# Alma mater matters: The value of school ties in the venture capital industry

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May, 2009

This paper examines the role and estimates the economic value of social networks tied to academic institutions in the venture capital industry. I show that having a shared academic background increases the likelihood of matching between entrepreneurs and venture capitalists by 57%. Similarly, a shared academic background increases the likelihood of matching between different venture capitalists by 42% when they syndicate portfolio company investments. Finally, a shared academic background improves portfolio company performance. For example, when an entrepreneur and a venture capitalist attended the same Top 3 academic institution, the likelihood that the investment will result in an initial public offering or acquisition increases by 42%. This is the incremental effect of having attended the same Top 3 academic institution. Taken together, these results provide strong evidence that shared academic backgrounds help reduce information gaps in the venture capital industry.

**Keywords**: Social networks, connections, matching, venture capital, entrepreneurship
**JEL codes:** G24, G3, L1, L2

*I want to thank Ola Bengtsson, Effi Benmelech, Lauren Cohen, Mariassunta Giannetti, Robin Greenwood, Samuel Lee, Josh Lerner, Christopher Malloy, Matthew Rhodes-Kropf, Per Strömberg and seminar participants in the Harvard Business School Finance Unit/Harvard Economics Department PhD Lunch Seminar for helpful discussions and valuable comments. I gratefully acknowledge financial support from the Jan Wallander and Tom Hedelius Foundation, the Centre for Business and Policy Studies, and the Institute for Banking Research. Stockholm School of Economics, P.O. Box 6501, SE-11383 Stockholm, Sweden. Email:daniel.sunesson@hhs.se.

# 1 Introduction

Anecdotal evidence suggests that social networks are important in the venture capital industry (Gompers and Lerner (2001)). Still, research in finance so far has given little consideration to this question. Two exceptions are Sorenson and Stuart (2001) and Hochberg, Ljungqvist, and Lu (2007). They show that social networks formed when venture capitalists syndicate portfolio company investments affect outcomes in the venture capital industry. Less is known about the effects of social networks tied to academic institutions.

The novel contribution of this paper is to introduce social networks of the latter type into the analysis of the likelihood of matching and performance in the venture capital industry. More specifically, first I examine the role of social networks in the matching between entrepreneurs and venture capitalists on a sample of venture capital investments. Then I examine how social networks affect the matching between different venture capitalists when they syndicate portfolio company investments on a sample of syndicated venture capital investments. Finally, I look at the economic effect of social networks on portfolio company performance. For this purpose I assemble a unique dataset with all early stage venture capital investments made by U.S. venture capital firms in U.S. portfolio companies during 2002. The final sample consists of 735 distinct investments rounds made by 456 venture capital firms in 651 portfolio companies.

My results show that, after controlling for venture capital firm, portfolio company, and investment round characteristics, the likelihood of matching between entrepreneurs and venture capitalists increases by 57% (or equivalently with 0.29%) when they attended the same academic institution. Closer inspection reveals that this effect is stronger for smaller and younger venture capital firms and for Non-Ivy League and Non-Top 3 academic institutions.[1] Similarly, when different venture capitalists syndicate portfolio company investments, the likelihood of matching increases by 42% (or equivalently with 0.23%) when they attended the same acad-

[1] Top 3 academic institutions refer to Harvard University, Stanford University, and University of California. See Table (5) for a more exhaustive description.

emic institution. This effect is stronger for Top 3 academic institutions, however. Finally, having a shared academic background improves portfolio company performance. In particular, when the academic institution is Top 3, the likelihood that the investment will result in an initial public offering or acquisition increases by 42% (or equivalently with 14%). This is the incremental effect of having attended the same Top 3 academic institution and is therefore over and above the effect of having an entrepreneur and a venture capitalist from different Top 3 academic institutions. Taken together, these results provide strong evidence that shared academic backgrounds help reduce information gaps in the venture capital industry. A back of the envelope calculation emphasizes the economic impact of this effect. For example, consider a situation where there are only two possible future states of the world and ignore discounting. In one state the portfolio company investment is successful and results in an initial public offering or acquisition worth $113 M. In the other state the portfolio company investment fails and it is worth zero. In this stylized case, having a shared academic background increase the present value of the portfolio company investments by roughly $16 M.[2]

These results complement a number of recent studies on the impact of social networks in corporate finance. To name a few, directors' social networks have been shown to influence the composition and quality of boards (Kramarz and Thesmar (2006)) as well as the level of executive pay (Barnea and Guedj (2007)); investment bankers' social networks affect investment banks' market shares in mergers and acquisitions and equity capital markets (Bradley and Clarke (2008)). More closely related to my study are Cohen, Frazzini, and Malloy (2007) and Cohen, Frazzini, and Malloy (2008). By linking mutual fund managers' investment behavior and equity analysts' stock recommendations to social networks tied to academic institutions they show that these social networks influence how information flow into public equity markets. While my study uses a similar social network as Cohen, Frazzini, and Malloy (2008), it is applied differently. In particular, they focus on public equity markets whereas I focus on venture capital markets.

For that reason, my study is also related to the literature on venture capi-

[2]Brav and Gompers (1997) study a sample of all venture capital backed initial public offerings between 1972 and 1992. The average size of these initial public offerings was $113 M expressed in 1992 dollars.

tal. This literature has studied the monitoring role of venture capitalists (Gorman and Sahlman (1989), Lerner (1995), and Bottazzi, Rin, and Hellmann (2007)); specificities in venture capital contracts (Gompers (1995), Kaplan and Stromberg (2003), and Kaplan and Strömberg (2004)); the syndication of venture capital investments (Lerner (1994)); and the role of venture capital in innovation (Kortum and Lerner (2000) and Lerner and Strömberg (2008)). Closer related to my study are Sorenson and Stuart (2001) and Hochberg, Ljungqvist, and Lu (2007). They examine how social networks, formed when venture capitalists syndicate portfolio company investments, affect outcomes in the venture capital industry. While the former focuses on the geographical distribution of portfolio company investments, the latter focuses on performance. My study differs from these in several ways. Firstly, the social networks are different. Secondly, they focus on the relationship between their social networks and the geographical distribution and performance of portfolio company investments. I focus on the relationship between my social networks and the likelihood matching between entrepreneurs and venture capitalists as well as portfolio company performance. The main contribution of my study is to show that social networks tied to academic institutions reduce information gaps between entrepreneur and venture capitalists. The main support for this interpretation is that these social networks lead to superior portfolio company performance. Nonetheless, my study also explains how syndicates are formed in the venture capital industry. For example, I show that the likelihood of matching between different venture capitalists increases when they attended the same academic institution when they syndicate portfolio company investments.

The rest of this paper is organized as follows. Section 2 provides a brief discussion of why social networks tied to academic institutions should affect the likelihood of matching and performance in the venture capital industry. Section 3 describes the data used in this study and explains how I construct my sample. Section 4 outlines my empirical methodology and presents the results from the empirical analysis on matching in the venture capital industry. Section 5 presents the results from the empirical analysis on portfolio company performance. Finally, Section 6 summarizes and offers some concluding remarks.

## 2 Why should social networks matter?

Venture capital markets are distinguished by the large information gap that exists between those who need and those who provide financing. Sometimes this information gap favors entrepreneurs, who know more about the businesses they are running. Other times it favors venture capitalists, who know more about the commercialization or financing processes. Ultimately, the fear of such information gaps prevent otherwise profitable transactions. By reducing such information gaps, social networks make possible some investments that would otherwise not have been possible. For example, when entrepreneurs and venture capitalists are part of the same social network, search and transaction costs associated with identifying and evaluating portfolio company investments are lower. Similarly, when two different venture capitalists are part of the same social network, costs of investing together are lower. As a result, social networks should be expected to influence the matching between entrepreneurs and venture capitalists as well as the matching between different venture capitalists when they syndicate portfolio company investments. Furthermore, if social networks render some individuals an information advantage vis-à-vis other, then those who enjoy the information advantage should earn abnormal returns on this information (Grossman and Stiglitz (1976)). Therefore, portfolio company investments where entrepreneurs and venture capitalists belong to the same social network should be expected to perform better than those where they are not.

The main objective of this study is to show that social networks tied to academic institutions reduce information gaps in the venture capital industry. For that reason, I first show that social networks tied to academic institutions are positively related to the matching between entrepreneurs and venture capitalists as well as between different venture capitalists when they syndicate portfolio company investments. I then show that social networks tied to academic institutions improve portfolio company performance.

# 3 Data

The data used in this study comes from several different sources. In particular, the data on venture capital investments comes from the VentureXpert database (now owned by Thomson Financial). It provides information on venture capital and private equity firms, funds, portfolio companies, executives and directors, and limited partners. Investments and commitments dates back to 1969 and include over 15,000 venture capital and private equity firms, 27,000 funds, and over 70,000 portfolio companies. Venture capital firms, funds, and portfolio companies relate to each other in the following way. Venture capital firms are management companies that manage funds. While funds usually have limited lifetimes (e.g. $10-12$ years), venture capital firms usually have infinite lifetimes. Portfolio companies represent the businesses that venture capital firms invest in through their funds.

This data is supplemented with the education background of the portfolio companies' entrepreneurs and the venture capitalists who served on the portfolio companies' board of directors. I define entrepreneurs as the non-venture capitalist founding members of the portfolio companies. Specifically, I require that the entrepreneurs were part of the founding members during the portfolio company founding year and that they were not employed by the venture capital firms that financed the portfolio company. The information on entrepreneurs and venture capitalists as well as their education background comes from the VentureXpert database, ZoomInfo, LinkedIn, Company Insight Center (CIC), old portfolio company- and venture capital firm websites, REGDEX documents and IPO prospectuses.[3] ZoomInfo is a business information search engine with data on industries, companies, people, products and services. It crawls the web to identify company and people information which it organizes into company and individual profiles. Currently, ZoomInfo covers over 5 million companies and 45 million individuals. LinkedIn is a web-based network of professionals from around the world. Joining LinkedIn is voluntary. When you join you create a profile that summarizes your professional expertise and accomplishments, including your education and professional

[3] I use the internet archive way back machine to visit old portfolio company and venture capital firm websites. REGDEX is a notice of sale of securities pursuant to Regulation D, Section 4(6), and/or uniform limited offering exemption. It filed with the US Securities and Exchange Commission.

background. Today, LinkedIn has over 38 million members representing 170 industries in over 200 countries worldwide. Finally, Company Insight Center is a comprehensive free business and financial information resource on the web that combines BusinessWeek's editorial content with Capital IQ's research to provide data on companies, industries, and key executives. If none of these sources contain the information about the education background of the entrepreneurs and venture capitalists I search the World Wide Web in a last attempt to assemble this information. The final sample consists of 735 investment rounds made by 456 different venture capital firms in 651 different portfolio companies.

## 3.1 Sample construction

This study examines the role of social networks tied to academic institutions in the likelihood of matching and performance in the venture capital industry. For this purpose I assemble a cross section with all early stage venture capital investments made by U.S. venture capital firms in U.S. portfolio companies in 2002.[4] Firstly, I look at the matching between entrepreneurs and venture capitalists and between different venture capitalists when they syndicate portfolio company investments. Because I only observe those investments that actually took place, I have to consider the issue of potential investments (syndications). When I construct my set of potential investments (syndications), I draw from past research on the venture capital industry. For example, Gompers and Lerner (2001) argue that venture capitalists specialize in specific industries and geographical markets.[5] Based on this observation I formulate two rules to select potential venture capitalists. The following example explains the procedure: Consider the investment in APT Therapeutics, Inc., a biotech startup in Missouri. A potential venture capitalist for this investment would have to be in my cross section of investments from 2002 and should have invested in a biotech startup in Missouri at least once during the last five years.[6] Secondly, I look at the performance of venture capital investments.

[4] Early stage investments are coded as Seed, Startup, Early Stage, First Stage, or Other Early by Venture Economics.

[5] Specialization is one reason why venture capitalists are able to invest in situations with severe information gaps to begin with.

[6] In robustness checks I relax the second requirement and the results are unaffected.

For this purpose I focus on those investments that actually took place, notably my cross section of investments from 2002. In both cases, since this study examines social networks tied to academic institutions, I require an education background on at least one of the entrepreneurs and at least one of the venture capitalists who invested in the portfolio company.[7]

The definition and construction of the specific variables used in the empirical analysis are reported in the Data appendix.

## 3.2 Sample description

Table (1) and (2) present descriptive statistics for the final sample of venture capital firms, portfolio companies, entrepreneurs and venture capitalists. The sample consists of 456 venture capital firms and 651 portfolio companies. The majority of venture capital firms are private equity firms that invest their own capital (80% of all venture capital firms). The average venture capital firm is 10 years old and manages around $1.1 billion. Meanwhile, the average portfolio company is 2.5 years old and 40% of the portfolio companies operate in computer related industries. Up to now 60% of all portfolio companies remain active, 4.3% has gone public, and 27% have been acquired. The total number of investment rounds is 735 of which 60% are new investments and 40% are follow-on investments. The average amount invested per round is $4.4 million. Finally, the total number of entrepreneurs is 1197 (or 1.8 per portfolio company) while the total number of venture capitalists is 957 (or 2.1 per venture capital firm). Table (3) presents summary statistics and a correlation matrix for the main variables used in the subsequent analysis.

[7] I focus on the education background of the portfolio companies' entrepreneurs and the venture capitalists who served on the portfolio companies' board of directors. I look at entrepreneurs instead of the chief executive officer or president because portfolio companies that obtain venture capital financing often experience a change in management whereby the original management team is replaced with a seasoned management team. This new management team might have other relationships with the venture capital firm that I do not want to measure. Still, in practice the entrepreneur is often the chief executive officer, the president and/or the chief technology officer of the portfolio company. On the venture capital firm side I focus on the venture capitalists who served on the portfolio companies' board of directors. I do so because venture capital firms often assign one (or two) of their partners to their portfolio companies' board of directors. These partners are responsible for the investments and work closely with the portfolio companies' management teams.

### 3.3 Most connected academic institutions

To get a sense of how connected my sample of entrepreneurs and venture capitalists is to different academic institutions, Table (5) lists the 10 most connected academic institutions for entrepreneurs and venture capitalists respectively. An entrepreneur is connected to an academic institution if he/she attended it during either undergraduate or graduate studies. Similarly, a venture capitalist is connected to an academic institution if he/she attended it during undergraduate or graduate studies. Entrepreneurs are most connected academic University of California (representing 5.1% of the total number of connections) followed by Stanford University and Harvard University. Meanwhile, venture capitalists are most connected to Harvard University (representing 11.3% of the total number of connections) followed by Stanford University and University of California. Finally, Ivy League represents 24.6% and 11.6% of the total number of connections for venture capitalists and entrepreneurs respectively.

## 4 Matching in the venture capital industry

### 4.1 Empirical methodology

This section examines the effect of social networks tied to academic institutions on the likelihood of matching between entrepreneurs and venture capitalists as well as between different venture capitalists when they syndicate portfolio company investments. To estimate this effect I propose the following linear probability model:

$$y_{ij} = \alpha + \beta School\ tie_{ij} + \Gamma X_{ij} + \delta_{ij} + \theta_i + \lambda_i + \varepsilon_{ij}, \tag{1}$$

where $y_{ij}$ is a dummy that equals one for actual investments (syndications) and zero for potential investments (syndications), $\alpha$ is a constant, $School\ tie_{ij}$ is a dummy that equals when the venture capitalist has attended the same academic institution as any of the portfolio company's entrepreneurs, $X_{ij}$ represents a vector of covariates, and $\varepsilon_{ij}$ is an error term. The remaining variables in equation (1) are fixed effects for academic institutions and portfolio company states and industries.

Finally, when estimating equation (1), I account for a general correlation structure between different observations for the same portfolio company or venture capital firm by double-clustering standard errors at the portfolio company- and venture capital firm level. This approach ensures conservative estimates of standard errors and thereby minimizes the risk of Type 1 errors.[8]

## 4.2 Results

### 4.2.1 Entrepreneurs and venture capitalists

Table (6) presents the results from estimations of (1) with different sets of covariates. Robust t-statistics are reported in brackets. The dependent variable, $Investment_{ij}$, is a dummy that equals one for actual investments and zero for potential investments. The main independent variable of interest, $School\ tie_{ij}$, is a dummy that equals one when the venture capitalist has attended the same academic institution as any of the portfolio company's entrepreneurs.

Overall, the findings in Table (6) suggest that venture capitalists and entrepreneurs are more likely to match when they have attended the same academic institution in the past. This effect is both statistically and economically significant. More specifically: After controlling for venture capital firm-, portfolio company-, and investment characteristics, the likelihood of matching between venture capitalists and entrepreneurs increases by 57% (or equivalently with 0.29%) when they attended the same academic institution in the past.

### 4.2.2 Robustness of results

The findings reported above suggest that on average venture capitalists and entrepreneurs are more likely to match when they have attended the same academic institution in the past. To verify the robustness of these findings I conduct a series

[8] All dependent variables in this study are binary. Still, the presented estimates are obtained from ordinary least squares regressions. Because these estimates are consistent but not efficient, this approach results in conservative estimates of the associated standard errors (Wooldridge (2002)). In unreported robustness checks I estimate probit and conditional logit models and confirm that the results remain unchanged.

of robustness checks. In particular, two straightforward checks examine how these findings relate to venture capital firm experience and academic institution quality.[9]

**Venture capital firm experience** Table (7) presents the results from estimations of (1) after including two additional interaction terms. The first one, $School\ tie * Firm\ size$, is the product of $School\ tie_{ij}$ and $Firm\ size_j$. Similarly, the second one, $School\ tie * Firm\ age$, is the product of $School\ tie_{ij}$ and $Firm\ age_j$. I find a negative and statistically significant relationship between the dependent variable and the interaction terms. This implies that having attended the same academic institution in the past matter more for smaller and younger venture capital firms in the matching between entrepreneurs and venture capitalists. One plausible explanation for this result is that social networks tied to academic institutions and other professional social networks act as substitutes. For example, when venture capitalists start out their career, they use the social networks closest to them, like those tied to academic institutions. As they gain more professional experience, they rely increasingly on other professional social networks, like those formed when syndicating portfolio company investments. As a result, larger and older venture capital firms rely more on professional social networks and less on social networks tied to academic institutions.

**Academic institution quality** Table (8) presents the results from estimations of (1) for different measures of $School\ tie_{ij}$. More specifically, I consider four different measures of $School\ tie_{ij}$ to capture salient characteristics of the academic institution quality. These are $Ivy\ League\ tie_{ij}$, $Non - Ivy\ League\ tie_{ij}$, $Top\ 3\ tie_{ij}$, and $Non - Top\ 3\ tie_{ij}$.[10]

Each of these variables is derived from $School\ tie_{ij}$. For example, $Ivy\ League\ tie_{ij}$ is the product between $School\ tie_{ij}$ and a dummy that equals 1 when the academic institution responsible for the connection is Ivy League.

The findings in Table (8) suggest that academic institution quality matters. More specifically, the coefficients in front of $Non-Ivy\ League\ tie_{ij}$ and $Non-Top$

[9] In addition to the robustness checks included below, the Selection model appendix presents results for estimations of two stage selection models à la Heckman (1979).

[10] Top 3 refers to the most connected academic institutions. These are Harvard University, Stanford University, and University of California.

3 $tie_{ij}$ are positive and statistically significant, whereas the coefficients in front of *Ivy League* $tie_{ij}$ and *Top* 3 $tie_{ij}$ are statistically indistinguishable from zero. This suggests that entrepreneurs and venture capitalists are more likely to match when they attended the same academic institution, but only when the academic institution is Non-Ivy League or Non-Top 3.

### 4.2.3 Summary

Overall, the results from this subsection suggest that social networks tied to academic institutions are positively related to the likelihood of matching between entrepreneurs and venture capitalists. More specifically, the likelihood of matching increases by 57%, when the entrepreneur and the venture capitalist have attended the same academic institution in the past. Closer inspection reveals that this effect is stronger for smaller and younger venture capital firms compared to larger and older ones. Finally, these results are mainly driven by Non-Ivy League and Non-Top 3 academic institutions.

### 4.2.4 Different venture capitaltsts

While the previous findings relate to the matching between venture capitalists and entrepreneurs, this subsection examines the matching between different venture capitalists as they syndicate portfolio company investments. Table (9) presents the results from estimations of equation (1) with different sets of covariates. Robust t-statistics are reported in brackets. The dependent variable, $Syndication_{ij}$, is a dummy that equals one for actual syndications and zero for potential syndications. The main independent variable of interest, *School* $tie_{ij}$, equals one when the lead- and non-lead venture capitalist have attended the same academic institution in the past.

By and large, the findings in Table (9) imply that different venture capitalists are more likely to match when they have attended the same academic institution in the past. This effect is both statistically significant and economically relevant. In particular: After controlling for lead- and non-lead venture capital firm-, portfolio company-, and investment characteristics, the likelihood of matching between different venture capitalists increases by 42% (or equivalently with 0.23%) when

they attended the same academic institution.

### 4.2.5 Robustness of results

The above findings imply that in general different venture capitalists are more likely to match when they have attended the same academic institution in the past. To confirm the robustness of these findings I perform a series of robustness checks. Like before, two simple checks examine how these findings relate to non-lead venture capital firm experience and academic institution quality.[11]

**Non-lead venture capital firm experience** Table (10) presents the results for estimations of equation (1) with the inclusion of two new covariates. The first one, $School\ tie * Firm\ size$, is the product of $School\ tie_{ij}$ and $Non-lead\ Firm\ size_j$. Similarly, the second one, $School\ tie * Firm\ age$, is the product of $School\ tie_{ij}$ and $Non-lead\ Firm\ age_j$. While I find a negative relationship between the dependent variable and the interaction terms, the effect is statistically indistinguishable from zero. This suggests that social networks tied to academic institutions play an equally important role in the matching between different venture capitalists for small- and large- and young- and old venture capital firms.

**Academic institution quality** Table (11) presents the results from estimations of equation (1) for the same measures of $School\ tie_{ij}$ as above. The findings in Table (11) suggest that academic institution quality matters for the matching between different venture capitalists. More precisely, the coefficient in front of $Top\ 3\ tie_{ij}$ is positive and statistically significant, whereas the coefficients in front of $Ivy\ League\ tie_{ij}$, $Non-Ivy\ League\ tie_{ij}$ and $Non-Top\ 3\ tie_{ij}$ are statistically indistinguishable from zero. This suggests that different venture capitalists are more likely to match when they attended the same academic institution in the past, but only when the academic institution is Top 3.

[11] In addition to the robustness checks included below, the Selection model appendix presents results for estimations of two stage selection models à la Heckman (1979).

### 4.2.6 Summary

Taken together, the findings in this subsection suggest that social networks tied to academic institutions are positively related to the likelihood of matching between different venture capitalists when they syndicate portfolio company investments. In particular, the likelihood of matching increases by 42%, when the lead and non-lead venture capitalist have attended the same academic institution in the past. Finally, a closer look reveals that these results are mainly driven by Top 3 academic institutions.

# 5 Portfolio company performance

## 5.1 Empirical methodology

The previous section examines the relationship between social networks tied to academic institutions and matching in the venture capital industry. While this relationship is important to understand what drives financing and risk sharing in the venture capital industry, the question begs whether social networks tied to academic institutions also improve portfolio company performance. The objective of this subsection is to address this question. To estimate this effect I propose the following linear probability model:

$$y_{ij} = \alpha + \beta School\ tie_{ij} + \Gamma X_{ij} + \theta_i + \lambda_i + \varepsilon_{ij}, \tag{2}$$

where $y_{ij}$ is a dummy that equals one when the portfolio company's current situation is coded as either "Went Public" or "Acquisition" by Venture Economics, $\alpha$ is a constant, $School\ tie_{ij}$ is a dummy that equals when the venture capitalist has attended the same academic institution as any of the portfolio company's entrepreneurs, $X_{ij}$ represents a vector of covariates, and $\varepsilon_{ij}$ is an error term. The remaining variables in equation (2) are fixed effects for portfolio company states and industries. Finally, as above, when estimating equation (2), I account for a general correlation structure between different observations for the same portfolio company or venture capital firm by double-clustering standard errors at the portfolio company- and venture capital firm level. This way I minimize the risk of

Type 1 errors by using conservative estimates of standard errors.

## 5.2 Results

Table (12) presents the results from estimations of equation (2) with different sets of covariates. Robust t-statistics are reported in brackets. The dependent variable, $Performance_{ij}$, is a dummy that equals one when the portfolio company's current situation is coded as either "Went Public" or "Acquisition" by Venture Economics. Although this is a coarse measure of investment outcomes, it is frequently used in the venture capital literature. For example, Gompers and Lerner (1998), Bottazzi, Rin, and Hellmann (2007), and Hochberg, Ljungqvist, and Lu (2007) all define portfolio company success in this way.[12] The main independent variable of interest, $School\ tie_{ij}$, is the same as above.

The findings in Table (12) suggest that there is an economically relevant positive relationship between social networks tied to academic institutions and portfolio company performance.[13] The estimated effect is statistically indistinguishable from zero, however.

### 5.2.1 Robustness of the results

The findings above imply that on average portfolio company performance improves when the venture capitalist and the entrepreneur have attended the same academic institution in the past. To verify the robustness of these findings I carry out a series of robustness checks. In particular, a straightforward check examines how these findings relate to academic institution quality.[14]

[12] Gompers and Lerner (1998) compare this measure of portfolio company success to the more narrow definition that excludes acquisitions and find that the different measures give qualitatively similar results.

[13] In particular, the coefficient in front of $School\ tie_{ij}$ suggests that the likelihood that the investment will result in an initial public offering or acquisition increases by 24% (or equivalently with 8%) when the venture capitalist and the entrepreneur attended the same academic institution in the past.

[14] In addition to the robustness checks included below, the Selection model appendix presents results for estimations of two stage selection models à la Heckman (1979).

**Academic institution quality** Table (13) presents the results from estimations of equation (2) for the same measures of $School\ tie_{ij}$ as above.

By and large, the findings in Table (13) imply that academic institution quality matters for portfolio company performance. In particular, the coefficient in front of $Top\ 3\ tie_{ij}$ is positive and statistically significant, whereas the coefficients in front of $Ivy\ League\ tie_{ij}$, $Non-Ivy\ League\ tie_{ij}$ and $Non-Top\ 3\ tie_{ij}$ are statistically indistinguishable from zero. This suggests that social networks tied to academic institutions improve portfolio company performance, but only when the academic institution is Top 3.

In particular, the interpretation and economic effect of these findings are as follows: The findings in Column (5) implies that the likelihood that the investment will result in an initial public offering or acquisition increases by 42% when the entrepreneur and venture capitalist have attended the same Top 3 academic institution in the past. Still, this estimate is confounded by the effect of having an entrepreneur and a venture capitalist from a Top 3 academic institution. Therefore, Column (6) includes separate controls for whether or not the entrepreneur or the venture capitalist attended a Top 3 academic institution. In this specification, the coefficient in front of $School\ tie_{ij}$ measures the incremental effect of having attended the same Top 3 academic institution over and above the effect of having an entrepreneur and a venture capitalist from a Top 3 academic institution. Finally, the findings in Column (6) implies that the likelihood that the investment will result in an initial public offering or acquisition increases by 42% when the entrepreneur and venture capitalist have attended the same Top 3 academic institution.

### 5.2.2 Summary

Overall, the results from this section suggest that social networks tied to academic institutions also improve portfolio company performance. This finding is particularly strong when the academic institution is Top 3. Then, the likelihood that the investment will result in an initial public offering or acquisition increases by 42% when the entrepreneur and venture capitalist attended the same academic institution in the past. This effect is over and above the effect of having an entrepreneur

and a venture capitalist from a Top 3 academic institution. Taken together, these results provide strong evidence that social networks tied to academic institutions help reduce information gaps prevalent in the venture capital industry.

# 6 Conclusions

The primary objective of this study is to show that social networks tied to academic institutions reduce information gaps in the venture capital industry. For this purpose, I first establish a positive relationship between social networks tied to academic institutions and matching in the venture capital industry. More specifically, I show that the likelihood of matching between entrepreneurs and venture capitalists increases by 57% when they attended the same academic institution in the past. Similarly, the likelihood of matching between different venture capitalists increases by 42% when they attended the same academic institution in the past. I then show that social networks tied to academic institutions improve portfolio company performance. In particular, the likelihood that portfolio company investments result in initial public offerings or acquisitions increases by 42% when the venture capitalist and the entrepreneur attended the same Top 3 academic institution in the past. Taken together, these findings imply that social networks tied to academic institutions reduce information gaps between venture capitalists and entrepreneurs.

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# A Selection model appendix

One benefit of studying social networks tied to academic institutions is that they are formed long before the actual investment takes place. As a result, they are relatively uncorrelated with present investment decisions of profit maximizing venture capitalists. Nonetheless, potential selection issues have to be considered. In this study, the main concern is whether the estimated positive correlation between $School\ tie_{ij}$ and $Investment_{ij}$, $Syndication_{ij}$, or $Performance_{ij}$ is caused by some omitted variable. To address this issue, I estimate a two stage selection model à la Heckman (1979). As always, a perfect instrument for $School\ tie_{ij}$ is hard to imagine. Still, based on Ackerberg and Botticini (2002) and Bottazzi, Rin, and Hellmann (2007) I consider two different exclusionary restrictions. Firstly, I include portfolio company state and venture capital firm state interactions in the (first stage) selection equation, but not in the (second stage) outcome equation (Bottazzi, Rin, and Hellmann (2007)). Secondly, I include portfolio company state and industry as well as portfolio company state and stage interactions in the selection equation, but not in the outcome equation (Ackerberg and Botticini (2002)). After estimating the selection equation I predict the likelihood of being selected for the outcome equation and compute the associated Inverse Mills ratio. Finally, I include the Inverse Mills ratio when I estimate the outcome equation. Below I describe the observations used in the selection and outcome equations in the setting of: Matching in the venture capital industry and Portfolio company performance.

## A.1 Entrepreneurs and venture capitalists

The selection equation uses all actual and potential investments. The outcome equation uses all actual investments, but only those potential investments where the venture capitalist has invested in the same state and industry as the portfolio company at least once during the last five years. Table (14) presents the results from estimations of the selection model under the exclusionary restrictions described above. Although a better instrument for $School\ tie_{ij}$ is desirable, the selection model does not change the conclusions from the baseline specification.

## A.2 Different venture capitalists

The selection equation uses all actual and potential syndications. The outcome equation uses all actual syndications, but only those potential syndications where the non-lead venture capitalist has invested in the same state and industry as the portfolio company at least once during the last five years. Table (15) presents the results from estimations of the selection model under the aforementioned exclusionary restrictions. Like above, the selection model does not change the conclusions from the baseline specification.

## A.3 Portfolio company performance

The selection equation uses the same observations as the outcome equation in "Entrepreneurs and venture capitalists". The outcome equation uses actual investments. Table (16) presents the results from estimations of the selection model under the exclusionary restrictions described above. Again, the selection model confirms the conclusions from the baseline specification.

# B Data appendix

The specific variables used in the empirical analysis are defined as follows:

## B.1 Dependent variables

- *Investment* is a dummy that equals one for those investments that actually took place and zero for potential investments.
- *Syndication* is a dummy that equals one for those syndications that actually took place and zero for potential syndications.
- *Performance* is a dummy that equals one whenever the portfolio company's current situation is coded as either "Went Public" or "Acquisition" by Venture Economics.

## B.2 Independent variables

- *School tie* is a dummy that equals one for those investments where the venture capitalist has attended the same academic institution as any of the portfolio company's entrepreneurs. In the matching between lead- and non-lead venture capitalists, it equals one for those syndications where the non-lead venture capitalist has attended the same academic institution as the lead venture capitalists.

- *Ivy League tie*, *Non-Ivy League tie*, *Top 3 tie*, *Non-top 3 tie* are dummies that equals one for those investments where the venture capitalist has attended the same academic institution as any of the portfolio company's entrepreneurs and this academic institution is an Ivy League, Non-Ivy League, etc.

- *Ivy League venture capitalist* and *Ivy League entrepreneur* are dummies that equals one when the venture capitalist and the entrepreneur has attended an Ivy League academic institution. Similarly for *Non-Ivy League*, *Top 3*, *Non-top 3*.

- *Distance* is the natural logarithm of the geographical distance (in miles) between the centre points of the portfolio company's- and venture capital firm's five digit zip codes+1.

- *Deal size* is the natural logarithm of the amount invested in the company during 2002 measured in millions of dollars+1.

- *Company age* is the natural logarithm of the difference between 2003 and the portfolio company's founding year.

- *Seed/Startup* is a dummy that equals one when the investment is classified as a seed- or startup investment by Venture Economics.

- *Firm age* is the natural logarithm of the difference between 2003 and the venture capital firm's founding year.

- *Firm size* is the natural logarithm of the venture capital firm's reported capital under management measured in millions of dollars+1.

- *Firm experience* is the natural logarithm of the total number of domestic rounds the venture capital firm has participated in during the last five years. This includes all types of private equity deals such as buyouts, mezzanine, etc.[15]

- *Independent firm* is a dummy that equals one when the venture capital firm is classified as Private Equity Firm Investing Own Capital by Venture Economics.

In addition to these variables most regressions include fixed effects to control for *academic institutions*, *portfolio company states*, *and portfolio company industries*.

# C Calculation of the geographical distance

Some regressions include a control for geographical distance. This variable is calculated using the same methodology as in Sorenson and Stuart (2001).

$$d_{ij} = C\left\{\arccos\left[\sin\left(lat_i\right)\sin\left(lat_j\right) + \cos\left(lat_i\right)\cos\left(lat_j\right)\cos\left(\left|long_i - long_j\right|\right)\right]\right\},$$

where latitude ($lat$) and longitude ($long$) are the centroids of 5-digit US zipcodes measured in radians and $C = 3,437$ represents the earth's radius.

[15] Sorensen (2007) argue that the number of rounds in which a venture capital firm has participated is a superior measure of venture capital firm experience relative to firm age since it inter alia accounts for important aspects such as venture capital firm activity and preferred investment stage.

# D Tables

**Table 1: Descriptive statistics I: Venture capital firms, portfolio companies, and investment rounds**

This table presents descriptive statistics as of September 2008 for the full sample of venture capital firms, portfolio companies, and investment rounds. My data consists of all early stage venture capital investments made by U.S. venture capital firms into U.S. portfolio companies in 2002. For an investment to be included in the sample, I require an education background on at least one of the entrepreneurs and at least one of the venture capitalists who invested in the portfolio company.

| Panel A: Firm discriptive statistics | Freq. | Percent | Cum. |
|---|---|---|---|
| Firm type | | | |
| Private Equity Firm Investing Own Capital | 367 | 80,48 | 80,48 |
| Affiliate/Subsidary of Oth. Financial. | 13 | 2,85 | 83,33 |
| Corporate Venture Program | 11 | 2,41 | 85,74 |
| Investment/Merchant Bank Subsidiary | 9 | 1,97 | 87,71 |
| Other | 56 | 12,29 | 100 |
| Total | 456 | 100 | |
| **Panel B: Company discriptive statistics** | | | |
| Company stage level | | | |
| Early Stage | 554 | 85,10 | 85,10 |
| Startup/Seed | 97 | 14,90 | 100 |
| Total | 651 | 100 | |
| Company industry group | | | |
| Computer Related | 276 | 42,4 | 42,4 |
| Medical/Health/Life Science | 97 | 14,9 | 57,3 |
| Communications and Media | 83 | 12,75 | 70,05 |
| Semiconductors/Other Electronic | 74 | 11,37 | 81,42 |
| Biotechnology | 67 | 10,29 | 91,71 |
| Non-High-Technology | 54 | 8,29 | 100 |
| Total | 651 | 100 | |
| Company situation | | | |
| Active | 388 | 59,6 | 59,6 |
| Acquisition | 173 | 26,57 | 86,17 |
| Defunct | 44 | 6,76 | 92,93 |
| Went Public | 28 | 4,3 | 97,23 |
| Other | 18 | 2,76 | 99,99 |
| Total | 651 | 100 | |
| Company public status | | | |
| Private | 471 | 72,35 | 72,35 |
| Subsidiary | 130 | 19,97 | 92,32 |
| Public | 28 | 4,3 | 96,62 |
| Defunct | 21 | 3,23 | 99,85 |
| Registration | 1 | 0,15 | 100 |
| Total | 651 | 100 | |
| **Panel C: Investment discriptive statistics** | | | |
| New or follow on investment | | | |
| F | 293 | 39.86 | 39.86 |
| N | 442 | 60.14 | 100.00 |
| Total | 735 | 100.00 | |

**Table 2: Descriptive statistics II: Venture capital firms, portfolio companies, investment rounds, and individuals**

This table presents descriptive statistics as of September 2008 for the full sample of venture capital firms, portfolio companies, and investment rounds. My data consists of all early stage venture capital investments made by U.S. venture capital firms into U.S. portfolio companies in 2002. For an investment to be included in the sample, I require an education background on at least one of the entrepreneurs and at least one of the venture capitalists who invested in the portfolio company.

| Panel A: Firm descriptive statistics II | N | mean | sd | min | p50 | max |
|---|---|---|---|---|---|---|
| Firm reported capital under management | 424,00 | 1137,02 | 4893,57 | 0,00 | 199,00 | 82661,00 |
| Firm founding year | 456,00 | 1992,54 | 11,53 | 1850,00 | 1997,00 | 2003,00 |
| Panel B: Company descriptive statistics II | | | | | | |
| Company founding year | 604,00 | 1999,52 | 4,02 | 1939,00 | 2000,00 | 2003,00 |
| Panel C: Investment descriptive statistics II | | | | | | |
| Round number | 735,00 | 1,73 | 1,12 | 1,00 | 1,00 | 9,00 |
| Estimated round total investment | 735,00 | 4,43 | 4,90 | 0,00 | 3,00 | 43,50 |
| Disclosed round total investment | 735,00 | 4,41 | 4,90 | 0,00 | 3,00 | 43,50 |
| Panel D: Individual descriptive statistics II | | | | | | |
| Number of entrepreneurs | 1197,00 | | | | | |
| Number of venture capitalists | 957,00 | | | | | |

**Table 3: Descriptive statistics III: Summary statictics for the main variables**

This table presents summary statistics for the main variables used in this study. Panel A presents means and standard deviations. Panel B presents a correlation matrix. My data consists of all early stage venture capital investments made by U.S. venture capital firms into U.S. portfolio companies in 2002. For an investment to be included in the sample, I require an education background on at least one of the entrepreneurs and at least one of the venture capitalists who invested in the portfolio company. Performance is a dummy that equals one whenever the portfolio company's current situation is coded as either "Went Public" or "Acquisition" by Venture Economics. School tie is a dummy that equals one for those investments where the venture capitalist has attended the same academic institution as any of the portfolio company's entrepreneurs. Distance is the natural logarithm of the geographical distance (in miles) between the centre points of the portfolio company's- and venture capital firm's five digit zip codes+1. Deal size is the natural logarithm of the amount invested in the company during 2002 measured in millions of dollars+1. Company (Firm) age is the natural logarithm of the difference between 2003 and the portfolio company's (venture capital firm's) founding year. Seed/Startup is a dummy that equals one when the investment is classified as a seed- or startup investment by Venture Economics. Firm size is the natural logarithm of the venture capital firms reported capital under management measured in millions of dollars+1. Independent firm is a dummy that equals one when the venture capital firm is classified as Private Equity Firm Investing Own Capital by Venture Economics.

| Panel A: Mean and standard deviations | N | mean | sd | min | max |
|---|---|---|---|---|---|
| Performance | 989 | 0.33 | 0.47 | 0.00 | 1.00 |
| School tie | 989 | 0.14 | 0.34 | 0.00 | 1.00 |
| Distance | 960 | -2.63 | 2.51 | -16.79 | 0.85 |
| Firm size | 954 | 6.22 | 1.78 | 0.00 | 11.32 |
| Firm age | 986 | 2.22 | 0.88 | 0.00 | 5.03 |
| Independent firm | 989 | 0.84 | 0.36 | 0.00 | 1.00 |
| Deal size | 989 | 1.50 | 0.78 | 0.00 | 3.70 |
| Company age | 940 | 0.88 | 0.65 | 0.00 | 3.22 |
| Seed/Startup | 989 | 0.15 | 0.36 | 0.00 | 1.00 |

| Panel B: Correlation matrix | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
|---|---|---|---|---|---|---|---|---|---|---|
| Performance | 1 | 1 | | | | | | | | |
| School tie | 2 | 0.05 | 1 | | | | | | | |
| Distance | 3 | 0.01 | -0.13 | 1 | | | | | | |
| Firm size | 4 | 0.05 | -0.02 | 0.14 | 1 | | | | | |
| Firm age | 5 | 0.09 | 0.01 | 0.13 | 0.58 | 1 | | | | |
| Independent firm | 6 | 0.11 | 0.06 | -0.01 | 0.18 | 0.08 | 1 | | | |
| Deal size | 7 | 0.14 | 0.00 | 0.08 | 0.43 | 0.26 | 0.12 | 1 | | |
| Company age | 8 | 0.07 | -0.07 | 0.05 | -0.20 | -0.13 | -0.07 | -0.16 | 1 | |
| Seed/Startup | 9 | -0.07 | 0.04 | 0.01 | -0.05 | -0.01 | -0.02 | -0.21 | -0.25 | 1 |

**Table 4: Univariate tests**

This table presents the results for simple tests of equal means across different subsamples. My data consists of all (observed) actual and (unobserved) potential early stage venture capital investments made by U.S. venture capital firms into U.S. portfolio companies in 2002. For each actual portfolio company investment, potential venture capitalists fulfill two requirements: Firstly, they are in my cross section of investments from 2002. Secondly, they have invested in the same state and industry as the portfolio company at least once during the last five years. Panel A compares differences in means between actual- and potential investments. Panel B compares differences in means between actual investments with and without school ties. Performance is a dummy that equals one whenever the portfolio company's current situation is coded as either "Went Public" or "Acquisition" by Venture Economics. School tie is a dummy that equals one for those investments where the venture capitalist has attended the same academic institution as any of the portfolio company's entrepreneurs. Distance is the natural logarithm of the geographical distance (in miles) between the centre points of the portfolio company's- and venture capital firm's five digit zip codes+1. Deal size is the natural logarithm of the amount invested in the company during 2002 measured in millions of dollars+1. Company (Firm) age is the natural logarithm of the difference between 2003 and the portfolio company's (venture capital firm's) founding year. Seed/Startup is a dummy that equals one when the investment is classified as a seed- or startup investment by Venture Economics. Firm size is the natural logarithm of the venture capital firms reported capital under management measured in millions of dollars+1. Independent firm is a dummy that equals one when the venture capital firm is classified as Private Equity Firm Investing Own Capital by Venture Economics.

| Panel A: Comparing actual- to potential investments | | | | | |
|---|---|---|---|---|---|
| Variable | Actual Investments | Potential investments | t | Pr(T < t) | Pr(\|T\| > \|t\|) |
| School tie | 0.135 | 0.094 | **-4.465** | 0.000 | 0.000 |
| Distance | -2.633 | -1.198 | **19.955** | 1.000 | 0.000 |
| Firm size | 6.220 | 6.898 | **13.076** | 1.000 | 0.000 |
| Firm age | 2.221 | 2.503 | **10.993** | 1.000 | 0.000 |
| Independent firm | 0.844 | 0.862 | 1.619 | 0.947 | 0.105 |
| Deal size | 1.499 | 1.355 | **-5.716** | 0.000 | 0.000 |
| Company age | 0.880 | 0.886 | 0.292 | 0.615 | 0.771 |
| Seed/Startup | 0.131 | 0.133 | 0.165 | 0.566 | 0.869 |
| Panel B: Comparing actual investments with school ties to actual investments without school ties | | | | | |
| Variable | School tie = 1 | School tie = 0 | t | Pr(T < t) | Pr(\|T\| > \|t\|) |
| Performance | 0.391 | 0.322 | -1.564 | 0.059 | 0.118 |
| Distance | -3.410 | -2.510 | **3.828** | 1.000 | 0.000 |
| Firm size | 6.165 | 6.229 | 0.383 | 0.649 | 0.702 |
| Firm age | 2.242 | 2.218 | -0.294 | 0.385 | 0.769 |
| Independent firm | 0.902 | 0.835 | **-1.983** | 0.024 | 0.048 |
| Deal size | 1.486 | 1.501 | 0.213 | 0.584 | 0.831 |
| Company age | 0.772 | 0.897 | **1.996** | 0.977 | 0.046 |
| Seed/Startup | 0.128 | 0.132 | 0.125 | 0.550 | 0.900 |

**Table 5: Descriptive statistics: Academic institutions**

This table presents the top 10 most connected academic institutions in my sample of entrepreneurs and venture capitalists. My data consists of all early stage venture capital investments made by U.S. venture capital firms into U.S. portfolio companies in 2002. For an investment to be included in the sample, I require an education background on at least one of the entrepreneurs and at least one of the venture capitalists who invested in the portfolio company. An individual is connected to an academic institution if he/she holds either an undergraduate or a graduate degree from that institution.

Panel A: top ten most connected academic institutions, 2002.

| Venture capitalists | | | | Entrepreneurs | | | |
|---|---|---|---|---|---|---|---|
| Rank | Academic institution | Number of investors | % | Rank | Academic institution | Number of entrepreneurs | % |
| 1 | Harvard University | 255 | 11,3 | 1 | University of California | 110 | 5,1 |
| 2 | Stanford University | 182 | 8,1 | 2 | Stanford University | 98 | 4,5 |
| 3 | University of California | 108 | 4,8 | 3 | Harvard University | 79 | 3,7 |
| 4 | University of Pennsylvania | 94 | 4,2 | 4 | M.I.T. | 70 | 3,2 |
| 5 | M.I.T. | 77 | 3,4 | 5 | Indian Institute of Technology | 36 | 1,7 |
| 6 | Dartmouth College | 48 | 2,1 | 6 | California State University | 35 | 1,6 |
| 7 | Northwestern University | 45 | 2,0 | 7 | Cornell University | 34 | 1,6 |
| 8 | Princeton University | 43 | 1,9 | 8 | University of Chicago | 30 | 1,4 |
| 9 | University of Chicago | 42 | 1,9 | 9 | University of Pennsylvania | 30 | 1,4 |
| 10 | Columbia University | 36 | 1,6 | 10 | University of Texas | 29 | 1,3 |
| Other | | 1328 | 58,8 | Other | | 1604 | 74,4 |
| Ivy League | | 559 | 24,8 | Ivy League | | 249 | 11,6 |
| Total | | 2258 | 100,0 | Total | | 2155 | 100,0 |

**Table 6: Entrepreneurs and venture capitalists**

This table presents results for ordinary least squares regressions. My data consists of all (observed) actual and (unobserved) potential early stage venture capital investments made by U.S. venture capital firms into U.S. portfolio companies in 2002. For each actual portfolio company investment, potential venture capitalists fulfill two requirements: Firstly, they are in my cross section of investments from 2002. Secondly, they have invested in the same state and industry as the portfolio company at least once during the last five years. The dependent variable, Investment, is a dummy that equals one for those investments that actually took place and zero for potential investments. School tie is a dummy that equals one for those investments where the venture capitalist has attended the same academic institution as any of the portfolio company's entrepreneurs. Distance is the natural logarithm of the geographical distance (in miles) between the centre points of the portfolio company's- and venture capital firm's five digit zip codes+1. Deal size is the natural logarithm of the amount invested in the company during 2002 measured in millions of dollars+1. Company (Firm) age is the natural logarithm of the difference between 2003 and the portfolio company's (venture capital firm's) founding year. Seed/Startup is a dummy that equals one when the investment is classified as a seed- or startup investment by Venture Economics. Firm size is the natural logarithm of the venture capital firms reported capital under management measured in millions of dollars+1. Independent firm is a dummy that equals one when the venture capital firm is classified as Private Equity Firm Investing Own Capital by Venture Economics. All regressions include school-, state- and industry dummies. Standard errors are double clustered at the venture capital firm and portfolio company level and robust t-statistics are presented in brackets.

| | 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|---|
| School tie | **0.0038** | **0.003** | **0.003** | **0.0029** | **0.0028** | **0.0029** |
| | [4.645] | [3.761] | [3.726] | [3.611] | [3.529] | [3.644] |
| Distance | | **-0.0017** | **-0.0016** | **-0.0017** | **-0.0017** | **-0.0017** |
| | | [-11.78] | [-11.01] | [-11.53] | [-10.80] | [-10.82] |
| Firm size | | | **-0.001** | | | **-0.001** |
| | | | [-5.673] | | | [-5.286] |
| Firm age | | | **-0.0015** | | | **-0.0015** |
| | | | [-5.296] | | | [-4.876] |
| Independent firm | | | -0.0009 | | -0.0005 | -0.0007 |
| | | | [-1.440] | | [-0.881] | [-1.057] |
| Deal size | | | | **0.002** | **0.002** | **0.002** |
| | | | | [5.669] | [5.711] | [5.726] |
| Company age | | | | 0.0005 | 0.0005 | **0.0007** |
| | | | | [1.294] | [1.277] | [1.715] |
| Seed/Startup | | | | 0.0008 | 0.0008 | 0.0007 |
| | | | | [1.204] | [1.225] | [1.149] |
| Firm experience | | | | | **-0.0024** | |
| | | | | | [-8.593] | |
| Observations | 192165 | 190863 | 188556 | 177202 | 177202 | 175076 |
| R-squared | 0.016 | 0.018 | 0.019 | 0.02 | 0.021 | 0.02 |
| State fixed effects | Yes | Yes | Yes | Yes | Yes | Yes |
| Industry fixed effects | Yes | Yes | Yes | Yes | Yes | Yes |
| Academic institution fixed effects | Yes | Yes | Yes | Yes | Yes | Yes |

**Table 7: Entrepreneurs and venture capitalists: Large vs small- & old vs young VC firms**

This table presents results for ordinary least squares regressions. My data consists of all (observed) actual and (unobserved) potential early stage venture capital investments made by U.S. venture capital firms into U.S. portfolio companies in 2002. For each actual portfolio company investment, potential venture capitalists fulfill two requirements: Firstly, they are in my cross section of investments from 2002. Secondly, they have invested in the same state and industry as the portfolio company at least once during the last five years. The dependent variable, Investment, is a dummy that equals one for those investments that actually took place and zero for potential investments. School tie is a dummy that equals one for those investments where the venture capitalist has attended the same academic institution as any of the portfolio company's entrepreneurs. Distance is the natural logarithm of the geographical distance (in miles) between the centre points of the portfolio company's- and venture capital firm's five digit zip codes+1. Deal size is the natural logarithm of the amount invested in the company during 2002 measured in millions of dollars+1. Company (Firm) age is the natural logarithm of the difference between 2003 and the portfolio company's (venture capital firm's) founding year. Seed/Startup is a dummy that equals one when the investment is classified as a seed- or startup investment by Venture Economics. Firm size is the natural logarithm of the venture capital firms reported capital under management measured in millions of dollars+1. Independent firm is a dummy that equals one when the venture capital firm is classified as Private Equity Firm Investing Own Capital by Venture Economics. School tie*Firm size is the product between School tie and Firm size. Similarly, School tie*Firm age is the product between School tie and Firm age. All regressions include school-, state- and industry dummies. Standard errors are double clustered at the venture capital firm and portfolio company level and robust t-statistics are presented in brackets.

| | 1 | 2 |
|---|---|---|
| School tie | **0.0127** | **0.0075** |
| | [2.775] | [2.323] |
| Distance | **-0.0017** | **-0.0017** |
| | [-10.75] | [-10.80] |
| Firm size | **-0.0008** | **-0.001** |
| | [-4.459] | [-5.272] |
| Firm age | **-0.0014** | **-0.0013** |
| | [-4.844] | [-4.053] |
| Independent firm | -0.0007 | -0.0007 |
| | [-0.998] | [-1.037] |
| Deal size | **0.002** | **0.002** |
| | [5.748] | [5.736] |
| Company age | **0.0007** | **0.0007** |
| | [1.722] | [1.708] |
| Seed/Startup | 0.0007 | 0.0007 |
| | [1.135] | [1.144] |
| School tie*Firm size | **-0.0014** | |
| | [-2.405] | |
| School tie*Firm age | | **-0.0018** |
| | | [-1.647] |
| Observations | 175076 | 175076 |
| R-squared | 0.02 | 0.02 |
| State fixed effects | Yes | Yes |
| Industry fixed effects | Yes | Yes |
| Academic institution fixed effects | Yes | Yes |

**Table 8: Entrepreneurs and venture capitalists: Ivy League & most connected academic institutions**

This table presents results for ordinary least squares regressions. My data consists of all (observed) actual and (unobserved) potential early stage venture capital investments made by U.S. venture capital firms into U.S. portfolio companies in 2002. For each actual portfolio company investment, potential venture capitalists fulfill two requirements: Firstly, they are in my cross section of investments from 2002. Secondly, they have invested in the same state and industry as the portfolio company at least once during the last five years. The dependent variable, Investment, is a dummy that equals one for those investments that actually took place and zero for potential investments. Ivy League tie, Non-Ivy League tie, Top 3 tie, Non-top 3 tie are dummies that equals one for those investments where the venture capitalist has attended the same academic institution as any of the portfolio company's entrepreneurs and this academic institution is an Ivy League, Non-Ivy League, etc. Distance is the natural logarithm of the geographical distance (in miles) between the centre points of the portfolio company's- and venture capital firm's five digit zip codes+1. Deal size is the natural logarithm of the amount invested in the company during 2002 measured in millions of dollars+1. Company (Firm) age is the natural logarithm of the difference between 2003 and the portfolio company's (venture capital firm's) founding year. Seed/Startup is a dummy that equals one when the investment is classified as a seed- or startup investment by Venture Economics. Firm size is the natural logarithm of the venture capital firms reported capital under management measured in millions of dollars+1. Independent firm is a dummy that equals one when the venture capital firm is classified as Private Equity Firm Investing Own Capital by Venture Economics. All regressions include school-, state- and industry dummies. Standard errors are double clustered at the venture capital firm and portfolio company level and robust t-statistics are presented in brackets.

| | 1 | 2 | 3 | 4 |
|---|---|---|---|---|
| Ivy League tie | 0.0008 | | | |
| | [0.657] | | | |
| Non-Ivy League tie | | **0.0039** | | |
| | | [3.754] | | |
| Top 3 tie | | | 0.0012 | |
| | | | [1.569] | |
| Non-Top 3 tie | | | | **0.0059** |
| | | | | [3.198] |
| Distance | **-0.0017** | **-0.0017** | **-0.0017** | **-0.0017** |
| | [-10.88] | [-10.80] | [-10.83] | [-10.88] |
| Firm size | **-0.001** | **-0.001** | **-0.001** | **-0.001** |
| | [-5.294] | [-5.279] | [-5.297] | [-5.270] |
| Firm age | **-0.0015** | **-0.0015** | **-0.0015** | **-0.0015** |
| | [-4.877] | [-4.875] | [-4.877] | [-4.881] |
| Independent firm | -0.0007 | -0.0007 | -0.0007 | -0.0007 |
| | [-1.061] | [-1.030] | [-1.063] | [-1.045] |
| Deal size | **0.002** | **0.002** | **0.002** | **0.002** |
| | [5.713] | [5.716] | [5.718] | [5.730] |
| Company age | **0.0007** | **0.0007** | **0.0007** | **0.0007** |
| | [1.734] | [1.734] | [1.731] | [1.726] |
| Seed/Startup | 0.0007 | 0.0007 | 0.0007 | 0.0007 |
| | [1.138] | [1.129] | [1.150] | [1.104] |
| Observations | 175076 | 175076 | 175076 | 175076 |
| R-squared | 0.02 | 0.02 | 0.02 | 0.02 |
| State fixed effects | Yes | Yes | Yes | Yes |
| Industry fixed effects | Yes | Yes | Yes | Yes |
| Academic institution fixed effects | Yes | Yes | Yes | Yes |

**Table 9: Different venture capitalists**

This table presents results for ordinary least squares regressions. My data consists of all (observed) actual and (unobserved) potential early stage venture capital syndications made by U.S. venture capital firms when investing in U.S. portfolio companies in 2002. For each actual portfolio company investment, potential non-lead venture capitalists fulfill two requirements: Firstly, they are in my cross section of investments from 2002. Secondly, they have invested in the same state and industry as the portfolio company at least once during the last five years. The dependent variable, Syndication, is a dummy that equals one for those syndications that actually took place and zero for potential syndications. School tie is a dummy that equals one for those syndications where the lead and non-lead venture capitalists have attended the same academic institution. Distance is the natural logarithm of the geographical distance (in miles) between the centre points of the portfolio company's- and venture capital firm's five digit zip codes+1. Deal size is the natural logarithm of the amount invested in the company during 2002 measured in millions of dollars+1. Company (Firm) age is the natural logarithm of the difference between 2003 and the portfolio company's (venture capital firm's) founding year. Seed/Startup is a dummy that equals one when the investment is classified as a seed- or startup investment by Venture Economics. Firm size is the natural logarithm of the venture capital firms reported capital under management measured in millions of dollars+1. Independent firm is a dummy that equals one when the venture capital firm is classified as Private Equity Firm Investing Own Capital by Venture Economics. All regressions include school-, state- and industry dummies. Standard errors are double clustered at the non-lead venture capital firm and portfolio company level and robust t-statistics are presented in brackets.

| | 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|---|
| School tie | **0.0027** | **0.0022** | **0.0022** | **0.0023** | **0.0023** | **0.0023** |
| | [2.457] | [1.960] | [1.998] | [2.014] | [2.004] | [2.056] |
| Distance: Lead-Non-lead | | -0.0003 | **-0.0004** | -0.0003 | -0.0003 | -0.0003 |
| | | [-1.555] | [-1.618] | [-1.301] | [-1.228] | [-1.373] |
| Distance: Lead-company | | **0.0003** | **0.0003** | **0.0002** | **0.0002** | **0.0003** |
| | | [3.018] | [3.831] | [1.749] | [1.923] | [3.085] |
| Distance: Non-lead-company | | **-0.0016** | **-0.0015** | **-0.0016** | **-0.0015** | **-0.0015** |
| | | [-5.609] | [-5.223] | [-5.546] | [-5.352] | [-5.167] |
| Lead size | | | 0.0004 | | | 0 |
| | | | [0.742] | | | [-0.0741] |
| Non-lead size | | | **-0.0022** | | | **-0.0021** |
| | | | [-4.767] | | | [-4.483] |
| Lead age | | | -0.0001 | | | 0.0001 |
| | | | [-0.334] | | | [0.219] |
| Non-lead age | | | **-0.0023** | | | **-0.0022** |
| | | | [-3.327] | | | [-3.063] |
| Lead independent firm | | | 0.0025 | | 0.0009 | 0.0015 |
| | | | [1.198] | | [0.452] | [0.677] |
| Non-lead independent firm | | | -0.0008 | | -0.0017 | -0.0009 |
| | | | [-0.540] | | [-1.109] | [-0.612] |
| Deal size | | | | **0.0013** | **0.0012** | **0.0014** |
| | | | | [2.035] | [1.736] | [2.019] |
| Company age | | | | -0.0002 | -0.0002 | -0.0001 |
| | | | | [-0.428] | [-0.535] | [-0.260] |
| Seed/Startup | | | | 0.0016 | 0.0015 | 0.0003 |
| | | | | [1.122] | [0.929] | [0.197] |
| Lead experience | | | | | -0.0003 | |
| | | | | | [-0.631] | |
| Non-lead experience | | | | | **-0.0037** | |
| | | | | | [-5.974] | |
| Observations | 58174 | 52155 | 51595 | 50595 | 50595 | 50048 |
| R-squared | 0.021 | 0.02 | 0.022 | 0.02 | 0.022 | 0.022 |
| State fixed effects | Yes | Yes | Yes | Yes | Yes | Yes |
| Industry fixed effects | Yes | Yes | Yes | Yes | Yes | Yes |
| Academic institution fixed effects | Yes | Yes | Yes | Yes | Yes | Yes |

**Table 10: Different venture capitalists: Large vs small- & old vs young VC firms**

This table presents results for ordinary least squares regressions. My data consists of all (observed) actual and (unobserved) potential early stage venture capital syndications made by U.S. venture capital firms when investing in U.S. portfolio companies in 2002. For each actual portfolio company investment, potential non-lead venture capitalists fulfill two requirements: Firstly, they are in my cross section of investments from 2002. Secondly, they have invested in the same state and industry as the portfolio company at least once during the last five years. The dependent variable, Syndication, is a dummy that equals one for those syndications that actually took place and zero for potential syndications. School tie is a dummy that equals one for those syndications where the lead and non-lead venture capitalists have attended the same academic institution. Distance is the natural logarithm of the geographical distance (in miles) between the centre points of the portfolio company's- and venture capital firm's five digit zip codes+1. Deal size is the natural logarithm of the amount invested in the company during 2002 measured in millions of dollars+1. Company (Firm) age is the natural logarithm of the difference between 2003 and the portfolio company's (venture capital firm's) founding year. Seed/Startup is a dummy that equals one when the investment is classified as a seed- or startup investment by Venture Economics. Firm size is the natural logarithm of the venture capital firms reported capital under management measured in millions of dollars+1. Independent firm is a dummy that equals one when the venture capital firm is classified as Private Equity Firm Investing Own Capital by Venture Economics. School tie*Firm size is the product between School tie and Non-lead size. Similarly, School tie*Firm age is the product between School tie and Non-lead age. All regressions include school-, state- and industry dummies. Standard errors are double clustered at the non-lead venture capital firm and portfolio company level and robust t-statistics are presented in brackets.

| | 1 | 2 |
|---|---|---|
| School tie | 0.0118 | 0.0039 |
| | [1.409] | [0.777] |
| Distance: Lead-Non-lead | -0.0003 | -0.0003 |
| | [-1.348] | [-1.376] |
| Distance: Lead-company | **0.0003** | **0.0003** |
| | [3.095] | [3.114] |
| Distance: Non-lead-company | **-0.0015** | **-0.0015** |
| | [-5.166] | [-5.167] |
| Lead size | -0.0001 | 0 |
| | [-0.0906] | [-0.0744] |
| Non-lead size | **-0.0019** | **-0.0021** |
| | [-4.065] | [-4.475] |
| Lead age | 0.0001 | 0.0001 |
| | [0.201] | [0.207] |
| Non-lead age | **-0.0022** | **-0.0021** |
| | [-3.079] | [-2.717] |
| Lead independent firm | 0.0015 | 0.0015 |
| | [0.681] | [0.673] |
| Non-lead independent firm | -0.0009 | -0.0009 |
| | [-0.615] | [-0.617] |
| Deal size | **0.0014** | **0.0014** |
| | [2.035] | [2.022] |
| Company age | -0.0001 | -0.0001 |
| | [-0.268] | [-0.263] |
| Seed/Startup | 0.0003 | 0.0003 |
| | [0.208] | [0.195] |
| School tie*Non-lead size | -0.0013 | |
| | [-1.210] | |
| School tie*Non-lead age | | -0.0006 |
| | | [-0.341] |
| Observations | 50048 | 50048 |
| R-squared | 0.022 | 0.022 |
| State fixed effects | Yes | Yes |
| Industry fixed effects | Yes | Yes |
| Academic institution fixed effects | Yes | Yes |

**Table 11: Different venture capitalists: Ivy League & most connected academic institutions**

This table presents results for ordinary least squares regressions. My data consists of all (observed) actual and (unobserved) potential early stage venture capital syndications made by U.S. venture capital firms when investing in U.S. portfolio companies in 2002. For each actual portfolio company investment, potential non-lead venture capitalists fulfill two requirements: Firstly, they are in my cross section of investments from 2002. Secondly, they have invested in the same state and industry as the portfolio company at least once during the last five years. The dependent variable, Syndication, is a dummy that equals one for those syndications that actually took place and zero for potential syndications. Ivy League tie, Non-Ivy League tie, Top 3 tie, Non-top 3 tie are dummies that equals one for those syndications where the lead and non-lead venture capitalists have attended the same academic institution and this academic institution is an Ivy League, Non-Ivy League, etc. Distance is the natural logarithm of the geographical distance (in miles) between the centre points of the portfolio company's- and venture capital firm's five digit zip codes+1. Deal size is the natural logarithm of the amount invested in the company during 2002 measured in millions of dollars+1. Company (Firm) age is the natural logarithm of the difference between 2003 and the portfolio company's (venture capital firm's) founding year. Seed/Startup is a dummy that equals one when the investment is classified as a seed- or startup investment by Venture Economics. Firm size is the natural logarithm of the venture capital firms reported capital under management measured in millions of dollars+1. Independent firm is a dummy that equals one when the venture capital firm is classified as Private Equity Firm Investing Own Capital by Venture Economics. All regressions include school-, state- and industry dummies. Standard errors are double clustered at the non-lead venture capital firm and portfolio company level and robust t-statistics are presented in brackets.

| | 1 | 2 | 3 | 4 |
|---|---|---|---|---|
| Ivy League tie | 0.0027 | | | |
| | [1.468] | | | |
| Non-Ivy League tie | | **0.0023** | | |
| | | [1.604] | | |
| Top 3 tie | | | **0.0022** | |
| | | | [1.745] | |
| Non-Top 3 tie | | | | 0.003 |
| | | | | [1.119] |
| Distance: Lead-Non-lead | -0.0003 | -0.0003 | -0.0003 | -0.0003 |
| | [-1.421] | [-1.385] | [-1.391] | [-1.409] |
| Distance: Lead-company | **0.0003** | **0.0003** | **0.0003** | **0.0003** |
| | [3.124] | [3.101] | [3.081] | [3.110] |
| Distance: Non-lead-company | **-0.0015** | **-0.0015** | **-0.0015** | **-0.0015** |
| | [-5.168] | [-5.165] | [-5.168] | [-5.166] |
| Lead size | 0 | -0.0001 | 0 | 0 |
| | [-0.0845] | [-0.0949] | [-0.0781] | [-0.0899] |
| Non-lead size | **-0.0021** | **-0.0021** | **-0.0021** | **-0.0021** |
| | [-4.486] | [-4.473] | [-4.484] | [-4.484] |
| Lead age | 0.0001 | 0.0001 | 0.0001 | 0.0001 |
| | [0.224] | [0.235] | [0.224] | [0.226] |
| Non-lead age | **-0.0022** | **-0.0022** | **-0.0022** | **-0.0022** |
| | [-3.065] | [-3.066] | [-3.062] | [-3.071] |
| Lead independent firm | 0.0015 | 0.0015 | 0.0015 | 0.0015 |
| | [0.665] | [0.699] | [0.673] | [0.690] |
| Non-lead independent firm | -0.0009 | -0.0009 | -0.0009 | -0.0009 |
| | [-0.611] | [-0.605] | [-0.616] | [-0.609] |
| Deal size | **0.0014** | **0.0014** | **0.0014** | **0.0014** |
| | [2.050] | [2.032] | [2.013] | [2.043] |
| Company age | -0.0001 | -0.0001 | -0.0001 | -0.0001 |
| | [-0.279] | [-0.262] | [-0.246] | [-0.289] |
| Seed/Startup | 0.0003 | 0.0003 | 0.0003 | 0.0003 |
| | [0.193] | [0.200] | [0.211] | [0.177] |
| Observations | 50048 | 50048 | 50048 | 50048 |
| R-squared | 0.022 | 0.022 | 0.022 | 0.022 |
| State fixed effects | Yes | Yes | Yes | Yes |
| Industry fixed effects | Yes | Yes | Yes | Yes |
| Academic institution fixed effects | Yes | Yes | Yes | Yes |

**Table 12: Portfolio company performance**

This table presents results for ordinary least squares regressions. My data consists of all (observed) actual early stage venture capital investments made by U.S. venture capital firms into U.S. portfolio companies in 2002. The dependent variable, Performance, is a dummy that equals one whenever the portfolio company's current situation is coded as either "Went Public" or "Acquisition" by Venture Economics. School tie is a dummy that equals one for those investments where the venture capitalist has attended the same academic institution as any of the portfolio company's entrepreneurs. Distance is the natural logarithm of the geographical distance (in miles) between the centre points of the portfolio company's- and venture capital firm's five digit zip codes+1. Deal size is the natural logarithm of the amount invested in the company during 2002 measured in millions of dollars+1. Company (Firm) age is the natural logarithm of the difference between 2003 and the portfolio company's (venture capital firm's) founding year. Seed/Startup is a dummy that equals one when the investment is classified as a seed- or startup investment by Venture Economics. Firm size is the natural logarithm of the venture capital firms reported capital under management measured in millions of dollars+1. Independent firm is a dummy that equals one when the venture capital firm is classified as Private Equity Firm Investing Own Capital by Venture Economics. All regressions include state- and industry dummies. Standard errors are double clustered at the venture capital firm and portfolio company level and robust t-statistics are presented in brackets.

| | 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|---|
| School tie | 0.0708 | 0.0789 | 0.0787 | 0.0771 | 0.0723 | 0.0755 |
| | [1.292] | [1.426] | [1.382] | [1.387] | [1.292] | [1.345] |
| Distance | | 0.0054 | 0.004 | 0.0022 | 0.0022 | 0.0017 |
| | | [0.742] | [0.529] | [0.294] | [0.285] | [0.220] |
| Firm size | | | -0.0049 | | | -0.0194 |
| | | | [-0.410] | | | [-1.499] |
| Firm age | | | 0.0292 | | | 0.0427 |
| | | | [1.197] | | | [1.681] |
| Independent firm | | | **0.1272** | | **0.0953** | **0.1214** |
| | | | [2.377] | | [1.888] | [2.315] |
| Deal size | | | | **0.0883** | **0.084** | **0.0882** |
| | | | | [2.748] | [2.521] | [2.482] |
| Company age | | | | 0.0493 | 0.0518 | 0.048 |
| | | | | [1.229] | [1.287] | [1.189] |
| Seed/Startup | | | | -0.0075 | -0.0035 | -0.0043 |
| | | | | [-0.110] | [-0.0514] | [-0.0617] |
| Firm experience | | | | | 0.0013 | |
| | | | | | [0.0938] | |
| Observations | 989 | 960 | 926 | 911 | 911 | 879 |
| R-squared | 0.075 | 0.077 | 0.091 | 0.1 | 0.105 | 0.115 |
| State fixed effects | Yes | Yes | Yes | Yes | Yes | Yes |
| Industry fixed effects | Yes | Yes | Yes | Yes | Yes | Yes |

**Table 13: Portfolio company performance: Ivy League & most connected academic institutions**

This table presents results for ordinary least squares regressions. My data consists of all (observed) actual early stage venture capital investments made by U.S. venture capital firms into U.S. portfolio companies in 2002. The dependent variable, Performance, is a dummy that equals one whenever the portfolio company's current situation is coded as either "Went Public" or "Acquisition" by Venture Economics. Ivy League tie, Non-Ivy League tie, Top 3 tie, Non-top 3 tie are dummies that equals one for those investments where the venture capitalist has attended the same academic institution as any of the portfolio company's entrepreneurs and this academic institution is an Ivy League, Non-Ivy League, etc. Distance is the natural logarithm of the geographical distance (in miles) between the centre points of the portfolio company's- and venture capital firm's five digit zip codes+1. Deal size is the natural logarithm of the amount invested in the company during 2002 measured in millions of dollars+1. Company (Firm) age is the natural logarithm of the difference between 2003 and the portfolio company's (venture capital firm's) founding year. Seed/Startup is a dummy that equals one when the investment is classified as a seed- or startup investment by Venture Economics. Firm size is the natural logarithm of the venture capital firms reported capital under management measured in millions of dollars+1. Independent firm is a dummy that equals one when the venture capital firm is classified as Private Equity Firm Investing Own Capital by Venture Economics. All regressions include state- and industry dummies. Standard errors are double clustered at the venture capital firm and portfolio company level and robust t-statistics are presented in brackets.

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Ivy League tie | -0.0107 | -0.0193 | | | | | | |
| | [-0.112] | [-0.191] | | | | | | |
| Ivy League venture capitalist | | 0.0002 | | | | | | |
| | | [0.00309] | | | | | | |
| Ivy League entrepreneur | | 0.0131 | | | | | | |
| | | [0.387] | | | | | | |
| Non-Ivy League tie | | | 0.0953 | 0.0969 | | | | |
| | | | [1.510] | [1.533] | | | | |
| Non-Ivy League venture capitalist | | | | 0.0025 | | | | |
| | | | | [0.0487] | | | | |
| Non-Ivy League entrepreneur | | | | -0.0149 | | | | |
| | | | | [-0.465] | | | | |
| Top 3 tie | | | | | **0.134** | **0.1423** | | |
| | | | | | [1.837] | [1.945] | | |
| Top 3 venture capitalist | | | | | | -0.0114 | | |
| | | | | | | [-0.199] | | |
| Top 3 entrepreneur | | | | | | -0.0021 | | |
| | | | | | | [-0.0606] | | |
| Non-Top 3 tie | | | | | | | -0.0224 | -0.0158 |
| | | | | | | | [-0.296] | [-0.204] |
| Non-Top 3 venture capitalist | | | | | | | | -0.0219 |
| | | | | | | | | [-0.381] |
| Non-Top 3 entrepreneur | | | | | | | | -0.0222 |
| | | | | | | | | [-0.655] |
| Distance | 0.0005 | 0.0004 | 0.0017 | 0.0016 | 0.002 | 0.0019 | 0.0004 | 0.0009 |
| | [0.0629] | [0.0489] | [0.220] | [0.206] | [0.254] | [0.242] | [0.0549] | [0.118] |
| Firm size | -0.0205 | -0.0207 | -0.0194 | -0.0196 | -0.0202 | -0.0202 | **-0.021** | **-0.021** |
| | [-1.576] | [-1.595] | [-1.496] | [-1.517] | [-1.557] | [-1.563] | [-1.601] | [-1.642] |
| Firm age | **0.0442** | **0.0433** | **0.0426** | **0.0416** | **0.0424** | **0.0425** | **0.0443** | **0.0438** |
| | [1.746] | [1.706] | [1.673] | [1.640] | [1.670] | [1.673] | [1.753] | [1.726] |
| Independent firm | **0.1261** | **0.127** | **0.1225** | **0.1234** | **0.1228** | **0.1235** | **0.1266** | **0.1236** |
| | [2.404] | [2.439] | [2.344] | [2.377] | [2.344] | [2.338] | [2.410] | [2.319] |
| Deal size | **0.0899** | **0.0904** | **0.0895** | **0.0901** | **0.0855** | **0.0864** | **0.0894** | **0.0864** |
| | [2.508] | [2.516] | [2.535] | [2.542] | [2.421] | [2.403] | [2.523] | [2.388] |
| Company age | 0.046 | 0.0463 | 0.0478 | 0.0483 | 0.0471 | 0.0476 | 0.0457 | 0.0453 |
| | [1.134] | [1.139] | [1.178] | [1.189] | [1.170] | [1.170] | [1.125] | [1.104] |
| Seed/Startup | -0.0001 | 0.0008 | -0.0037 | -0.0029 | -0.0025 | -0.0017 | 0.0005 | -0.0011 |
| | [-0.000883] | [0.0112] | [-0.0541] | [-0.0423] | [-0.0364] | [-0.0242] | [0.00736] | [-0.0156] |
| Observations | 879 | 879 | 879 | 879 | 879 | 879 | 879 | 879 |
| R-squared | 0.112 | 0.112 | 0.115 | 0.115 | 0.117 | 0.118 | 0.112 | 0.113 |
| State fixed effects | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Industry fixed effects | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |

**Table 14: Entrepreneurs and venture capitalists: A selection model**

This table presents results for a two stage selection model à la <cite>Heckman1979</cite>. In the selection equation, my data consists of all (observed) actual and (unobserved) potential early stage venture capital investments made by U.S. venture capital firms into U.S. portfolio companies in 2002. For each actual portfolio company investment, potential venture capitalists are in my cross section of investments from 2002. The dependent variable in the selection equation is a dummy that equals one for those investments that actually took place and zero for potential investments. In the outcome equation, my data consists of all (observed) actual and (unobserved) potential early stage venture capital investments made by U.S. venture capital firms into U.S. portfolio companies in 2002. For each actual portfolio company investment, potential venture capitalists fulfill two requirements: Firstly, they are in my cross section of investments from 2002. Secondly, they have invested in the same state and industry as the portfolio company at least once during the last five years. The dependent variable in the outcome equation, Investment, is a dummy that equals one for those investments that actually took place and zero for potential investments. School tie is a dummy that equals one for those investments where the venture capitalist has attended the same academic institution as any of the portfolio company's entrepreneurs. Distance is the natural logarithm of the geographical distance (in miles) between the centre points of the portfolio company's- and venture capital firm's five digit zip codes+1. Deal size is the natural logarithm of the amount invested in the company during 2002 measured in millions of dollars+1. Company (Firm) age is the natural logarithm of the difference between 2003 and the portfolio company's (venture capital firm's) founding year. Seed/Startup is a dummy that equals one when the investment is classified as a seed- or startup investment by Venture Economics. Firm size is the natural logarithm of the venture capital firms reported capital under management measured in millions of dollars+1. Independent firm is a dummy that equals one when the venture capital firm is classified as Private Equity Firm Investing Own Capital by Venture Economics. All regressions include school-, state- and industry dummies. Standard errors are double clustered at the venture capital firm and portfolio company level and robust t-statistics are presented in brackets.

| | Selection | Outcome | Selection | Outcome |
|---|---|---|---|---|
| School tie | **0.0111** | **0.0028** | **0.0148** | **0.0029** |
| | [3.187] | [3.475] | [4.363] | [3.595] |
| Distance | **-0.0196** | **-0.0012** | **-0.0691** | **-0.0015** |
| | [-5.088] | [-7.874] | [-38.36] | [-7.893] |
| Firm size | **0.1145** | **-0.0018** | **0.0986** | **-0.0013** |
| | [60.35] | [-5.718] | [63.37] | [-3.322] |
| Firm age | **0.1084** | **-0.0022** | **0.0993** | **-0.0018** |
| | [43.35] | [-5.249] | [44.86] | [-3.749] |
| Firm round investment | **-0.0272** | **0.0005** | **-0.0267** | 0.0004 |
| | [-12.70] | [1.642] | [-13.71] | [1.194] |
| Independent firm | 0.008 | -0.0005 | 0.005 | -0.0008 |
| | [1.425] | [-0.748] | [1.294] | [-1.150] |
| Company age | 0.006 | -0.0001 | **0.0068** | -0.0001 |
| | [1.061] | [-0.262] | [2.333] | [-0.197] |
| Seed/Startup | 0.0143 | **-0.0012** | **-0.3866** | **-0.0013** |
| | [1.217] | [-1.932] | [-33.72] | [-1.982] |
| Inverse Mills ratio | | **-0.0208** | | -0.0077 |
| | | [-3.330] | | [-0.980] |
| Observations | 459993 | 174380 | 498978 | 174422 |
| R-squared | | 0.016 | | 0.02 |
| State fixed effects | Yes | Yes | Yes | Yes |
| Industry fixed effects | Yes | Yes | Yes | Yes |
| Academic institution fixed effects | Yes | Yes | Yes | Yes |
| Identification in the selection equation | | | | |
| Company state-Firm state interactions | Yes | | | |
| Company state-industry and state-stage interactions | | | Yes | |

**Table 15: Different venture capitalists: A selection model**

This table presents results for a two stage selection model à la <cite>Heckman1979</cite>. In the selection equation, my data consists of all (observed) actual and (unobserved) potential early stage venture capital syndications made by U.S. venture capital firms into U.S. portfolio companies in 2002. For each actual portfolio company investment, potential non-lead venture capitalists are in my cross section of investments from 2002. The dependent variable in the selection equation is a dummy that equals one for those syndications that actually took place and zero for potential syndications. In the outcome equation, my data consists of all (observed) actual and (unobserved) potential early stage venture capital syndications made by U.S. venture capital firms into U.S. portfolio companies in 2002. For each actual portfolio company investment, potential non-lead venture capitalists fulfill two requirements: Firstly, they are in my cross section of investments from 2002. Secondly, they have invested in the same state and industry as the portfolio company at least once during the last five years. The dependent variable, Syndication, is a dummy that equals one for those syndications that actually took place and zero for potential syndications. School tie is a dummy that equals one for those syndications where the lead and non-lead venture capitalists have attended the same academic institution. Distance is the natural logarithm of the geographical distance (in miles) between the centre points of the portfolio company's- and venture capital firm's five digit zip codes+1. Deal size is the natural logarithm of the amount invested in the company during 2002 measured in millions of dollars+1. Company (Firm) age is the natural logarithm of the difference between 2003 and the portfolio company's (venture capital firm's) founding year. Seed/Startup is a dummy that equals one when the investment is classified as a seed- or startup investment by Venture Economics. Firm size is the natural logarithm of the venture capital firms reported capital under management measured in millions of dollars+1. Independent firm is a dummy that equals one when the venture capital firm is classified as Private Equity Firm Investing Own Capital by Venture Economics. All regressions include school-, state- and industry dummies. Standard errors are double clustered at the non-lead venture capital firm and portfolio company level and robust t-statistics are presented in brackets.

| | Selection | Outcome | Selection | Outcome |
|---|---|---|---|---|
| School tie | **0.0205** | **0.0022** | **0.022** | **0.0022** |
| | [2.478] | [1.970] | [2.734] | [1.915] |
| Distance: Lead-Non-lead | **0.0113** | -0.0003 | -0.0025 | -0.0003 |
| | [2.407] | [-1.281] | [-1.035] | [-1.296] |
| Distance: Lead-company | **0.0048** | **0.0003** | 0.0009 | **0.0003** |
| | [2.595] | [2.833] | [0.956] | [3.231] |
| Distance: Non-lead-company | **-0.0714** | **-0.0012** | **-0.0725** | **-0.0011** |
| | [-19.58] | [-4.415] | [-20.88] | [-3.416] |
| Lead capital under mgmt. | **0.0097** | 0 | 0.0039 | -0.0001 |
| | [1.776] | [-0.0143] | [1.113] | [-0.177] |
| Non-lead capital under mgmt. | **0.1186** | **-0.0022** | **0.1158** | **-0.0026** |
| | [35.74] | [-3.617] | [42.80] | [-3.440] |
| Lead age | -0.0019 | -0.0001 | -0.0033 | 0.0001 |
| | [-0.260] | [-0.133] | [-0.649] | [0.215] |
| Non-lead age | **0.1461** | **-0.0029** | **0.1328** | **-0.0031** |
| | [25.08] | [-3.437] | [24.88] | [-3.410] |
| Lead round investment | 0.0068 | 0.0014 | **0.016** | 0.0013 |
| | [0.647] | [1.581] | [2.299] | [1.546] |
| Non-lead round investment | **0.011** | **-0.0028** | **0.0122** | **-0.003** |
| | [2.337] | [-3.840] | [2.758] | [-3.989] |
| Lead independent firm | **0.0493** | 0.0011 | 0.0209 | 0.0015 |
| | [1.941] | [0.521] | [1.513] | [0.656] |
| Non-lead independent firm | **-0.1165** | -0.0005 | **-0.0758** | -0.0001 |
| | [-9.461] | [-0.312] | [-7.549] | [-0.0858] |
| Company age | **0.0146** | -0.0001 | **0.0072** | -0.0002 |
| | [2.340] | [-0.364] | [1.726] | [-0.517] |
| Seed/Startup | **-0.041** | 0.0003 | **-0.0575** | 0.0003 |
| | [-2.097] | [0.203] | [-2.603] | [0.181] |
| Inverse Mills ratio | | -0.0138 | | **-0.0213** |
| | | [-1.515] | | [-1.708] |
| Observations | 116366 | 50017 | 118475 | 50048 |
| R-squared | | 0.021 | | 0.022 |
| State fixed effects | Yes | Yes | Yes | Yes |
| Industry fixed effects | Yes | Yes | Yes | Yes |
| Academic institution fixed effects | Yes | Yes | Yes | Yes |
| Identification in the selection equation | | | | |
| Lead and Non-lead firm state interactions | Yes | | | |
| Company state-industry and state-stage interactions | | | Yes | |

**Table 16: Portfolio company performance: A selection model**

This table presents results for a two stage selection model à la <cite>Heckman1979</cite>. In the selection equation, my data consists of all (observed) actual and (unobserved) potential early stage venture capital investments made by U.S. venture capital firms into U.S. portfolio companies in 2002. For each actual portfolio company investment, potential venture capitalists fulfill two requirements: Firstly, they are in my cross section of investments from 2002. Secondly, they have invested in the same state and industry as the portfolio company at least once during the last five years. The dependent variable in the selection equation, Investment, is a dummy that equals one for those investments that actually took place and zero for potential investments. In the outcome equation, my data consists of all (observed) actual early stage venture capital investments made by U.S. venture capital firms into U.S. portfolio companies in 2002. The dependent variable in the outcome equation, Performance, is a dummy that equals one whenever the portfolio company's current situation is coded as either "Went Public" or "Acquisition" by Venture Economics. School tie is a dummy that equals one for those investments where the venture capitalist has attended the same academic institution as any of the portfolio company's entrepreneurs. Top 3 tie is a dummy that equals one for those investments where the venture capitalist has attended the same academic institution as any of the portfolio company's entrepreneurs and this academic institution is Top 3. Distance is the natural logarithm of the geographical distance (in miles) between the centre points of the portfolio company's- and venture capital firm's five digit zip codes+1. Deal size is the natural logarithm of the amount invested in the company during 2002 measured in millions of dollars+1. Company (Firm) age is the natural logarithm of the difference between 2003 and the portfolio company's (venture capital firm's) founding year. Seed/Startup is a dummy that equals one when the investment is classified as a seed- or startup investment by Venture Economics. Firm size is the natural logarithm of the venture capital firms reported capital under management measured in millions of dollars+1. Independent firm is a dummy that equals one when the venture capital firm is classified as Private Equity Firm Investing Own Capital by Venture Economics. All regressions include state- and industry dummies. Standard errors are double clustered at the venture capital firm and portfolio company level and robust t-statistics are presented in brackets.

| | Selection | Outcome | Selection | Outcome | Selection | Outcome | Selection | Outcome |
|---|---|---|---|---|---|---|---|---|
| School tie | **0.0016** | 0.0767 | **0.0015** | 0.0758 | | | | |
| | [3.763] | [1.361] | [3.680] | [1.347] | | | | |
| Top 3 tie | | | | | **0.0011** | **0.1392** | **0.001** | **0.1403** |
| | | | | | [1.818] | [1.899] | [1.723] | [1.913] |
| Top 3 venture capitalist | | | | | -0.0001 | 0.0032 | -0.0001 | 0.0021 |
| | | | | | [-0.313] | [0.0558] | [-0.339] | [0.0366] |
| Top 3 entrepreneur | | | | | -0.0003 | 0.0072 | -0.0004 | 0.0078 |
| | | | | | [-0.894] | [0.210] | [-1.318] | [0.227] |
| Distance | **-0.0008** | 0.0043 | **-0.0009** | 0.0057 | **-0.0008** | 0.0048 | **-0.0009** | 0.0064 |
| | [-7.330] | [0.527] | [-14.28] | [0.640] | [-7.396] | [0.585] | [-14.43] | [0.725] |
| Firm size | **-0.0005** | -0.0073 | **-0.0005** | -0.0085 | **-0.0005** | -0.0086 | **-0.0005** | -0.0099 |
| | [-3.580] | [-0.574] | [-4.876] | [-0.671] | [-3.528] | [-0.664] | [-4.758] | [-0.775] |
| Firm age | **-0.0008** | **0.0436** | **-0.0008** | **0.0453** | **-0.0008** | **0.0433** | **-0.0008** | **0.0453** |
| | [-3.181] | [1.714] | [-3.846] | [1.790] | [-3.142] | [1.701] | [-3.790] | [1.787] |
| Firm round investment | 0.0003 | 0.0174 | 0.0002 | 0.0162 | 0.0003 | 0.0179 | 0.0002 | 0.0166 |
| | [0.844] | [0.525] | [0.892] | [0.488] | [0.832] | [0.538] | [0.847] | [0.496] |
| Independent firm | 0 | **0.1262** | 0.0001 | **0.1254** | 0 | **0.1273** | 0.0001 | **0.1259** |
| | [-0.0623] | [2.384] | [0.245] | [2.380] | [-0.00955] | [2.391] | [0.304] | [2.371] |
| Company age | **-0.0004** | 0.0337 | **-0.0004** | 0.0318 | **-0.0004** | 0.0338 | **-0.0004** | 0.0318 |
| | [-2.779] | [0.834] | [-2.696] | [0.787] | [-2.790] | [0.834] | [-2.718] | [0.786] |
| Seed/Startup | **-0.0006** | -0.0673 | 0.0013 | -0.0708 | **-0.0006** | -0.0599 | 0.0013 | -0.0635 |
| | [-2.161] | [-1.002] | [1.048] | [-1.051] | [-2.149] | [-0.895] | [1.011] | [-0.946] |
| Inverse Mills ratio | | -0.7513 | | -1.1529 | | -0.8372 | | -1.3009 |
| | | [-0.829] | | [-0.745] | | [-0.932] | | [-0.849] |
| Observations | 156606 | 866 | 173650 | 874 | 156606 | 866 | 173650 | 874 |
| R-squared | | 0.097 | | 0.1 | | 0.1 | | 0.104 |
| State fixed effects | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Industry fixed effects | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Identification in the selection equation | | | | | | | | |
| Company state-Firm state interactions | Yes | | | | Yes | | | |
| Company state-industry and state-stage interactions | | | Yes | | | | Yes | |