

## **THE IMPORTANCE OF DISTANCE AND LOCATION IN VENTURE CAPITAL FINANCE**

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### **ABSTRACT**

We examine the role of distance and network effects in venture capital investing. The majority of venture capital investment activity in the United States occurs in California and Massachusetts. However, growth in the industry throughout the 1990s has led to an increase in activity outside of these areas. Alongside this development in venture investing outside of the traditional centers of activity, we find that the average distance between venture capitalists and portfolio companies has shown no tendency to increase. We find evidence that firms that are farther away from the venture capitalists funding them are less likely to achieve a successful exit. This result is robust when controlling for other factors that influence the success of venture investments. *JEL classifications: G24, D80.*

### **INTRODUCTION**

Research by Petersen and Rajan (2002) has shown that distance between commercial banks and small business borrowers has become much less important due to improvements in information technology over time. They demonstrate a shift in the nature of small business lending from a focus on strict ex ante screening to less costly ex post monitoring. Firms in the venture capital industry typically provide capital to small businesses that are prohibitively risky for commercial banks. Venture capitalists are not as likely to have the benefit of prior relationships with entrepreneurs seeking venture capital as commercial banks may have with small businesses seeking loans, and they also tend to engage in a more active role in monitoring their investments. Because of this, it is less likely that technological improvements will allow for a similar shift from screening to monitoring in the venture capital industry.

Research in the venture capital field has emphasized the role of the venture capitalist in the ex post monitoring of their portfolio companies.<sup>1</sup> The extent of the monitoring role has been shown to be dependent upon the distance between venture capitalists and their investments. Lerner (1995) analyzes the differences in the monitoring intensity of venture capitalists when the distance to portfolio companies increases. He finds that venture capitalists are more likely to be board members of their portfolio firms if they are closer to the portfolio company. Because monitoring costs are higher the farther away the firms are located, this conclusion is intuitive. The impact of these disparities in the monitoring of portfolio firms has yet to be analyzed. Because the monitoring role of the venture capitalist is considered to be so crucial to the development of high-risk portfolio firms, our expectations are that portfolio firms that are farther away from their nearest, associated venture firms will face a higher risk of failure.

This monitoring component of venture investing is the key difference between commercial bank lending and venture capital investing. Commercial banks have become more dependent on so-called, “hard” information in the monitoring of small business loans.<sup>2</sup> Hard information has become less costly to obtain in recent years due to advances in information technology, allowing for the role of distance to diminish in importance for commercial banking over time. While improvements in technology have made it less costly for distant firms to receive commercial bank financing, we predict that distance still matters for successful venture capital financing. Hard information may be helpful to venture capitalists in their monitoring role, but the traditional role of a venture capitalist in the development of portfolio companies requires frequent contact with firm management, through phone calls or visits to the firms, and often sitting on the board of directors, among other responsibilities.

The active nature of venture capital investing precludes a similar shift in focus from screening to less costly monitoring by use of hard information. The ex post monitoring of portfolio companies relies on the gathering and processing of soft information, as well as steering entrepreneurs in the right direction when necessary. This is not unlike the syndicated loan market in the sense that there is a need for more intense monitoring when information asymmetries are more pronounced. Sufi (2007) examines the behavior of participants in the syndicated loan market and shows that lenders that participate in syndicates tend to be geographically closer to borrowers that have limited public information available (i.e., firms that have no SEC filings or no credit rating). Presumably, the lead banks are seeking to mitigate the need to gather information by inviting local banks to join the syndicate, particularly in cases where the local banks have a prior relationship with the borrowing firm.

Distance may also be a factor due to an informational advantage in the screening of potential investments, much like evidence from public stock market investing. Coval and Moskowitz (2001) demonstrate that professional fund managers earn significantly greater returns from local investments, attributing the abnormal returns to superior monitoring or possibly greater access to private information regarding local firms. The idea that distance matters in stock market investing is also supported by Ivkovic and Weisbrenner (2005), who show that individual investors’ local investments tend to outperform their overall investment portfolio. They argue that this lends further support to the idea that local investors have access to better information regarding the potential of local firms. Gaspar and Massa (2007) demonstrate that local ownership results in improved monitoring of firm activity, though the effects on the firms’ stock prices are offset by lower liquidity due to adverse selection for less informed investors. Further research has demonstrated an informational advantage for local stock analysts. Malloy (2005) shows that local analysts are significantly more accurate than those analysts located further away from the firms that they cover, particularly when information asymmetry is more likely to be a problem in analysts’ coverage of the firms (e.g., firms in more remote areas or small firms). Bae, Stulz and Tan (2008) find similar results using cross-country data with a sample of 32 countries, again with most significant results where private firm information is most difficult for analysts and investors to access.

Butler (2008) examines the importance of distance in investment banking and demonstrates that soft information is still important to the municipal bond underwriting industry. Unlike commercial banks, investment banks have been unable to take full advantage of the recent changes in information technology. There is little need for ex post monitoring in investment banking, and improvements in the

production of hard information may have limited benefits to the ex ante screening process. Thus, Butler concludes that local underwriters hold an advantage over non-local underwriters, especially when underwriting high-risk or non-rated bonds. He interprets this result to show that local investment banks are better able to assess soft information, allowing them to charge lower underwriting fees and sell bonds at better yields.

#### **NETWORK EXTERNALITIES**

Growth in venture capital investing in the 1990s was accompanied by some important changes in the industry, including the development of venture capital firms across the United States. We examine the extent of the development of venture investing outside of the traditional centers of venture investment activity, Silicon Valley in California and Route 128 in Massachusetts. To be sure, these areas still dominate the investment activity that is tracked by the Securities Data Corporation. California and Massachusetts firms receiving venture capital accounted for \$2.4 billion of the \$4.3 billion in venture investments in the third quarter of 2004. There appear to be network benefits to operating venture capital firms near one another. Bygrave (1988) demonstrates the importance of information sharing between venture capitalists to the reduction of uncertainty concerning investments. The principal means of reducing risk is through the syndication of investments among a network of venture capital firms. Syndication allows a greater number of venture capitalists to screen potential investments, thus reducing the likelihood of investing in a poor project.

Bygrave and Timmons (1992) further examine the importance of other network externalities that apparently influence venture investing. Venture capitalists often provide entrepreneurs a list of industry contacts to facilitate the development of the portfolio firm. These contacts may include accountants, lawyers, suppliers, and customers; relationships that are critical to the success of an entrepreneurial firm. It is not unreasonable to assume that there are external benefits to operating a venture capital firm in regions of the country that are known to contain many such firms. These benefits may come in the form of a greater selection of industry contacts to choose from, or simply contacts that are amicable to the venture capitalists due to the volume of business that takes place between them. Sorensen and Stuart (2001) also examine the role of information flow and interpersonal social relations in distribution of venture capital investments across the United States. They conclude that both networks and distance are important factors in investment decision-making in the venture capital industry; and that the stronger the venture capitalists networks are the less important is distance. We will examine the importance of these potential network effects on success alongside our exploration of the role of distance in venture investing.

We proceed with a detailed look at the empirical data in order to determine trends over the past 20 years regarding the distance between venture capitalists and their portfolio companies. It is expected that growth in venture capital investment flows in the 1990s encouraged entry into the venture capital industry, and along with entry we expect that we will find geographic expansion of the industry into states with little prior venture activity. We will observe any changes in the distance between venture capitalists and portfolio firms over this time period, possibly due to the lack of an established venture capital industry in these states with less overall venture activity. Since entrepreneurs are aware of the strength of the industry in California

and Massachusetts, as well as their relative strengths in different industries, venture capitalists that operate in these two states are inundated with proposals for investment.

Venture capitalists operating outside of Massachusetts and California may be forced to consider firms that are farther from their offices because of the lack of good investment projects in close proximity. On the other hand, venture capitalists looking to expand into other parts of the country may choose to operate from California or Massachusetts to take partial advantage of network externalities, but finance portfolio companies outside the state. In either case, any increase in distance between venture firms and entrepreneurs should have consequences since monitoring intensity has been shown to fall as this distance increases.<sup>3</sup>

## **DATA ANALYSIS**

It is useful to first establish if there is any evidence that the distance between venture capitalists and their portfolio firms has changed over time. We can also determine whether there have been trends in venture investing outside of California and Massachusetts. We will describe the data set before we proceed to the analysis.

### **Sample description**

A sample of 10,092 continental U.S. companies that received venture capital funding between January 1978 and December 1997, was drawn from the Securities Data Corporation (SDC) VentureExpert database. The sample is limited to those portfolio companies that received venture capital from independent private partnerships in the U.S. that report to the SDC.<sup>4</sup> Table 1 provides descriptive statistics of the sample by year. It is clear from the average distance statistic that there has been no tendency for the distance between venture capitalists and their investments either to increase or to decrease over the sample period. On a related note, there has been no tendency for venture activity outside of California and Massachusetts to increase at a faster rate than within these two states over the sample period. The average distance between portfolio firms and venture capitalists also appears to be unrelated to whether or not the portfolio firm is operating in either of these two states.

### **Univariate analysis**

Ideally we would examine the actual returns from each investment in order to determine the relative success across our sample. These data are not publicly available, so we use the eventual outcome of the investments as a proxy. Following Gompers and Lerner (1998a, 2000) and Santhanakrishnan (2002), a venture capital investment is classified as a success if the portfolio company was acquired or if the company went public through an IPO (or was in registration for a public offering), and alternatively, IPO only.<sup>5</sup> Table 2 shows the distribution of investment outcomes across the twenty-year sample period. In most years, companies receiving venture capital were more likely to remain private than any other outcome. This is considered a failed investment and these companies are commonly referred to as “the living dead.”<sup>6</sup>

We first organize the dataset into pairs of venture capital funds and portfolio firms. We then focus our analysis on the pair with the shortest distance between offices. The closest venture capitalist is most likely to take the more active role in portfolio company development. We then group the portfolio company-venture capitalist pairs into quartiles by actual distance<sup>7</sup>. The top quartile represents those

**TABLE 1  
SAMPLE DESCRIPTION, BY YEAR**

Fund Year	All States		All States but CA or MA		% outside CA & MA
	Total Portfolio Companies	Average Distance	Total Portfolio Companies	Average Distance	
1978	613	956	245	942	0.40
1979	340	725	129	852	0.38
1980	1,103	889	365	1,003	0.33
1981	1,496	895	583	918	0.39
1982	1,603	901	629	779	0.39
1983	1,928	923	874	724	0.45
1984	2,351	918	1,072	777	0.46
1985	1,221	782	647	717	0.53
1986	1,163	754	590	551	0.51
1987	1,420	778	793	690	0.56
1988	1,085	832	533	822	0.49
1989	1,141	751	466	798	0.41
1990	514	920	261	674	0.51
1991	373	868	158	954	0.42
1992	899	935	363	896	0.40
1993	912	852	474	761	0.52
1994	959	692	468	756	0.49
1995	1,384	892	548	946	0.40
1996	1,409	882	630	873	0.45
1997	2,384	786	1,172	789	0.49

**TABLE 2  
INVESTMENT OUTCOMES, BY YEAR**

Fund Year	Total Portfolio Companies	Initial Public Offering Complete (or IPO filing)	Acquired	Still Private
1978	613	24.3%	36.2%	33.0%
1979	340	21.8	41.2	30.0
1980	1,103	21.9	37.1	33.3
1981	1,496	20.3	35.2	36.4
1982	1,603	18.8	37.0	36.8
1983	1,928	24.4	33.2	34.9
1984	2,351	22.0	35.9	33.5
1985	1,221	23.9	31.1	38.5
1986	1,163	24.1	32.5	36.5
1987	1,420	24.7	28.7	42.3
1988	1,085	27.6	31.3	37.0
1989	1,141	27.3	32.2	35.0
1990	514	29.4	28.0	38.9
1991	373	32.1	28.7	32.7
1992	899	29.4	30.0	36.0
1993	912	24.0	27.9	42.7

portfolio companies that are within 12.90 miles of the nearest venture investor, while the bottom quartile encompasses pairs that are greater than 787 miles apart. This approach deals directly with the question we are trying to answer as we speculate that venture investors are less likely to fully participate in the active monitoring of portfolio firms as the distance between them and their investments increases.

Table 3 provides evidence that the longer the distance between a portfolio company and its closest venture capital investor, the less likely the portfolio company will be successful. The difference between the success rates of the top quartile versus the lowest quartile is once again insignificant for IPOs only, but significant for the measure of success that includes acquisitions. Firms receiving venture capital that are relatively close to the nearest venture investor are more likely to successfully IPO or be acquired than those that are relatively far away from the nearest venture investor. The firms in the top quartile were successful 45% of the time, as opposed to the firms in the bottom quartile success rate of 40%. It is noteworthy that success rates fall from 18.5% to 16.9%, and then to 16.5%, moving from the first quartile to the third, before jumping back to 18.1% for the fourth quartile when defining success as IPO only. This may be due to large venture capital firms that operate on both coasts and the fact that venture firms only report one address to the SDC. If these firms are more disposed to rely upon IPOs for an exit strategy, then they may appear to be more successful at long distance (the last quartile is greater than 787.66 miles) when the distance is more likely much less.

**TABLE 3**  
**UNIVARIATE ANALYSIS, DISTANCE EFFECTS**

*PC-VC pairs by distance quartile*

	<b>1st</b>	<b>2nd</b>	<b>3rd</b>	<b>4th</b>
Number of Pairs	2540	2506	2523	2523
Success Rates (IPO only)	0.1854	0.1692	0.1645	0.1807
<i>t-test</i> , Difference in Success Rates between 1st and 4th quartile:				.432 (.666)
Success Rates (IPO or Acquisition)	0.4504	0.4461	0.4162	0.4023
<i>t-test</i> , Difference in Success Rates between 1st and 4th quartile:				3.463 (.001)***

Notes: (1) \*, \*\*, \*\*\* indicates significance at the 10%, 5%, and 1% levels, respectively.  
(2) The first quartile consists of PC-VC pairs below 12.90 miles apart, the second quartile 12.90 - 110.91, the third 110.92 - 787.66, and the last quartile are pairs separated by more than 787.66 miles. P-Values are in parentheses.

Since we are looking for evidence of network effects in the venture industry, we further classify the portfolio companies in our sample by state and Metropolitan Statistical Area (MSA). Our ex ante conjecture is that success rates for entrepreneurial firms in Massachusetts and California will be higher than the average across all other states. This effect should be even more dramatic in a comparison between firms located in the Boston, San Jose, or San Francisco metropolitan regions and those in all other areas of the country. These are the top three metropolitan regions in both total venture deals and total dollars invested, and are the traditional centers of venture investing in the United States.

Table 4 presents the results of this univariate analysis. Regardless of the measure of success, the data support the theory that the long-established centers of venture activity in California and Massachusetts are more conducive to successful

venture investing. Panel A shows that the rate of successful exit via IPO for firms receiving venture capital in Massachusetts and California is 18.4% versus 16.8% for portfolio companies in all other states. A *t*-test shows that the difference is significant at the 5% level. When considering acquisitions as successful exits, the effects are even more impressive: 46.0% versus 40.1%, significant at the 1% level. Similar results are reported in Panel B, which breaks down the portfolio companies by MSA. Entrepreneurial firms located in the Boston, San Jose, or San Francisco metropolitan regions are more likely to successfully IPO or be acquired. In the following section, we will examine the effects of both distance and network effects on success in a multivariate framework in order to control for other factors that may influence the chances of a successful exit for portfolio companies receiving venture capital.

**TABLE 4**  
**UNIVARIATE ANALYSIS, NETWORK EFFECTS**

*Panel A: California and Massachusetts versus all other states*

	CA or MA	All other states
Number of PCs	4725	5367
Success Rates (IPO only)	0.1835	0.1675
<i>t</i> -test, Difference in Success Rates:		-2.109 (.035)**
Success Rates (IPO or Acquisition)	0.4601	0.4012
<i>t</i> -test, Difference in Success Rates:		-5.981 (.000)***

*Panel B: Boston, San Jose and San Francisco versus all other MSAs*

	Top 3 MSAs	All other MSAs
Number of PCs	2995	7097
Success Rates (IPO only)	0.1866	0.1701
<i>t</i> -test, Difference in Success Rates:		-2.002 (.045)**
Success Rates (IPO or Acquisition)	0.4604	0.4154
<i>t</i> -test, Difference in Success Rates:		-4.181 (.000)***

Notes:(1) \*, \*\*, \*\*\* indicates significance at the 10%, 5%, and 1% levels, respectively. (2) The table presents success rates for sample portfolio companies. Panel A shows the difference in the success rates for portfolio companies that are located in California or Massachusetts versus those outside of these two states. Panel B shows the difference in the success rates for portfolio companies located in the top three Metropolitan Statistical Areas (MSAs) for venture investment dollars, Boston, San Jose and San Francisco versus portfolio companies outside of these areas. P-Values are in parentheses.

### Multivariate analysis

Gompers and Lerner (2000) analyze success rates of firms receiving venture capital during periods of increased commitments and find that the portfolio firms' probability of success are independent of fund inflows. While they do not examine success rates in a multivariate framework, they do explore potential factors that may influence the *valuation* of venture investments. Gompers and Lerner (2000) examine the impact of fund inflows on venture capital valuations. They are able to show that portfolio companies have higher valuations during periods of increased inflows, and the higher valuations are not due to changing company characteristics. According to

their analysis, venture capitalists tend to increase the amount of capital committed to firms when faced with growth in investment dollars. Several of the factors used in their analysis will be used to control for any effects that they may have on portfolio company success rates. Other factors are based upon prior literature.

Gompers (1996) suggests that the entry of young, less experienced venture capitalists leads to a rush to take portfolio companies public. This “grandstanding” hypothesis is supported by empirical evidence and is caused by a need to establish a positive reputation in order to raise new funds. Inexperienced venture capitalists cannot credibly signal their ability to investors unless they have a track record of successfully bringing firms to IPO. Gompers interprets the cost of bringing a firm to IPO early as either a smaller equity stake in the firm or greater underpricing at the IPO. Another potential cost lies in the success rates of the other portfolio companies in the venture capitalist’s fund. If bringing just one firm public early gives a new venture capitalist the ability to raise a follow-on fund, then it may be in the interest of the venture capitalist to focus his managerial advice on one or two of the best prospects in the portfolio.<sup>8</sup> This implies that the other firms in a venture portfolio should have less likelihood of success, all else equal. Regardless, seasoned venture capitalists should have more success than those who are inexperienced, whether due to the grandstanding actions of inexperienced venture capitalists or improvements in human capital over time. We use the average age of the venture capital firms investing in each portfolio company as a control for venture capitalists’ experience.<sup>9</sup>

Older portfolio companies should be more likely to succeed, particularly if they are later stage firms, as much of the uncertainty concerning future revenues ought to be resolved over time. Therefore, our model will consider the number of years since incorporation for the portfolio firms as a control variable for company age.<sup>10</sup> Reputation may be important for the success rates of the venture capitalists’ investments, if entrepreneurs with better projects seek out venture capitalists with better reputations. Gompers and Lerner (1998b) suggest that venture capitalists with good reputations are able to raise more funds and larger funds. Total fund commitments will be used as a proxy for venture capitalist reputation. Industry effects may influence the results if some industries are known to have a higher risk/return profile. Portfolio companies are classified by the SDC into one of three general industries: information technology, non-high technology, or medical/health/life science. A dummy variable that is set equal to one if the company is in an information technology industry, and zero otherwise, will control for industry effects.

Finally, if exit through IPO is easier during “hot markets”, increases in success rates may be due to the easy access to the public markets, rather than distance or any other factor. We use a dummy variable that equals one if the firm conducted an IPO in a hot market, and zero otherwise. For our purposes, a hot market is defined as a year in which more than 600 IPOs occurred.<sup>11</sup>

The multivariate analysis is conducted using logit regression. The dependent variable is set equal to one if the portfolio company was acquired or went public through an IPO.<sup>12</sup> The model to be tested is

$$\begin{aligned} \text{SUCCESS} = & \\ & \beta_0 + \beta_1 \text{DISTANCE} + \beta_2 \text{FUND\_SIZE} + \beta_3 \text{CO\_AGE} \\ & + \beta_4 \text{FUND\_AGE} + \beta_5 \text{HIGH\_TECH} + \beta_6 \text{HOT\_MARKET} + \varepsilon \end{aligned} \quad (1)$$

where,

<i>SUCCESS</i>	is a dummy variable set equal to one if the portfolio company was acquired or went public through an IPO, and zero otherwise;
<i>DISTANCE</i>	is the distance in miles between the portfolio company and the nearest venture investor;
<i>FUND_SIZE</i>	is the average amount of money raised by the venture funds investing in the portfolio company;
<i>CO_AGE</i>	is the age of the portfolio company at the time of its initial investment;
<i>FUND_AGE</i>	is the average age of the venture funds investing in the portfolio company;
<i>HIGH_TECH</i>	is a dummy variable set equal to one if the portfolio company is an information technology firm, and zero otherwise;
<i>HOT_MARKET</i>	is a dummy variable set equal to one if the portfolio company IPO'd during a hot market, and zero otherwise;
<i>CA_MA</i>	is a dummy variable set equal to one if the portfolio company is located in California or Massachusetts, and zero otherwise.

Tables 5 and 6 contain the results of our multivariate analysis.<sup>13</sup> Regarding the impact of distance on portfolio company success, the multivariate results mirror our findings in the preceding univariate analysis. Distance is not a significant determinant of portfolio company success when limiting the definition of success to IPO only. However, when acquisitions are considered to be successful venture investments along with IPOs, distance is significantly related to entrepreneurial firm success. Entrepreneurial companies that are farther away from their nearest venture investors are less likely to succeed via IPO or acquisition.

**TABLE 5  
MULTIVARIATE ANALYSIS OF PORTFOLIO COMPANY SUCCESS  
RATES [IPO OR ACQUISITION]**

	<b>Independent variable: Portfolio Company Success</b>				
Intercept	-1.099 (.0000)***	-.964 (.0000)***	-1.141 (.0000)***	-1.000 (.0000)***	-.940 (.0000)***
Distance	-.0000747 (.0041)***	-.0000669 (.0199)**			-.0000628 (.0296)**
Same state			.311 (.5050)	.0716 (.1467)	
Portfolio company age		.0154 (.0000)***		.0149 (.0000)***	.0149 (.0000)***
Average fund age	-.00405 (.1100)	-.00687 (.0168)**	-.00443 (.0804)***	-.00708 (.0136)**	-.00690 (.0162)**
Average fund size	.131 (.0000)***	.124 (.0000)***	.129 (.0000)***	.129 (.0000)***	.131 (.0000)***
High-tech	.226 (.0000)***	.196 (.0000)***	.227 (.0000)***	.205 (.0000)***	.208 (.0000)***
Hot market	3.023 (.0000)***	2.876 (.0000)***	3.024 (.0000)***	2.881 (.0000)***	2.881 (.0000)***
Fund in top 3 MSA				.116 (.0306)**	.128 (.0123)**
Fund in CA or MA	.176 (.0000)***	.204 (.0000)***	.168 (.0004)***		

Notes: (1) \*\*\*,\*\* indicates significance at the 10%, 5%, and 1% levels, respectively.  
(2) See text for variable descriptions.  
(3) Successful exits are defines as IPOs (or registration for an IPO) or Acquisitions.

All other independent variables are significant and match our predictions with the exception of average fund age. Portfolio company age is positive and significant, as is the average fund size. Whether or not average fund size is a reasonable proxy for venture capitalist reputation, it is highly significant in our regressions and captures some effect on venture portfolio company success. Our indicator variables for both high technology firms and hot market years are also positive and highly significant. Controlling for these industry effects and market fluctuations enables us to take in a clearer picture of how distance influences success. Considering location, portfolio firms receiving venture capital in the states of California and Massachusetts are more likely to be successful venture investments. These areas of the country lead the United States in venture activity year after year, possibly because there are positive network externalities present that influence the success rates for entrepreneurial firms.<sup>14</sup>

**TABLE 6**  
**MULTIVARIATE ANALYSES OF PORTFOLIO COMPANY**  
**SUCCESS RATES [IPO ONLY]**

	<b>Independent variable: Portfolio Company Success</b>				
Intercept	-2.539 (.0000)***	-2.318 (.0000)***	-2.495 (.0000)***	-2.265 (.0000)***	-2.318 (.0000)***
Distance	.0000279 (.4152)	-.0000315 (.3832)			-.0000386 (.2879)
Same state			.0733 (.2456)	-.0753 (.2376)	
Portfolio company age		.00758 (.0300)**		.00752 (.0314)**	.00764 (.0284)**
Average fund age	-.00163 (.6324)	-.00125 (.7311)	-.00167 (.6239)	-.00147 (.6875)	-.00149 (.6833)
Average fund size	.176 (.0000)***	.159 (.0000)***	.175 (.0000)***	.159 (.0000)***	.159 (.0000)***
High-tech	-.0782 (.1782)	-.128 (.0374)**	-.766 (.1876)	-.133 (.0311)**	-.136 (.0277)**
Hot market	2.633 (.0000)***	2.438 (.0000)***	2.632 (.0000)***	2.441 (.0000)***	2.881 (.0000)***
Fund in top 3 MSA				.145 (.0349)**	.127 (.0525)*
Fund in CA or MA	.0715 (.2166)	.0794 (.1920)	.101 (.1131)		

Notes: (1) \*, \*\*, \*\*\* indicates significance at the 10%, 5%, and 1% levels, respectively.  
(2) See text for variable descriptions.  
(3) Successful exits are defines as IPOs (or registration for an IPO) only.

## CONCLUSION

We set out to examine the role of distance in venture capital investing. We have found evidence that supports the idea that distance between portfolio firms and venture capital investors is a significant predictor of venture capital portfolio company success. We did not find any evidence that distance between venture capitalists and their portfolio firms has changed over the time period under study, nor

did we find evidence that a greater percentage of investment was taking place outside of the two major hubs of venture activity, California and Massachusetts. However, venture activity in these two states has been shown to be more likely to result in a successful IPO or acquisition for the entrepreneurial firm.

As a corollary to our findings on the importance of distance for successful venture investing, we have confirmed that at least several other factors have some ability to influence venture success rates. While these factors have been introduced as potential indicators of venture portfolio firm valuations (Gompers and Lerner, 2000), very little work has been done looking at the determinants of success in venture investing. We propose that the factors discussed in this paper are a good start for future research of this question.

### REFERENCES

- Bae, Kee-Hong, Rene M. Stulz, and Hongping Tan. 2008. "Do local analysts know more? A cross-country study of the performance of local analysts and foreign analysts." *Journal of Financial Economics* 88: 581-606.
- Black, Bernard S., and Ronald J. Gilson. 1998. "Venture capital and the structure of capital markets: banks versus stock markets." *Journal of Financial Economics* 47: 243-277.
- Butler, Alexander. 2008. "Distance still matters: evidence from municipal bond underwriting." *Review of Financial Studies* 21: 763-784.
- Bygrave, William D. 1988. "The Structure of the investment networks of venture capital firms." *Journal of Business Venturing* 3: 137-157.
- Bygrave, William D., and Jeffrey A. Timmons. 1992. *Venture Capital at the Crossroads* Harvard Business School Press: Boston, MA.
- Chan, Yuk-Shee. 1983. "On the positive role of financial intermediation in allocation of venture capital in a market with imperfect information." *Journal of Finance* 38: 1543-1568.
- Coval, Joshua D. and Tobias J. Moskowitz. 2001. "The Geography of Investment: Informed Trading and Asset Prices." *Journal of Political Economy* 109: 811-841.
- Fenn, George W., Nellie Liang and Stephen Prowse. 1997. "The private equity market: an overview." *Financial Markets, Institutions, and Instruments* 6: 1-106.
- Florida, Richard and Donald F. Smith, Jr., 1993. "Venture capital formation, investment, and regional industrialization." *Annals of the Association of American Geographers* 83: 434-451.
- Gaspar, Jose-Miguel and Massimo Massa. 2007. "Local ownership as private information: evidence on the monitoring-liquidity trade-off." *Journal of Financial Economics* 83: 751-792.
- Gompers, Paul. 1995. "Optimal investment, monitoring and the staging of venture capital." *Journal of Finance* 50: 1461-1489.
- Gompers, Paul. 1996. "Grandstanding in the venture capital industry." *Journal of Financial Economics* 42: 133-156.
- Gompers, Paul and Josh Lerner. 1998a. "The determinants of corporate venture capital success: organizational structure, incentives and complementarities." NBER working paper no. 6725.
- Gompers, Paul and Josh Lerner. 1998b. "What drives venture capital fundraising?" *Brooking Papers on Economic Activity, Microeconomics*: 149-192.

- Gompers, Paul and Josh Lerner. 1999. *The Venture Capital Cycle* MIT Press: Cambridge, MA.
- Gompers, Paul and Josh Lerner. 2000. "Money chasing deals? The impact of fund inflows on private equity valuations." *Journal of Financial Economics* 55: 281-325.
- Gompers, Paul and Josh Lerner. 2001. "The venture capital revolution." *Journal of Economic Perspectives* 15: 145-168.
- Gorman, Michael and William A. Sahlman. 1989. "What do venture capitalists do?" *Journal of Business Venturing* 4: 231-248.
- Helwege, Jean and Nellie Liang. 2001. "Initial public offerings in hot and cold markets." Working paper, Ohio State University.
- Ivkovic, Zoran and Scott Weisbenner. 2005. "Local Does as Local Is: Information Content of the Geography of Individual Investors' Common Stock Investments." *Journal of Finance* 60: 267-306.
- Lerner, Josh. 1994. "Venture capitalists and the decision to go public." *Journal of Financial Economics* 35: 293-316.
- Lerner, Josh. 1995. "Venture capitalists and the oversight of private firms." *Journal of Finance* 50: 301-318.
- Lerner, Josh. 2002. "Boom and bust in the venture capital industry and the impact on innovation." *Economic Review* 87 (4): 25-39.
- Lowry, Michelle and G. William Schwert. 2002. "IPO market cycles: bubbles or sequential learning?" *Journal of Finance* 57: 1171-1200.
- Lowry, Michelle. 2003. "Why does IPO volume fluctuate so much?" *Journal of Financial Economics* 67: 3-40.
- Malloy, Christopher J. 2005. "The geography of equity analysis." *Journal of Finance* 60: 719-755.
- Petersen, Mitchell A. 2002. "Information: hard and soft." Working paper, Northwestern University.
- Petersen, Mitchell A., and Raghuram G. Rajan. 2002. "Does distance still matter? The information revolution in small business lending." *Journal of Finance* 57: 2533-2570.
- Sahlman, William A. 1990. "The structure and governance of venture capital organizations." *Journal of Financial Economics* 27: 473-521.
- Santhanakrishnan, Mukunthan. 2003. "The influence of complementarity on the performance of entrepreneurial companies." Working paper, Arizona State University.
- Schertler, Andrea. 2002. "Path dependencies in venture capital markets." Working paper #1120, Kiel Institute for World Economics.
- Sorensen, Olav and Toby E. Stuart. 2001. "Syndication Networks and the Spatial Distribution of Venture Capital Investments." *American Journal of Sociology* 106: 1546-1588.
- Sufi, Amir. 2007. "Information asymmetry and financing arrangements: evidence from syndicated loans." *Journal of Finance* 62: 629-668.

#### ENDNOTES

<sup>1</sup> See Gorman and Sahlman (1989) or Bygrave and Timmons (1992) for more on the role of venture capitalists in monitoring portfolio firms.

<sup>2</sup> Petersen (2002) defines hard information as information that may easily be reduced to numbers. An anonymous referee suggests that the key element to hard information is that it is easily passed along to others.

<sup>3</sup> Lerner (1995) finds that a venture investor with an office within 5 miles of a portfolio company has a 47 percent probability of serving on the board, while a venture capitalist whose nearest office is 500 miles away has a 22 percent chance of serving as a director for that portfolio company.

<sup>4</sup> Private partnerships account for the vast majority of all venture capital raised over the time period of interest and have emerged as the dominant organizational form in the industry (approximately 80% of commitments in recent years according to Gompers (1998)).

<sup>5</sup> Gompers and Lerner (1999, p.23) cite a 1988 Venture Economics study entitled *Exiting Venture Capital Investments* that finds that a \$1 investment in a firm that goes public provides a 295% average return over an average of 4.2 years. The next best payoff is 40% over 3.7 years, on average, to investments in acquired firms. To our knowledge, there has been no more recent study on this matter.

<sup>6</sup> From Gorman and Sahlman (1989, p. 237), “Much more common is the phenomenon know (sic) euphemistically among venture capitalists as ‘the living dead,’ a phrase that refers to venture-backed companies that have failed to meet expectations but that nonetheless squeeze out a stable, independent existence.”

<sup>7</sup> A software program, called ZIPFind® Deluxe 5.0, was used to calculate the distance between postal codes of the portfolio company-venture capitalist pairs.

<sup>8</sup> Gompers (1996, p. 137) provides anecdotal evidence that substantiates this possibility.

<sup>9</sup> In cases where the SDC data is inconsistent, the fund age is set to zero.

<sup>10</sup> The sample size drops from 10,092 portfolio companies to 8,273 in models including portfolio company age due to limited data availability.

<sup>11</sup> This is the top 25% of years in our sample.

<sup>12</sup> We also run all regressions with IPO only as the definition of success.

<sup>13</sup> Table 6 demonstrates the results when considering IPOs as the only successful exit for a venture investment. None of the variables of interest are significant.

<sup>14</sup> This is consistent with the findings of Florida and Smith (1993), who determine that capital mobility occurs, but it is not due to unimpeded capital markets, rather through the network structure of the venture capital industry. Their focus is on the geographic effects of the venture industry.

