The Cost of Friendship*

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Abstract

We investigate how personal characteristics affect people's desire to collaborate and whether this attraction enhances or detracts from performance in venture capital. We find that venture capitalists who share the same ethnic, educational, or career background are more likely to syndicate with each other. This homophily reduces the probability of investment success, and the detrimental effect is most prominent for early-stage investments. A variety of tests show that the cost of affinity is most likely attributable to poor decision making by high-affinity syndicates after the investment is made. These results suggest that "birds-of-a-feather-flock-together" effects in collaboration can be costly.

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1. Introduction

People collaborate with others in a variety of settings. Construction of the Panama Canal and group hunting of mammoths are independent examples of mutually beneficial cooperation. Collaboration enables groups to achieve what cannot be accomplished as a result of solely individual effort. Joint work can also increase the efficiency of individual production as in the celebrated example of the multi-stage production of pins. The division of labor, which such collaborations entail, drives economic progress and greater productivity (Smith, 1776). In spite of the tremendous importance of collaborations, we lack a complete understanding of how people select their future working partners and whether there are any economic implications of different selection strategies.

In this paper, we explore two related questions on collaboration using venture capital as the laboratory. First, we ask what personal characteristics influence individuals' desires to work together in venture capital syndication. Second, given the influence of these personal characteristics, we ask whether this attraction enhances or detracts from investment performance. There are four sets of characteristics that we explore in our analysis: educational and professional background, ethnicity, and gender. Some of the characteristics are related to ability (e.g., whether a person has a degree from a top university) and have a clear connection with the success of an individual in the venture capital industry. For other characteristics (e.g., being part of a particular ethnic minority group) it is harder—if not impossible—to establish an obvious link with venture capitalists' ability and hence investment performance; these are affinity-related characteristics. We find that individual venture capitalists have a strong tendency to

collaborate with other venture capitalists because of affinity. We then show how the similarities between members of a group affect its performance. Surprisingly, collaborating for affinity-based characteristics—shown to be unrelated to venture capitalists' abilities—dramatically reduces investment returns.

The tendency of individuals to associate, interact, and bond with others who possess similar characteristics and backgrounds has long been viewed as the organizing basis of networks (e.g., McPherson et al., 2001). The principle of homophily shapes group formation and social connection in a wide variety of settings, such as school, work, marriage, and friendship, in which similarity between dyad or group members is observed across a broad range of characteristics including ethnicity, age, gender, class, education, social status, organizational role, etc. For example, positive assortative mating along observable inheritable traits (e.g., intelligence, race, and height) discussed by Becker (1973) in the context of a marriage market can be viewed as the micro foundation of homophily in which choosing a partner with similar characteristics increases the certainty about the quality of one's offspring. Currarini et al. (2009) provide theoretical foundations for the pattern of homophily in social networks using a search-based model of friendship formation and conclude that biases towards same-types in both individual preferences and the matching processes affect pairing outcomes.

Despite growing evidence that people do indeed tend to partner with similar individuals, the success implications of this bias remain unclear. One conjecture is that the more characteristics a pair of individuals have in common, the better performance the dyad is likely to demonstrate. This better performance may result from easier communication, the ability to better convey tacit information, or the ability to make

joint decisions in a timely and productive manner (e.g., Ingram and Roberts, 2000; McPherson et al., 2001; Cohen et al., 2008; Gompers and Xuan, 2010).

On the other hand, however, homophily may induce social conformity and groupthink that may lead to inefficient decision making (e.g., Asch, 1951; Janis, 1982; Ishii and Xuan, 2014). Individuals in homophilic relationships often have an enhanced desire for unanimity and ignore, or insufficiently consider, the disadvantages of the favored decision as well as the advice from experts outside the group. Furthermore, individuals may lower the expected return hurdle and due diligence standards on a project (consciously or unconsciously) for the opportunity to work with similar others because they derive personal utility from the collaboration. Consequently, under an alternative hypothesis, collaborations based on characteristics unrelated to ability might suffer from a "cost of friendship" and induce a negative relationship between affinity-based similarities and performance.

We test these hypotheses in the venture capital syndication setting, analyzing individual venture capitalists' selection of co-investment partners in syndicated deals as well as the associated performance implications. Venture capital syndication is an important and common mechanism for venture capital investors to diversify their portfolios, accumulate and share resources and expertise, and reduce asymmetric information concerning portfolio companies (e.g., Lerner, 1994). Although extant studies on syndication largely focus on the characteristics of the partnership at the venture capital firm level (e.g., firm reputation and investment scope), investment in venture capital is typically individual-led. The individual venture capitalist pursuing and initiating an investment in a portfolio company (the *founding* investor) normally identifies other individuals at different venture capital firms with whom he or she may

wish to collaborate on this particular deal. In other words, consistent with the idea of venture capitalists competing with each other for investment opportunities (Gompers and Lerner, 2000), it is natural to think of a *follow-on* investor as being chosen by the founding investor from a pool of potential co-investors. Both the founding and follow-on investors usually serve on the board of directors of the portfolio company, representing the interests of their respective venture capital firms and seeking to maximize the return on their investment. Depending on the performance of the portfolio companies and the market conditions, venture capitalists may use a variety of exit strategies, ranging from initial public offerings (IPO) to the sale of shares back to the entrepreneur or strategic investors. Although there are examples of successful exits by venture capitalists by means of mergers and acquisitions, the consensus in the industry and academia is that an exit via IPO is the best indicator of investment success, in which venture capitalists achieve not only the highest returns, but also wide recognition for their abilities.[1] The individual-led nature of the venture capital investing and syndication process, the availability of rich biographic information on individual venture capitalists, the existence of frequent collaborations between these individuals aiming for a common goal, the importance of their actions and decisions for the investment's success, and a clear-cut measure of success make venture capital syndication an ideal platform to study the factors that influence individuals' choices to work together and the accompanying value implications.

[1] Prior research indicates that the return to venture investing is primarily driven by the small fraction of investments that goes public (Venture Economics, 1988). Similarly, Gompers (1996) demonstrates that venture capital firms are able to more easily raise new funds after exiting a portfolio company via an IPO.

Using a novel dataset of 3,510 individual venture capitalists investing into 12,577 portfolio companies from 1973 to 2003, we first examine the selection of co-investment partners on syndicated deals. In particular, we are interested in determining a set of pairwise personal characteristics based on which people are attracted to work with each other. For each venture capitalist, we hand-collect detailed biographic information including gender, ethnicity, educational background, and employment history. To assess how these various personal characteristics affect the likelihood of collaborations between individual venture capitalists, for each pair of actual venture capitalist partners in syndication, we construct a plausible set of counterfactual pairs each consisting of the actual founding partner and a potential follow-on partner that was available for syndication, but who was not selected by the founding venture capitalist that originated the deal. We find that individual venture capitalists are more likely to collaborate with others who possess similar characteristics and backgrounds. For example, two venture capitalists that both hold degrees from top universities are 16.3% more likely to co-invest together than individuals who are not both graduates of top academic institutions. An even stronger effect is documented with respect to non-ability-related, affinity-based characteristics. A pair of venture capitalists who graduated from the same university are 34.4% more likely to partner on a deal, and even more strikingly, the probability of collaboration between two individual venture capitalists increases by 39.2% if they are part of the same ethnic minority group. Partnership is also more likely to happen if the two venture capitalists worked at the same company earlier in their careers. These results on syndication decision represent strong evidence of homophilic selection in collaboration.

We then examine how these similarities between members of a venture capitalist dyad affect its performance by assessing the outcomes of the portfolio companies in which the pair has co-invested. Similarities between venture capitalists based on affinity-related characteristics worsen the performance of their common investments. Specifically, the probability of a successful exit outcome decreases by 17% if two venture capitalists who previously worked at the same company choose to partner. The likelihood of success drops by 19% if co-investors attended the same undergraduate school. The negative effect of affinity is even stronger when it relates to ethnicity. Collaboration with someone from the same ethnic minority group comes at the expense of a 20% reduction in performance.

We further explore the impact of similarities between collaborators on performance using aggregate similarity scores. We construct the affinity score of a pair of venture capitalists as the average of pairwise affinity characteristics (measures indicating whether members of the pair are of the same gender, in the same minority ethnic group, attended the same school, or previously worked for the same employer.) Upon examining the relationship between the aggregate similarity score and investment performance, we again find that the more alike the partnering venture capitalists are in affinity-related characteristics, the less likely their investment outcome is ultimately successful. We also find that the affinity score of a pair of venture capitalists is significantly and positively related to the total number of syndicated deals on which the pair collaborates over their investment careers. Therefore, affinity-based similarity not only determines people's attractions to work together for the first time, but also increases their frequency of repeated collaborations.

To illustrate the effects of affinity-based similarities on the syndication decision and investment performance, consider as an example from our data the co-investment pattern of Mr. A through the lens of his background. Mr. A lived in Israel before moving to the U.S. for school, and graduated from Massachusetts Institute of Technology (MIT). He was actively involved in the Jewish communities in the U.S. During his career as a venture capitalist at venture capital firm Z, Mr. A co-invested on fourteen deals from 1984 to 2001. An MIT graduate, Mr. A co-invested on eleven deals with at least one other venture capitalist having a degree from a top school. Out of these eleven deals, two deals also have syndication teams characterized by the Jewish ethnicity commonality. In the remaining three of the fourteen co-investments, Mr. A's syndication partners are characterized by similar ethnic background only: they are all Jewish. Mr. A is a very successful venture capitalist: four of the fourteen deals resulted in a portfolio company going public and are classified as successful in our analysis; all of these four deals are syndications with top school degree holders who he had no mutual affinity based on ethnic, educational, or career background.

The fourteen deals are represented in a two-by-two matrix in Table 1; deals are assigned to a particular cell depending on whether the syndication was with a top school graduate or whether the syndication was based on affinity. Consistent with the homophily bias of founders selecting a working partner possessing similar characteristics, Mr. A had no joint investments with venture capitalists that he is unlikely to associate himself with either based on affinity or a high ranking academic institution. Moreover, all successful deals feature a venture capital team with other top school degree holders. There is not a single successful deal among affinity-based co-investments. The unconditional success ratio of Mr. A is 28.6% (4/14). Conditional on the co-investment

with a top school graduate free of mutual affinity, his success ratio increases to 44.4% (4/9), whereas conditional on affinity-based syndications, the success ratio drops to 0% (0/5). This illustrates the negative effect of affinity-based similarities within a syndication dyad on its performance.

[Insert Table 1 here]

An interesting question stemming from the performance results is whether the underperformance of investments undertaken by venture capitalists with a high level of affinity between them is primarily attributed to high-affinity venture capitalists selecting into investing in low-quality deals to begin with, or to poor decision making by such venture capitalists post investment. We conduct a series of additional tests to address this question. First, we show that ex-ante deal characteristics that significantly predict deal success are not significantly correlated with the affinity between syndicating partners, and use these ex-ante deal characteristics to control for the underlying investment quality. In addition, we instrument for the affinity between two partnering venture capitalists using local affinity, which captures the degree to which an individual founding venture capitalist is similar to the community of venture capitalists who are based in her same location and who invest in similar industries. Local affinity proxies for the local pool of potential collaborators faced by an individual founding venture capitalist and is significantly related to the affinity between the founding venture capitalist and her actual syndicating partner, but it is unlikely to directly drive deal success, especially after controlling for firm locations in the performance analysis. We find that the negative effect of affinity on investment performance remains economically

and statistically significant even after controlling for deal quality and using the instrumental variable approach to address the potential selection issue.

Finally, to further alleviate the selection concerns and to better understand the mechanisms through which affinity affects investment performance, we investigate how the effect of affinity on deal success varies by the stage of investment. We find that while affinity also significantly and negatively influences deal success for deals in the later stage of the investment cycle, the negative effect of affinity is significantly stronger for investments in portfolio companies that are in the earliest stage of the start-up process. Since early-stage startups typically involve more key decisions and milestones in their growth process, they require more input and oversight from the venture capitalists that invest in them, and their success depends more keenly on the value-add provided by the venture capitalists post investment. Therefore, poor decision making induced by high affinity can have a more pronounced effect on the performance of early-stage investments. The differential effect of affinity in early-stage investments versus later-stage investments is consistent with the hypothesis of high-affinity syndicating venture capitalists making poor decisions after the investment is made. Such a test of interaction term effects is also less subject to selection and third-factor concerns since any omitted factor is less likely to correlate with the interaction terms than with the linear term (Angrist and Pischke, 2009). Overall, although it is impossible to completely rule out the selection story of high-affinity venture capitalist syndicates choosing low-quality investments at the time of financing, our analysis indicates that selection seems unlikely to be the primary factor that accounts for the performance patterns documented in our paper.

Taken together, our results show that venture capitalists who share the same affinity-based characteristics are more likely to syndicate with each other and that this homophily has a detrimental effect on the probability of investment success, most likely due to poor decision making by high-affinity syndicates after the investment is made. The findings of this paper relate to several strands of literature. First, we contribute to the growing evidence that preferences for homophily strongly affect the composition and performance of working groups in the financial markets (e.g., Cohen et al., 2008; Ishii and Xuan, 2014). In the venture capital context, Kaplan et al. (2012) examines how personal characteristics matter for performance for companies involved in venture capital transactions. Several contemporaneous studies examine shared backgrounds between partners at venture capital firms and startup founders and focus on a single dimension of linkage such as education background (e.g., Bengtsson and Hsu, 2010; Hegde and Tumlinson, 2011). Our paper employs a comprehensive set of personal characteristics, including education, employment, ethnicity, and gender, and focuses on the syndication decision between partners of different venture capital firms.

Our paper is also related to the venture capital literature examining networks and connections as well as syndication decisions (e.g., Lerner, 1994; Hochberg et al., 2007; Hochberg et al., 2011; Gompers and Xuan, 2010; Tian, 2012). These studies typically focus on the characteristics of venture capital investors at the firm level. For example, the extent to which a syndicate is homogenous is generally measured using venture capital firm characteristics such as firm reputation. The breadth of our data allows us to dive a level deeper into the venture capital syndicates beyond the firm-level connections and to identify partners directly involved in each particular deal, thus arming us with a relevant and precise measure of syndicate-specific homogeneity on an

individual level. Focusing on the individual decision-makers, which is relatively unexplored in the venture capital networks literature, increases our ability to understand the determinants of the collaboration choice and make inferences about the relationship between team composition and success beyond the traditional factors and existing insights at the firm level.

Our paper also speaks to the mechanism of venture capital performance (e.g., Kaplan and Schoar, 2005; Harris, Jenkinson, and Kaplan, 2013). Kaplan et al. (2009) examine whether the people or the business model of a startup is more important for the success of venture capital-backed companies. By providing evidence that venture capital partners can affect investment success post-investment, our paper adds to this literature on the venture capitalists' ability to add value beyond investment target selection (e.g., Brander et al., 2002; Tian, 2012).

The remainder of the paper is organized as follows. Section 2 presents the data and the construction of variables used in the analysis. Empirical results are presented in Section 3. Section 4 investigates whether the cost of affinity on investment performance is attributed to selection or treatment effects. Section 5 concludes.

2. Data and variables

2.1. Data construction

The data used in this paper is derived from several different sources. We start with VentureSource, a database that contains detailed information on venture capital investments. For each portfolio company, VentureSource reports the identities of the venture capital firms and individual venture capitalists that invested in the company as well as the date of each investment.

For each individual venture capitalist in the data, we hand-collect through web searches, SEC filings, and news articles a broad range of biographic information including past career track, education history, and gender. For prior job histories, we record companies at which an individual had worked in the past. The education array includes data on the academic institutions at which individuals obtained their academic degrees as well as the types of degrees: undergraduate, postgraduate non-business (Ph.D., M.S., J.D., and M.D.), or postgraduate business (MBA). To determine whether an individual holds a degree from a top academic institution, we classify as top universities the Ivy League schools (Brown University, Columbia University, Cornell University, Dartmouth College, Harvard University, Princeton University, University of Pennsylvania, and Yale University) as well as other top U.S. schools (Amherst College, California Institute of Technology, Duke University, MIT, Northwestern University, Stanford University, University of California, Berkeley, University of Chicago, and Williams College).[2]

Venture capitalists' genders are determined based on their first names. In the cases of unisex names, we determine gender by reading news articles and web pages mentioning or containing pictures of the individual venture capitalists.[3] As for ethnic background, we use the name-matching algorithm developed by Kerr and Lincoln (2010) to determine the most likely ethnicities of venture capitalists based on their last names. Individual venture capitalists are classified into five non-overlapping ethnic groups: East

[2] The results presented in the paper are robust to classifying only the Ivy League universities as top schools as well as to adding top European universities (Cambridge University, INSEAD, London Business School, London School of Economics, and Oxford University) to the list of top schools.

[3] Despite our best effort, we cannot determine the gender of 26 venture capitalists in our sample.

Asians, Indian, Jewish, Middle Eastern, and all others. Although the limitation of the name-matching algorithm does not allow us to identify all possible ethnicities such as African American, the groups that the algorithm has been shown to successfully identify capture the most active ethnic minority groups in the venture capital industry, and all have a strong sense of cultural identity.[4]

We determine the investment outcome using VentureSource and Thomson Financial's SDC database, supplemented by Thomson Financial's VentureXpert database. Although there are examples of successful investments which did not result in IPOs, public floatation of a portfolio company is the cleanest signal of the venture's success (Gompers et al., 2010). We therefore consider an investment to be successful if and only if it results in the IPO of the portfolio company.[5] Finally, we use the *Pratt's Guide to Private Equity and Venture Capital Sources* to manually code the locations of venture capital firm offices at the Metropolitan Statistical Area (MSA) level and at the Combined Statistical Area (CSA) level where an MSA is not available.

2.2. Individual and pairwise personal characteristics

[4] We take into account the information on the country/geographic region of a venture capitalist's undergraduate academic institution to determine ethnicity when the name-matching algorithm fails to do so.

[5] Although some exits via acquisitions are successful, others are clearly not, such as companies sold to another firm under distress or at a substantial loss (Gompers et al., 2008; Kaplan et al., 2012). For example, in our data, the ambiguity of an acquisition as an indicator of success is evidenced by the 40% of investments that exited via acquisition. As a check, we gather exit values for as many acquisitions as we could using a variety of databases and news searchers. All the results in the paper are robust to defining successful investments as including IPOs and successful acquisitions, defined as acquisitions with a transaction value exceeding the total amount invested or exceeding a threshold of $25 million (or alternatively, $50 million or $100 million).

The data are used to construct two sets of variables: individual and pairwise. Individual variables include personal characteristics of a venture capitalist that are fixed over time such as education, ethnicity, and gender dummy variables. The education dummy variables *Top College*, *Top Business School*, *Top Graduate School*, and *Top School* equal one if a venture capitalist holds, respectively, an undergraduate, business, graduate, or any degree from a top university and zero otherwise. *Ethnic Minority* takes the value of one if a venture capitalist is East Asian, Indian, Jewish or Middle Eastern. Dummy variables *East Asian*, *Indian*, *Jewish* and *Middle Eastern* pin down a venture capitalist's ethnicity; the dummy variable *Female* identifies an individual's gender.

Also included in the personal characteristics of a venture capitalist is a metric that changes with each additional deal completed and measures her success up to the current deal. The variable *Performance* measures the venture capitalist's success ratio up to the current deal, defined as the total number of successful investments made before the current investment divided by the sum of the total number of investments.[6]

We then construct pairs of individual venture capital investors that co-invested on syndicated deals. For each deal, we use the investment dates—as well as the lead investor status and the amount invested when available—to distinguish between founding venture capitalists and follow-on investors.[7] Consistent with the idea that

[6] For the first deal of a venture capitalist—when there is no investment track record by construction—the *Performance* variable is set equal to 0. Our results are robust to dropping such observations from specifications that rely on *Performance* as an explanatory variable.

[7] Specifically, investment dates, lead investor status, and the amount invested are used successively to pin down founding investors. The investor who invested in the deal first is defined as the founding investor. If multiple people invested at the same time, we look at the lead investor status and define the lead investor with the earliest investment date as the founding investor. If the investment date

founding investors initiate and lead the deal and make decisions to bring follow-on investors on board, we focus on pairs of venture capitalists in which at least one member of the dyad is a founding investor. We focus on the first co-investment between two individual venture capitalists since the decision to collaborate for the first time is not colored by confounding factors such as experience of past collaborations and allows us to better isolate the impact of personal characteristics similarities in driving partnership decisions.[8]

For each pair of individual venture capital investors in the sample, two groups of pairwise variables are constructed based on the individual variables. The first group uses the qualifiers *At Least One* and *Both*. Values of such dummy variables depend on the number of venture capitalists in a dyad that possess a given characteristic. For example, *Top School: Both* takes the value of one if both venture capitalists in a pair hold degrees from top universities and zero otherwise; *Jewish: At Least One* equals one if there is either one or two Jewish venture capitalists in a dyad and zero otherwise.

A separate group of pairwise variables are constructed using the qualifier *Same*. *Same School* equals one if the pair of venture capitalists attended the same academic institution and zero otherwise. *Same College*, *Same Business School*, and *Same Grad School* are defined in a similar way but impose a requirement on obtaining degrees of the same type. *Same Ethnic Minority* equals one if both venture capitalists in a dyad

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and the lead investor status combined still do not uniquely determine the founding investor, we look at the amount invested by defining the investor with the largest amount invested as the founding investor.

[8] Our results are robust to including all pairs (first-time and repeated syndications) in the sample. First-time syndication pairs constitute about 93% of all pairs; the rest 7% are repeated collaboration pairs. We analyze these repeated collaborations in Section 3.4.

are part of the same ethnic minority group and zero otherwise. *Same Previous Employer* is a dummy variable equal to one if two venture capitalists worked at the same company earlier in their careers and zero otherwise.

Our sample consists of 3,510 venture capitalists that invested into 12,577 different portfolio companies from 1973 to 2003. The distribution of their personal characteristics is summarized in Table 2. The pairwise data set contains 15,979 collaborations between pairs of venture capitalists—containing at least one founding investor—partnering for the first time.

[Insert Table 2 here]

2.3. Counterfactual syndication pairs

In order to understand which factors lead to the establishment of collaborations between people, we construct a plausible set of potential partners that were available for syndication at the time when a founding venture capitalist partnered with a different co-investor. This set of counterfactual partners allows us to construct counterfactual pairs, essentially, a control group, which, when contrasted with the set of actual pairs, enables us to assess the significance of various personal characteristics in determining the likelihood of collaborations between people. Central to the construction of the set of counterfactual partners and pairs, therefore, are the assumptions on what makes a partner "available for syndication at the time of co-investment but not selected by the founding investor", i.e., counterfactual.

For each actual pair of venture capitalists syndicating on a deal, we generate all possible counterfactual, or pseudo, pairs by letting the founding venture capitalist "choose" a counterfactual partner that satisfies the following three criteria. First, the

counterfactual partner and the founding investor must be from different venture capital firms. Second, the counterfactual partner must have invested in the same industry within 30 days of the actual co-investment between the founding venture capitalist and the actual follow-on partner. Third, the counterfactual partner must not have ever co-invested with the founding venture capitalist. The overall universe of counterfactual syndication pairs thus generated has 1,353,039 pairs. For each actual syndication pair, there are on average roughly 85 counterfactual pairs matched, representing the available collaborators that the actual founding partner could have chosen at the time when the syndication decision is made. Our results are robust to alternative methodologies for constructing the counterfactual syndication pairs, including, for example, further requiring the counterfactual partner to come from the same firm as the actual follow-on partner, varying the window length around the actual investment date to 60 days or 90 days, requiring a fixed number of randomly chosen matched pseudo pairs for each actual pair in the sample of counterfactual pairs, or restricting the estimation sample to a random sample of 50,000 pairs stratified by year and industry. The results being qualitatively and quantitatively similar under different methodologies indicate that personal characteristics of a pair of individual venture capitalists are first-order important for predicting the likelihood of syndication.

3. Empirical Results

In this section we report empirical results of three major blocks of our analysis. First, we are interested in determining the set of personal characteristics that affect the performance of an individual venture capitalist. Second, we examine interactions between personal characteristics of two individuals and establish their impact on the

likelihood of a pair working together. Third, we study the performance implications of different kinds of similarities between venture capitalists co-investing together. We use probit regressions to fit models with binary dependent variables—whether an investment outcome is considered successful (in the first and third blocks) and whether a pair of venture capitalists actually collaborate in syndication (in the second block). We cluster robust standard errors by portfolio company because different individual venture capitalists and syndicates that invest into the same portfolio company share the same realization of a random investment outcome as a dependent variable. Portfolio company industry and year of investment fixed effects are included in every specification to capture differences in syndication patterns and in the investment success across different sectors and over time. In addition, we analyze repeated collaborations between venture capitalists and explore differences in pairwise characteristics between individuals that partner with each other once and those who collaborate more frequently. Each of these analyses is discussed in turn.

3.1. Individual investment success

In Table 3 we examine how individual demographic characteristics are related to investment success. The unit of analysis is person-investment pair, where *person* is an individual venture capitalist. We want to understand whether any venture capital personal characteristics are associated with differences in investment success. We find that individual performance is persistent which is reflected in the positive and significant effect of past investment success on the current deal's success. Holding a degree from a top academic institution also matters. For example, controlling for past performance, graduating from a top college increases the likelihood of investment

success by 1.2 percentage points. Given that the overall fraction of successful investments is 17.0%, these marginal effects are economically significant and are equivalent to an increase of the probability of a favorable outcome by 7.1%. Holding any degree from a top academic institution is a stronger and more precise signal of individual ability than holding a particular kind of degree from a top university: the point estimate of the *Top School* dummy variable corresponds to a 12.9% boost in the probability of success. In contrast, ethnicity and gender characteristics do not have any significant effect on individual performance. This justifies the distinction between ability-based characteristics, which positively affect individual success, and affinity-based characteristics, which have no relationship with individual performance.

[Insert Table 3 here]

3.2. Syndication partnering decision

We next explore the determinants of collaboration between people, focusing on the effects of the interactions between personal characteristics of two individual venture capitalists. Regression results are summarized in Table 4. The unit of analysis is a pair of venture capitalists, actual or counterfactual. If the syndication pair is counterfactual, the dependent variable takes the value of zero; if venture capitalists in a dyad are actual collaborators on a syndicated deal, the dependent variable takes the value of one.[9]

[Insert Table 4 here]

[9] The empirical results presented in this section are robust to correcting for a much larger proportion of nonevents in the estimation sample using rare event logistic regressions (King and Zeng, 2001).

In specifications 1 to 6, we explore the explanatory power of three groups of pairwise variables, school rank, same school, and same ethnicity, in isolation; fully specified models are reported in columns 7 and 8. We find strong support for the homophily-driven choice of working partners. Most ability- and affinity-based pairwise characteristics have positive and significant point estimates. For example, two venture capitalists both holding degrees from top universities are more likely to work together by 0.2 percentage points (Column 2), or by 16.7% relative to the unconditional sample probability of collaboration of 1.2%.[10] Finer classification of the schools (Columns 1 and 7) suggests that syndication based on similar ability characteristics seems to be largely driven by top college and top business school graduates.

An even stronger effect is observed with respect to affinity-based characteristics. Getting a degree from the same school increases the likelihood of two venture capitalists working together by 33.3% (Column 4). Adding a restriction on the shared educational background to be of the same type further raises the chances of collaboration between a pair of individuals with such commonalities. For example, venture capitalists who attended the same undergraduate school are 58.3% more likely to co-invest (Column 3).[11] Furthermore, the likelihood of two individuals partnering is 33.3% higher if both belong to the same ethnic minority group (Column 6). In particular, a partnership between two randomly drawn venture capitalists that are both East Asian is more than

[10] The unconditional sample probability of cooperation is calculated from the number of actual syndication pairs (15,838) and the number of counterfactual syndication pairs (1,344,567) used in the regression.

[11] Because there is greater diversity of undergraduate schools as opposed to business schools, our results indicate that our school tie effect is not driven by a small number of educational institutions.

twice as likely to occur in reality (Column 5). All these effects remain strong and significant in the fully specified models in Columns 7 and 8.

Venture capitalists also exhibit a strong preference to partner with individuals with whom they share prior employment histories. Having at least one common past employer more than doubles the probability of two people investing together. Finally, gender is another characteristic based on which homophily may potentially come into play. We find a significant effect for the *Female: Both* variable, which suggests that shared gender also acts as a significant factor in driving the decision of venture capitalists to syndicate with each other.

Estimations using alternative counterfactual samples produce qualitatively and quantitatively robust results. For example, estimation using a stratified random sample of 50,000 counterfactual pairs suggests that having a degree from the same school and belonging to the same ethnic minority group significantly increase the likelihood of collaboration between two venture capitalists, by 34.4% and 39.2%, respectively. In addition, all the results in the paper are robust to controlling for similarities between pairwise venture capital firm-level characteristics that may affect syndication decisions (Lerner, 1994), including the total number of past syndications, total dollar amount of past investments, past investment success rate, and the Herfindahl industry concentration of past investments.[12] Shared personal characteristics between a pair of individual venture capitalists have significant explanatory power for syndication decisions beyond the firm-level factors documented in the existing literature.

[12] These results are not tabulated for brevity but are available from the authors upon request.

Overall, our results on syndication partnering decisions show that individual venture capitalists are more likely to collaborate with others who possess similar characteristics and backgrounds, whether these characteristics are related to ability or not. The effects of these similarities on collaboration likelihood are highly significant, both statistically and economically.[13]

3.3. Investment success: pairwise characteristics

Having found strong evidence for homophily in the syndication patterns of venture capitalists, we next explore whether there are success implications of these biases. Table 5 presents the estimation results. The unit of analysis is an actual pair of venture capitalists that partnered on a syndicated deal. We regress the investment outcome (a dummy variable indicating success) on a set of pairwise individual characteristics. Some pairwise characteristics are represented by two dummy variables with qualifiers *At Least One* and *Both*. The purpose of having two types of variables is to understand whether a characteristic has an additive impact on success or whether it only matters if both individuals in a pair share it.

[Insert Table 5 here]

The results in Table 5 indicate that ability characteristics have a positive effect on the co-investment success. In particular, both venture capitalists in a pair having

[13] It is important to keep in mind that the homophily documented over different characteristics cannot be attributed to the number of investments in which venture capitalists with certain characteristics are involved. For example, investors educated at a highly ranked academic institution participate in a larger number of deals than their counterparts without a top school degree. This has an equal effect, however, on both the number of actual and counterfactual syndications between top degree holders, and hence, cannot explain the homophily biases discussed in this section.

degrees from top schools consistently increases its chances of success of the investment. Adding a second top degree holder in a dyad increases the probability of success by approximately 9.6% to 14.9%, given the unconditional success rate of venture capital syndicates at 20.8%.

On the contrary, collaborating for affinity-based characteristics severely worsens the performance of a syndication dyad. In particular, syndication between venture capitalists who are part of the same ethnic minority group or who attended the same school or worked at the same company in the past have significantly lower chances of success. For example, deals in which two former co-workers co-invest with each other have a 22.5% to 26.4% lower probability of investment success compared to non-coworker deals. Attending the same school is also detrimental. Syndicate partners who attended the same school exhibit an 11.5% lower success rate. The cost of affinity is even stronger for venture capitalists with similar ethnic backgrounds. Being part of the same ethnic minority group reduces the probability of success by 26.4% to 32.2%. In particular, East Asian investors collaborating with each other exhibit the largest cost of affinity, a drop in the probability of investment success by more than 60%. When two Jewish venture capitalists partner on a deal, the probability of investment success drops by approximately 25%. It is important to note that none of the affinity variables with a qualifier *At Least One* is significant. It is not the presence of an ethnic minority investor that drives underperformance. Indeed, Table 3 shows that individual's ethnicity is not related to success. Investment success is negatively affected only when *both* investors are part of the same ethnic minority group.

We bring the analysis one step further by introducing an affinity score. We construct the affinity score of a pair of venture capitalists as the average of pairwise

affinity characteristics—measures indicating whether members of the pair are of the same gender, in the same minority ethnic group, attended the same school, or previously worked for the same employer—for the sake of reducing the dimensionality of the problem and having an intuitive measure that represents the overall level of similarities between co-investors across multiple characteristics.

The affinity score thus constructed can be used as an aggregate independent variable to explain the investment success of the syndication dyad. Results of the analysis at the syndication pair level are presented in Table 6. In Columns 1 and 3, we employ a broad definition of the affinity score, constructed using the variables *Same School*, *Same Ethnic Minority*, *Same Previous Employer*, and *Same Gender.* The affinity score in Columns 2 and 4 is defined in a detailed way over the education and ethnicity components—it uses the variables *Same College*, *Same Business School*, *Same Graduate School*, *East Asian: Both*, *Indian: Both*, and *Jewish: Both*—and is similar otherwise. Using these aggregate scores to measure similarities between members of a pair, we again find that the more alike the partnering venture capitalists are in affinity-related characteristics, the less likely their investment will ultimately be successful.[14]

[Insert Table 6 here]

3.4. Repeated collaborations

Our analysis so far examines only first-time co-investments made by pairs of venture capitalists. In this section we supplement the analysis by considering the total

[14] All the results in the paper are robust to controlling for venture capital firm-level characteristics including the total number of past syndications, total dollar amount of past investments, past investment success rate, and the Herfindahl industry concentration of past investments. For brevity, these results are not tabulated but are available upon request.

number of co-investments a pair of venture capitalists makes together. In particular, we explore whether aggregate measures of affinity-based similarities between individuals can be used to predict the total number of collaborations in which a pair of individuals engage.

We run Poisson regressions of the total number of co-investments by a syndicate on the affinity score controlling for the number of top university degree holders in a pair as a measure of their ability. Estimation results are presented in Table 7. Results in Columns 1 and 2 are based on the analysis over both actual and counterfactual pairs, whereas results in Columns 3 and 4 are derived solely from actual pairs. Counterfactual pairs, by definition, have no collaborations together. Since the distinction—in terms of pairwise personal characteristics—between counterfactual and actual pairs is sharper than the difference between actual pairs with unequal number of collaborations, Columns 1 and 2 bear estimates of greater magnitudes. The number of co-investments—among actual and counterfactual pairs—is positively and significantly related to the affinity score. Any positive relationship between the number of co-investments a pair of venture capitalists made together and their joint ability, however, seems to be entirely driven by the contrast between counterfactual pairs with zero collaborated deals and those pairs collaborating at least once. It is interesting that Columns 1–2 suggest that pairs with only one venture capitalist with a degree from a top school are likely to syndicate less frequently. It is an additional argument towards homophily preferences over ability, albeit weak because the effect does not hold if counterfactual pairs are excluded from comparison (Columns 3–4). Among actual pairs only, we find strong positive relationship between the affinity score and the number of co-investments. Overall, the results in Table 7 indicate that the frequency of

collaborations is increasing in the affinity score. Therefore, affinity-based similarity not only determines people's attractions to work together for the first time, but also increases their frequency of repeated collaborations.

[Insert Table 7 here]

3.5. Syndicate-level similarity among individual investors

The unit of analysis in the paper focuses on dyadic relationships. This is a common methodology in the literature and has justifiable merits. For example, the literature on firm-level syndication looks at dyadic relationships even though there are far more firms involved. Hegde and Tumlinson (2011) examine VC-entrepreneur dyadic relationships even though there are multiple VC-entrepreneur pairs in the same investment. Dyadic relationships are typically the preferred unit of analysis because a shared characteristic between a pair (e.g., same school) is very natural and easy to understand. On a philosophical level, any group-level similarity measure boils down to pairwise comparisons and, as such, is equivalent to what the pairwise analysis can achieve. Nonetheless, we perform additional tests to show that our results are robust to taking into consideration third-party effects of other investors outside the dyad in a syndicate and to measuring similarity among individual investors at the syndicate level.[15]

For each pair of individual venture capitalists in our sample, we first calculate the average affinity score of all the other pairs of individual venture capitalists in the same syndicate and then rerun the investment success regressions including both the

[15] For brevity, these results are not tabulated in the paper but are available from the authors upon request.

affinity score of the dyad under study and the average affinity score of all the other pairs in the syndicate as right-hand side variables. We find that the results of our pairwise analysis are highly robust to taking into account any third-party effects of other investors in the syndicate. The average affinity score of all the other pairs of individual venture capitalists in the syndicate also has a significantly negative effect on investment success. However, controlling for the average similarity among other investors outside the dyad in a syndicate, the affinity between a pair of individual venture capitalists continues to significantly and negatively affect investment success.

Alternatively, we re-perform all the analysis in the paper at the syndicate level, focusing on an entire syndicate as the unit of analysis and the similarity among all the individual venture capitalists in the syndicate as the key measure of affinity. Specifically, for each syndicate, we calculate the syndicate-level affinity score as the average of the affinity scores of all possible pairs of individual venture capitalists in the syndicate. The syndicate-level affinity score captures the overall degree of similarity among all group members within the syndicate.

Using this measure of group-level affinity, we then investigate how syndicate-level similarity among all individual group members affects the syndication partnering decision and the investment success. To examine the syndication partnering decision, we again construct a pseudo sample consisting of counterfactual syndicates in the following manner. For each actual syndicate in our sample, we construct a corresponding counterfactual syndicate by substituting each venture capitalist in the actual syndicate with a venture capitalist who is not in the syndicate, but who has invested into another portfolio company in the same industry as close in time as possible (without replacement). Using the sample of counterfactual syndicates and our sample of

actual syndicates, we find that affinity at the syndicate level is significantly and positively related to the likelihood of actual syndicate formation. In other words, the more similar the individual venture capitalists are in affinity-based characteristics, the more likely they are to partner in syndication. Syndicate-level affinity among all individual venture capitalists in the group also significantly impacts investment success. Higher syndicate-level affinity is associated with a lower likelihood of IPO for the portfolio company in which the syndicate invests. Overall, the analysis using measures of similarity among individual venture capital investors at the syndicate level yields results that are consistent with those from pairwise analysis. Individual similarity in personal characteristics, pairwise or at the group level, significantly increases the likelihood of collaboration but reduces the probability of investment success.

4. Selection versus treatment

The inferior performance of investments undertaken by venture capitalists with a high level of affinity between them may be attributed either to selection or treatment effects. On the one hand, collaboration with similar others may have value in itself. In this case, a venture capitalist may derive personal utility from the collaboration and consciously reduce the required investment hurdle rate if making the investment involves future cooperation with a syndicate partner sharing common features. As a result, syndications based on affinity will have lower probabilities of success because of less stringent requirements on portfolio companies at the time of investment, i.e., the deal would be of lower quality. Alternatively, it is possible that affinity makes it easier for one venture capitalist to convince another that the investment is worthwhile. Consequently, if the attractiveness of an investment opportunity is questionable and

hence it is hard for a founding venture capitalist to reach out to a wide set of potential syndication partners, it is more likely that a future co-investor will display a high level of affinity with the original investor.

On the other hand, the negative effect of affinity may be due to treatment effects after the investment is made. The dark side of homophily can lead to poor decision making by inducing social conformity and groupthink. In contrast, differences in knowledge, skills, and perspectives among team members with varied backgrounds may enhance creativity and innovation and elicit a multiplicity of views, adding dimensions to problem-solving and decision-making processes as well as eventually improving performance (William and O'Reilly, 1998; Jehn, et al., 1999). Venture capital investors provide significant value-add to their portfolio companies beyond the supply of capital (Gorman and Sahlman, 1989). Post investment, they make important decisions and offer invaluable advice on a variety of issues: hiring and firing the CEO, the senior management team, and the board of directors; identifying customers or partnering opportunities; and devising a viable overall strategy, all of which are critical to moving the venture forward along the path to success. Thus, any inefficient decision making post investment induced by homophily among high-affinity venture capitalists will negatively impact the success of the portfolio company that they oversee. In other words, the lower likelihood of success of co-investments between venture capitalists that share similar characteristics is triggered by them making inefficient decisions or even mistakes that they would otherwise avoid.

Although similar in terms of empirical outcomes, the selection and treatment effects explanations have different welfare implications. According to the selection story, the success of a portfolio company is independent of the composition of the venture

capital team once the investment is made. As long as investors act rationally, i.e., all investments have nonnegative ex ante expected returns, there is no efficiency loss post investment. Potential losses are incurred if some deals undertaken would not have been financed absent the affinity between co-investors or if high-affinity deals crowd out better deals that should have been financed instead. In the treatment story, however, the investment outcome is affected by whether syndication partners exhibit high homophily or not. To this end, there is scope for greater efficiency if venture capitalists become more cautious in choosing to collaborate with investors possessing similar traits.

It is clearly possible that both mechanisms take place in practice, and it is not entirely obvious which effect contributes more to the empirical biases that we document. In the tests that follow, we try to disentangle selection versus treatment effects.

4.1. Portfolio company ex-ante quality measures

First, we identify a set of measures that proxy for the quality of portfolio companies known to venture capitalists at the time of financing and investigate the effect of affinity on investment success after directly controlling for the underlying investment quality using these measures. The ex-ante deal quality measures that we examine include whether the portfolio company was founded by an entrepreneur who had previously founded another successful venture capital-backed company (*Serial Entrepreneur*), the stage of the portfolio company (e.g., Startup/Seed, Early Stage, Expansion, Later Stage, and Buyout/Acquisition) at the time of fundraising as well as the financing round, and the amount of attention that the media paid to the portfolio company *at the time of investment*. We identify serial entrepreneurs by tracking the careers of founders and identifying those who had already established a venture capital-

backed business. An entrepreneur with a track record of success is more likely to succeed than a first time entrepreneur (Gompers et al., 2010). With respect to investment stage and round, earlier stages and rounds involve more risks and hence are less likely to result in a successful outcome. Media attention may proxy for market sentiment at the time of investment (Tetlock, 2007; Soo, 2013), and therefore, deals with more media coverage prior to the first venture capital investment may be of higher quality and thus may have higher success rates. We use *Dow Jones Factiva* to identify portfolio companies which had news stories about them released prior to or at the time of financing. Specifically, we search for publications with the portfolio company name and the phrase "venture capital" in the time frame from six months before the investment until one month after.[16] We then separate the investments into three groups, those with no media coverage, those with moderate media coverage, and those with high media coverage, captured by a categorical variable, *Media Coverage*.[17]

In Table 8, we examine the relation between these ex-ante portfolio company characteristics and investment success. The dependent variable is a dummy variable equal to 1 if the portfolio company eventually conducted an IPO. The estimates are based on probit regressions with industry, year, and venture capital firm fixed effects. The results in Table 8 show that these portfolio company characteristics display statistical and economic significance in predicting the future investment outcome,

[16] Our results are robust to using alternative windows such as six months before to six months after the investment.

[17] Investments with zero news articles covering them account for 68% of observations. For investments covered by at least one news article, we separate them into moderate media coverage (18.1% of observations) and high media coverage (13.9% of observations) using the median number of articles covering the investment in that year.

separately as well as jointly. A portfolio company is more likely to go public if its founder is a serial entrepreneur, if it is of later stage and in financing rounds, and if it has received media attention at the time of investment.

[Insert Table 8 here]

Overall, the results in Table 8 demonstrate that these characteristics are good proxies for the ex-ante quality of the portfolio companies. These investment quality measures, however, do not appear to be correlated with the affinity of the syndicate. As the regression results in Table 9 indicate, in which the dependent variable is the detailed affinity score between a pair of venture capitalists, the affinity between syndicating venture capital partners is not significantly related to any of the measures for deal quality, separately or jointly, thereby casting doubt on the selection story that high-affinity venture capitalists choose low-quality deals to invest into to begin with.[18]

[Insert Table 9 here]

Furthermore, in Table 10, we include the ex-ante deal quality measures as independent variables and re-estimate the relationship between affinity and investment success. The point estimates on the affinity score remains negative, highly statistically and economically significant across all specifications, with magnitudes similar to those in our baseline regressions in Table 6. The robust relationship between affinity and investment success following the inclusion of objective fundamental controls—which are highly significant in explaining future investment outcomes—suggests that the major

[18] Using the broadly defined affinity score as the dependent variable produces robust results.

portion of the negative side of affinity likely stems from the post-investment actions of the syndicate as opposed to the deal selection patterns.

[Insert Table 10 here]

4.2. Instrumental variable estimation

So far we have used observable characteristics of portfolio companies to control for deal quality. However, real investment decisions are made based on a rich information set that may include unobservable attributes of portfolio companies as well. Therefore, we take a more general approach and use instrumental variable estimation to address the endogeneity issue.

We instrument for the level of affinity between a pair of venture capitalists involved in a deal with the level of affinity between the founding venture capitalist in the pair and potential collaborators with similar industry profile based in the same location, hereafter referred to as the local affinity score. Our measure of local affinity captures the degree to which the founding venture capitalist is similar to the community of venture capitalists who are based in her same location and who invest in similar industries. The local affinity score is constructed in three steps. First, for any given venture capitalist, we identify the pool of potential collaborators: these are other venture capitalists who are based in the same location as the venture capitalist under consideration and who have invested into a common industry at least once. Actual syndication partners of the venture capitalist are excluded from this pool. Second, we compute the affinity scores for the venture capitalist under consideration vis-à-vis every potential collaborator, i.e., every venture capitalist in the pool. Third and last, we take an average of these scores and arrive at the local affinity score for the venture capitalist

under consideration. Thus, the local affinity score captures the extent to which a particular venture capitalist is similar to the local community of her peer investors. In essence, it is a measure of local availability that can be viewed as "an exogenous, geographically imposed limitation", much in the same spirit as the instruments based on local conditions in Berger, Miller, Petersen, Rajan, and Stein (2005).[19]

Constructed in this manner, our local affinity measure has three sources of variation: location, time, and person. Therefore, even two different individual venture capitalists from the same firm investing at the same time almost surely face different local affinity measures as long as they have unique personal characteristics (i.e., education, employment, or ethnic backgrounds), because the local affinity score for each individual is determined by that individual's unique personal characteristics. As an instrument, the local affinity score can thus survive the introduction of venture capital firm fixed effects and location fixed effects.

There are two channels—direct and indirect—through which the relevance criteria of the instrument could be satisfied. As long as the local community of venture capitalists is considered as the pool from which a syndicate partner is drawn, higher *local affinity* results on average in higher *pairwise affinity* between a founding venture capital investor and her coinvestor even in the world without preferences for homophily—due to a greater proportion of people with similar characteristics among potential coinvestors. This is the direct channel. In terms of the indirect channel, it is well documented in the social psychology literature that individuals prefer familiar

[19] Berger, Miller, Petersen, Rajan, and Stein (2005) instrument for bank size with the median size of all banks in the market where the firm is located as well as a measure capturing local branching regulations.

goods or people (e.g., Zajonc, 1968; Saegert, Swap, and Zajonc, 1973). This familiarity bias has manifested itself in various settings in the capital markets and corporate finance such as investing and mergers and acquisitions, in which individual decision-makers prefer familiar securities or choose to work with managers with similar backgrounds (e.g., French and Poterba, 1991; Coval and Moskowitz, 1999; Huberman, 2001; Ishii and Xuan, 2014). In the context of venture capital syndication, investors immersed in an environment featuring certain personal characteristics more than others can be more prone to form partnerships with investors possessing such characteristics due to the familiarity bias induced by the local community of venture capitalists.

As for the exogeneity criteria, it is important to keep in mind that the reference set of venture capitalists against which the local affinity measure is computed are not involved in the actual deal in any way, i.e., the local affinity measure captures the resemblance between a venture capitalist involved on a deal and other venture capitalists in the same location who are not involved in the deal in any capacity. This measure, by construction, cannot have any direct effect on deal success. Moreover, in our instrumental variable analysis, we further include firm location dummies to account for any location-related effect on investment performance. Therefore, it is unlikely that a mechanism exists through which local affinity could directly drive the investment outcome.[20]

[20] Also, the strategic choice of location by the founding venture capitalist and/or by the venture capital community is unlikely an issue of concern. We observe very little mobility among venture capitalists in our data. Out of 3,510 investors, only 202 worked in two firms or more, and just 103 switched for a firm with at least one office in a new location. Moreover, the instrumental variable results are robust to constructing the instrument based on a pool of venture capitalists assigned to a certain location *after* the investor under consideration.

Table 11 presents the estimates obtained using the two-stage least squares method with the local affinity score as the instrument for the affinity score. *Local Affinity Score* displays significant statistical power in predicting the endogenous variable of interest in the first stage (one specification shown in Column 7), with large F-statistics on the excluded instruments, while none of the observable portfolio company characteristics prove to be significant determinants of the syndicate's level of affinity. Reported in Columns 1–6, structural form equations show that controlling for the endogenous determination of a syndicate's affinity level does not change the conclusion that greater similarity between co-investment partners is associated with lower success rates. The coefficients on the affinity score are negative and highly statistically significant across all specifications.

[Insert Table 11 here]

As a robustness check (in unreported results), we split our observations by whether the two individual venture capitalists in the dyad are from the same location ("local dyads") and then perform the instrumental variable estimation on each subsample. The direct channel through which the instrument affects pairwise affinity only comes into play for local dyads, i.e., higher local affinity results in higher pairwise affinity due to a greater proportion of people with similar characteristics among potential coinvestors for the founding venture capitalist to select from in the local pool. Given this nature of the instrument, we expect that the instrument variable works better in the subsample of local dyads than in the subsample of non-local dyads. Indeed, we find that in the subsample of local dyads (52.9% of the overall sample), the pairwise affinity score instrumented by local affinity continues to have a negative and significant

impact on investment success. In the subsample of non-local dyads, however, the coefficients on the pairwise affinity score instrumented by local affinity, albeit still negative and similar in magnitude as those in the analysis with local dyads, are no longer statistically significant. This dichotomy is consistent with local affinity affecting investment performance only through the potentially endogenous pairwise affinity, but not directly. As such, it increases our level of confidence in the validity of the instrument.

4.3. Investment stage and the effect of affinity on investment success

To further alleviate the selection concerns and to better understand the mechanisms through which affinity affects investment performance, we investigate how the effect of affinity on deal success varies by the stage of investment. Since early-stage startups typically involve more key decisions and milestones in their growth process, they require more input and oversight from the venture capitalists that invest in them, and their success depends more keenly on the value-add provided by the venture capitalists after the investment is made. Therefore, poor decision making induced by high affinity would have a more pronounced effect on the performance of early-stage investments.

To test this empirically, we add a dummy variable *Early Stage*, which indicates whether a portfolio company is in the earliest stage of the startup growth process, and its interaction term with affinity score to the investment success regressions. Econometrically, such a test of interaction term effects is also less subject to selection and third-factor concerns since any omitted factor is less likely to be correlated with the interaction terms than it is with the linear term (Angrist and Pischke, 2009). We

present the regression results in Table 12, with Columns 1 to 3 using the broad affinity scores and Columns 4 to 6 using the detailed affinity scores.

[Insert Table 12 here]

As shown in Table 12, affinity significantly and negatively influences investment success for deals in the later stage of the investment cycle, as indicated by the negative and significant coefficient on *Affinity Score* across all specifications. More importantly, the coefficient on the interaction between *Affinity Score* and *Early Stage* is also negative and significant across all specifications, suggesting that the negative effect of affinity is much stronger for investments in portfolio companies that are in the earliest stage of the start-up growth process. The differential effect of affinity in early-stage investments versus later-stage investments is consistent with the hypothesis of high-affinity syndicating venture capitalists making poor decisions post investment.

Overall, although it is impossible to completely rule out the selection story of high-affinity venture capitalists choosing low-quality investments at the time of financing, a variety of tests discussed in this section—controlling for portfolio company ex-ante quality, accounting for endogeneity using the instrumental variable approach, and exploring the differential effect of affinity across investment stages using interaction terms—indicate that selection seems unlikely to be the primary factor that accounts for the performance patterns documented in our paper. The treatment effect post-investment is most likely the key channel through which the mutual affinity of venture capitalists involved in a deal affects ultimate investment success.

5. Conclusion

Collaborative behavior between people is of great importance in different spheres of life. We engage in brainstorming discussions with our colleagues at work to find an optimal solution to a business problem. Companies we work at form partnerships with other firms to develop creative products and enhance joint productivity. Our children form study groups with their classmates to learn the material better. Our countries collaborate with other nations upon security and environmental issues. Living in a globalized world, we face great opportunities not only in terms of what to work on, but also with whom to cooperate. The growth in the number of projects that are being done in a team rather than individually makes it increasingly important to understand the following questions. First, what personal characteristics are taken into account when people select their working partners? Second, how does the influence of these personal characteristics on the team composition affect performance? We use the venture capital syndication setting to answer these questions.

Conducting the analysis at the individual venture capitalist level with a dataset most comprehensive of its kind to date, we find that personal characteristics that are related to success or ability significantly influence venture capital syndication decisions and ultimately affect investment performance. Consistent with the homophily literature, we conclude that investors who share similar characteristics with each other—common past employer, ethnicity, and academic institution—are more likely to co-invest together. However, the attraction to each other based on affinity that venture capitalists exhibit is costly. Investment teams that exhibit a high degree of similarity between members over characteristics not related to ability are less likely to succeed. The adverse effect of affinity based on prior employment, educational background or ethnicity is economically and statistically significant, in many cases lowering the probability of investment

success by more than 20%. A variety of tests show that the cost of affinity is not driven by selection into inferior deals; the effect is most likely attributable to poor decision making by high-affinity syndicates after the investment is made. The detrimental nature of affinity is especially prominent for early-stage investments. We also find that venture capitalists who collaborate most frequently with each other are precisely those who have high mutual affinity. In such groups, people partner because they associate with each other, they share a bond, and perhaps they are even *friends*.

Our conclusion is that, to paraphrase Ralph Waldo Emerson, you cannot afford to be stupid with old friends when you are venture capitalists co-investing together.[21] While our study focuses on the venture capital industry, "friendly" collaborations undoubtedly can occur in many other important settings, such as business partnerships and strategic alliances, mergers and acquisitions, and employer-employee matching. Our findings on the tendency of individuals to partner with similar others and the potential detrimental effect of such homophily, therefore, have general implications for team design and group decision-making, and highlight the importance of diversity in fostering an element of critical thinking and learning that is conducive to performance.

[21] The original quote from Ralph Waldo Emerson (1803–1882) is: "It is one of the blessings of old friends that you can afford to be stupid with them."

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Table 1
Illustrative example.

This table presents co-investments of a Jewish venture capitalist in our sample, Mr. A, an MIT graduate, into four categories depending on the characteristics of his syndication partners. Partnerships are affinity-based if investors share Jewish background.

Affinity-based co-investment	Co-investment with top school degree holders: No	Co-investment with top school degree holders: Yes
Yes	Number of deals: 3 Number of IPOs: 0 Success rate: 0.0%	Number of deals: 2 Number of IPOs: 0 Success rate: 0.0%
No	Number of deals: 0 Number of IPOs: 0 Success rate: N/A	Number of deals: 9 Number of IPOs: 4 Success rate: 44.4%

Table 2
Summary of personal characteristics.

This table summarizes the distribution of venture capitalists' personal characteristics. A venture capitalist is counted in Top College, Top Business School, Top Grad School or Top School if she holds, respectively, an undergraduate, business, graduate or any degree from a top university. There are individuals who hold more than several different degrees from top schools. That is why, Top College, Top Business School and Top School numbers do not add up to Top School. Ethnicity is uniquely determined. Gender information is missing for 26 venture capitalists in the dataset.

Personal characteristic	Number of venture capitalists	Fraction of venture capitalists
Top college	1,089	31.0%
Top business school	1,308	37.3%
Top grad school	466	13.3%
Top school	1,867	53.2%
Indian	83	2.4%
East Asian	113	3.2%
Middle Eastern	15	0.4%
Jewish	640	18.2%
Ethnic minority	851	24.2%
Male	3,265	93.0%
Female	219	6.2%
Total number of venture capitalists	3,510	100.0%

Table 3
Individual investment success.

This table reports marginal effects of probit regressions for the probability of success of an investment made by a venture capitalist. The dependent variable is a dummy variable that takes the value of one if the investment is successful and zero otherwise. Independent variables are success and personal (education, ethnicity, and gender) characteristics of a venture capitalist. *Performance* is the venture capitalist's success ratio up to the current deal. *Top College*, *Top Business School*, *Top Grad School* and *Top School* are dummy variables which take the value of one if a venture capitalist holds, respectively, an undergraduate, business, graduate or any degree from a top university and zero otherwise. *Ethnic Minority* is a dummy variable that equals one if a venture capitalist is East Asian, Indian, Jewish, or Middle Eastern. Portfolio company's industry and year of investment fixed effects are included in all specifications. Robust standard errors clustered at the portfolio company level are reported in brackets. Asterisks denote statistical significance at the 1% (***), 5% (**), or 10% (*) level.

Independent variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Performance	0.088***	0.090***	0.093***	0.093***	0.088***	0.088***	0.089***	0.089***
	[0.008]	[0.008]	[0.008]	[0.008]	[0.008]	[0.008]	[0.008]	[0.008]
Top college	0.012**				0.012**	0.012**		
	[0.005]				[0.005]	[0.005]		
Top business school	0.008				0.009	0.009		
	[0.006]				[0.006]	[0.006]		
Top grad school	0.016***				0.016***	0.016***		
	[0.004]				[0.004]	[0.004]		
Top school		0.022***					0.022***	0.022***
		[0.005]					[0.005]	[0.005]
East Asian			-0.000		-0.006		-0.004	
			[0.013]		[0.012]		[0.012]	
Indian			-0.012		-0.013		-0.015	
			[0.013]		[0.013]		[0.013]	
Jewish			-0.005		-0.004		-0.004	
			[0.006]		[0.006]		[0.006]	
Middle Eastern			-0.012		-0.011		-0.013	
			[0.038]		[0.038]		[0.038]	
Ethnic minority				-0.005		-0.005		-0.005
				[0.005]		[0.005]		[0.005]
Female	-0.005	-0.005	-0.007	-0.007	-0.005	-0.005	-0.006	-0.006
	[0.009]	[0.009]	[0.009]	[0.009]	[0.009]	[0.009]	[0.009]	[0.009]
Observations	28,495	28,495	28,495	28,495	28,495	28,495	28,495	28,495
R^2	0.157	0.157	0.156	0.156	0.157	0.157	0.157	0.157

Table 4

Syndication partnering decision.

This table reports marginal effects of probit regressions for the probability of a venture capitalist to partner with another venture capitalist based on a set of observable characteristics. The dependent variable is a dummy variable equal to one if the syndication between two investors takes place (actual pairs) and zero otherwise (counterfactual pairs). Independent variables are pairwise personal characteristics (education, ethnicity, career, and gender) of a dyad of venture capitalists. *Both Top College*, *Both Top Business School*, *Both Top Grad School*, and *Both Top School* are dummy variables which take the value of one if both venture capitalists in a pair hold, respectively, undergraduate, business, graduate, or any degrees from a top university and zero otherwise. *Same School* equals one if venture capitalists attended the same academic institution and zero otherwise. *Same College*, *Same Business School* and *Same Grad School* are defined similarly with a restriction on the type of degree obtained. *Same Ethnic Minority* equals one if venture capitalists are both part of the same ethnic minority group and zero otherwise. *Same Previous Employer* is a dummy variable equal to one if two venture capitalists worked at the same company before entering the venture capital industry and zero otherwise. Portfolio company's industry and year of co-investment fixed effects are included in all specifications. Robust standard errors clustered at the portfolio company level are reported in brackets. Asterisks denote statistical significance at the 1% (***), 5% (**), or 10% (*) level.

Independent variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Top college: both	0.001***						0.001***	
	[0.000]						[0.000]	
Top business school: both	0.001***						0.001**	
	[0.000]						[0.000]	
Top grad school: both	0.001						-0.000	
	[0.001]						[0.001]	
Top school: both		0.002***						0.001***
		[0.000]						[0.000]
Same college			0.007***				0.005***	
			[0.001]				[0.001]	
Same business school			0.003***				0.002***	
			[0.000]				[0.001]	
Same grad school			0.006***				0.006***	
			[0.002]				[0.002]	
Same school				0.004***				0.0034***
				[0.000]				[0.0003]
East Asian: both					0.013***		0.013***	
					[0.004]		[0.004]	
Indian: both					0.011***		0.010**	
					[0.004]		[0.004]	
Jewish: both					0.003***		0.003***	
					[0.001]		[0.001]	
Same ethnic minority						0.004***		0.004***
						[0.007]		[0.007]
Same previous employer	0.016***	0.016***	0.016***	0.015***	0.016***	0.016***	0.015***	0.015***
	[0.002]	[0.002]	[0.002]	[0.002]	[0.002]	[0.002]	[0.002]	[0.002]
Female: both	0.003**	0.003**	0.003*	0.003*	0.003*	0.003*	0.003**	0.003**
	[0.002]	[0.002]	[0.002]	[0.002]	[0.002]	[0.002]	[0.002]	[0.002]
Observations	1,360,405	1,360,405	1,360,405	1,360,405	1,360,405	1,360,405	1,360,405	1,360,405
R^2	0.074	0.074	0.074	0.075	0.074	0.074	0.075	0.075

Table 5

Investment success: pairwise characteristics.

This table reports marginal effects of probit regressions for the probability of investment success by a pair of venture capitalists. The dependent variable is a dummy variable that equals one if the investment is successful and zero otherwise. Independent variables are pairwise personal characteristics (education, ethnicity, career, and gender) of a dyad of venture capitalists. Variables with the classifier *at least one (both)* take the value of one if at least one (both) individual(s) in a pair has (have) a specific attribute and zero otherwise. *Same Previous Employer* is a dummy variable which equals one if venture capitalists in a dyad worked at the same company. *Performance: Average* is an average of two venture capitalists' success ratios up to the current deal. Portfolio company's industry and year of co-investment fixed effects are included in all specifications. Robust standard errors clustered at the portfolio company level are reported in brackets. Asterisks denote statistical significance at the 1% (***), 5% (**), or 10% (*) level.

Independent variables	(1)	(2)	(3)	(4)	(5)	(6)
Performance: average	0.335***	0.335***	0.335***			
	[0.024]	[0.024]	[0.024]			
Top school: at least one	0.004	0.004	0.004	0.016	0.016	0.016
	[0.011]	[0.011]	[0.011]	[0.011]	[0.011]	[0.011]
Top school: both	0.020**	0.020**	0.022**	0.029***	0.028***	0.031***
	[0.009]	[0.009]	[0.009]	[0.009]	[0.009]	[0.009]
Same college	-0.049***	-0.049***		-0.047***	-0.046***	
	[0.017]	[0.017]		[0.017]	[0.017]	
Same business school	-0.013	-0.014		-0.009	-0.009	
	[0.014]	[0.014]		[0.014]	[0.014]	
Same grad school	-0.014	-0.015		-0.029	-0.029	
	[0.034]	[0.034]		[0.032]	[0.032]	
Same school			-0.024**			-0.023**
			[0.011]			[0.011]
East Asian: at least one	-0.009			-0.011		
	[0.019]			[0.019]		
East Asian: both	-0.133***			-0.140***		
	[0.024]			[0.023]		
Indian: at least one	-0.005			-0.008		
	[0.023]			[0.024]		
Indian: both	-0.056			-0.048		
	[0.060]			[0.070]		
Jewish: at least one	0.004			-0.004		
	[0.009]			[0.009]		
Jewish: both	-0.050***			-0.059***		
	[0.017]			[0.017]		
Same ethnic minority		-0.055***	-0.056***		-0.067***	-0.067***
		[0.017]	[0.016]		[0.016]	[0.016]
Female: at least one	0.003	0.003	0.003			
	[0.015]	[0.015]	[0.015]			
Female: both	-0.022	-0.022	-0.020			
	[0.045]	[0.045]	[0.045]			
Same previous employer	-0.055***	-0.055***	-0.054***	-0.048***	-0.048***	-0.047**
	[0.018]	[0.018]	[0.018]	[0.019]	[0.018]	[0.019]
Observations	15,844	15,844	15,844	15,979	15,979	15,979
R^2	0.194	0.193	0.193	0.159	0.158	0.158

Table 6
Affinity and investment success.

This table reports marginal effects of probit regressions for the probability of investment success by a pair of venture capitalists. The dependent variable is a dummy variable that equals one if the investment is successful and zero otherwise. The affinity score is the simple average of pairwise affinity characteristics. The broad affinity score uses *Same School*, *Same Ethnic Minority*, *Same Previous Employer*, and *Female: Both* in its construction. The detailed affinity score is based on education degree-specific (*Same College*, *Same Business School*, and *Same Grad School*) and minority-specific (*East Asian: Both*, *Indian: Both*, and *Jewish: Both*) variables for education and ethnicity, *Same Previous Employer*, and *Female: Both*. *Performance: Average* is an average of two venture capitalists' success ratios up to the current deal. Portfolio company's industry and year of co-investment fixed effects are included in all specifications. Robust standard errors clustered at the portfolio company level are reported in brackets. Asterisks denote statistical significance at the 1% (***), 5% (**), or 10% (*) level.

Independent variables	(1)	(2)	(3)	(4)
Affinity score: broad	-0.151***		-0.161***	
	[0.037]		[0.037]	
Affinity score: detailed		-0.167***		-0.176***
		[0.038]		[0.038]
Top school: at least one	0.004	0.004	0.015	0.015
	[0.011]	[0.011]	[0.011]	[0.011]
Top school: both	0.027***	0.024***	0.035***	0.032***
	[0.009]	[0.009]	[0.009]	[0.009]
Performance: average	0.336***	0.336***		
	[0.023]	[0.024]		
Observations	15,844	15,844	15,844	15,844
R^2	0.193	0.193	0.160	0.160

Table 7
Affinity and repeated collaborations.

This table reports the results of Poisson regressions for the number of co-investments a pair of venture capitalists made together. Columns 1 and 3 use a broad definition of the affinity score using the variables *Same School*, *Same Ethnic Minority*, *Same Previous Employer*, and *Same Gender.* The affinity score in Columns 2 and 4 is defined in a detailed way over the education and ethnicity components—it uses the variables *Same College*, *Same Business School*, *Same Graduate School*, *East Asian: Both*, *Indian: Both*, and *Jewish: Both*—and is similar otherwise. Results in Columns 1 and 2 are based on the analysis over both actual and counterfactual pairs, whereas results in Columns 3 and 4 are derived solely from actual pairs. The first co-investment year fixed effects are included in all specifications. Robust standard errors are reported in brackets. Asterisks denote statistical significance at the 1% (***), 5% (**), or 10% (*) level.

Independent variables	(1)	(2)	(3)	(4)
Affinity score: broad	1.595***		0.071***	
	[0.086]		[0.023]	
Affinity score: detailed		1.656***		0.077***
		[0.092]		[0.026]
Top school: at least one	-0.091***	-0.091***	-0.003	-0.003
	[0.024]	[0.024]	[0.006]	[0.006]
Top school: both	0.098***	0.133***	0.002	0.004
	[0.020]	[0.019]	[0.005]	[0.005]
Observations	1,360,411	1,360,411	15,844	15,844
R^2	0.046	0.046	0.001	0.001

Table 8

Portfolio company characteristics and investment success.

This panel reports marginal effects of probit regressions for the probability of success of an investment made by an individual venture capitalist. The dependent variable is a dummy variable that equals one if the investment is successful and zero otherwise. Independent variables are characteristics of a portfolio company at the time of investment. *Serial Entrepreneur* is a dummy equal to one if the founder of a portfolio company had previously founded another venture capital-backed company. *Portfolio Company Stage* is a variable with integer values from 1 to 5 corresponding to start-up/seed, early stage, later stage, expansion, and buyout/acquisition, respectively. *Financing Round* indicates the round at which the first investment was made into the portfolio company. *Media Coverage* is a categorical variable that equals one (two) if the number of news articles covering the investment is greater than zero and is below (above) the median number of news articles for investments covered by at least one news article in that year and zero if there is no media coverage on the investment. Portfolio company's industry and year of investment fixed effects are included in all specifications. Robust standard errors clustered at the portfolio company level are reported in brackets. Asterisks denote statistical significance at the 1% (***), 5% (**), or 10% (*) level.

Independent variables	(1)	(2)	(3)	(4)	(5)	(6)
Serial entrepreneur	0.026***				0.027***	0.028***
	[0.008]				[0.008]	[0.010]
Portfolio company stage		0.027***			0.022***	0.028***
		[0.003]			[0.004]	[0.005]
Financing round			0.025***		0.017***	0.019***
			[0.003]		[0.003]	[0.004]
Media coverage				0.034***	0.020***	0.027***
				[0.004]	[0.005]	[0.007]
Venture capital firm FE	No	No	No	No	No	Yes
Observations	8,713	12,168	11,679	12,563	8,606	6,628
R^2	0.173	0.166	0.175	0.159	0.187	0.226

Table 9
Portfolio company characteristics and affinity.

This panel reports the results of OLS regressions estimating the relationship between the affinity measure of a pair of venture capitalists and their underlying quality measures of their investment. The dependent variable is *Affinity Score* (detailed average). Independent variables are characteristics of a portfolio company at the time of investment. *Serial Entrepreneur* is a dummy equal to one if the founder of a portfolio company had previously founded another venture-backed company. *Portfolio Company Stage* is a variable with integer values from 1 to 5 corresponding to start-up/seed, early stage, later stage, expansion, and buyout/acquisition, respectively. *Financing Round* indicates the round at which the investment was made into the portfolio company. *Media Coverage* is a categorical variable that equals one (two) if the number of news articles covering the investment is greater than zero and is below (above) the median number of news articles for investments covered by at least one news article in that year and zero if there is no media coverage on the investment. Portfolio company's industry and year of investment fixed effects are included in all specifications. Robust standard errors clustered at the portfolio company level are reported in brackets. Asterisks denote statistical significance at the 1% (***), 5% (**), or 10% (*) level.

Independent variables	(1)	(2)	(3)	(4)	(5)	(6)
Serial entrepreneur	-0.0012				-0.0011	-0.0012
	[0.0022]				[0.0022]	[0.0021]
Portfolio company stage		-0.0005			-0.0008	-0.0004
		[0.0011]			[0.0012]	[0.0012]
Financing round			-0.0003		0.0000	0.0004
			[0.0006]		[0.0007]	[0.0007]
Media coverage				-0.0015	-0.0011	-0.0001
				[0.0012]	[0.0012]	[0.0012]
Venture capital firm FE	No	No	No	No	No	Yes
Observations	14,973	15,699	15,197	15,840	14,765	14,765
R^2	0.005	0.005	0.006	0.005	0.005	0.150

Table 10

Affinity and investment success: controlling for ex-ante deal quality.

This table reports marginal effects of probit regressions for the probability of investment success by a pair of venture capitalists. The dependent variable is a dummy variable that equals one if the investment is successful and zero otherwise. Results are presented for the detailed definition of the *Affinity Score* as the key independent variable. *Performance: Average* is an average of two venture capitalists' success ratios up to the current deal. *Serial Entrepreneur* is a dummy equal to one if the founder of a portfolio company had previously founded another venture-backed company. *Portfolio Company Stage* is a variable with integer values from 1 to 5 corresponding to start-up/seed, early stage, later stage, expansion, and buyout/acquisition, respectively. *Financing Round* indicates the round at which the investment was made into the portfolio company. *Media Coverage* is a categorical variable that equals one (two) if the number of news articles covering the investment is greater than zero and is below (above) the median number of news articles for investments covered by at least one news article in that year and zero if there is no media coverage on the investment. Portfolio company's industry and year of co-investment fixed effects are included in all specifications. Robust standard errors clustered at the portfolio company level are reported in brackets. Asterisks denote statistical significance at the 1% (***), 5% (**), or 10% (*) level.

Independent variables	(1)	(2)	(3)	(4)	(5)	(6)
Affinity score	-0.161***	-0.169***	-0.157***	-0.165***	-0.161***	-0.200***
	[0.039]	[0.038]	[0.039]	[0.038]	[0.040]	[0.043]
Top school: at least one	0.338***	0.337***	0.332***	0.327***	0.319***	0.275***
	[0.024]	[0.024]	[0.024]	[0.023]	[0.024]	[0.026]
Top school: both	0.001	0.001	0.000	0.004	-0.002	-0.003
	[0.011]	[0.011]	[0.011]	[0.011]	[0.011]	[0.013]
Performance: average	0.025***	0.021**	0.020**	0.024***	0.022**	0.007
	[0.009]	[0.009]	[0.009]	[0.009]	[0.009]	[0.009]
Serial entrepreneur	0.035**				0.035**	0.047***
	[0.014]				[0.014]	[0.016]
Portfolio company stage		0.030***			0.019***	0.027***
		[0.006]			[0.006]	[0.007]
Financing round			0.018***		0.011***	0.019***
			[0.004]		[0.004]	[0.004]
Media coverage				0.036***	0.026***	0.032***
				[0.007]	[0.007]	[0.008]
Venture capital firm FE	No	No	No	No	No	Yes
Observations	14,973	15,699	15,197	15,840	14,765	12,382
R^2	0.202	0.202	0.207	0.197	0.213	0.289

Table 11

Affinity and investment success: instrumental variable approach.

This table reports results from two-stage least squares estimation for the probability of investment success by a pair of venture capitalists. The dependent variable is a dummy variable that equals one if the investment is successful and zero otherwise. *Affinity Score* is instrumented for with the *Local Affinity Score*, which measures the level of similarity between a founding venture capitalist and potential collaborators with similar industry profile based in the same location. *Top School* and *Performance* are characteristics of a founding venture capitalist on a deal. Columns 1–6 report structural form equation estimates for the probability of investment success by a pair of venture capitalists. Column 7 presents first-stage estimates corresponding to the second stage displayed in Column 6. Portfolio company's industry and year of co-investment fixed effects are included in all specifications. Robust standard errors clustered at the portfolio company level are reported in brackets. Asterisks denote statistical significance at the 1% (***), 5% (**), or 10% (*) level.

				2nd stage			1st stage
Independent variables	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**
Affinity score: broad	-0.380*	-0.570***	-0.579***				
	[0.195]	[0.155]	[0.157]				
Affinity score: detailed				-0.426*	-0.550***	-0.559***	
				[0.218]	[0.173]	[0.175]	
Top school	0.033**	0.023**	0.023**	0.028**	0.014	0.013	0.006**
	[0.014]	[0.010]	[0.010]	[0.012]	[0.009]	[0.009]	[0.002]
Performance	0.345***	0.276***	0.276***	0.345***	0.276***	0.276***	-0.008*
	[0.025]	[0.014]	[0.014]	[0.025]	[0.014]	[0.014]	[0.004]
Serial entrepreneur	0.037**	0.043***	0.043***	0.037**	0.044***	0.044***	-0.000
	[0.015]	[0.007]	[0.007]	[0.015]	[0.007]	[0.007]	[0.002]
Portfolio company stage	0.012	0.016***	0.016***	0.012	0.016***	0.016***	0.000
	[0.008]	[0.004]	[0.004]	[0.008]	[0.004]	[0.004]	[0.001]
Financing round	0.012**	0.017***	0.017***	0.012**	0.017***	0.017***	0.000
	[0.005]	[0.003]	[0.003]	[0.005]	[0.002]	[0.003]	[0.001]
Media coverage	0.027***	0.025***	0.025***	0.027***	0.025***	0.025***	-0.000
	[0.007]	[0.004]	[0.004]	[0.007]	[0.004]	[0.004]	[0.001]
Local affinity score							0.783***
							[0.053]
Venture capital firm FE	No	Yes	Yes	No	Yes	Yes	Yes
Location FE	No	No	Yes	No	No	Yes	Yes
Observations	13,745	13,745	13,745	13,745	13,745	13,745	13,745
R^2	0.217	0.309	0.309	0.217	0.312	0.312	0.156

Table 12

Investment stage and the effect of affinity on investment success.

This table reports OLS regression results on the effect of investment stage on the relation between affinity and the probability of investment success by a pair of venture capitalists. The dependent variable is a dummy variable that equals one if the investment is successful and zero otherwise. Columns 1–3 and 4–6 use the broad and detailed definitions in constructing the affinity scores, respectively. *Early Stage* is a dummy variable equal to one if the portfolio company is in the earliest stage of the startup growth process and zero otherwise. *Performance: Average* is an average of their success ratios up to the current deal. *Financing Round* indicates the round at which the investment was made into the portfolio company. *Media Coverage* is a categorical variable that equals one (two) if the number of news articles covering the investment is greater than zero and is below (above) the median number of news articles for investments covered by at least one news article in that year and zero if there is no media coverage on the investment. Portfolio company's industry and year of co-investment fixed effects are included in all specifications. Robust standard errors clustered at the portfolio company level are reported in brackets. Asterisks denote statistical significance at the 1% (***), 5% (**), or 10% (*) level.

Independent variables	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
Affinity score	-0.114***	-0.105***	-0.118***	-0.117***	-0.113***	-0.115***
	[0.035]	[0.036]	[0.035]	[0.035]	[0.036]	[0.036]
Affinity score x Early stage	-0.140*	-0.150*	-0.202**	-0.154*	-0.166*	-0.219**
	[0.079]	[0.083]	[0.082]	[0.086]	[0.090]	[0.090]
Early stage	-0.061***	-0.037*	-0.037**	-0.062***	-0.038**	-0.038**
	[0.018]	[0.019]	[0.017]	[0.018]	[0.019]	[0.017]
Top school: at least one	-0.001	-0.005	-0.004	-0.001	-0.005	-0.004
	[0.009]	[0.010]	[0.010]	[0.009]	[0.010]	[0.009]
Top school: both	0.020**	0.020**	0.008	0.017*	0.018**	0.005
	[0.009]	[0.009]	[0.009]	[0.009]	[0.009]	[0.008]
Performance: average	0.409***	0.394***	0.297***	0.409***	0.394***	0.296***
	[0.027]	[0.028]	[0.027]	[0.027]	[0.028]	[0.027]
Serial entrepreneur		0.034**	0.042***		0.034**	0.042***
		[0.015]	[0.015]		[0.015]	[0.015]
Financing round		0.014***	0.019***		0.014***	0.019***
		[0.005]	[0.004]		[0.005]	[0.004]
Media coverage		0.023***	0.024***		0.023***	0.024***
		[0.007]	[0.006]		[0.007]	[0.006]
Venture capital firm FE	No	No	Yes	No	No	Yes
Observations	15,699	14,765	14,765	15,699	14,765	14,765
R^2	0.200	0.210	0.321	0.200	0.210	0.320