



**THE FLIP SIDE OF THE COIN:  
NASCENT TECHNOLOGY VENTURES AND CORPORATE VENTURE FUNDING**

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SEPTEMBER 2005

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## **ABSTRACT**

My study examines when and why technology entrepreneurs raise venture funding from corporations. I focus on how strategic and social capital drivers influence entrepreneurs when making these critical funding decisions for their technology ventures. I draw on previous research on resource dependence, appropriability, and social capital to argue when entrepreneurs will seek corporate venture funding. Utilizing empirical data on venture fundraising rounds over a 25-year period, I assess which factors explain these funding decisions. My findings suggest that resource needs, technology development, prominent affiliate partners, and socio-regional differences influence entrepreneurs when deciding to raise funding from corporations.

## **THEORETICAL BACKGROUND**

The genesis of new ventures is an important topic in organization theory and strategy. New ventures are of interest to a wide set of researchers including those who study the birth and death of organizations (Delacroix and Carroll 1983), the social ties that enable entrepreneurs to build successful ventures (Thornton 1999; Shane and Cable 2002), and the imprinting effects of founding team demographics and early management styles (Boeker 1988; Eisenhardt and Schoonhoven 1990; Baron et al. 2001). Studying new ventures allows scholars to study these important issues as they evolve from an organization's inception.

One aspect of paramount importance to entrepreneurs is access to financial resources. Venture funding is an especially crucial resource because new ventures tend to be cash flow negative and trying to expand rapidly (Bygrave and Timmons 1992). Because funding is critical for new ventures, researchers have studied how venture investments begin (Bruno and Tyebjee 1985) and why some investment processes are more effective than others (Gompers 1995).

The research addressing these issues has traditionally focused on the investor's perspective, and relies primarily on agency theory and social capital arguments to understand the investment decision-making, management, and contribution of venture capitalists (Gorman and Sahlman 1989; Fried and Hisrich 1994; Sapienza and Gupta 1994). Researchers have also explored the unique issues of corporate venture investing, defined as direct investments by established corporations in private ventures (Kann 2000; Maula 2001). This literature augments the agency theory and social capital findings on venture capital by addressing the role of the strategic fit between corporate investors and new ventures (Hellmann 2002; Henderson and Leleux 2002; Wilson et al. 2004).

Realizing that fundraising is one of the earliest strategic activities entrepreneurs undertake, researchers have recently turned to the entrepreneur's perspective of venture investing (e.g. Hsu 2004). Deciding when and from whom to raise venture capital affects a venture's corporate governance, alliance partners and competitors, and early financial performance (Hochberg 2004). This research stream describes why entrepreneurs raise venture capital (Sandberg 1986; Kortum and Lerner 2000), which entrepreneurs raise venture capital (MacMillan et al. 1985; Schefczyk and Gerpott 2000), and how they initially approach venture capitalists (Wright et al. 1997; Lee et al. 2001; Hellmann 2003).

While this literature from the entrepreneur's view of venture capital complements the previous work from the investor's side, it has generated little insight into the entrepreneur's view of corporate investments. There are several unexamined drivers for when entrepreneurs will raise corporate funding. One emerges from the differences in funding capacity between venture capitalists and corporate investors coinciding with a venture's evolving resource needs over time (Gompers and Lerner 1999). Another potential driver comes from the strategic benefits

corporate investors anticipate when investing in new ventures (Kann 2000). Such strategic motives may create unique issues around access to technology between a venture and corporate investors that entrepreneurs avoid with venture capital firms. In addition to these strategic drivers, there are several social factors that may play a role. For example, prior research has noted that venture capitalists help entrepreneurs to connect with future investors and that prominent venture capitalists contribute to new ventures in a myriad of ways (Bruno and Tyebjee 1985; Smith 1999; Stuart et al. 1999; Hsu 2004), but the research has not examined the role of venture capital status in connecting entrepreneurs with corporate investors.

This research gap around the entrepreneur's view of corporate investments appears particularly glaring in light of fruitful new research on the experience of entrepreneurs at acquired technology ventures (Graebner and Eisenhardt 2004). My study aims to advance this growing research stream that examines "the flip side of the coin" by specifically addressing the entrepreneur's view of corporate venture investments. The primary research question of my study is: *When and why do entrepreneurs raise corporate venture funding?* That is, what are the conditions that influence the likelihood and timing in which entrepreneurs raise corporate funding?

This research question is important because raising corporate funding allows entrepreneurs to engage firms that can provide both complementary resources and external legitimacy (Maula 2001; Santos and Eisenhardt 2004). And because corporate investors have their own strategic goals for investing in new ventures they can impose unique control and appropriation risks for entrepreneurs (Gompers and Lerner 1999; Dushnitsky 2004; Keil et al. 2004). These strategic benefits and risks make research on these issues compelling for both entrepreneurship and strategic management scholars.

## **HYPOTHESES**

There are six primary hypotheses for the study:

*H1a: Entrepreneurs with greater financial resource needs will be more likely to raise corporate venture funding.*

*H1b: Entrepreneurs with greater complementary resource needs will be more likely to raise corporate funding.*

*H2a: Entrepreneurs with more appropriable technology will be less likely to raise corporate venture funding.*

*H2b: Entrepreneurs with later stage technologies will be more likely to raise corporate venture funding.*

*H3a: Entrepreneurs with funding from prominent venture capital firms will be more likely to raise corporate venture funding.*

*H3b: Entrepreneurs with funding from prominent venture capital firms that discontinue investing will be more likely to raise corporate venture funding.*

*H4: Entrepreneurs in well developed entrepreneurial regions will be more likely to raise corporate venture funding.*

## **PILOT STUDY**

This project began with a field study where I interviewed nine individuals involved in funding Silicon Valley high-tech ventures. The goal of the pilot was to explore the experiences of entrepreneurs and investors in the fundraising process. The interviewees included entrepreneurs, angel investors, venture capitalists, and corporate investors. The interviews highlighted the role of corporate investors in funding new ventures and provided preliminary findings about the entrepreneur's perspective of corporate investors. Overall, the entrepreneurs saw value in corporate investors, but tried to manage the risks with varied means including: allowing multiple corporations to invest to counteract each other, keeping them off the board, excluding them to later rounds, or contracting out the risks directly in their term sheets.

## **SAMPLE**

The sample of ventures was drawn from the population of U.S. technology ventures that received their first venture funding from 1979-1995. I started the sample in 1979 because that was the year pension fund managers were first allowed to invest in venture capital. This dramatically increased the supply of venture funding in the ensuing years and helped institutionalize the venture capital industry (Bygrave and Timmons 1992). I concluded the sample selection in 1995 to ensure that the sample ventures were not instances of entrepreneurs being emboldened to start ventures by the funding excesses of 1996-2001 (Sahlman 2001). Fundraising data on the ventures was collected through 2003, the last full year of available data.

The primary data source was the Venture Economics database which includes detailed information about ventures, firms investing in these ventures, and funding rounds. Venture Economics collects the data from venture capitalists and corporate investors through the National Venture Capital Association (NVCA) which includes over 400 venture investors with venture capital firms such as Austin Ventures, Charles River Ventures, and Kleiner Perkins Caufield and Byers, as well as corporate investors like Eli Lilly and Intel. The Venture Economics database has been tested and used extensively by researchers in prior studies (Gompers and Lerner 1999).

To collect a representative sample of technology ventures, a stratified random sample of 781 ventures was chosen from the technology ventures that received their first funding in 1979-1995. The sample size was chosen using statistical power calculations to capture small effects given the number of variables in the statistical models (Cohen 1988; Green 1991). The sample represents approximately 12% of the technology ventures funded during this time period and was stratified by five industry groups: biotechnology, medical, communications, semiconductors, and software. These five industries were the largest technology industries during the study period.

## VARIABLES

The primary dependent variable of the study is whether a venture receives corporate venture funding (*CVF*). This is a binary variable where *CVF* equals one if a venture receives corporate venture funding in an investment round and equals zero if not. I also construct two related dependent variable measures: the *number of corporate venture investors* and the *hazard rate to first corporate venture funding*.

There are eight primary independent variables in the study. *Resource needs* is the amount of capital a venture requires in a funding round. I measured resource needs by the funding round amount in millions of U.S. dollars. Round amount is an effective measure of resource needs because entrepreneurs determine the size of a funding round by trading off their capital requirements against unnecessary ownership dilution from raising excessive funding. This tension keeps entrepreneurs from raising less funding than they need and risking the viability of the venture, and raising more than they need and rendering too much ownership to investors (Gompers and Sahlman 2002). I used the producer price index (PPI) for finished goods to adjust round amount for inflation and then logged it to mitigate skewness.

*Complementary resources* are those additional resources that a venture does not have but requires to be viable. Since the need for complementary resources varies widely at the industry level (Arora and Gambardella 1990), I chose to measure it at that level. Specifically, I measured complementary resources with a three point scale where the industries requiring the most complementary resources receive a three (biotechnology and medical), those requiring moderate amounts receive a two (communications and software), and those requiring the least receive a one (semiconductors).



Patents and secrecy are two alternative measures for *technology appropriability* risk. I measured patents and secrecy directly from a scale developed by previous researchers that estimates the effectiveness of these two mechanisms against appropriation risks (Levin et al. 1987; Cohen et al. 2000). In industries where patents are more effective, entrepreneurs will be more likely to raise corporate funding because they view appropriation risks as manageable. In contrast, if ventures are required to rely on secrecy to protect their technology, appropriation risks will be higher because corporations often require ventures to share information about their technologies before investing (Dushnitsky 2004). To standardize the patent and secrecy measures, I logged the scales so the variables would have approximately the same range.

*Technology stage* is the development stage of a venture's technology. It is used to test whether entrepreneurs push corporate funding into later stages when their technology is better developed to mitigate appropriation risks. I measured technology stage by using the investment round number and logging it to reduce skewness. This is an effective measure of technology stage because it captures the duration in which a venture has developed the technology.

*Venture capital status* is the social capital of an investing venture capital firm. I measured venture capital status to encompass both the status and network elements of social capital (Granovetter and Swedberg 1992), and utilize venture capital centrality rankings from a study on investment syndication networks (Piskorski and Snellman 2004). I measured venture capital status by coding the ten most central early stage venture capital firms from the Piskorski and Snellman (2004) study into a dummy variable equal one whenever one of the ten firms invests in a round and equals zero otherwise. I conducted several robustness tests for this measure which are not included in this summary.

*Status loss* is the likelihood that a venture loses its organizational status over time. I use this variable to test whether entrepreneurs try to compensate for a loss of status by raising corporate funding. I measured status loss by whether a prominent venture capital firm invested in a round and subsequently discontinued investing in the next round.

*Venture region* is the location of the venture in a well-developed venture area. I measured venture region with a dummy variable that is one for a venture located in Boston or the Silicon Valley and zero for other regions. Following Saxenian (1999), I defined Boston to include Middlesex, Norfolk, Suffolk, and Essex counties and Silicon Valley to include all of San Francisco, Alameda, San Mateo, and Santa Clara counties.

I included control variables for the year of the investment round because the amount of venture funding varies cyclically over time (Sahlman and Stevenson 1985; Gompers and Lerner 1999). Year effects are incorporated into the models by using yearly dummy variables.

## **STATISTICAL METHODS**

The primary statistical technique for the study was logistic regression. I used logistic regression to test the likelihood that a venture receives corporate funding in an investment round. The model is:  $\ln[p_{ij}/(1-p_{ij})] = \alpha_{ij} + \beta_{ij}X_{ij}$ , where  $p_{ij}$  is the probability that venture  $i$  raises corporate venture funding in a funding round  $j$  and  $X_{ij}$  is the set of independent and control variables. I also used a negative binomial regression and an event history model to further probe the hypotheses. The negative binomial regression was used to analyze whether the factors that predict the likelihood of raising corporate funding also predict the number of corporate investors that will be engaged in a funding round. I used a Cox event history model (Cox 1972; Tuma and Hannan 1984) to analyze the rate of first corporate venture funding. Cox regression allows me to isolate the potentially unique role of the first corporate investor in each venture.

## **FINDINGS**

The main findings of the study reveal positive effects for financial resource needs, technology stage, venture capital status, and well-developed venture regions on the likelihood that a venture raises corporate funding. Entrepreneurs are more likely to raise corporate funding when their financial needs are greatest, when their technology is more developed, they have high status venture capitalists, and they are located in well developed venture regions.

I also conducted some split sample analysis which was not described in this summary. The split sample results highlight several additional findings. Venture capital status appears less important for the biotechnology industry than the other industries, and the medical industry appears different from the other industries in that the main variables do not show significant results. The split sample analysis also highlights that having high status venture capital is more important in the middle rounds for raising corporate funding, venture capitalists discourage entrepreneurs from seeking corporate investors when they cannot defend their technology with patents, locating in Silicon Valley or Boston provides some of the benefits of having high status venture capital, and that losing a high status venture capital investor has a more negative effect on ventures in these well developed venture regions.

Additionally, corporate venture funding appears to be more prevalent than previously believed. Prior studies have estimated that 20-25% of ventures receive corporate funding (Ernst-&-Young/VentureOne 2002). While only 14% of the investment rounds in my sample include corporate investors, almost 40% of the sample ventures received corporate funding when looking across all their funding rounds. One explanation for this discrepancy is that technology ventures, the foci of my study, may raise corporate funding at higher rates than non-technology ventures, making the results of this study all the more relevant for would be technology entrepreneurs.

## **CONTRIBUTIONS TO PRACTICE**

This dissertation highlights the resource benefits from having corporate investors. It also notes that corporate investments are fraught with risks for new ventures as corporations have distinct strategic goals for investing in emerging ventures. One entrepreneur articulated this by contrasting venture capitalists who are focused on financial returns and “primarily interested in the long-term success of your company” against corporate investors who want you to “set your course in alignment with whatever their agenda is in the marketplace.” Consequently, entrepreneurs should recognize these risks and manage the relationships carefully to prevent being overrun by their corporate investors. This research project finds limited evidence that entrepreneurs use investment timing as a strategy for managing such corporate control risks.

## **CONCLUSIONS**

Overall, the contribution of the study is to elucidate the entrepreneur’s perspective of corporate venture investing. I developed two theoretical approaches from strategy and social capital research and tested the arguments using longitudinal archival data on nascent technology ventures. By modeling the influences of strategy and social capital, the study provides access to multiple logics used by entrepreneurs in corporate funding decisions.

I found that equity investments are crucial for creating external credibility. This is especially true for ventures that lose credibility when a prominent venture capital firm discontinues investing. At the same time, entrepreneurs trade off these affiliation benefits against risks of losing control of the venture to their investors. Entrepreneurs manage these risks by pacing corporate investments to occur when their resource needs are greatest, when they lose backing from prominent venture capitalists, and when they have greater control of their technology and market.

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