before your involvement ended)? (3): "were salaries or wages of the owners who were active in managing the business included in the monthly expense for more than six of the past twelve months?" By asking these three questions, we can make sure that a business has gotten stable positive cash flow and the amount of positive cash flow has reached a certain amount. The time of earning stable positive cash flow is the first month and year in which monthly revenue was greater than all monthly expenses, including salaries for owners active in managing the business. There are two types of censoring in the analysis of success time. The first one is the attrition of follow-up interviews; the second one is the disengagement of respondents from their ventures.

Independent Variables

Team Type: A team is defined as a group of owners in this paper. PSED II asked respondents about the relationship between any two owners. If the size of a team is n, there are C_n^2 possible dyadic relationships. I differentiate six types of teams: solo entrepreneurs; spousal teams (which only consist of an entrepreneur and his/her spouse); kin teams (all of

dyadic relationships are kinship); friends teams (all of dyadic relationships are friendship); teams having spouse and other non-spouse persons; teams having friends and kin but no spouse. In previous research, some scholars measure team composition in terms of focal entrepreneurs' relationship with co-owners. They calculated the proportion of kinship by dividing the number of kin by the size of a team. I argue that that measure is arbitrary in determining who is the focal entrepreneur of a team and also limited because it ignores the relationship between any two non-focal owners.

Human capital: I measure human capital at the team level. I focus on work experience, managerial experience and self-employment experience. Respondents reported each owner's years of work experience in industries related to their start-up businesses. I calculate the mean of the years of work experience in related industries for each team. Managerial experience is a continuous variable at the individual level. I calculate the mean of the years of managerial experiences of team members before they began work on the current business. Similarly, as for the self-employment experience, I sum the total number of businesses that team members ever helped to start before working on the current business.

Financial capital: Scholars have realized the importance of financial capital, but few of them have empirically analyzed its effects. PSED II asked the sources of financial capital and the amount of money invested, giving me a big advantage in exploring the effects of financial capital. I use a time-dependent continuous variable to explore the effects of financial capital on the survival and success of start-up ventures. The variable indicates the sum of dollars invested by all owners for each year. I focus on the changing amount of financial capital invested in start-up businesses in the period before they transition into profitable firms. Taken together, I not only consider the amount of financial capital but also examine the times at which capital is invested.

Work hours: the number of work hours is also an indicator of entrepreneurs' investment. A categorical variable, "whether an owner has worked for a business more than thirty five hours a week," will be used to represent the extent of an owner's time investment. I then use a timing variable to measure the time when an owner started spending more than thirty five hours on a business.

The count of activities undertaken by teams: it is the sum of all activities finished by a team. It is a time-varying variable.

Control Variables

Previous research has emphasized the importance of owners' demographic characteristics, industrial type, and industrial environment. Thus, I will control for these variables in my analysis.

Business characteristics: I consider two types of business characteristics: (1).Whether a business is high-tech. This variable is a binomial variable. (2).Whether there are businesses offering the same products or services to your potential customers? This is a categorical variable having three categories: many, few, or none.

Industrial type: PSED II uses SIC industry code to record each business's industry type. Based on the industry code information, I categorize all these start-up businesses into four types of industries: manufacture, consumer service, technological and agricultural.

The count of helpers and key non-owners; I control for the number of helpers who helped the owners start a new venture and the number of key non-owners who made significant contribution to a new venture.

Methods

A comparative quantitative study of start-up businesses calls for appropriately analytic methods to the data. Survival analysis (Event-history analysis) are ideal to categorical data referenced by time, since the techniques use all the information on number, timing, and sequence of changes between discrete states of the dependent variable (Tuma, Hannan, and Groeneveld 1979; Knoke 1982; Chaves 1996). In this paper, the objective of conducting survival analysis is to describe and explain the transition of a business from its nascent status to a fledging firm or termination.

Although survival analysis has been commonly used in social science, scholars did not pay enough attention to several key issues, such as left-truncation problem and model estimation when the time of events involve ties. This paper shows the development of modeling taking consideration of the both issues.

So far, there are three types of survival models: exponential transition rate model, parametric models and semi-parametric transition rate model (Cox proportional hazards model). Cox Proportional Models will be used in the paper for three reasons. First, unlike exponential transition models and parametric models assuming specific trend of baseline survival functions, proportional hazards models leave the shape of the transition rate

unspecific (Blossfeld and Rohwer 2002; Allison, 1995). Second, Cox Proportional models make it easy to incorporate time-varying variables and allow the hazard rate change cross time with time-varying variables. Third, the Partial Likelihood approach used in Cox Proportional Hazard models can appropriately handle left-truncated data, which is the case in PSED II. Some people assert that the downside of Cox Proportional Model is that it assumes the constant hazard over time. However, that understanding of Cox Proportional model is partially incorrect. In fact, the hazard changes once we include time varying variables into the model.

In survival analysis, specific approximation method is needed when the survival time involves ties. There are three methods of handling data with ties, Breslow, Efron and discrete methods. I will use Efron in my analysis.

The second important issue in survival analysis is to set up an appropriate original time of being at risk for subjects, the risk of termination in this study. As I mentioned above, PSED II include nascent entrepreneurs who were working on start-ups but had not achieved substantial revenue at the date of screening interview. This method of selection means that all of start-ups had already been exposed to the risk of quitting for a certain period (depending

on when they started) when they came under our observation. Using this research design, it is logically impossible for respondents to have abandoned their start-ups before the date of our screening interview with them. If they had quit at any point before the date of screening interview, they could not have been selected into the sample. Accordingly, left-truncation has occurred. Left-truncation arises when start-ups which did not survive long enough to be observed are left out of the sample. Left-truncated data are incomplete and include hardy subjects. The longer the time start-ups have been exposed to the risk of quitting before they come under observation, the greater the possibility that they over-represent the resilient cases. By contrast, the most fragile cases were quickly selected out and we never observed them.

With left-truncated data, when the start time of being at risk is unknown, we face the problem of a biased estimation of the hazard of quitting because the full length of exposure to risk is Unknown. However, knowing the start time of being at risk makes it possible to estimate the hazard of quitting efficiently with the Conditional Likelihood Approach (Guang 1993; Allison 1995). Fortunately, PSED II collected time information of more than thirty activities, including making a plan, marketing, getting funding, hiring employees, developing products, and so on. The previous literature in entrepreneurship has suggested that the most appropriate birth date of a start-up is the time when nascent entrepreneurs (or their team) take

their first activity and become involved in business creation. Following previous research, I define the birth date of a start-up as the date of the first activity undertaken by the startup team. Thus, the start time of being at risk for a startup is the time when its nascent entrepreneur undertook the first activity.

It is important to mention that a start-up is exposed to the risk of quitting as soon as it is born, but it can only quit after it enters into our observation. Otherwise, by definition it would not be in the sample. Given the possibility that some start-ups quit before entry into the observation, the risk set of quitting is not available at any time point before screening interview date. Some scholars claim that they can pull start-ups of different ages into a cohort and estimate the hazard of quitting from the point of start-ups' age zero.

So the question is how to appropriately estimate the hazard of termination, given data having left-truncated subjects with known start time. In this paper, I will mainly explain how Cox Proportional Hazard model handles left-truncated data with Conditional Likelihood Approach.

With the conditional likelihood function, it is easy to handle left-truncated subjects. The simple idea behind the conditional likelihood approach is that it excludes subjects from

the risk set when they have yet not entered into our observation. (Or, to put it positively, it only includes subjects in the risk set when we began actually observing them.) Mathematically, a subject is excluded from the denominator if it has not entered into our observation at the i th point. It specifies the length of elapsed time that subjects have experienced before entry into the observation. The computing process with the Conditional Likelihood Approach can be accomplished very easily with the procedure Proc Phreg in SAS.

[Insert Figure 1]

In Figure 1, I compare the cumulative survival function estimated with controlling for left-truncation and without controlling for left-truncation. The green line is the estimated survival function without controlling for the left-truncation. The blue line is the estimated survival function with controlling for the left-truncation. It is obvious that the survival function without controlling for the left-truncation tends to underestimate the hazard of quitting early in the period. The reason is that it did not exclude left-truncated subjects from risk set during periods in which they are not supposed to be in the risk set.

In this paper, I explore not only the survival of start-ups but also explain why some of them are more successful, conditional on survival. It is beneficial for both academia

research and policy making to identify important conditions under which survived start-up can successfully transit into fledging firms.

I have fully discussed the methodological issues in survival analysis for termination. The similar principles of left-truncation and discrete models are also applicable to the analysis of success. It might be different in other research, depending on the data collection procedure. In PSED II, we selected nascent entrepreneurs who were working on start-ups but had not achieved substantial revenue at the date of screening interview. Using this research design, it is logically impossible for respondents to have abandoned their start-ups before the date of our screening interview with them. The first important point involving success is that respondents who had already achieved stable positive cash flow before the screening date are not eligible to be selected into the data either. Although the screening interview unfortunately selected 35 respondents who had achieved stable positive cash flow, I use the information on the date of success identified them and exclude them from the current sample. The second point is that the right censoring is different for success than that for termination. There are two types of right-censoring in the analysis of termination: we did not observe termination when the observation ended; randomly drop-out of start-ups. In analysis of success, right

censoring is also from termination. We did not observe success under the whole observation process once start-ups dropped out. Thus, I analyze the success of start-ups, conditional upon their survival.

ANALYSIS AND RESULTS: THE MYTH OF NASCENT ENTREPRENEURS AND THEIR START-UPS

Descriptive Results

Although plenty of projects have been conducted to explore new ventures' survival or success, little research examined success conditional on survival. I plot the graph in figure 2 to show the difference between survival function and non-success function. It is important to mention that when the event is success, the statistical "survival function" is the function of non-success For both the non-success function and the survival function, I used the procedure that I discussed earlier to handle left-truncation problem. In figure 2, the survival function almost decreases at a constant rate. But we can still see that the decreasing magnitude of the survival function is larger in month 0 to 40 than later. The plots vividly show that there is only a tiny proportion of surviving start-ups that obtained stable positive cash flow at the early period. The gap between the survival function and the non-success function increases over time. This means the proportion of successful new ventures over surviving new ventures

increases as time passes. The finding that new ventures with better performance are more likely to survive might be the result of selection mechanisms.

[Insert Figure 2]

The average survival probability by the time of the fourth yearly interview is 59% but the success probability is 17.1%. It is interesting that teams consisting of only kin have the lowest probability of survival but the highest probabilities of success, in terms of obtaining stable positive cash flow. The survival time is between 30 to 40 months and the time of obtaining stable positive cash flow for the first time is between 20 to 40 months. This means that new ventures have to survive long enough to obtain substantial performance. Among those terminated start-ups, spousal teams and teams having spouses and other people survive longer time than other teams. Among those successful teams, kin teams need a longer time to obtain stable positive cash flow. The mixed teams need a shorter time to obtain stable positive cash flow. There are 457 teams that were neither terminated nor successful. Among these teams which were surviving but were under-performing, spousal teams, teams having spouses and other people, and kin teams keep being active for a longer time than other teams. The main goal of my analysis is to find predominant factors influencing the termination rate

and success rate of six types of teams: solo entrepreneurs, spousal teams, teams including spouse and others, teams including friends and kin, teams only having friends, and teams only having kin.

Model Results

I report the models results of Cox Proportional Hazard models in Table 1. All the coefficients in the table are exponential coefficients indicating hazard ratio. (In Cox Proportional Hazard models a coefficient $\hat{\beta}$ is the maximum partial likelihood estimate). The form of hazard ratio is identical to the odds ratio in logistic regression. However, the hazard ratio is the ratio of hazards rather than the ratio of odds. I also reported the global tests for models; Wald, score and likelihood ratio tests, but using partial likelihood. I do not include the confidence intervals for coefficients in the table. But the confidence intervals for hazard ratios can be easily obtained using this formula: $(e^{\widehat{\beta_l}-z_{1-\frac{a}{2}}\widehat{se}(\widehat{\beta_l})}, e^{\widehat{\beta_l}+z_{1-\frac{a}{2}}\widehat{se}(\widehat{\beta_l})})$.

[Insert Table1]

In the first model, I include team type, which is one of main explanatory variables; industry type; business type; the number of helpers; and the number of persons who made significant contributions to the businesses. The baseline is solo team for the variable team

type. The exponential coefficients for the five dummy variables of team type indicate the hazard ratio of the termination hazard for the five types of teams to the termination hazard for solo teams. Among the five dummy variables of team types, teams only consisting of friends have the only hazard of termination significantly different than the hazards for solo entrepreneurs. The hazard ratio is 1.499, which is significant at the level of 0.005. The number of helpers does not have a significant effect on the hazard of termination. Having at least three persons making significant contributions to a start-up will significantly reduce the hazard of termination by 60%.

In model2, I add all the variables of human capital to model1. Except for experience in related industries, all other variables, including managerial experience, the number of other businesses owned by owners and the number of businesses started by owners, are not significant. The hazard rate of termination decreases by 0.025 with a one year increase in work experience. The magnitude of impact is not trivial, but not large, either. With an additional ten years work experience in related industries, the hazard rate of termination will decrease by 10% ($\exp(10 * \log(0.975))$. Looking at the two times negative log likelihood to see the increases in the global effects of the model, the difference in two times negative

log likelihood is 50.6. Correspondingly, as for the chi square test of the difference in -2LL with degrees freedom of 7, 7.228 is not significant and the p value is 0.4053. This means that adding the human capital variables to the model does not improve the explanatory power significantly.

In model 3, I test the effects of work hours and invested financial capital. The baseline for invested hours is the category of less than 300 hours. The first dummy variable is more than 300 hours but less than 1000 hours. The second dummy variable is more than 1000 hours. Compared to the hazard rate of termination for teams which spent less than 300 hours in their start-ups, the hazard rate of termination for teams which had spent more than 300 hours but less than 1000 hours increases by 40% whereas the hazard rate for teams which spent more than 1000 hours decreases by 33%. It suggests that entrepreneurs quit startups after they have invested a certain amount of time and perhaps realize that they could not obtain as much revenue as they expected. However, if entrepreneurial teams are persistent and invest more than 1000 hours, the hazard rate of termination for their teams will decrease. I also included the variable of the number of owners spending more than 35 hours per week in a startup. The greater the number of owners on a team spending greater than 35

hours per week, the lower their start-up's hazard rate will be. However, the magnitude of the decrease in hazard rate resulting from a larger number of owners spending more than 35 hours per week is only 0.008, which is not substantively significant.

As for the invested financial capital, I include the logarithm of invested dollars by the first interview date and the logarithm of extra money invested by the later three follow-up interview dates. Except for the invested financial capital during the third and fourth interviews, the money invested at the initial point and the money invested in the following two years have significantly positive impacts on start-ups' survival. It is also noticeable that the magnitude of the effects of money invested in later years is larger than the magnitude of money invested by the first interview date. With controlling for financial capital and work hours, teams consisting of spouses and other have a significantly higher hazard rate than solo teams. In descriptive results, we have found that such teams are advantaged in financial capital. This suggests that the large amount of invested financial capital can suppress the higher hazard rate for teams having spouses and others. However, it also indicates that, given the same financial capital, teams having spouses and others have a higher hazard rate than

solo teams. Also, controlling for invested financial capital and work hours, teams of friends still have a higher hazard rate than solo entrepreneurs.

In model4, both teams having friends and spouses and teams having only friends no longer have significantly different hazard rates than solo entrepreneurs, while controlling for the number of owners having other jobs. But almost all the significance levels and the substantive effects of financial capital and work hours remain the same when I control for the number of owners having other jobs. For example, the hazard ratio for logarithm invested financial capital by the first interview date is 0.93.This means that the hazard rate will decrease by 0.07 with a one unit increase of logarithm money. If team A invested 1000 dollars and team B invested 20000 dollars by the first interview date, the hazard rate for team B will be 0.14 (0.07*2) less than the hazard rate for team A. However, if the 19000 dollars difference occurred between the second interview and third interview, the decrease in hazard rate will be 0.66 (0.33*2) given the amount of financial capital invested at the initial point.

In model 5, I test the effects of start-up activities undertaken by entrepreneurial teams. The hazard rate for new ventures decreases by 11% with one additional activity undertaken by teams. Results of model 6 suggest that the hazard rate of termination for a start-up will

decrease by 43% if a start-up has obtained stable positive cash flow. While controlling for the number of activities undertaken by teams and the performance of start-ups, the effects of extra money invested after the initial point decrease somewhat but still remain fairly substantive and significant. However, the hazard ratio of the hazard rate for teams having spouses and others and the hazard rate for solo teams is significant again. The interpretation is that teams having spouses and others have a higher hazard rate of termination than solo entrepreneurs, given the same performance.

[Insert Table2]

In Table 2, I present the results from Cox Proportional Hazard models on success. Success is defined as obtaining stable positive cash flow in this paper. In model 1, I include all control variables and the explanatory variable team type. Teams only consisting of kin have significantly higher success rate than solo entrepreneurs. As I mentioned earlier, kin teams have the largest probabilities of obtaining stable positive cash flow. In survival models, we are not only interested in the odds of success but are also interested in the time of success. The baseline is solo team in this model. I am also interested in the comparison between any pair of teams. As we can see, the ratio of the transition rate of success for teams having

friends and kin to the rate of success for solo teams is 0.506. This suggests a lower transition rate of success for teams having friends and kin than that for solo entrepreneurs. To see whether the difference is significant, I contrasted any possible pair of teams and report the results in table 2. Except for the contrast between teams of kinship and solo entrepreneurs, none of the p-values are significant. Thus, the only pair of teams whose transition rates of success are significantly different is the pair of teams only having kin and solo teams. In model 2, I test the effects of human capital on the transition rate of success. Education level, managerial experience, and work experience in related industries do not have significant effects on success. However, the start-up experience, measured by the number of start-ups started by team members and the number of businesses owned by team members, has a significant effect on success. At first glance, we can see that if team members own other businesses, the start-up that they are starting has a lower transition rate of success. However, the number of other businesses started by owners has a positive effect on a new venture's success. When we interpret the effect of owning other businesses, we should connect it with the number of businesses started by owners because the number of businesses owned by owners is dependent on the number of businesses started by owners. The transition rate of success will increase by 120% with two additional businesses started by owners. The

transition rate of success will decrease by 60% with two additional businesses owned by owners. This means that the transition rate for a team for which team members have, on average, started two businesses and owned two businesses will be 60% lower than the transition rate for a team for which team members on average have, on average, started two businesses but do not own any businesses. I am not saying that ownership of other businesses by team members has negative effects on a new venture's success. The correct interpretation is that, given the number of businesses that owners have started, if they own these other businesses, the transition rate of success for the new venture that they are starting is lower than when they do not own these new business. The explanation might be that owners can spend more time in the new ventures that they are currently starting if they do not own other new ventures. However, I control for the work hours in model 3 and the negative effects of having other new businesses still hold.

In model3, I test the effects of work hours and invested financial capital on the transition rate of success for teams. Compared to teams spending less than 300 hours, teams spending more than 1000 hours have a much higher transition rate of success. The increase in transition rate is 165%. Unlike what I found in the results for hazard rate of termination, it is

the financial capital invested by the second interview date rather than the later period that mostly influences the performance of a start-up. This makes sense because the time of obtaining stable positive cash flow will be postponed if a team invests extra financial capital later. As I pointed out above, the average age of obtaining stable positive cash flow is 30-40 months. At the moment of our second interview date, most new ventures are about 30-40 months old. This suggests that investing extra financial capital in a window of time shortly after the investment of money at the initial point will help a new venture get substantial revenue more quickly.

In model 4, I test the effects of the number of owners working more than 35 hours per week on the new ventures. Taking the number of owners spending more than 35 hours per week into consideration, the higher transition rate of success for kin teams is not significant any more. I model5, I added the number of activities undertaken by entrepreneurs and the interaction of the time varying variable with time. The more activities undertook by entrepreneurs, the higher transition rate of success for a start-up. The negative significant effects of the interaction variable of the count of events and time suggests that if a team is slower in undertaking activities, a startup will be slower in transition rate success. The

contrasts shown in table 2 show two significant contrasts: the first between teams having friends and kin and teams having only friends; and the other between teams having only friends and teams having only kin.

DISCUSSION

I examined why entrepreneurial teams differ in survival and success. I unpack the black box of team composition by exploring the resources invested by teams, the start-up efforts made by teams, and the cooperation between team members. To analyze the emergence of new business firms, I examine both survival and success to better differentiate surviving new ventures from new ventures with good performance. By the time of our fourth annual interview, the probability of survival is 60% while the probability of success is only 17%. Unlike previous studies showing that human capital is one of the strongest factors influencing new ventures' survival, this study finds that the financial capital invested by teams and the start-up efforts made by teams are the most significant factors. However, teams' start-up experience does have substantive and significant effect on new ventures' performance. My finding also reveals that the magnitude of financial capital's effects on success is smaller than the magnitude of financial capital's effects on survival. My interpretation is that the positive effects of financial capital upon survival is not only through

improving performance but also through the escalated commitment generated by resource investment itself.

In my analysis, the facets of team composition serve as the conditions which constrain or facilitate team members' efforts, cooperation, and investment of resources. In the descriptive results, I found that mixed teams of spouses and others are stronger in their resources profile, but I did not find that such teams are advantaged in survival or success. The dark horse is the team consisting of only kin. While teams consisting of only kin have lower survival rates, such teams have much higher transition rates of success than other teams. The advantages are mostly explained by the number of owners working more than 35 hours per week and by their financial capital. However, the existence of both a small probability of survival and a large probability of success also indicate the large variance within this type of team.

The effects of team composition are more complicated than scholars have previously stated. I showed how the relationship between owners influences new ventures' survival and success, but I did not explain why teams consisting of kin have a higher transition rate of success than spousal teams. The difference between the two types of teams in survival rate

and success rate indicates that we need to specify family ties. Spousal teams are more like solo entrepreneurs, in both resource investment and outcomes. The second issue not explored in my analysis is the explanation for why two types of mixed teams are different. Why are mixed teams of spouses and others doing better than mixed teams of kin and friends? Overall, teams composed of mixtures of two different types of social contacts are a minority in the population of entrepreneurial teams. However, as the new ventures survive and grow, entrepreneurial teams may expand by recruiting people representing various social ties.

Figure 1K-P estimate of Survival Function of New Ventures

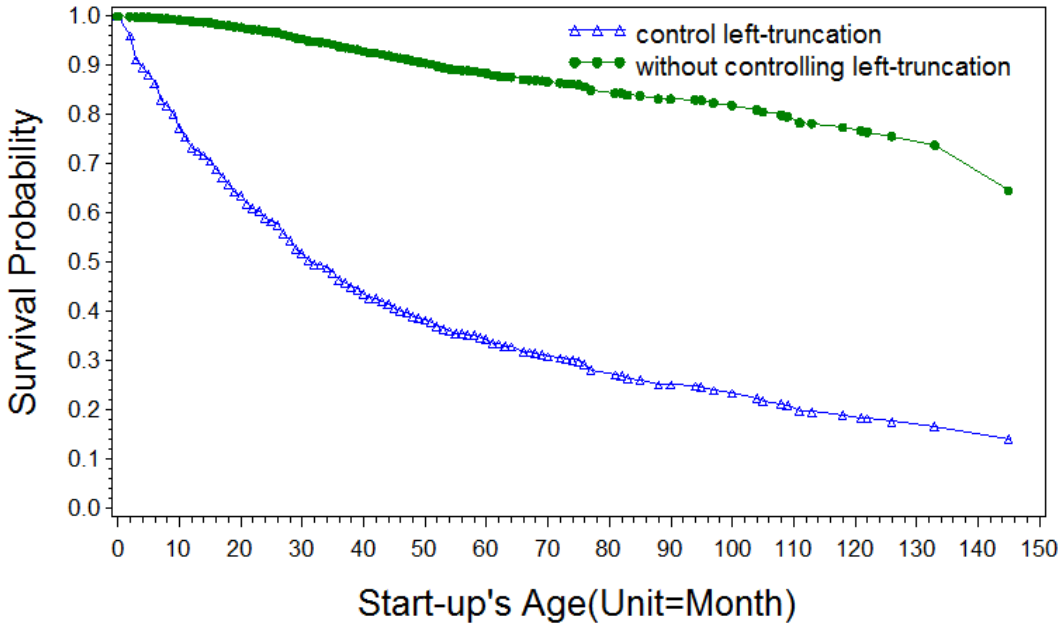

Figure2. Survival Function and Non-Success Function of New Ventures

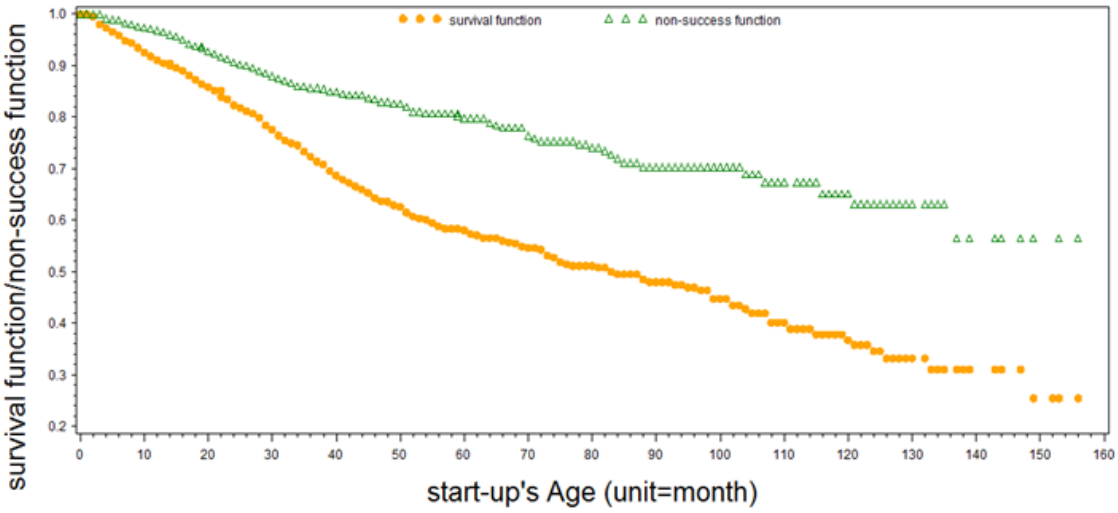

Table 1. Model Results of Cox Proportional Hazard models on Termination

Parameter	Model1	Model2	Model3	Model4	Model5	Model6
industry.						
retail/wholesale	1.577**	1.484*	1.476**	1.439*	1.436*	1.484*
Consumer	1.00	0.95	1.00	0.98	0.99	1.01
Professional	1.13	1.19	1.26	1.22	1.17	1.21
business support	1.06	1.04	1.01	0.97	0.86	0.88
business type.						
purchase	0.69	0.73	0.89	0.89	1.44	1.45
franchise	0.95	0.90	0.78	0.80	0.90	0.90
multi lmarketing	1.625*	1.555*	1.31	1.52	1.817**	1.867****
sponsored	1.03	1.21	1.25	1.26	1.44	1.52
# of helpers						
1.00	1.28	1.20	1.22	1.25	1.498***	1.516***
2.00	1.05	0.94	1.17	1.16	1.26	1.22
3.00	1.27	1.23	1.35	1.465*	1.33	1.33
# of persons						
1.00	1.05	0.99	1.05	1.06	1.22	1.21
2.00	1.10	1.04	1.03	0.97	1.07	1.04
3.00	0.407****	0.42***	0.431***	0.466**	0.57	0.59
Team type						
spousal	1.06	1.09	1.01	0.87	1.04	1.03
spouse&other	1.53	2.049*	2.395***	1.67	2.087*	2.064*
kin&friends	0.96	1.56	1.43	1.12	1.11	1.10
only friends	1.499***	1.926****	1.783***	1.51	1.34	1.34
only kin	1.04	1.15	1.04	0.93	1.01	1.05
average education		0.92	0.895*	0.888**	0.99	0.98
# of males		0.87	0.90	0.85	0.87	0.88
avg managerial		0.99	1.00	1.00	1.00	1.00
avg work exp		0.975****	0.973****	0.974****	0.977****	0.978****
# of biz started						
1.00		0.95	0.85	0.81	0.87	0.87
2.00		1.23	1.03	1.04	1.18	1.22
at least 3		0.86	0.84	0.88	1.00	1.01
# of biz owned						
1.00		1.04	1.10	1.15	1.18	1.15

2.00		1.06	1.10	1.11	1.05	1.00
at least 3		0.90	0.79	0.74	1.05	0.99
invested hours.						
300<=hours<1000			1.398*	1.439*	1.16	1.18
hours>=1000			0.664***	0.649***	0.87	0.85
Log money			0.937****	0.93****	0.966*	0.964***
# of owners 35 h/w			0.991****	0.992****	.0.992***	0.987***
money 2nd interview			0.727****	0.725****	0.694****	0.694****
money 3rd interview			0.678***	0.676***	0.669***	0.672***
money 4th interview			0.10	0.10	0.09	0.09
owners' other jobs						
1.00				0.88	0.91	0.89
2.00				1.36	1.41	1.36
3.00				1.43	1.55	1.49
4.00				2.724*	2.30	2.09
# of activities					0.896****	0.906****
cash flow						0.576***
Event	445.00	444.00	442.00	442.00	442.00	442.00
censored	2841.00	2827.00	2826.00	2820.00	2820.00	2820.00
-2 LOG L	5679.4	5628.80	5390.10	5371.10	5237.10	5226.70
AIC	5717.40	5686.80	5462.00	5451.10	5319.10	5310.70
SBC	5795.30	5805.60	5609.30	5614.80	5486.90	5482.50

****<0.001,***<0.005,**<0.01,*<0.05

Table 2. Model Results of Cox Proportional Hazard models on Success

Parameter	Hazard Ratio	Hazard Ratio	Hazard Ratio	Hazard Ratio	Hazard Ratio
industry					
retail/wholesale	1.232	1.344	1.359	1.404	1.104
Consumer	0.825	0.993	1.066	1.032	0.767
Professional	1.072	1.13	1.155	1.136	0.986
business support	1.166	1.235	1.203	1.284	1.288
business type.					
purchase	1.395	1.167	1.448	1.342	0.931
Franchise	0.863	1.002	1.096	1.183	1.291
multi marketing	0.419	0.485	0.533	0.611	0.655
sponsored	1.94*	2.057*	2.414***	2.26**	1.589
# of helpers.					
1	1.458	1.53	1.448	1.385	1.32
2	1.253	1.261	1.243	1.293	1.144
3	1.577	1.555	1.349	1.396	1.582
# of non-owner					
1	1.253	1.325	1.393	1.391	1.125
2	0.665	0.603	0.537	0.55	0.497*
3	1.252	1.16	1.196	1.21	1.001
solo					
spousal	0.95	0.905	0.946	0.839	0.767
Spouse & other	1.731	1.635	1.574	1.408	1.011
Kin & friends	0.506	0.516	0.559	0.356	0.393
only friends	1.451	1.455	1.336	0.966	0.891
only kin	1.982*	2.02*	2.185*	1.898	1.934
average education		1.024	1.009	1.041	0.966
# of males		1.075	1.048	1.107	1.135
avg managerial exp		1.012	1.007	1.009	1.02
avg work exp related		1.01	1.012	1.012	1.012
# of businesses started					
1		1.314	1.32	1.373	1.021
2		2.201***	2.18***	2.205***	1.073
at least 3		1.326	1.333	1.345	0.89
# of businesses owned					
1		0.476***	0.471***	0.488	0.529*
2		0.413*	0.413*	0.423*	0.594
at least 3		0.591	0.638	0.647	0.307

invested hours.					
300<=hours<1000			0.819	0.915	0.774
hours>=1000			1.654*	1.305	1.32
money 1st interview			1.011	1.006	0.989
money 2nd interview			1.101***	1.096***	1.094***
money 3rd interview			1	0.99	0.989
money 4th interview			0.865*	0.863*	0.951
# of owners 35 h/week					
1				1.447	1.032
2				2.464**	0.931
3				0.733	1.012
4				0	0
# of activities undertook					1.436****
# of activities undertook varying with time					0.994****
event	156	155	155	155	155
censored spells	2702	2689	2688	2687	2687
-2 LOG L	1929.59	1892.86	1868.96	1859.55	1643.233
AIC	1967.6	1950.86	1938.96	1937.55	1725.233
SBC	2025.5	2039.12	2045.48	2056.24	1850.013

****<0.001,***<0.005,**<0.01,*<0.05

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