

Bridge Building in Venture Capital-Backed Acquisitions*

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This Draft: December 2009

Abstract

This paper studies the role of common venture capital investors in alleviating asymmetric information between public acquirers and private venture capital-backed targets. We find that acquisition announcement returns are more positive for acquisitions in which both the target and the acquirer are financed by the same venture capital firm. Similarly, having a common investor increases both the likelihood that a transaction will be all equity-financed as well as the fraction of stock in the overall acquisition payment. In addition, an acquisition is more likely to take place when there is a common venture capital investor linking the acquirer and the target. Our results suggest that common venture capital investors can form a bridge between acquiring and target firms that reduces asymmetric information associated with the transaction for both parties.

* We thank Malcolm Baker, Christa Bouwman, Benjamin Esty, Steven Kaplan, Josh Lerner, Jeffrey Pontiff, Erik Stafford, Jeremy Stein, Belén Villalonga, and seminar participants at the Harvard Business School and the 2009 American Finance Association meetings for helpful comments. Support for this research was provided by the Division of Research at the Harvard Business School. Henry Chen provided excellent research assistance.

The acquisition of new capabilities through the purchase of small, venture capital-backed start-ups is a strategy that has been employed by many large technology firms including Cisco, Microsoft, Google, and EMC. Young venture capital-backed companies often develop innovative technologies that can be exploited by existing technology companies (Gompers and Lerner, 2001). This strategy has become more important for large public companies as internal R&D budgets have declined in recent years. The value inherent in these start-ups is typically tied up in the intellectual property or human capital that has been developed during the early stages of the company's life.

The opportunity to acquire valuable intangible assets is balanced by the difficulty in assessing the value of those underlying assets. Unlike purchasing companies with substantial operating profits and a long track record of sales, the ability to fully assess the prospects of intangible assets is subject to substantial asymmetric information and uncertainty. Assessing the value often entails relying on third parties to provide information about the quality of the intangible assets and the prospects for the target firm's technology. Similarly, the ability to evaluate a particular acquisition candidate may depend very heavily upon the location of the acquiring firm and target. If the firms are located in the same area, then the ability to verify information and assess value may be enhanced. From the other perspective, the target company potentially worries about the acquirer utilizing overvalued stock to pay for the acquisition (Loughran and Vijh, 1997). Asymmetric information about the acquiring firm's value may reduce the willingness of the selling firm's owners of accepting stock in the transaction (Myers and Majluf, 1984).

Similarly, the sale of companies by venture capitalists to public acquirers is an important and attractive exit opportunity for their investors. Smith, Pedace, and Sathe (2009) show that the

sale of portfolio companies to public acquirers is an important driver of venture capital returns and that part of the performance persistence of experienced venture capital firms can be attributed to their greater ability to sell portfolio companies. Hence, acquisitions are a critical feature of venture capital activity that warrants deeper study and exploration. In this paper, we explore mechanisms for limiting the asymmetric information that potentially plagues the acquisition of young, venture capital-backed companies.

We compare two potential mechanisms for alleviating the asymmetric information between the acquiring firm and the venture capital-backed target. First, because venture capitalists repeatedly sell their portfolio companies through acquisitions, venture capitalists may be able to certify the quality of the target to an outside buyer because they are “staking their reputation” on not selling overvalued assets. Second, personal and professional relationships may “bridge” the asymmetric information. We explore the role that venture capitalists play in alleviating asymmetric information through the personal relationships that they possess with both the acquiring and target firms. If both the target and the acquiring firm are venture capital-backed, there may be a greater ability to convey value-relevant information to the acquirer. This bridge may be particularly strong if both firms were financed by the same venture capital firm.¹ The common venture capital investor has credibility with both the buyer and seller and thus has the ability to “bridge” the information gap between the two firms. In this case, potential adverse selection issues for both the target and the acquirer may be greatly diminished.

Technology firms cluster in a small number of geographic regions. Silicon Valley, Route 128, Austin, etc. have disproportionately high densities of technology companies in concentrated

¹ A conspicuous recent example is Google, Inc.’s acquisition of YouTube in 2006. YouTube’s sole venture capital investor, Sequoia Capital, was also an early investor in Google. The view of the media, such as the *New York Times* and the *Oakland Tribune*, maintained that Sequoia was instrumental in bringing the two companies together as its link to both firms provided more insights and confidence into the deal.

industries. We therefore examine whether bridge building or certification is the result of geographic proximity which could reduce the asymmetric information between a target and an acquiring firm. Doing due diligence may be easier if the two firms are in the same area (Uysal, Kedia, and Panchapagesan, 2008). “Kicking the tires” of the potential target is dramatically easier. Similarly, managers from the two firms may have associates or colleagues in common that can aid in the due diligence process. In this case, reduction in asymmetric information may not be due to venture capital-backing, but instead may be due to the firms being co-located in the same geography.

We explore the implications of bridge building in a sample of 1,261 acquisitions of venture capital-backed private companies from 1992 and 2006. We restrict our analysis to acquirers that are public and targets that are venture capital-financed. We identify whether an acquirer was venture capital-financed when it was private and whether the acquirer was financed by the same venture capital firm as the target.² Similarly, we note whether the target and the acquiring firms are headquartered in the same geographic region.

We find strong evidence that venture capital firms can form a bridge between acquiring firms and target firms that reduces asymmetric information associated with the transaction. Acquisition announcement period returns are more positive for acquisitions in which both the target and the acquirer are financed by the same venture capital firm. Compared to acquirers without a common venture capital investor link to the targets, the average three-day cumulative abnormal return around acquisition announcement is 2.6 to 2.8 percentage points higher for acquirers that share common venture capital investors with their targets, everything else equal. This difference is not only statistically significant, but is also economically important given the empirically documented combined two percent three-day average announcement return for

² Kamath and Yan (2008) study similar variables in a different sample.

shareholders of both the target and acquirer in mergers and acquisitions over the last three decades (Andrade, Mitchell, and Stafford, 2001). Moreover, the market views acquisitions involving common venture capital investors particularly favorably in situations where the problem of asymmetric information is likely to be more severe (e.g., acquisitions of younger targets, and acquisitions in which the acquirer and the target are located farther apart) or when the common venture capital investor is more experienced.

Similarly, we find that having a common investor increases both the likelihood that a transaction will be all stock as well as the fraction of stock in the overall acquisition payment. The effect is particularly pronounced for acquirers that are more likely to be overvalued (e.g., with lower industry-adjusted book-to-market ratios) and is consistently opposite for cash transactions. Targets that are concerned that the acquirer is potentially overvalued may be less willing to accept stock in an acquisition. A common investor can reduce this uncertainty about overvaluation of the acquirer as well as the target. Hence, our evidence shows that the bridge runs in both directions.

In addition, our results indicate that an acquisition is more likely to take place when there is a common venture capital investor linking the acquirer and the target. For a potential acquirer who shares a venture capital investor with the target, the odds of becoming an acquirer of the target are 3.5 to 3.8 times as large as the odds for a potential acquirer without such a tie becoming an actual acquirer. Using the Abadie and Imbens (2002) bias-corrected matching estimator, we find that the actual probability of an acquisition involving a common venture capital investor is almost three times as high as what one would expect from randomly pairing up the target with a potential acquirer, a difference that is statistically significant at the 1% level.

Our results confirm the findings in Uysal, Kedia, and Panchapagesan (2008) that geographic proximity is also an important mediator of information, but the effect of proximity does not reduce the impact of a common venture capital investor on stock returns or equity share in the purchase. Acquisitions of targets that are “local” have a more positive announcement period abnormal return. Additionally, acquisitions are more likely by acquirers who are local to the target firm. Including a local variable in the regressions, however, does not reduce the effect of having a common venture capital investor. In other words, the information asymmetry reducing effect of a common venture capital investor and a local deal are independent of each other. Local deals, however, do not have any greater amount of stock in the purchase consideration than non-local deals. It therefore appears that being local reduces asymmetric information about the target’s valuation, but not about the acquiring firm’s valuation.

Overall, our analysis demonstrates that bridge building is a crucial mechanism for conveying value-relevant information between acquiring and target firms that significantly influences the structure of merger transactions and the announcement return to shareholders. Acquisitions are a primary exit for venture capital investors and are increasingly important under the current market conditions given the relative lack of IPOs as an exit alternative. Additionally, we find that a significant percentage of acquisitions involve venture capital investors that have financed both the target and the acquirer. Therefore, understanding the bridge building role that venture capitalists play in acquisitions is an important topic shedding light on the value venture capitalists add to their portfolio companies as well as companies in their venture capital network. Indeed, bridge building is one potential mechanism promoting the persistence in venture capital investment performance identified in Kaplan and Schoar (2005) and the investment success of well-networked venture capital firms identified in Hochberg, Ljungqvist, and Lu (2007).

The rest of the paper is organized as follows. Section I presents the motivation for our paper. The construction and description of our data are presented in Section II. Our empirical tests of bridge building are presented in Section III. Section IV concludes the paper.

I. Motivation

The role that venture capitalists play in the companies they finance has been explored in a variety of settings. The majority of this work has examined how venture capitalists design investments to reducing potential agency costs that plague young entrepreneurial firms. Lerner (1994) examines the role that syndication of investment among numerous venture capitalists plays in reducing asymmetric information concerning the company. Gompers (1995) demonstrates that the staging of venture capital investment controls potential agency conflicts between outside investors and the entrepreneur. Baker and Gompers (2003) show that venture capital-backed companies have better boards of directors than similar non-venture capital-backed companies and that these better boards are related to better long-run post-IPO performance. Similarly, Kaplan and Stromberg (2003) examine the contracts that are utilized by venture capitalists when they finance startup companies and show how they are designed to align incentives of the entrepreneur with those of the venture capitalist. Kaplan and Stromberg (2004) suggest that venture capitalists design contracts to mitigate agency and hold-up problems.

What has been less explored in the literature is the role that venture capitalists play in intermediating relationships between various market participants. One exception is Lindsey (2008), who explores the role of venture capitalists in providing contacts with strategic partners. Lindsey shows that strategic alliances are more common within the network of prior venture

capital investments for a given venture capital firm. Additionally, the formation of these strategic alliances increases the probability of a successful exit.

We explore potential “bridge building” in the venture capital industry in the context of the acquisition of private venture capital-backed companies by public acquirers. Prior research on acquisitions (Jensen and Ruback, 1983) has shown that announcement period event returns for acquiring firm shareholders tend to be insignificant or slightly negative. Typically, acquisitions of public targets have either a negative announcement period return in the case of stock purchases or no reaction at all in the case of cash purchases (Andrade, Mitchell, and Stafford, 2001). Moeller, Schlingemann, and Stulz (2004) find that shareholders of small acquirers gain from acquisition announcements and those of large acquirers suffer losses. Acquirer announcement period returns for private targets are typically higher than those for public targets (Hansen and Lott, 1996; Chang, 1998; Fuller, Netter, and Stegemoller, 2002). Within the sample of acquisitions of private firms, stock offers typically experience higher abnormal returns than cash offers while both enjoy non-negative abnormal returns at merger announcements. In addition to announcement period event studies, Loughran and Vijh (1997) find that acquirers in cash mergers earn positive five-year post-merger abnormal returns and acquirers in stock deals earn negative long-run abnormal returns, although the results are somewhat sensitive to the estimation methodology. Finally, other research that focuses on the pre-merger and post-merger accounting performance of the event firms (Healy, Palepu, and Ruback, 1992) finds that while the acquirers show no evidence of superior industry-adjusted pretax operating cash flow returns prior to the mergers, their post-merger operating performance improves relative to the industry benchmarks.

Our paper is focused on the role that venture capitalists play in an acquisition. We explore whether the role that venture capital investors play in the acquisition process is mediated through a simple certification story or a more subtle “bridge building” process.³ We define bridge building as the credible conveying of information through personal relationships between two firms. In addition, we explore whether geographic proximity of the target and acquirer can account for the reduction in asymmetric information.

Venture capitalists typically have portfolios that contain between twenty and forty private companies (Gompers and Lerner, 2001). Of these firms, typically twenty to thirty percent will go public and twenty to thirty percent will be acquired (Gompers, 1995). In addition, venture capitalists raise multiple funds (Gompers, 1996) every two to four years. Hence, venture capitalists repeatedly sell companies to public acquirers. Because a potential acquirer understands this repeated desire for venture capitalists to sell portfolio companies, venture capitalists may be able to credibly certify the value of the target by their reputational capital. Selling overvalued private firms to public acquirers would tarnish a venture capital firm’s reputation and hinder its ability to sell firms to other public acquirers in the future. In this case, venture capital-backing and higher tier venture capital-backing would both reduce potential asymmetric information through certification. Because the reputation of the venture capitalist and their past track record of portfolio company sales would be seen by the market, the identity of the acquirer, i.e., whether the acquirer was venture capital-backed or had a common investment relationship with the venture capital firm, would not have an effect on the market’s reaction to the acquisition or the form of payment.

³ A contemporaneous paper by Masulis and Nahata (2009) examines the role that venture capital backing plays in the acquisition of private companies. Masulis and Nahata (2009), however, focus on the type of venture capital-backer of the private company, i.e., either financial or corporate venture capital, and whether a conflict of interest exists when selling a portfolio company to a public acquirer.

On the other hand, bridge building would credibly convey information in both directions based on prior relationships with the acquirer and target. Acquisition of young, venture capital-backed companies entails evaluating future prospects when uncertainty and asymmetric information are high. Most private venture capital-backed firms have little operating history, as well as few customers and few hard assets to assess. We would expect a much smaller asymmetric information problem for firms that shared a common investor, i.e., when the public acquirer had been financed by the same venture capitalist as the private target. Because venture capitalists are typically involved with startups from a very early stage, they have substantial information about the firm's technology and market that may be hard for any acquirer to verify. A venture capitalist that has been involved with both an acquirer and a young, private target may be able to credibly convey that information. In this case, the asymmetric information about the valuation of the target would be smaller for the acquiring firm with a common venture capital investor. Because any "winner's curse" problem is reduced, the market would have a more positive response to the acquisition.⁴

Research has also shown that potential informational asymmetries may exist from the perspective of the target firm's management about the true valuation of the acquiring firm's equity. Loughran and Vijh (1997) show that firms utilizing stock in acquisitions are typically overvalued. A variety of papers have looked at the market's reaction to the choice of payment and found that the market reacts more negatively to acquisitions that use equity as the method of payment and conclude that these firms are more overvalued than firms paying for acquisitions in

⁴ The reduction in asymmetric information may induce the acquirer to pay a higher price for the target. Everything else being equal, this might imply a smaller surplus for the acquiring firm and a lower abnormal return. However, everything else is not equal. The presence of a common venture capital investor would be interpreted by the market as the (unobserved) quality of the target being higher and the potential winner's curse problem being reduced. Hence, in equilibrium, the abnormal return would be more positive for acquisitions with common venture capital investors.

cash. In the literature on acquisitions of private companies, the acceptance of an acquirer's stock by a private target's investors is often attributed to reduction in information asymmetries and viewed as a positive sign for the acquirer stock valuation (Hansen and Lott, 1996; Chang, 1998; Fuller, Netter, and Stegemoller, 2002). Because a common venture capital investor would also likely know substantial private information about the acquirer, he may be able to credibly convey valuation information about the acquiring firm to the target. If this information can confirm that the acquiring firm is less likely to be overvalued by the public market, the target's management would be more willing to accept stock as consideration for the acquisition.⁵

Because venture capitalists tend to concentrate their investments in relatively narrow geographies (Lerner, 1994), the reduction in asymmetric information may be a result of the acquirer and target firms being located in the same geographic region. It is easier to do due diligence and “kick the tires” of a firm that is in the same local area than it is for a firm that is 1,000 miles away. Uysal, Kedia, and Panchapagesan (2008) find that local acquisitions tend to have higher acquirer announcement period returns and conclude that proximity can reduce asymmetric information. Hence, we explore whether the reduction in asymmetric information and more positive announcement period returns identified by bridge building are due to geographic proximity. If this is the case, we would expect that when both the target and acquirer are in the same geographic location, announcement period returns would be higher and the acquisition would be more likely to contain stock.

⁵ Faccio and Masulis (2005) also explore the endogeneity of the method of payment in acquisitions, but they focus on corporate governance considerations and their effect on the method of payment.

II. Data

A. Sample Construction and Data Sources

Our sample of mergers and acquisitions containing the targets that are venture capital-backed U.S. private companies was constructed using the VentureXpert Mergers and Acquisitions (VCMA) database. We first obtained a sample of all acquisitions with announcement dates between 1992 and 2006 in which the acquiring firm was a U.S. public company and the target firm was a U.S. private company that was venture capital-backed as reported by VCMA. We obtained relevant data including the acquisition announcement date, the value of the transaction, the industry classifications of the acquirer and the target, and the percentage of stock and cash used to pay for the acquisition. Each transaction was then checked using Factiva news search to correct any inaccurate information reported by VCMA. We filled in any missing values when possible. We eliminated transactions in which less than 100 percent of the target was acquired as well as announcements of multiple transactions on the same date.

Next, we searched in VentureXpert, a database on venture capital financing, for each acquiring company. We matched each acquiring firm by hand using company name to distinguish acquirers that were also once venture capital-backed from those that were not. Then for each target company and each acquiring company that was venture capital-backed, we obtained from VentureXpert the location of the company's headquarter, the names of the venture capital firms that invested in the company prior to the merger announcement, and the dates of the investments. Financial and return data for the acquiring companies were obtained from Compustat and CRSP.

B. Descriptive Statistics

Our final sample consists of 1,261 acquisitions of venture capital-backed private companies. Based on the acquirers' venture capital relationships, we classify these transactions into three groups: 1) acquisitions in which the acquirer is not venture capital-backed, 2) acquisitions in which the acquirer is venture capital-backed but the acquirer and the target do not share a common venture capital investor (the "No Common VC" group), and 3) acquisitions in which the acquirer is venture capital-backed and the acquirer and the target share at least one common venture capital investor (the "Common VC" group). Of the 1,261 transactions in our sample, 870 (69%) involve an acquirer that is also venture capital-backed. Of these 870 venture capital-backed acquirers, 163 (19%) share at least one common venture capital investor with the target company.

[INSERT TABLES I AND II ABOUT HERE]

Table I shows the number of transactions by year, and Table II contains the industry distribution of the acquirers in the sample where each acquirer is assigned to one of the twelve Fama-French industry categories⁶ based on its SIC code. The number of acquisitions increases monotonically until its peak in 1999, reflecting the surge in venture capital investing which increased dramatically from 1993 through 2000, and are roughly uniformly distributed after 2000. As expected, Business Equipment, which includes computers, software, and electronic equipment, is the most represented industry in our sample. Healthcare has the second highest concentration of acquisitions. A breakout by acquirer type in each table indicates that all three sub-samples involving different types of acquirers display similar time patterns and comparable

⁶ See Ken French's website at http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/Data_Library/ for the twelve Fama-French industry categories.

industry compositions. We include year fixed effects and industry fixed effects in our regressions to account for potential systematic time effects and industry differences.

[INSERT TABLE III ABOUT HERE]

We present the sample summary statistics for acquirer characteristics as well as deal characteristics in Table III. Venture capital-backed acquirers are on average smaller in assets than nonventure capital-backed acquirers, with higher percentage of assets in cash and short-term investments and lower debt ratios. Compared to venture capital-backed acquirers, nonventure capital-backed acquirers undertake transactions that are larger both in dollar value and as a percentage of acquirer market capitalization (denoted by relative transaction value), and are more likely to acquire targets in an unrelated industry.⁷

Venture capital-backed acquirers who share common venture capital investors with the targets are more likely to engage in local deals, defined as acquisitions in which the acquirer and the target are headquartered in the same Combined Statistical Area (CSA). For targets and venture capital-backed acquirers, we use VentureXpert to identify the Metropolitan Statistical Area (MSA) each company is headquartered in and then match each MSA to its CSA using definitions created by the Census Bureau.⁸ For nonventure capital-backed acquirers, we use Compustat to identify the county the acquirer is headquartered in and match the county to the respective CSA. Only 14 percent of the acquisitions involving nonventure capital-backed acquirers are classified as local deals, whereas for acquirers that are venture capital-backed, local

⁷ We define the acquisition as related if the acquirer and the target have the same 2-digit SIC code. Our results are unchanged if we define relatedness using 4-digit SIC code.

⁸ A Combined Statistical Area (CSA) is a combination of adjacent Metropolitan Statistical Areas (MSA) and Micropolitan Statistical Areas (μ SA) defined by the Census Bureau. We chose to define local deals as those occurring between companies headquartered in the same CSA rather than MSA because regions with high venture capital activity are often split into multiple MSAs that all belong to the same CSA. For example, San Francisco, CA and San Jose/Mountain View/Santa Clara, CA are classified as different MSAs, but are all grouped in the San Jose-San Francisco-Oakland, CA CSA. Our results do not change if we use MSA to define local deals.

deals comprise 29 percent of the acquisitions for the No Common VC group of acquirers and as high as 42 percent of the acquisitions by the Common VC group of acquirers.

Deals involving a common venture capital investor also differ significantly from the other two groups in the form of payment. A pure stock (cash) deal implies that the acquisition is paid for 100 percent with stock (cash). Percentage in stock (cash) indicates how much percent of the transaction value of an acquisition is paid for by stock (cash). It is evident that stock is used much more frequently in payment for deals with venture capital-backed acquirers who share common venture capital investors with their targets, and cash is used much less often. For example, pure stock deals constitute more than 55 percent of the acquisitions involving the Common VC group of acquirers. The percentage of pure stock deals in the Common VC group is almost twice as large as the percentages for acquisitions involving the No Common VC group of acquirers and the nonventure capital-backed acquirers. We explore this pattern of differences further in the next section.

III. Results

A. Announcement Period Abnormal Returns

In this section, we explore the market's reaction to the announcement of the acquisition of venture capital-backed private companies, examining the relationship between the venture capital connection of the acquirer and the return around the announcement period. Announcement period abnormal returns are calculated following the standard estimation methodology for event study with daily returns as in Brown and Warner (1985). For each observation in the sample, we use trading days -200 through -20 relative to the event date as the

estimation period. The daily returns for our sample of acquirers are regressed on the value-weighted returns on the market portfolio for this period. We require that a stock have at least 30 non-missing daily returns in days -200 through -20 in order to be included in the estimation. The difference between the actual daily return and the market model predicted daily return using the estimated factor loadings over the event period is the measure of abnormal performance.

[INSERT TABLE IV ABOUT HERE]

Table IV tabulates the results of the event time analysis. We report the average cumulative abnormal return (CAR) over the standard three-day event window from one day before the announcement of the acquisition until one day after the announcement of the acquisition for each of our three categories of acquirers. Using an alternative event window such as day -2 to day +2 yields qualitatively similar results (unreported).

Panel A breaks out the acquirers by their venture capital connections. The full sample split indicates that the mean CARs around announcement are similar for acquisitions made by nonventure capital-backed acquirers and those by venture capital-backed acquirers who do not share any common venture capital investors with the targets, neither significantly different from zero. This casts doubts on a simple certification story where the mere presence of a venture capital investor signals quality. The market, however, has very different reactions to the announcement of an acquisition made by a venture capital-backed acquirer who shares one or more common venture capital investors with the target company. The CAR from day -1 to day +1 is 2.72 percent for the Common VC group of acquirers, significantly different from zero and from the CARs for both the nonventure capital-backed group and the No Common VC group. Furthermore, in untabulated results, we perform the median test and the Wilcoxon rank-sum test and confirm that the medians as well as the distributions of CARs are statistically different for

acquisitions involving common venture capital investors and acquisitions without such investors. The market views the transactions in which the acquirer and the target share common venture capital investors as being positive for the acquiring firm, consistent with the hypothesis that the link of common venture capital investor between the acquirer and the target can be beneficial to the acquirer by bridging the information gap between the two parties and reducing the winner's curse.

The common venture capital investor's bridge-building role should be particularly valuable in situations where the asymmetric information problem is more severe. We explore such situations in the rest of Panel A by breaking out the full sample by deal locality and target firm age. First we examine local deals versus non-local deals. Geographic proximity might reduce the uncertainty in valuation by allowing acquirers better access to information through due diligence and shared business community such as service providers and customer bases. Having a common venture capital investor, therefore, should have a stronger impact if the geographic distance between the acquirer and the target is farther and thus precludes such advantages. Panel A confirms that acquisitions involving a common venture capital investor enjoy significantly higher announcement returns when the acquirer and the target are located in different CSAs. The announcement returns for local deals without a common venture capital investor are on average higher than those for non-local ones and are comparable to the announcement returns for the Common VC group. Since a higher percentage of acquisitions involving common venture capital investors occur in the same geographic area, this split on deal location also alleviates the concern that the documented positive effect of common venture capital investors on announcement returns might just be a location effect.

The final separation we do in Panel A of Table IV is to separate the target firms by firm age. Compared to younger targets, targets that are more mature might be later-stage firms with more proven track records and completed milestones. The level of uncertainty in the assessment of the valuation of and the prospects for the younger venture capital-backed private companies will therefore be higher in general. The ability of a common investor to reduce the substantial asymmetric information and uncertainty should be especially helpful in transactions involving such targets. Indeed, we find that the market's more positive reaction upon announcement to the acquisitions with common venture capital investors is much more pronounced for the subsample of target firms that are below median in age.

The value of common venture capital investors also depends on the quality and the credibility of the information they can bring to both sides of the deal. A key factor in this regard is the venture capital firm's experience. Venture capital firms with greater experience may be better at accessing the prospects of hard-to-value start-ups. More importantly, more experienced common venture capital investors with a greater reputation may be less likely to take advantage of the acquirer by selling it a "lemon", thereby risking tarnishing their reputation among the entrepreneurs and the previous portfolio companies in their network at the same time. Therefore, when a transaction is announced in which a common venture capital investor with high experience is involved, the market will react even more positively. In Panel B of Table IV, we examine Common VC group of acquisitions, separating them according to whether the common venture investor's experience is below or above the median. Our measure of venture capitalist experience follow Gompers, Kovner, Lerner, and Scharfstein (2008), which captures the number of all investments a venture capital firm has made in the past relative to the average venture capital firm in the VentureXpert database. Consistent with our hypothesis, we find that acquirers

with more experienced common venture capital investors enjoy a significantly more positive stock price reaction upon acquisition announcement than acquirers whose common venture capital investors have lower experience.

[INSERT TABLE V ABOUT HERE]

These results are explored further in Table V using multivariate OLS regressions, allowing us to control for factors other than common venture capital investors that might affect event window returns. The dependent variable is CAR (day -1 to day +1). Our key independent variable is an indicator that takes the value of one if the acquirer is venture capital-backed and shares at least one common venture capital investor with the target and zero otherwise. We also include a dummy variable that takes the value of one if the acquirer is venture capital-backed and zero otherwise. Column 1 includes controls for the size, book-to-market ratio, cash position, and leverage of the acquirer, the relative size of the acquisition, the experience of the target's best venture capital firm,⁹ the age of the target firm,¹⁰ whether the acquirer and the target are in related industries, whether the transaction is financed 100 percent with stock,¹¹ and whether the transaction is a local deal, and Column 2 adds year and acquirer industry fixed effects. Including additional controls for acquirer stock volatility, acquirer stock liquidity, acquirer R&D intensity, target industry fixed effects, target stage at the most recent round of funding, age of the venture

⁹ To control for the experience of the venture capital firms investing in the target, we follow Gompers, Kovner, Lerner, and Scharfstein (2008) and create a measure of venture capitalist experience. Using the VentureXpert database, which provides a record of each portfolio company a given venture capital firm has invested in, we count the number of portfolio companies each venture capital firm has invested in prior to making an investment in the portfolio company. We also calculate the number of investments the average venture capital firm has ever invested in as of each year in our sample. We then create a measure of venture capital firm experience equal to the log of one plus the number of companies the venture capital firm ever invested in prior to investing in the target minus the log of one plus the number of companies the average venture capital firm has invested in as of the same year. In many cases, multiple venture capital firms made investments in the target company. We use the experience of the target company's best (most experienced) venture capital investor in our regressions. Using the experience of the target company's average venture capital investor produces similar results.

¹⁰ Since the firm age for a private company is typically not reported, we define the target firm age as the number of months between the initial venture capital investment in the company by any venture capital firm as reported by VentureXpert to the acquisition announcement date.

¹¹ Controlling for the percentage of stock in the payment instead produces qualitatively similar results.

capital fund at the time of the acquisition, whether the venture capital investor is a corporate venture capitalist, and whether there are competing bidders produces qualitatively similar results.

The results from the first two columns of Table V show that, consistent with prior literature, deals that are smaller relative to the acquirer's size and deals that are financed 100 percent by stock have lower announcement returns.¹² Local deals have higher announcement returns than non-local ones, indicating that geographic proximity might help mitigate the information asymmetry. Having a link of common venture capital investor between the acquirer and the target is associated with a more positive stock market reaction upon announcement. *Ceteris paribus*, the three-day CAR is more than 2.6 percent higher, a difference that is highly significant both statistically and economically. The positive announcement reaction associated with common venture capital investors cannot be explained away by firm or deal characteristics, including deal location.

In Columns 3 to 5, we add interaction terms with the Common VC indicator variable to examine factors that can impact the value of the common investor's bridge building role. In Column 3, we interact the Common VC dummy with an indicator variable that equals one if the common venture capital investor's experience is higher than the median and zero otherwise.¹³ In Column 4, we include a dummy variable that equals one if the target firm is younger than the median target firm and its interaction with the Common VC dummy. The interaction between the Common VC dummy and the local deal dummy variable is included in Column 5. The regression coefficients on these interaction variables are consistent with the univariate results and largely significant at the 10 percent level or better (the interaction with the local deal dummy is

¹² We report robust standard errors in the regression tables. Clustering the standard errors by acquirer industry or by target industry yields qualitatively similar results.

¹³ Interacting the Common VC dummy with the continuous variable measuring the common venture capital investor's experience produces qualitatively similar results, significant at the 10% level.

significant at the 12 percent level). We include all the interactions at once in Column 6, and the magnitudes and significance levels of the coefficients indicate that these proxies are largely independent of each other.¹⁴ The market's positive reaction to having a common venture capital investor is particularly prominent when the investor has more experience, when the target is relatively young, and when the acquirer and the target are located in different CSAs.

In unreported results, we also examine the one-year buy-and-hold abnormal returns following the acquisition of private venture capital-backed companies. We find that acquirers who share the common venture capital investor link with their targets do not underperform the size and book-to-market matched benchmark or the other two groups of acquirers, suggesting that the market's positive reaction to deals involving common venture capital investors on acquisition announcement does not get reversed in the long run.¹⁵

Overall, the results on announcement period abnormal returns are consistent with the bridge building hypothesis. The market reacts positively to acquisitions involving common venture capital investors, particularly in situations where the bridge building role of such an investor is most valuable: when the asymmetric information between the target and the acquirer is severe and when the common venture capital investor has the experience and the credibility to bridge the information gap.

B. Method of Payment

In this section we examine the effect of acquirer's venture capital relationship and location on the structure of the purchase transaction. If targets are concerned that the acquirer is

¹⁴ The interaction of the target firm age dummy and the Common VC dummy is significant at the 15 percent level.

¹⁵ Employing a calendar time methodology or examining post-merger operating performance to study the long-run performance of the acquirers produces the same conclusion.

potentially overvalued, the target may be less willing to accept stock in an acquisition. A common venture capital investor's past relationship with the acquirer can help mitigate this uncertainty about overvaluation. The literature on acquisitions of private companies often attributes the acceptance of the acquirer's stock by the private target's investors to reduction in information asymmetries (Hansen and Lott, 1996; Chang, 1998; Fuller, Netter, and Stegemoller, 2002). As a result of the reduced asymmetric information about the acquirer stock value, the target as well as the venture capitalists may be more willing to accept acquirer stock as the method of payment, and consequently, acquisitions involving a common venture capital investor between the acquirer and the target will more likely be financed by stock than cash.

[INSERT TABLE VI ABOUT HERE]

In Table VI, we perform OLS regressions to examine the impact of a common venture capital investor on the payment method using four different dependent variables: a dummy variable indicating whether or not the acquisition is paid for entirely with cash (Columns 1 and 2); the percentage of the transaction value paid for by cash (Columns 3 and 4); a dummy variable indicating whether or not the acquisition is paid for entirely with stock (Columns 5 and 6); and the percentage of the transaction value paid for by stock (Columns 7 and 8).¹⁶ In all regressions, we include a dummy variable that takes the value of one if the acquirer is venture capital-backed and zero otherwise and a dummy variable that takes the value of one if the acquirer and the target share at least one common venture capital investor and zero otherwise. For each dependent variable, we run three specifications. The first includes controls for the size, book-to-market ratio, cash position, and leverage of the acquirer in the last fiscal year ending before the date of acquisition announcement, the relative size of the acquisition, the experience of the target's best venture capital firm, the age of the target firm, whether the acquirer and the target are in related

¹⁶ Estimating logit regressions using the indicator dependent variables produces qualitatively similar results.

industries, and whether the transaction is a local deal; the second adds year and acquirer industry fixed effects. Including additional controls for acquirer stock volatility, acquirer cumulative stock returns over the twelve months preceding the announcement month, acquirer R&D intensity, acquirer bond rating, target industry fixed effects, target stage at the most recent round of funding, age of the venture capital fund at the time of the acquisition, whether the venture capital investor is a corporate venture capitalist, and whether there are competing bidders yields qualitatively similar results. In the third specification, we use industry-adjusted acquirer book-to-market as a proxy for acquirer valuation and add to the regression its interaction with the Common VC indicator variable.¹⁷

Our results indicate that the common venture capital investor link has a strong effect on the acquisition form of payment. Having a common venture capital investor between the acquirer and the target significantly decreases the percentage of cash used in the payment for the acquisition as well as the likelihood that the acquisition is financed 100 percent with cash across all specifications. The effect is consistently opposite for stock transactions. Using coefficients from Column 8 of Table VI, for example, having a common venture capital investor between the acquirer and the targets implies that the acquisition is 11.6 percentage points more likely to be financed 100 percent with stock than an acquisition by a venture capital-backed acquirer who shares no common venture capital investor with the target, and 14.2 percentage points more likely compared to an acquisition by a nonventure capital-backed acquirer, everything else equal. Moreover, the coefficients on the interaction terms indicate that these effects are especially pronounced for acquirers that are more overvalued (i.e., with lower industry-adjusted book-to-market ratios). The common venture capital investor link between the acquirer and the target is

¹⁷ Using non-adjusted acquirer book-to-market yields similar results.

associated with less cash and more stock used in the overall acquisition payment, particularly when the acquiring firm is more likely to be overvalued.¹⁸

These results clearly support the bridge building hypothesis. Certification would be independent of a common investor. Bridge building to reduce asymmetric information, however, is mediated through a personal connection. As such, the common investor can convey to the target that the acquiring firm is not overvalued and hence taking stock in the target would not be subject to an adverse selection problem.

We also control for whether the target and acquirer are located in the same CSA. We do not find that being located in the same geography, once we control for acquirer characteristics, impacts the form of payment. It therefore appears that being close to the acquirer does not reduce the asymmetric information about valuation of the acquiring firm's stock for the target firm. Hence, if location reduces asymmetric information, it only does so for the acquiring firm.

C. Probability of Acquisition with a Common Venture Capital Investor Tie

A common venture capital investor's relationship with both the acquirer and the target not only can provide credible information about the quality of the acquisition and bring to the acquirer the best strategic match, but also can make it easier for both parties to eventually strike a deal by helping facilitate target identification and screening as well as the negotiation process. In other words, if having a common venture capital investor reduces asymmetric information between a target and an acquirer, an acquisition is more likely to occur when the acquirer and the target share a common venture capital investor. We conduct two sets of analyses in this section to test this hypothesis.

¹⁸ The coefficient on the interaction term in Column 12 of Table VI is significant at the 15% level.

First, to investigate whether acquisitions are more likely to occur between acquirers and private targets who share common venture capital investors, we take the true acquirers in the sample together with all public firms sharing the same SIC codes with the acquirers in the year of the acquisition announcement as the potential acquirers,¹⁹ and examine the impact of sharing a common venture capital investor with the target on the likelihood of a firm being an acquirer of the target. We first estimate a logit model with the dependent variable equal to one if the firm is an actual acquirer of the target and zero if the firm is a potential acquirer. Explanatory variables in the model include dummy variables indicating whether the firm is venture capital-backed, whether the firm shares a common venture capital investor with the target, whether the firm is in the same CSA as the target,²⁰ and whether the firm is in the same industry as the target, as well as controls for relative transaction value, firm size, and industry-adjusted measures of profitability (operating income before depreciation over assets), book-to-market, capital expenditures, sales growth, and leverage in the last fiscal year ending before the date of acquisition announcement. We also estimate OLS regressions, adding the acquirer industry fixed effects and the year fixed effects.²¹

[INSERT TABLE VII ABOUT HERE]

These results are presented in Table VII. In the first three columns, we report the marginal effects from the logit regressions, and the sample is constructed using 4-digit, 3-digit, and 2-digit SIC code matching, respectively. In Columns 4 to 6, we report estimates from OLS regressions using samples constructed by 4-digit, 3-digit, and 2-digit SIC code matching,

¹⁹ Using an alternative definition of the potential acquirers as the public firms sharing the same SIC codes with either the acquirers or the targets in the year of the acquisition announcement produces qualitatively similar results.

²⁰ As before, location of potential acquirers is determined using Compustat state and county information and then matched to the correct CSA.

²¹ Including additional controls such as firm cash position, stock liquidity, stock volatility, R&D intensity and target industry fixed effects or using non-industry-adjusted measures as controls does not impact the results.

respectively. We find that whether the firm is located in the same area as the target is an important predictor of the likelihood of a firm becoming an acquirer. Same geographic location might potentially help reduce asymmetric information between firms as well as ease integration in the event of a merger. In addition, larger firms with faster sales growth are more likely to become acquirers. Being venture capital-backed in the past also increases a firm's probability to engage in acquisitions. Controlling for all these factors, however, having a common venture capital investor with the target strongly increases a firm's likelihood of acquiring the target. Using the 4-digit SIC matching, the unconditional probability of a firm being an acquirer is 1.7 percent. Sharing a venture capital investor with the target increases the probability of becoming an acquirer by 0.4 percentage points. The odds ratios calculated from these regressions (unreported) indicate that, for a potential acquirer who shares a venture capital investor with the target, the odds of becoming an acquirer of the target are 3.5 to 3.8 times as large as the odds for a potential acquirer without such a tie becoming an actual acquirer.

The regression results in Table VII are consistent with the hypothesis that acquisitions are more likely to occur when the acquirer and the target share a common venture capital investor. One potential concern, however, is that potential acquirers defined using SIC codes might be different from the actual acquirers on various dimensions, which could impact the likelihood of being an acquirer and the likelihood of having a common venture capital investor, causing bias in the regression estimates. To address the selection problem, we perform a second test, employing the Abadie and Imbens (2002) bias-corrected matching estimator methodology, and directly examine the probability of acquisitions with a common venture capital investor tie by comparing our sample to a control group of matched potential acquirers. Abadie and Imbens (2002) develop a nearest-neighbor estimator that enables one to match a treated firm with a most similar

control firm based on a set of covariates. Their bias-corrected estimator, which ensures consistency and removes the potential bias arising from non-exact matching that could happen when matching is based on multidimensional covariates, is more preferable than estimators based on regression without matching or estimators based on the propensity score.²² Recent studies in corporate finance have used the estimator to address the endogeneity selection problem in estimating treatment effects (e.g., Villalonga, 2004; Almeida, Campello, Laranjeira, and Weisbenner, 2009).

[INSERT TABLE VIII ABOUT HERE]

We present the matching estimator results for the probability of occurrence of an acquisition involving common venture capital investors in Table VIII. The first row in the table reports the proportion of deals between acquirers and targets with a common venture capital investor tie in our full sample. Out of 1,002 acquisitions of venture capital-backed private companies with non-missing control variables in our sample, 12.5 percent (125) involve common venture capital investors. This 12.5 percent can be thought of as an estimate for the actual probability of occurrence of an acquisition involving a common venture capital investor given that an acquisition of a venture capital-backed private company takes place.

We then employ the methodology in Abadie and Imbens (2002) to match each actual acquirer in the sample with a control firm (“a matched potential acquirer”).²³ The matching is based on the following covariates including dummy variables indicating whether the firm is venture capital-backed, whether the firm is in the same CSA as the target, and whether the firm is in the same industry as the target, as well as continuous variables such as relative transaction

²² See Imbens (2004) for a review of the nonparametric estimation of average treatment effects under exogeneity, Abadie and Imbens (2002) for a detailed discussion on the bias-corrected matching estimator, and Abadie, Drukker, Herr, and Imbens (2004) for a discussion and an implementation of the estimator.

²³ Using a matching methodology based on propensity scores yields similar results.

value, firm size, and profitability, book-to-market, capital expenditures, sales growth, and leverage. Rows 2, 3 and 4 of Table VIII report the proportion of matched potential acquirers that share a common venture capital investor with their targets. In Row 2, a control firm in the matching process is drawn from U.S. public companies listed in Compustat in the year of the acquisition announcement with the same 2-digit SIC codes as the actual acquirer.²⁴ In Row 3, a matched potential acquirer is drawn from U.S. public companies listed in Compustat in the year of the acquisition announcement with the same 2-digit SIC codes as either the actual acquirer or the target. In Row 4, a matched potential acquirer is drawn from all U.S. public companies listed in Compustat in the year of the acquisition announcement.

Rows 2, 3 and 4 can be viewed as the expected probability that a venture capital-backed target in our sample is paired with an acquirer sharing a common venture capital investor if such pairing occurs randomly between the target and the potential acquirer. The results in Table VIII indicates that the actual probability of an acquisition involving a common venture capital investor (12.5 percent) is almost three times as high as what one would expect from randomly pairing up the target with a potential acquirer (4.4 to 4.5 percent), and this difference, bias-corrected and heteroskedasticity-consistent, is highly statistically significant at the 1% level. In other words, the proportion of deals where the acquirer and the target share a common venture capital investor in the sample is so high that it cannot be purely random.

In short, our results suggest that an acquisition is more likely to occur if the target and the acquirer share a common venture capital investor. By matching targets with acquirers already in their venture capital networks, venture capital firms may streamline the target identification, screening, and negotiation processes and make the acquisitions more likely to take place.

²⁴ We find qualitatively similar results using 3-digit or 4-digit SIC codes instead.

D. Alternative Explanations and Robustness Tests

In this section, we investigate the robustness of our results and perform additional tests to distinguish alternative explanations. First, we show that our results hold using the propensity score matching estimation. Second, we examine the multiples paid for the target companies in the acquisition transactions. Next, we investigate common venture capital investors' ownership in the acquirer. We then focus on repeated transactions by the same acquirer. Finally, we study a sample of acquisitions of public companies that were once venture capital-backed and investigate the role of common venture capital investors in that setting.

Propensity Score Matching Estimator

One concern about our results is self-selection. Acquisitions involving the common venture capital investor might be inherently different than acquisitions without such a tie; OLS estimates may then be biased. To address this issue, we employ the propensity score matching methods (Dehejia and Wahba, 1999, 2002; Villalonga, 2004). Treatment, in this case, is having a common venture capital investor between the acquirer and the target. The outcomes we examine include the announcement period return and the method of payment of the acquisition.

In the first stage, we run a probit regression on the sample of venture capital-backed acquirers to estimate the probability of an acquisition having a common venture capital investor based on acquirer and target characteristics including the size, book-to-market ratio, cash position, and leverage of the acquirer, the size of the target relative to the acquirer, the experience of the target's best venture capital firm, the age of the target firm, whether the acquirer and the target are in related industries, and whether the acquirer and the target are located in the same CSA. The results show that an acquisition is more likely to involve a

common venture capital investor when the acquirer and the target are located in the same CSA, when the target has more experienced venture capitalists, and when the acquirer is smaller and has less cash on hand.²⁵ The predicted probabilities from the first stage, or the propensity scores, are then used as a summary measure to match acquisitions with common venture capital investors and acquisitions without common venture capital investors.²⁶

[INSERT TABLE IX ABOUT HERE]

Using the matched sample to correct for any selection on observables, we estimate the effect of having a common venture capital investor on the cumulative abnormal return upon acquisition announcement and on method of payment. The estimates are calculated following Becker and Ichino (2002) as the weighted average of the mean difference in the outcome variable between acquisitions with common venture capital investors and those without within each block in the stratification algorithm, with the weight of each block given by the block's share of acquisitions with common venture capital investors in the matched sample. These propensity score matching estimates are reported in Panel A of Table IX. Having a common venture capital investor increases the three-day CAR by 3.0 percentage points and increases the probability that a deal is financed 100 percent by equity by 19.9 percentage points, both significant at the one percent level.²⁷ The magnitude and significance level of the estimator are consistent with the OLS estimates in Tables V and VI, suggesting that our results are robust to correction for self-selection.

²⁵ The results from the first stage are not included in the paper but are available upon request.

²⁶ The match is done by block, or the stratification algorithm, following Dehejia and Wahba (1999). The optimal number of blocks is identified to ensure that the mean propensity score and the mean of each characteristic are not different significantly within each block for the two groups matched. The final number of blocks is three.

²⁷ We report the percentage of pure stock deals in this section. Using other measures of method of payment produces the same conclusion.

Acquisition Multiples

An alternative explanation for our results on the announcement returns is that common venture capital investors might offer more favorable pricing to acquirers that they had previously backed, and such underpricing translates to more positive announcement returns for these acquirers.²⁸ However, since venture capital investors' financial interests are primarily aligned with the targets, it is unlikely that, on average, the common venture capital investors consistently failed to negotiate a favorable price for the target companies and leave money on the table.

To test whether target underpricing is a potential explanation, we examine the multiples paid for the target companies in the acquisition transactions. We collect accounting data including sales, book value, EBITDA, and net income for the targets prior to the acquisitions from the SEC filings of the acquirers and construct acquisition multiples as the ratio of transaction value to the corresponding financial item. We find that, on average, there is no statistically significant difference between the multiples paid in acquisitions involving a common venture capital investor and those paid in acquisitions without such investors.²⁹ If anything, the average sales multiple, for which the data is most available, is higher for acquisitions with a common venture capital investor link between the acquirer and the target than those without. Adjusting by the target industry median multiples produces similar results. Therefore, target companies backed by common venture capital investors do not seem to be sold at a discount in the acquisition transactions compared target companies with no common venture capital investors. Underpricing does not explain our findings.

²⁸ Lee and Wahal (2004), among others, study the role of venture capital backing in the underpricing of IPOs and show that higher underpricing leads to larger inflows of capital into venture capital funds in the future.

²⁹ Financial data of the private targets are frequently unreported and unavailable from the acquirer SEC filings. We were able to obtain data on sales for 284 target companies, book equity for 72 target companies, EBITDA for 65 target companies, and net income for 58 target companies. These results are not reported in the paper but are available upon request.

Common Venture Capital Investors' Ownership in the Acquirer

Another concern is that common venture capital investors might still have holdings in the public acquiring firms they once backed. Ownership in the acquirer might bias a common venture capital investor's incentive leading them to undersell the target resulting in lower acquisition price and hence higher acquirer returns upon announcement.³⁰ This does not seem particularly likely as venture capital firms typically own a significantly larger fraction of the private company's equity and thus much of the common venture capital investor's financial interest should be aligned with that of the target.³¹ Moreover, as discussed earlier, we do not observe underpricing of target companies backed by common venture capital investors. Nonetheless, to examine this possibility, for each acquisition involving a common venture capital investor in our sample, we check the last annual report and proxy statement filed by the acquirer before the acquisition announcement to determine the percentage of the acquirer still owned by the common venture capital investor.³² We identify 34 acquisitions in which the common venture capital investor still holds an ownership stake in the acquirer, with an average ownership of 7.2 percent.

Panel B of Table IX splits the Common VC group by whether the common venture capital investor holds a stake in the acquirer and examines the announcement period returns and method of payment for each sub-group. For deals in which the common venture capital investor still has ownership in the acquirer, the three-day CAR is higher and the percentage of pure stock

³⁰ Masulis and Nahata (2009) find that conflicts of interest can arise from venture capitalist investors having financial relationships with both the target and the acquiring firms.

³¹ Gompers and Lerner (1998) and Dore, Gompers, and Metrick (2009) show that venture capitalists begin to distribute their equity holdings to their limited partners shortly after the expiration of the underwriter lock-up (typically six months after the IPO) and seek to liquidate their holdings of public securities in a relatively short period of time.

³² A common venture capital firm's holdings in the acquirer can be determined if the common venture capital investor owns at least five percent of the acquirer or if an individual affiliated with the common venture capital investor is on the board of the acquirer.

deals is lower, but neither difference is significantly different from zero. We further confirm that our results are robust to dropping these 34 observations where the common venture capital investor holds a stake in the acquirer, alleviating the concerns that such ownership might bias the results. Dropping these observations does not impact our results.

Repeated Transactions by the Same Acquirer

We also examine repeated acquisitions by the same acquirer and investigate whether the effect of having a common venture capital investor on announcement return and on method of payment holds *within* acquirer. Out of the full sample of acquirers, thirty-six have undertaken multiple transactions with and without common venture capital investors. The acquirer that has made the most acquisitions over the sample period is Cisco Systems, Inc., which conducted a total of thirty-one transactions, ten with common venture capital investors and twenty-one without. The average three-day CAR around announcement for Cisco's ten acquisitions with common venture capital investors is 2.21 percent, while the CAR for the twenty-one acquisitions without common venture capital investors is 0.02 percent, and the difference is significant at the five percent level. Cisco's acquisitions with common venture capital investors also have a higher percentage of pure stock deals and a higher percentage of the transaction value paid for by stock than those without.

The thirty-six repeated acquirers have conducted 194 transactions in total, out of which seventy involve common venture capital investors. We use acquirer fixed effects to allow the effect of having a common venture capital investor which is identified off within-acquirer differences on this sample of repeated transactions. We find that the three-day CAR around announcement is 2.99 percent higher for acquisitions with common venture capital investors compared to those without, a difference significant at the five percent level. Also, acquisitions

involving common venture capital investors are 13.1 percentage points more likely to be financed 100 percent with stock, significant at the ten percent level. Our results focusing on the repeated transactions corroborate the results from the full sample and indicate that the effect of having a common venture capital investor remain strong within acquirer.

Common Venture Capital Investors and Public Targets

We examine the role of common venture capital investors in the acquisition of public companies that were once venture capital-backed. The bridge building hypothesis suggests that common venture capital investors' value lies in their ability to reduce asymmetric information for both the acquirer and the target, which is particularly severe when the target is a young, private company. If the target in an acquisition is already a public firm, there will be much more information available on its financials, operations and prospects through mandatory disclosure, analyst coverage, etc. Moreover, venture capital investors likely have much less involvement in the target's business and decisions if it is public. Therefore, we should expect to see no differential effects of having a common venture capital investor in the acquisition of public target firms that were once venture capital-backed.

We obtain a sample of completed acquisitions with announcement dates between 1992 and 2006 in which the acquirer is a U.S. public company and the target is a U.S. public company that was once venture capital-backed as reported by VCMA. We then use VentureXpert to identify the acquisitions in which the acquirer and the target share one or more common venture capital investors. Our sample of acquisitions of venture capital-backed public targets consists of 102 observations, among which 18 have at least one common venture capital investor.

In Panel C of Table IX, we present the announcement period returns and method of payment for this sample, split by whether or not a common venture capital investor is involved in

the acquisition. The three-day CAR and the percentage of pure stock deals are not statistically different for the two groups. As expected, having a common venture capital investor no longer has an impact on the market reaction to the acquisition announcement or the payment method of the acquisition if the target firm is public.

Common Individual Venture Capital

We also sought to explore whether or not the bridge between the companies was influenced by whether or not they shared a common individual as a board member rather than just a common venture capital firm investor. We use the VentureOne database, complemented with the acquirers' IPO prospectuses, to identify acquisitions in which an individual general partner from a venture capital firm can be linked to both the acquirer and the target. Because the VentureOne database has relatively little coverage of board members for companies that went public prior to 1988, we use the IPO prospectus to classify boards of companies at the time they go public if we do not have VentureOne board data. We are able to find only 19 acquisitions with such a common individual link. Because venture capitalists often step down from boards of portfolio companies prior to an IPO, it is not surprising that we find so few common individual board members in the sample. It is possible that far more companies had common board members that served on each company's board. What is true, however, is that once the firm is public, there is little chance that the venture capital investors will remain on the board. Hence, at the time of the acquisition, very few of the acquiring companies will still have a venture capital board member. Splitting the group of acquisitions involving a common venture capital firm using a criterion based on common individual board members, however, does not produce significant differences.

Role of Other Intermediaries as Bridge Builders

Private and public companies often use service providers that sometimes play a role in acquisitions. Lawyers, commercial bankers, and investment bankers may sometimes service both public and private clients and could, at least in theory, provide a bridge between the two companies. Data on these service providers does not exist for the private targets, so it would be impossible to test whether they serve as an information bridge between the companies. Similarly, because none of these intermediaries has ownership positions in either company or has control rights (like venture capital investors/board members would), it is far less likely that they have the incentives, information, or influence to serve as a credible bridge between the two companies.

It is also likely that the public companies utilize a variety of intermediaries over the course of their existence, i.e., they are unlikely to stick with just one banker or lawyer. While we do not have time series data for the public acquirers, we examine the stickiness of the investment banker-venture capitalist relationship in a sample of all IPOs backed by venture capital investors from 1970 to 2007. In this sample, we calculate the intensity of pairing between venture capitalists and the lead underwriter for the IPOs of the companies they have financed. We find that the average intensity of pairing is 2.1%. This can be compared to the intensity of the acquisition pairing in our sample. Of the acquirers that were once venture capital-financed, 18.7% (163 out of 870) have a common venture capital investor. This is not surprising given the number of investment banks and the competitiveness of the process by which companies select underwriters. Hence, the results here would indicate that the common bond created by having a common venture capital investor is much stronger and much more likely to convey value relevant information than would the information conveyed by other intermediaries.

IV. Conclusion

In this paper, we examine acquisitions of venture capital-backed private companies and focus on what factors facilitate the reduction in asymmetric information between acquiring and target firms. In particular, we contrast a simple certification story and a local knowledge generation story with a bridge building alternative. In the bridge building case, the common personal relationship between the two firms is critical to conveying value-relevant information about both the target and the acquiring firm. Our analysis clearly demonstrates that bridge building is an important mechanism for information transmission that reduces asymmetric information and adverse selection.

In addition, we show that location is also an important determinant of asymmetric information. Like Uysal, Kedia, and Panchapagesan (2008), we find that deals located in the same CSA have higher announcement period returns. Similarly, acquirers are far more likely to come from the local CSA controlling for factors such as industry, size, age, etc. Controlling for location, however, does not mitigate the effect of having a common venture capital investor. The venture capital “bridge building” is not a proxy for location.

Our results shed light on the value venture capitalists add to their portfolio companies as well as companies in their venture capital network. A common venture capital investor’s relationship with both the acquirer and the target allows it to credibly convey the quality of the target to the acquirer, the quality of the acquirer to the target, and the quality of the acquisition to the market. By bringing together the best matched pair of acquirer and target and facilitating the target identification, screening, and negotiation process, the common venture capital investor can increase the likelihood of a successful acquisition. Bridge building is one potential mechanism promoting the persistence in venture capital investment performance identified in Kaplan and

Schoar (2005) and the investment success of well-networked venture capital firms identified in Hochberg, Ljungqvist, and Lu (2007). Smith, Pedace, and Sathe (2009) identify the importance that acquisitions play in performance persistence of experienced venture capital firms.

We find that the common venture capital investor link between the acquirer and the target has a strong effect on how the purchase transaction is structured, how the market reacts to announcement of the acquisition, and how likely the acquisition takes place. Compared to acquisitions of venture capital-backed private companies in which the acquirer is not venture capital-backed or is venture capital-backed but does not share a common venture capital investor with the target, acquisitions of venture capital-backed private companies are more likely to be financed by equity. An acquisition is more likely to take place when the acquirer and the target share a common venture capital investor. The market tends to react more positively to the announcement of acquisitions involving common venture capital investors.

Our results provide important insights into the venture capital process that deserve further exploration. The personal network in the acquisition process may indicate that bridge building may be critical to other elements of venture capitalist value-add. Lindsey (2008) shows that having a common venture capitalist increases the likelihood of forming a strategic alliance and that these alliance formations are positively related to successful exits. Additionally, the recruitment of management and the identification of first-time customers may be improved through bridge building networks that the venture capitalist creates. Similarly, bridge building may be important in relationships with service providers and strategic partners. The size and the quality of a venture capitalist's network, therefore, may be an important predictor of their investment success.³³

³³ For example, Hochberg, Ljungqvist, and Lu (2007) provide evidence that venture capital firms that have more influential networks have more successful exits of their investments.

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Table I**Number of Acquisitions of Venture Capital-Backed Private Companies by Year**

The table indicates by year the number of acquisitions of venture capital-backed private companies in our sample. The acquirers are U.S. public companies, differentiated by whether or not they are venture capital-backed. No Common VC indicates that the acquirer and the target do not share a common venture capital investor. Common VC indicates that the acquirer and the target share at least one common venture capital investor.

Year	Full Sample		Acquirer Not VC-Backed		Acquirer VC-Backed			
	#	%	#	%	No Common VC		Common VC	
					#	%	#	%
1992	43	3.4%	21	5.4%	18	2.5%	4	2.5%
1993	47	3.7%	23	5.9%	15	2.1%	9	5.5%
1994	48	3.8%	23	5.9%	16	2.3%	9	5.5%
1995	60	4.8%	18	4.6%	27	3.8%	15	9.2%
1996	64	5.1%	25	6.4%	20	2.8%	19	11.7%
1997	81	6.4%	36	9.2%	37	5.2%	8	4.9%
1998	100	7.9%	41	10.5%	46	6.5%	13	8.0%
1999	135	10.7%	51	13.0%	65	9.2%	19	11.7%
2000	121	9.6%	36	9.2%	74	10.5%	11	6.7%
2001	99	7.9%	27	6.9%	61	8.6%	11	6.7%
2002	90	7.1%	12	3.1%	70	9.9%	8	4.9%
2003	79	6.3%	12	3.1%	58	8.2%	9	5.5%
2004	108	8.6%	24	6.1%	74	10.5%	10	6.1%
2005	99	7.9%	25	6.4%	67	9.5%	7	4.3%
2006	87	6.9%	17	4.3%	59	8.3%	11	6.7%
Total	1,261	100%	391	100%	707	100%	163	100%

Table II**Number of Acquisitions of Venture Capital-Backed Private Companies
by Industry of Acquirer**

The table indicates by industry the number of acquisitions of venture capital-backed private companies in our sample. Industries are defined by the Fama-French 12-industry categories, and acquisitions are assigned to one of the 12 industry categories based on the SIC code of the acquirer. The acquirers are U.S. public companies, differentiated by whether or not they are venture capital-backed. No Common VC indicates that the acquirer and the target do not share a common venture capital investor. Common VC indicates that the acquirer and the target share at least one common venture capital investor.

Fama-French Industry	Full Sample		Acquirer Not VC-Backed		Acquirer VC-Backed			
	#	%	#	%	No Common VC		Common VC	
	#	%	#	%	#	%	#	%
Consumer nondurables	13	1.0%	10	2.6%	3	0.4%	0	0.0%
Consumer durables	10	0.8%	8	2.0%	2	0.3%	0	0.0%
Manufacturing	43	3.4%	30	7.7%	9	1.3%	4	2.5%
Oil, gas and coal	2	0.2%	1	0.3%	0	0.0%	1	0.6%
Chemical products	1	0.1%	0	0.0%	1	0.1%	0	0.0%
Business equipment	844	66.9%	195	49.9%	531	75.1%	118	72.4%
Telephone and television	43	3.4%	17	4.3%	19	2.7%	7	4.3%
Utilities	1	0.1%	1	0.3%	0	0.0%	0	0.0%
Wholesale and retail	41	3.3%	17	4.3%	21	3.0%	3	1.8%
Healthcare	143	11.3%	49	12.5%	72	10.2%	22	13.5%
Finance	36	2.9%	28	7.2%	7	1.0%	1	0.6%
Other	84	6.7%	35	9.0%	42	5.9%	7	4.3%
Total	1,261	100.0%	391	100.0%	707	100.0%	163	100.0%

Table III**Summary Statistics**

The table presents summary statistics for the sample of acquisitions of venture capital-backed private companies, where the acquirers are U.S. public companies and the targets are U.S. venture capital-backed private companies. Acquirers are differentiated by whether or not they are venture capital-backed. No Common VC indicates that the acquirer and the target do not share a common venture capital investor. Common VC indicates that the acquirer and the target share at least one common venture capital investor. Book-to-market is calculated as the ratio of book equity to market equity. Book equity is defined as total assets less total liabilities and preferred stock plus deferred taxes. Market equity is calculated as stock price times the number of shares outstanding. Cash includes cash and short-term investments. Debt is defined as the sum of long-term debt and debt in current liabilities. Relative transaction value is calculated as transaction value divided by acquirer market capitalization. Local deals are defined as acquisitions in which the acquirer and the target are headquartered in the same Combined Statistical Area (CSA) using definitions by the Census Bureau. A deal is classified as related if the target and the acquirer have the same two-digit SIC code. Target firm age is calculated as the number of months between the initial venture capital investment in the company by any venture capital firm to the acquisition announcement date. A pure stock (cash) deal implies that the acquisition is paid for 100 percent with stock (cash). Percentage in stock (cash) indicates how much percent of the transaction value of an acquisition is paid for by stock (cash).

	Acquirer VC-Backed					
	Acquirer Not VC-Backed		No Common VC			
	Mean	s.d.	Mean	s.d.	Mean	s.d.
Acquirer Characteristics						
Assets (\$ millions)	11,468.39	26,786.42	4,132.51	11,610.00	2,019.00	6,263.08
Book to market equity	0.36	0.43	0.37	0.48	0.39	0.48
Cash/Assets	0.21	0.22	0.41	0.24	0.40	0.24
Debt/Assets	0.18	0.19	0.11	0.17	0.09	0.17
Deal Characteristics						
Transaction value (\$ millions)	177.05	615.09	144.69	654.22	108.17	186.09
Relative transaction value	0.22	0.71	0.13	0.32	0.16	0.33
Local deals	13.6%	0.34	29.0%	0.45	42.3%	0.50
Related deals	62.4%	0.48	69.9%	0.46	73.0%	0.45
Target firm age	55.13	40.39	48.66	34.80	55.09	43.10
Method of Payment						
Pure cash deals	28.1%	0.45	29.7%	0.46	18.4%	0.39
Pure stock deals	31.2%	0.46	32.1%	0.47	55.2%	0.50
Percentage in cash	44.7%	0.48	40.9%	0.47	24.3%	0.41
Percentage in stock	49.9%	0.49	44.2%	0.48	69.1%	0.45
Number of Observations	391		707		163	

Table IV

Announcement Period Abnormal Returns for Acquirers

The table presents announcement period abnormal returns over the three-day event window (CAR[-1, +1]) for the acquirers of venture capital-backed private companies. The acquirers are U.S. public companies, differentiated by whether or not they are venture capital-backed. No Common VC indicates that the acquirer and the target do not share a common venture capital investor. Common VC indicates that the acquirer and the target share at least one common venture capital investor. Local deals are defined as acquisitions in which the acquirer and the target are headquartered in the same Combined Statistical Area (CSA) using definitions by the Census Bureau. Target firm age is calculated as the number of months between the initial venture capital investment in the company by any venture capital firm to the acquisition announcement date. The measure for venture capital firm experience follows Gompers, Kovner, Lerner, and Scharfstein (2008) and is defined as the log of one plus the number of companies the venture capital firm ever invested in prior to investing in the target minus the log of one plus the number of companies the average venture capital firm has invested in as of the same year. Panel A examines the full sample and breaks out the sample by deal location and target firm age. Panel B focuses on the Common VC group and breaks out the Common VC group by the common venture capital investor's experience. Asterisks denote statistical significance at the 1% (***), 5% (**), or 10% (*) level.

Panel A: By Acquirer Type									
CARs	(1) Acquirer Not VC-Backed		Acquirer VC-Backed				Differences Between Groups		
	Mean	s.d.	(2) No Common VC	s.d.	(3) Common VC	s.d.	(1) and (2)	(1) and (3)	(2) and (3)
Full Sample									
[-1, +1]	0.65%	0.092	0.25%	0.102	2.72%	0.113		**	***
# of obs.	391		707		163				
Non-Local Deals vs. Local Deals									
<i>Non-Local Deals</i>									
[-1, +1]	0.42%	0.086	-0.14%	0.100	3.21%	0.130		**	***
# of obs.	338		502		94				
<i>Local Deals</i>									
[-1, +1]	2.14%	0.123	1.22%	0.105	2.06%	0.087			
# of obs.	53		205		69				
Target Firm Age Below Median vs. Above Median									
<i>Target Age < Median</i>									
[-1, +1]	1.66%	0.098	0.16%	0.107	4.67%	0.140		**	***
# of obs.	173		372		81				
<i>Target Age > Median</i>									
[-1, +1]	-0.21%	0.086	0.31%	0.096	0.80%	0.075			
# of obs.	216		331		82				
Panel B: By Common VC's Experience									
CARs	Common VC's Experience				Differences Between Groups				
	(1) Below Median		(2) Above Median		(1) and (2)				
	Mean	s.d.	Mean	s.d.					
Common VC Deals									
[-1, +1]	1.19%	0.009	4.28%	0.015				*	
# of obs.	82		81						

Table V

Regressions for Acquirer Announcement Period Abnormal Returns

The table reports results of OLS regressions for acquirer announcement period abnormal returns. The dependent variable is the cumulative abnormal return over the three-day event window (CAR[-1, +1]). The independent variables include a dummy variable that takes the value of one if the acquirer is venture capital-backed and zero otherwise and a dummy variable that takes the value of one if the acquirer and the target share at least one common venture capital investor and zero otherwise, as well as controls for the size, book-to-market ratio, cash position, and leverage of the acquirer, the relative size of the acquisition, the experience of the target's best venture capital firm, the age of the target firm, whether the acquirer and the target are in related industries, whether the transaction is financed 100 percent with stock, whether the transaction is a local deal, and whether the common venture capital investor's experience is above median. Robust standard errors are in brackets. Asterisks denote statistical significance at the 1% (***), 5% (**), or 10% (*) level.

Independent Variables	CAR[-1, +1]					
	(1)	(2)	(3)	(4)	(5)	(6)
Acquirer VC-backed?	0.001 [0.007]	0.006 [0.008]	0.006 [0.008]	0.006 [0.008]	0.005 [0.008]	0.005 [0.008]
Acquirer and target share common VC?	0.028*** [0.010]	0.026** [0.011]	0.004 [0.012]	0.010 [0.011]	0.039*** [0.015]	0.007 [0.014]
Local deal?	0.013 [0.008]	0.013* [0.008]	0.013* [0.008]	0.013 [0.008]	0.019** [0.009]	0.019** [0.009]
Pure stock deal?	-0.017** [0.007]	-0.018** [0.008]	-0.018** [0.008]	-0.019** [0.008]	-0.017** [0.008]	-0.019** [0.008]
Related deal?	0.002 [0.006]	0.004 [0.007]	0.004 [0.007]	0.004 [0.007]	0.004 [0.007]	0.004 [0.007]
Relative transaction value	0.033** [0.016]	0.034** [0.016]	0.034** [0.016]	0.034** [0.016]	0.034** [0.016]	0.034** [0.016]
VC experience (Target's best VC)	-0.004 [0.002]	-0.002 [0.003]	-0.003 [0.003]	-0.002 [0.003]	-0.003 [0.003]	-0.003 [0.003]
Target firm age	-4.8E-05 [0.000]	-4.5E-05 [0.000]	-2.9E-05 [0.000]	1.4E-04 [0.000]	-4.5E-05 [0.000]	1.4E-04 [0.000]
Acquirer book-to-market	-0.009 [0.008]	-0.010 [0.008]	-0.010 [0.008]	-0.010 [0.008]	-0.010 [0.008]	-0.010 [0.008]
Acquirer Cash/Assets	-0.019 [0.017]	-0.013 [0.018]	-0.013 [0.018]	-0.013 [0.018]	-0.013 [0.018]	-0.013 [0.018]
Acquirer Debt/Assets	0.011 [0.021]	-0.002 [0.022]	-0.005 [0.022]	-0.001 [0.022]	-0.002 [0.022]	-0.004 [0.022]
Acquirer log assets	-0.002 [0.002]	-4.2E-04 [0.002]	-0.001 [0.002]	-0.001 [0.002]	-2.0E-04 [0.002]	-0.001 [0.002]
Common VC * (Common VC's experience > median?)			0.042** [0.018]			0.038** [0.017]
Common VC * (Target firm age < median?)				0.032* [0.019]		0.027 [0.018]
Target firm age < median?				0.016 [0.010]		0.015 [0.010]
Common VC * Local deal					-0.030 [0.019]	-0.034* [0.020]
Acquirer industry fixed effects	No	Yes	Yes	Yes	Yes	Yes
Year fixed effects	No	Yes	Yes	Yes	Yes	Yes
Number of observations	1099	1099	1099	1099	1099	1099
R-squared	0.04	0.07	0.08	0.08	0.07	0.08

Table VI

Regressions for Method of Payment

The table reports results of OLS regressions for method of payment for the sample of acquisitions of venture capital-backed private companies, where the acquirers are U.S. public companies and the targets are U.S. venture capital-backed private companies. The dependent variable is a dummy variable indicating whether or not the acquisition is paid for entirely with cash (Columns 1, 2 and 3), or the percentage of the transaction value paid for by cash (Columns 4, 5 and 6), or a dummy variable indicating whether or not the acquisition is paid for entirely with stock (Columns 7, 8 and 9), or the percentage of the transaction value paid for by stock (Columns 10, 11 and 12). The independent variables include a dummy variable that takes the value of one if the acquirer is venture capital-backed and zero otherwise and a dummy variable that takes the value of one if the acquirer and the target share at least one common venture capital investor and zero otherwise, as well as controls for the size, book-to-market ratio, cash position, and leverage of the acquirer, the relative size of the acquisition, the experience of the target's best venture capital firm, the age of the target firm, whether the acquirer and the target are in related industries, and whether the transaction is a local deal. Robust standard errors are in brackets. Asterisks denote statistical significance at the 1% (***), 5% (**), or 10% (*) level.

Independent Variables	Pure Cash Deals?			Percentage in Cash			Pure Stock Deals?			Percentage in Stock		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Acquirer VC-backed?	-0.019 [0.034]	-0.057* [0.034]	-0.056* [0.034]	-0.014 [0.035]	-0.061* [0.034]	-0.059* [0.034]	-0.058* [0.035]	0.026 [0.033]	0.026 [0.033]	-0.070* [0.037]	0.042 [0.032]	0.041 [0.033]
Acquirer and target share common VC?	-0.117*** [0.035]	-0.077** [0.036]	-0.078** [0.035]	-0.158*** [0.037]	-0.110*** [0.039]	-0.112*** [0.038]	0.191*** [0.043]	0.116*** [0.040]	0.115*** [0.040]	0.236*** [0.040]	0.136*** [0.037]	0.136*** [0.037]
Local deal?	0.035 [0.031]	0.038 [0.031]	0.040 [0.031]	0.020 [0.032]	0.029 [0.031]	0.032 [0.031]	0.048 [0.032]	0.041 [0.030]	0.040 [0.030]	0.024 [0.034]	0.012 [0.030]	0.010 [0.030]
Related deal?	3.7E-04 [0.030]	0.009 [0.029]	0.008 [0.029]	-0.005 [0.031]	0.001 [0.030]	-2.1E-04 [0.030]	0.001 [0.031]	-0.007 [0.028]	-0.003 [0.028]	-3.0E-04 [0.032]	-0.007 [0.028]	-0.005 [0.028]
Relative transaction value	-0.024 [0.045]	-0.034 [0.038]	-0.034 [0.036]	-0.026 [0.047]	-0.038 [0.037]	-0.038 [0.036]	0.055 [0.054]	0.058 [0.043]	0.057 [0.042]	0.027 [0.054]	0.027 [0.038]	0.026 [0.037]
VC experience (Target's best VC)	-0.005 [0.011]	-0.014 [0.011]	-0.014 [0.011]	-0.009 [0.011]	-0.022** [0.011]	-0.021** [0.011]	0.018* [0.010]	0.033*** [0.009]	0.033*** [0.009]	0.005 [0.011]	0.023** [0.010]	0.022** [0.010]
Target firm age	0.002*** [0.000]	0.001*** [0.000]	0.001*** [0.000]	0.002*** [0.000]	0.002*** [0.000]	0.002*** [0.000]	-0.002*** [0.000]	-0.001** [0.000]	-0.001*** [0.000]	-0.002*** [0.000]	-0.001*** [0.000]	-0.001*** [0.000]
Acquirer book-to-market	0.126*** [0.035]	0.101*** [0.034]	0.084** [0.036]	0.145*** [0.037]	0.115*** [0.035]	0.096*** [0.037]	-0.226*** [0.031]	-0.154*** [0.027]	-0.150*** [0.029]	-0.248*** [0.035]	-0.153*** [0.029]	-0.144*** [0.031]
Acquirer Cash/Assets	-0.074 [0.057]	-0.078 [0.057]	-0.090 [0.057]	-0.100 [0.062]	-0.104* [0.062]	-0.118* [0.062]	0.012 [0.066]	0.054 [0.065]	0.064 [0.066]	0.061 [0.066]	0.114* [0.060]	0.126** [0.060]
Acquirer Debt/Assets	-0.131* [0.071]	-0.092 [0.074]	-0.105 [0.073]	-0.156** [0.075]	-0.140* [0.077]	-0.155** [0.076]	0.100 [0.083]	0.144* [0.080]	0.149* [0.080]	0.120 [0.084]	0.136* [0.078]	0.145* [0.079]
Acquirer log assets	0.049*** [0.007]	0.032*** [0.007]	0.032*** [0.007]	0.061*** [0.008]	0.043*** [0.008]	0.044*** [0.008]	-0.041*** [0.008]	-0.013 [0.008]	-0.014* [0.008]	-0.053*** [0.008]	-0.020** [0.008]	-0.022*** [0.008]
Common VC * Acquirer book-to-market			0.125* [0.069]			0.136** [0.070]			-0.063 [0.068]			-0.085 [0.060]
Acquirer industry fixed effects	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes
Year fixed effects	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes
Number of observations	1099	1099	1099	1004	1004	1004	1099	1099	1099	949	949	949
R-squared	0.11	0.20	0.20	0.16	0.27	0.28	0.13	0.31	0.32	0.18	0.44	0.44

Table VII

Regressions for Likelihood of Being an Acquirer

The table presents the results for estimating the likelihood of being an acquirer. The true acquirers in the sample are included together with all public firms sharing the same SIC codes with the acquirers in the year of the acquisition announcement. The samples are constructed based on 4-digit SIC codes in Columns 1 and 4, 3-digit SIC codes in Columns 2 and 5, and 2-digit SIC codes in Columns 3 and 6. Columns 1 to 3 report results from logit regressions, with marginal effects reported. Columns 4 to 6 report results from OLS regressions. The dependent variable is a dummy variable that equals one if the firm is an actual acquirer of the target and zero otherwise. Explanatory variables include dummy variables indicating whether the firm is venture capital-backed, whether the firm shares a common venture capital investor with the target, whether the firm is in the same CSA as the target, and whether the firm is in the same industry as the target, as well as controls for relative transaction value, firm size, and industry-adjusted measures of profitability, book-to-market, capital expenditures, sales growth, and leverage in the last fiscal year ending before the date of acquisition announcement. Robust standard errors are in brackets. Asterisks denote statistical significance at the 1% (***) , 5% (**), or 10% (*) level.

Independent Variables	Target's Actual Acquirer?					
	(1)	(2)	(3)	(4)	(5)	(6)
Venture-capital backed?	0.001*** [0.001]	3.9E-04*** [0.000]	3.1E-04*** [0.000]	0.016*** [0.001]	0.004*** [0.000]	0.003*** [0.000]
Share common VC with the target?	0.004** [0.002]	0.001*** [0.000]	4.4E-04** [0.000]	0.062*** [0.007]	0.015*** [0.002]	0.012*** [0.001]
Located in the same CSA as the target?	0.045*** [0.016]	0.014*** [0.005]	0.007*** [0.002]	0.316*** [0.016]	0.106*** [0.006]	0.069*** [0.004]
In the same industry as the target?	-0.002*** [0.001]	-3.0E-04*** [0.000]	-9.3E-05*** [0.000]	-0.001 [0.001]	-0.001** [0.000]	-3.3E-04** [0.000]
Relative transaction value	-0.002*** [0.000]	-0.001*** [0.000]	-2.5E-04*** [0.000]	-0.001*** [0.000]	-2.8E-04*** [0.000]	-1.7E-04*** [0.000]
Log assets	2.9E-04** [0.000]	7.6E-05** [0.000]	2.6E-05** [0.000]	0.005*** [0.000]	0.001*** [0.000]	0.001*** [0.000]
Earnings/Assets	-2.6E-04** [0.000]	-5.7E-05*** [0.000]	-3.1E-05** [0.000]	-0.004*** [0.001]	-0.001*** [0.000]	-4.9E-04*** [0.000]
CAPX/Assets	-0.003* [0.002]	-0.001* [0.000]	-3.4E-04* [0.000]	-0.038*** [0.011]	-0.009*** [0.002]	-0.003*** [0.001]
Sale growth	1.5E-05*** [0.000]	4.2E-07*** [0.000]	3.0E-08** [0.000]	-5.8E-06 [0.000]	4.5E-06* [0.000]	4.2E-07*** [0.000]
Book-to-market	2.0E-04** [0.000]	1.7E-05*** [0.000]	5.6E-06* [0.000]	3.2E-04** [0.000]	6.0E-05*** [0.000]	1.5E-05 [0.000]
Debt/Assets	2.8E-04 [0.000]	6.6E-05* [0.000]	-1.7E-05 [0.000]	0.004* [0.002]	0.001*** [0.000]	1.7E-04 [0.000]
Acquirer industry fixed effects	No	No	No	Yes	Yes	Yes
Year fixed effects	No	No	No	Yes	Yes	Yes
Number of observations	62,105	279,672	475,915	62,105	279,672	475,915
R-squared	0.261	0.217	0.213	0.139	0.059	0.026

Table VIII**Probability of Acquisition with Common Venture Capital Investors: Matching Estimator**

The table examines the probability of occurrence of an acquisition involving common venture capital investors. The first row reports the proportion of deals between acquirers and targets with a common venture capital investor tie in the full sample. We then employ the methodology in Abadie and Imbens (2002) to match each actual acquirer in the sample with a control firm (“a matched potential acquirer”). The matching is based on the following covariates including dummy variables indicating whether the firm is venture capital-backed, whether the firm is in the same CSA as the target, and whether the firm is in the same industry as the target, as well as continuous variables such as relative transaction value, firm size, and profitability, book-to-market, capital expenditures, sales growth, and leverage. Rows 2, 3 and 4 report the proportion of matched potential acquirers that share a common venture capital investor with their targets. In Row 2, a control firm in the matching process is drawn from U.S. public companies listed in Compustat in the year of the acquisition announcement with the same 2-digit SIC codes as the actual acquirer. In Row 3, a control firm is drawn from U.S. public companies listed in Compustat in the year of the acquisition announcement with the same 2-digit SIC codes as either the actual acquirer or the target. In Row 4, a control firm is drawn from all U.S. public companies listed in Compustat in the year of the acquisition announcement. Asterisks denote statistical significance at the 1% (***), 5% (**), or 10% (*) level.

		Mean	Difference from (1)
Proportion of deals between acquirers and targets with a common VC relationship	(1)	12.48%	
Proportion of <i>matched</i> potential acquirers with a common VC relationship with the targets			
Matching drawn from all firms in the actual acquirer's industry	(2)	4.43%	***
Matching drawn from all firms in either the actual acquirer's or the target's industry	(3)	4.52%	***
Matching drawn from all firms in Compustat	(4)	4.41%	***

Table IX**Robustness and Additional Tests**

The table reports the results of robustness tests. Panel A reports the propensity score matching estimates of the effect of having a common venture capital investor on the three-day cumulative abnormal return (CAR[-1, +1]) and on whether the acquisition is financed 100 percent by stock. The estimates are calculated following Becker and Ichino (2002) on a matched sample of acquisitions with common venture capital investors and acquisitions without common venture capital investors, where the matching is achieved using the propensity score predicted in a first stage probit regression estimating the probability of an acquisition having a common venture capital investor based on acquirer and target characteristics. Standard errors are in brackets. Asterisks denote statistical significance at the 1% (***), 5% (**), or 10% (*) level. Panel B presents CAR[-1, +1] and the percentage of acquisitions financed 100 percent by stock for the Common VC group and breaks out the Common VC group by whether the common venture capital investor has an ownership stake in the acquirer. Panel C reports CAR[-1, +1] and the percentage of acquisitions financed 100 percent by stock for a sample of acquisitions in which the acquirer is a U.S. public company and the target is a U.S. public company that was once venture capital-backed, breaking out the sample by whether the acquirer and the target share a common venture capital investor.

Panel A: Propensity Score Matching Estimator of Effect of Common VC on CAR and Payment Method				
	CAR[-1,+1]			
Acquirer and target share common VC?	0.030 *** [0.011]			
	Pure Stock Deal?			
Acquirer and target share common VC?	0.199 *** [0.047]			
Panel B: Common VC's Ownership in the Acquirer				
	Common VC Has Ownership in the Acquirer?			
	(1) No		(2) Yes	
	Mean	s.d.	Mean	s.d.
CAR[-1, +1]	2.49%	0.116	3.62%	0.018
Pure stock deals	57.36%	0.496	47.06%	0.507
# of obs.	129		34	
Panel C: Common VC and Public Targets				
	Acquirer and Public Target			
	(1) No Common VC		(2) Common VC	
	Mean	s.d.	Mean	s.d.
CAR[-1, +1]	-2.89%	0.105	-4.21%	0.068
Pure stock deals	65.48%	0.478	66.67%	0.485
# of obs.	84		18	