

# **Does Venture Capital Syndication Affect Mergers and Acquisitions?**

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# **Does Venture Capital Syndication Affect Mergers and Acquisitions?**

## **Abstract**

We find that targets backed by venture capital (VC) syndication spend more time in negotiating transaction terms and receive higher acquisition premiums. The acquirers of syndicate-backed targets experience lower cumulative abnormal returns surrounding the acquisition announcements; however, they out-perform those of individual-backed targets over the long-term. We show that VC syndication creates value for entrepreneurial firms by appointing more non-managing executives, larger and more independent boards of directors prior to acquisitions. Syndicate-backed targets prefer stock payments, suggesting VC syndication continues to influence acquirers during the post-acquisition period. It aligns the incentive of acquirers' CEO to their shareholders by increasing CEO equity and variable pay.

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## 1. Introduction

Syndication arises when venture capitalists jointly invest in entrepreneurial firms. In the U.S., VC syndication accounts for approximately 70% of entrepreneurial financing. The importance of syndication is long recognized in the VC literature; however, a majority of studies focus on the *formation* of VC syndication (e.g., Bayar, Chemmanur, and Tian (2019), Brander, Amit, and Antweiler (2002), Casamatta and Haritchabalet (2007), Du (2016), Lerner (1994a), Tyková (2007b)). In this paper, we study the *benefits* of VC syndication on mergers and acquisitions (M&As) which are the most dominant exit route of entrepreneurial firms. From 1990 to 2017, about 60% of entrepreneurial firms exit through mergers and acquisitions which are widely considered to be successful exit pathways (Brander et al., (2002) Hochberg et al., (2007), Nahata (2008)). Due to the difficulty of collecting data on *private* acquisitions of entrepreneurial firms (hereafter referred to as targets) (Cumming (2010), Cumming and Johan (2017)), there has been no prior evidence on the benefits of VC syndication to this popular type of exit.

Existing theories present with contradictory predictions regarding the effects of VC syndication on targets' premiums in acquisitions. According to the selection hypothesis (Brander, Amit, and Antweiler (2002), Das, Jo, and Kim (2011), Lerner, (1994a), Sah and Stiglitz, (1986), Sorenson and Stuart (2001), Tian (2012), Wilson (1968)), when a venture capitalist considers a project as a high expected value, they then accept the project without the need for seeking another opinion. Consequently, the selection hypothesis suggests that entrepreneurial firms with VC syndication investment (hereafter referred to as syndicate-backed targets) should have poorer acquisition outcomes than individual-backed firms. On the other hand, the value-added hypothesis proposes that different venture capitalists have different skills and information (Brander, Amit,

and Antweiler, (2002), Tian (2012), Tykvová (2007a)). By investing together, venture capitalists add value to entrepreneurial firms. The value-added hypothesis, therefore, predicts that syndicate-backed firms should have better acquisition outcomes than non-syndicate-backed firms.

To test these competing hypotheses, we collect private VC-backed M&As from SDC Platinum VentureXpert, acquisition characteristics from SDC Platinum M&A, stock trading data from CRSP, and acquirers' firm characteristics from Compustat. Our final sample consists of 2,614 VC-backed transactions from 1990 to 2017. We define a target as a syndicate-backed firm if there is more than one venture capitalist invested in the target prior to the transaction announcement following Cumming et al. (2019), Kogut, Urso, and Walker (2007), and Krishnan et al. (2011). In our sample of VC-backed acquisitions, 75% of targets are syndicate-backed.

We find that syndicate-backed targets have higher sales multiple than individual-backed targets. Especially, after controlling for both transaction- and acquirer-characteristics, sales multiple increases 15.298 times when targets are syndicate-backed. We further adjust the sales multiple to the median of sales multiples of similar transactions and find that the adjusted sales multiple for syndicate-backed firms increases by 15.046 times.<sup>1</sup>

Our evidence supports the value-added hypothesis that VC syndication is linked to higher bidding premiums for targets.

We then examine the effect of VC syndication on the time to completion of VC-backed mergers and acquisitions. Building on Golubov, Petmezas, and Travlos's (2012) finding that advisors who have superior skills to advise and monitor spend more time negotiating acquisitions'

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<sup>1</sup> We identify similar transactions as follows. For each VC-backed acquisition, we search for all listed transactions that are announced two years before and after, have the target value ranging between 50% and 150% of its value, and share the same target industry (defined by the first 2 digits of the target's SIC code).

terms, we propose that syndicate-backed targets will spend more time (or exert greater efforts) in completing acquisition transactions. Follow Grinstein and Hribar (2004), we measure time to completion as a dummy variable equals to one if targets complete the acquisition deals in one or more days and as the number of days from the acquisition announcement date to the effective date. We show evidence that the likelihood of spending one or more days to complete transactions increases by significantly when targets are syndicate-backed. We also use the natural logarithm of the number of days from the acquisition announcement date to the effective date plus one as an indicator for time to completion. Consistently, we find that VC syndication is associated with longer time to complete a transaction which supports our view that VC syndicates spend more time to discuss important deal terms.

While VC syndication improves outcomes for targets, it negatively affects acquirers' cumulative abnormal returns (CAR) in the short-term. In particular, acquirers of syndicate-backed firms experience 1.5% lower announcement returns, CAR(-2, 2), compared to those of individual-backed firms. We also find a weaker negative effect of VC syndication on acquirers' CAR when we extend the event window to 11 days. Our findings suggest that VC syndication influences the price of acquisition through careful negotiations which significantly hinder the acquirer's short-term performance.

We further examine whether acquirers of syndicate-backed targets will benefit from the VC syndication in the long-term. We argue that venture capitalists continue to offer value-added services to entrepreneurial firms when they transit from a private corporation into a part of public corporations (Hochberg, (2012), Tian, Udell, and Yu (2016)). Specifically, we find that the acquirer's return on total assets (ROA) increases by 3.9% within 3 years from the announcement

of syndicate-backed targets. As well, we measure the adjusted return on total assets to the average ROA of similar-sized acquirers in the same industry and find a consistent increase of 4.8% in adjusted ROA when the target is syndicate-backed.

We provide three explanations for these effects. Existing literature has shown that venture capitalists improve entrepreneurial firms' corporate governance since they serve on the board of directors (Barry et al. (1990)), have the right to appoint the CEO and members of the board (Burchardt et al. (2016), Hellmann (1998)), and allocate control rights independent from cash flow rights (Gompers (1997), Kaplan and Stromberg (2003)). In addition, good governance structures are associated with entrepreneurial firms' better performance (Daily and Dalton (1992)). Building on prior literature, we hypothesize that VC syndication adds value to acquisition outcomes through their contribution to the target's corporate governance. Using the targets' governance data at the time of acquisition exits obtained from VentureXpert, we find that VC syndication appoints more non-managing executives, larger and more independent board of directors in the targets as both the number and ratio of non-managing directors increase in the presence of VC syndication.

Moreover, we argue that syndicate-backed targets prefer stock as the method of payment because it facilitates VC syndication's strategy to offer value-added services. Existing literature shows that when entrepreneurial firms exit through IPOs, venture capitalists continue to hold shares instead of liquidating them to influence the IPO firms with reference to long-term performance (Chemmanur, Krishnan, and Nandy (2011), Jain (2001)). VC syndication could form blockholding in the acquirer during the post-acquisition period as they maintain a large part of the equity in the private entrepreneurial firms (Adra and Menassa (2019), Slovin, Sushka, and Polonchek (2005)). We find consistent evidence that syndicate-backed targets are 4.8% more

likely to receive all-stock payment than individual-backed targets. In terms of the proportion of stock payments, syndicate-backed targets receive 10.6% more stock than individual-backed targets.

We further explore how VC syndication can offer value-added services that lead to higher long-term performance of acquirers that we document earlier. In particular, we examine whether VC syndication can improve the acquirers' governance after acquisitions by focusing on the alignment between CEO's wealth and the benefits of stockholders (Bebchuk et al., 2011; Anderson and Bizjak, 2003). This alignment, as a result, improves the firms' long-term performance (e.g., Shleifer and Vishny, 1997; Deckop, Merriman, and Gupta, 2006). We measure CEO variable pay and equity pay for CEO-shareholder incentive alignment in the long-term. We show that VC syndication significantly increases the incentive alignment between CEO and acquirers' shareholders in the long-term. CEO equity (variable) pay in three years and five year increases 12.8% (4.9%) and 13.1% (7.2%) if the target is syndicate-backed, respectively.

One may concern that our findings of VC syndication on the outcome of M&As can be the result of promising targets attracting more VC firms (Lerner (1994b), Sorenson and Stuart (2001)), or because of VC syndication's advising efforts. To separate VC syndication's selection effect from the influence of a VC syndication's value-added services in M&As, we exploit the Heckman (1979) two-step procedure to address the self-selection. To further address the issue of self-selection bias, we employ the propensity score matching technique. With these methods, we reaffirm our earlier results that VC syndication is positively related to targets' sales multiple and acquirers' long-term performance, but it negatively affects the acquirers' short-term performance. There is other potential concern that rather than being backed by VC syndication, targets and their acquirers may share a common venture capitalist that bridges the information gap and improves

acquisition performance. We restrict the sample to only non-VC-backed acquirers to address this concern and confirm that our findings are not sensitive to common venture capitalists between targets and acquirers. We additionally control for VC ownership in the targets to address a concern that VC syndication may own larger shares in target firms than individual VC. Our earlier findings remain unchanged.

To the best of our knowledge, our paper is one of the first comprehensive studies on the effect of VC syndication on acquisition outcomes. The richness of data on private VC-backed M&As allows us to look at VC syndication's influence on acquisition outcomes from both targets' and acquirers' perspectives, instead of the likelihood of having a successful exit. Brander, Amit, and Antweiler (2002) compare the mean returns of the syndicated and standalone investments in Canada and find that the former has higher rate of returns. Das, Jo, and Kim (2011), however, document contradicting results that VC syndication reduces the time to exit but does not impact on the exit multiple. More broadly, our paper contributes to a growing field of research that considers the role of VC syndication (e.g., Bayar, Chemmanur, and Tian (2019), Cumming, Grilli and Murtinu (2017), Chemmanur, Hull and Krishnan (2016), Das, Jo, and Kim (2011), Hochberg, Ljungqvist, and Lu (2007), Tian (2012)). Furthermore, our empirical results contribute to the understanding of factors that drive M&A outcomes (Cornaggia and Li (2019), Li, Qiu, and Shen (2018), Ma, Whidbee, and Zhang (2019), Schmidt (2015)), especially in the context of private firms (Bayar and Chemmanur (2012), Ivanov and Xie (2010), Masulis and Nahata (2011)). While Masulis and Nahata (2011) raise a concern that conflict of interests might influence venture capitalists to advise or pressure entrepreneurial firms to pursue strategies that benefit their exit-oriented interest, we provide a new perspective that VC syndication can mitigate this agency

problem and lead to significantly higher target sales multiple and lower acquirer announcement returns.

The remainder of our paper is organized as follows. Section II discusses the sample selection, variable measurements, and descriptive statistics. Sections III and IV present the effect of VC syndication on targets' and acquirers' acquisition outcomes, respectively. Section V suggests potential explanations for VC syndication's value creation. Section VI provides additional robustness tests. Section VII concludes the paper.

## 2. Sample Selection, Variable Measurements, and Descriptive Statistics

### 2.1 Sample Selection

We construct our sample as follows: We begin with all private VC-backed mergers and acquisitions from the SDC Platinum VentureXpert database between January 1, 1990, and December 31, 2017.<sup>3</sup> We use data from VentureXpert because they are the most comprehensive and detailed data available for VC-backed mergers and acquisitions. We retain only targets that operate in the U.S. and have a value equal to or greater than \$1 million. Also, we exclude transactions with the percentage of target acquired being less than 100% and transactions that are classified as the acquisition of partial interest, acquisition of remaining interest, buy-back, exchange offer, and recapitalization. Our resulting sample comprises 5,136 M&A announcements between 1990 and 2017.

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<sup>3</sup> We start our sample from January 1, 1990 to collect reliable information for mergers and acquisitions. Masulis and Nahata (2011) use the sample of transactions announced between January 1, 1991 and December 31, 2006, which is shorter than our sample. Gompers and Xuan (2009) collect M&As for a slightly shorter period from 1992 to 2006.

We then match this sample with the whole sample of private mergers and acquisitions listed in SDC Platinum M&A database to obtain transaction details, for example, the method of payment, the transaction multiple, the SIC code of targets and acquirers. We match using target *cusip*, acquirer *cusip*, transaction announcement date, and transaction value. We require the database of private M&A transactions to be announced between 1990 and 2017; both targets and acquirers are located in the U.S.; transaction value is equal or greater than \$1 million; deal status is “Completed”; transaction types are not spinoffs, recapitalizations, self-tenders, exchange offers, repurchases, minority stake purchases, acquisitions of remaining interest, and privatization. We exclude observations from financial and utility industries (targets’ 4-digit SIC code between 4900-4999 and 6000-6999). After dropping observations with missing data on lead venture capitalists or transaction characteristics, our final sample consists of 2,614 VC-backed M&A transactions.<sup>4</sup> We collect stock trading data from CRSP, accounting data for acquirer characteristics from Compustat, and target governance data is from VentureXpert (SDC Platinum). We winsorize all continuous variables at the 1st and 99th percentiles.

## 2.2 Variables Measurement

We follow the existing literature (Brander, Amit, and Antweiler (2002), Cumming et al. (2019), Kogut, Urso, and Walker (2007), Krishnan et al. (2011), Tian (2012)) to measure our main explanatory variable SYNDICATION, as the dummy variable, which equals to one if there is more than one VC firm invested in the target prior to the M&A announcement. We further provide

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<sup>4</sup> Although our main sample includes 2,614 transactions, we have missing information on transaction premiums, acquirer characteristics, and acquirer performance. Specifically, 1,529 firms have adequate information to generate announcement returns, while only 809 transactions have information of premiums available. This is because our sample is restricted to private transactions as in Gompers and Xuan, (2008), Masulis and Nahata (2011), and Nguyen and Nguyen (2019).

robustness tests for an alternative measurement of VC syndication as the number of all venture capitalists invested in the target.<sup>5</sup>

We construct two sets of variables to measure M&A outcomes. First, from the perspective of targets, we follow the prior literature (Masulis and Nahata (2011), Nguyen and Nguyen (2019)) to measure sales multiple, PREMIUM, as the ratio between the transaction value and the target's total sales available immediately before the announcement date. We also measure the adjusted premium, ADJ\_PREMIUM, by subtracting the difference between the target's sales multiple and the median of the sales multiples of similar deals. We select similar deals as follows: For a given VC-backed transaction, we search for all listed deals that are announced two years before and after the announcement which have a value ranging between 50% and 150% and operate in the same target industry (defined by the first two digits of the SIC code). We then construct two measurements reflecting the speed of completing deals. First, we construct TIME as a dummy variable equal to one if the announcement date is similar to the effective date, zero otherwise. Second, we measure LOG(TIME) as the natural logarithm of the number of days the target spends to complete the transaction plus one.

From the perspective of acquirers, we follow Masulis and Simsir (2018) and Masulis, Wang, and Xie (2019) and measure acquirer returns, CAR(-2, 2) and CAR(-5, 5), as the total abnormal returns during the period (-2, 2) and (-5, 5), given time 0 is the announcement date. Abnormal returns are estimated using the market model of which parameters are estimated over the period of

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<sup>5</sup> Specifically, we count the number of venture capitalists invested in the target and measure LN(N\_VCS) as its natural logarithm. We then redo the main regressions and report results in Appendix 2 using LN(N\_VCS) as the main independent for VC syndication. The evidence remains robust. Sales multiple and changes in return on total assets are positively associated with the logarithm of the number of venture capitalists, and negatively related to acquirer announcement returns.

one (trading) year and CRSP value-weighted returns serve as the market benchmark.<sup>6</sup> We calculate the long-term performance,  $\Delta\text{ROA}$ , as the difference between the return on assets (ROA) at time 0 and time 3, given time 0 is the fiscal year immediately prior to the announcement date. We also calculate  $\Delta\text{ADJ\_ROA}$  as the change in the adjusted ROA. Adjusted ROA is the difference between the acquirer's ROA and the average ROA of firms that operate in the same industry and have total assets ranging between +50% and +150% of their total assets.

We include two groups of controls in our analysis following the existing literature (Bayar, Chemmanur, and Tian (2019), Cumming et al. (2019), Cumming, Grilli and Murtinu (2017), Masulis and Nahata (2011), Tian (2012)). First, we control for transaction characteristics, including: STOCK\_RATIO, the fraction of stock as the method of payment; target's financing stages, ACQ\_STAGE, a dummy variable equal to one if the target receives an investment at the acquisition/buyout stage; LATER\_STAGE, a dummy variable equal to one if the target receives an investment at the later stage;<sup>7</sup> RELATEDNESS, a dummy variable equal to one if the target's SIC is the same as the acquirer's SIC code; DEAL\_SIZE, the natural logarithm of the transaction value; and LEAD\_VC AGE, the natural logarithm of the lead VC's age. Second, we control for the acquirer's characteristics including firm size, SIZE, the natural logarithm of the acquirer's total assets; Q, the acquirer's market value of assets divided by the book value of assets; LEVERAGE, the ratio between the acquirer's total debts and the total assets. A detailed description of all variables is presented in Appendix 1.

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<sup>6</sup> In our main sample of 2,614 transactions, acquirers can be listed or unlisted. We can only obtain information to generate abnormal returns during the period (-2, 2) and (-5, 5) for 1,529 listed acquirers in CRSP.

<sup>7</sup> We control for acquisition/buyout and later financing stages since investors during these stages may be opportunistic and benefit from exits rather than providing value-added services. Other stages to be compared with in multivariate regressions include early stage, expansion, start-up/seed, or others.

## 2.3 Descriptive Statistics

We provide annual and industry distribution of VC-backed M&A transactions announced between 1990-2017 in Panel A and Panel B of Table 1, respectively. In Panel A, we show that the numbers of VC-backed targets and VC-syndicated-backed targets both peak around the period 1999-2000. In 2000, we observe the highest number of 179 VC-backed transactions, and 141 transactions are syndicate-backed, which accounts for 78.8%. This peak period is followed by the period 2004-2007 in which 156 to 166 transactions are announced. The ratio of VC syndication of 85.4% in 2004 is the highest during this period which is only lower than in 1993 with 91.7%.

[Insert Table 1 here]

In Panel B, we present the distribution of VC-backed transactions by target industries which are defined by the first two digits of SIC codes. The distribution concentrates on Business Services industry with 1,193 transactions, and 79.9% of them are syndicate-backed. It is followed by Industrial Machinery & Equipment industry with only 242 transactions, but the syndication ratio in this industry is the highest at 84.8%. Other industries with a relatively high number of transactions are Chemical & Allied Products, Instruments & Related Products, and Communications.

We report mean, standard deviation, and median for our full sample of 2,614 transactions, subsamples of 1,954 syndicated-backed (74.8%) and 660 individual-backed transactions (25.2%) in Table 2. In Column (10), we present univariate comparisons for the characteristics of syndicate-backed and individual-backed transactions.

[Insert Table 2 here]

Regarding targets' performance, the sale multiple of targets, PREMIUM, equals 24.36 on average with a standard deviation of 67.83, but more than 50% of transactions have the multiple below 3.13. The difference of takeover premiums across samples of syndicate-backed and individual-backed transactions equals 18.76, statistically significant at the 1% level. Similarly, the mean of ADJ\_PREMIUM equals 27.09 with a median of 2.05. The difference of adjusted premiums in Column (10) is also economically significant between the two samples. Overall, the univariate comparisons indicate that syndicate-backed targets are traded at a better price than individual-backed targets.

On average, it takes entrepreneurial firms 40.47 days to complete a VC-backed transaction. Syndicate-backed targets spend 1.53 days more than individual-backed targets, but the mean difference is not statistically significant. Consistently, TIME is equal to 0.74 indicating 74% of transactions are not effective immediately after the transaction announcement. We observe a difference of 8% of TIME in Column (10), suggesting that targets receive investments from multiple venture capitalists who tend to spend more time completing the transaction.

In terms of acquirer performance, the average abnormal returns for 5-day and 11-day window are 2% and 1% in Column (1), respectively, suggesting that VC-backed M&As are value-creating, consistent with existing findings (Gompers and Xuan (2009), Masulis and Nahata (2011)).<sup>8</sup> Gompers and Xuan (2009) also find that the announcement returns of acquirers are larger when they share a common VC with the target. Masulis and Nahata (2011) document that acquirers experience 6.31% CAR when targets are VC-backed using a sample of 245 transactions between

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<sup>8</sup> Gompers and Xuan (2009) use the sample of VC-backed M&As between 1992 to 2006, while Masulis and Nahata (2011) use the sample of both VC-backed and non-VC-backed M&As for the period of 1991-2006). Our sample has a similar construction as Gompers and Xuan (2009); however, it cover much longer period.

2001-2006, while CAR is only 3.38% when targets are not backed by venture capitalists. In Column (10) of Table 2, we compare the acquirer's announcement returns when targets are syndicate-backed and individual-backed. We observe a negative and statistically significant difference of CAR between the two subsamples for both 5-day and 11-day windows, suggesting that syndicating investments in VC-backed targets reduce the acquirer's announcement returns.

Column (1) of Table 2 shows that acquisitions of VC-backed targets decrease the value of acquirers in the long-term, i.e.  $\Delta\text{ROA}$  and  $\Delta\text{ADJ\_ROA}$  are negative at -5% and -2%, respectively. However, they are less negative when targets are backed by VC syndication. Specifically, the difference of  $\Delta\text{ADJ\_ROA}$  between year 0 and 3 equals 2% and statistically significant at 10%. The difference of  $\Delta\text{ROA}$  is positive but statistically insignificant.

Regarding transaction characteristics, VC-backed targets receive 29% of stock as the method of payment on average. The stock proportion in syndicate- and individual-backed transactions equals 31% and 38%, respectively. As shown in Column (10) of Table 2, the difference of 8% is statistically significant at 1%, implying that syndicate-backed targets prefer stock as the method of payment. In addition, 21% of targets obtain VC investments at the acquisition stage. In this stage, only 15% of syndicate-backed targets receive investments, while a large proportion of individual-backed targets receives VC investments (39%). The difference of -25% is statistically significant at 1%, indicating a lower financing rate at acquisition stage for syndicate-backed firms. In contrast, syndicate-backed targets are more likely to receive financing at the later stage. Specifically, the mean difference of LATER\_STAGE in Column (1) equals 18% and is statistically significant at 1%. DEAL\_SIZE has mean and median of 4.25 and 4.32 in the full sample, respectively. The mean difference of DEAL\_SIZE between syndicate-backed and

individual-backed transactions is small at 0.02 and statistically insignificant, suggesting that targets with multiple investors are not larger than targets with only one investor. The ratio of transactions with a similar target and acquirer industry, RELATEDNESS, is 51%. The univariate comparison indicates that the ratio of relatedness is higher in the sample of syndicated-backed than it is in the sample of individual-backed targets. We also show that the lead VC of syndicate-backed targets is older than that of individual-backed targets. Our evidence suggests that syndicated firms attract more reputable venture capitalists, consistent with the VC selection hypothesis that: firstly, “hot” targets characterized by high quality may attract a large number of investors; and secondly, and these investors tend to have a high reputation.

In terms of acquirer characteristics, syndicate-backed and individual-backed targets have a similar acquirer size. The mean difference of SIZE measured as the natural logarithm of the acquirer’s total assets is positive but statistically insignificant. We also document that individual-backed targets choose acquirers with lower leverage and high growth opportunities (measured as Tobin’s Q).

### **3. The Effect of VC Syndication on Acquisition Outcomes from Target Perspectives**

#### **3.1 VC Syndication and Acquisition Premiums**

Previous studies propose that there are contradictory predictions concerning the effect of VC syndication on targets’ premiums. According to the selection hypothesis (Brander, Amit, and Antweiler (2002), Das, Jo, and Kim (2011), Lerner, (1994a), Sah and Stiglitz, (1986), Sorenson and Stuart (2001), Tian (2012), Wilson (1968)), syndicate-backed targets should, on average, receive lower premiums than individual-back targets via M&A exit. This is because the most promising projects would be taken up as standalone investments, while projects with less potential

would be put in the syndication pool. On the other hand, according to the value-added hypothesis (Brander, Amit, and Antweiler, (2002), Tian (2012), Tykrová (2007a)), venture capitalists can add value to targets rather than screening to choose the best ventures; consequently, syndicate-backed acquisitions should have higher premiums than individual-backed ones. To test whether syndicate-backed firms have higher or lower premiums in the event of an acquisition, we estimate the following equation:

$$(1) \quad PREMIUM (ADJ\_PREMIUM)_{i,t} = \alpha + \beta SYNDICATION_{i,t} + \gamma X_{i,t-1} + \delta Z_{i,t} + n_j + v_t + \varepsilon_{i,t}$$

where PREMIUM is the ratio between the transaction value and the target's total sales and ADJ\_PREMIUM is the difference between the target's sales multiple and the median of sales multiples of similar transactions. The main independent variable, SYNDICATION, equals to one if there is more than one VC firm invested in the target, and zero otherwise.  $X_{i,t-1}$  is a vector of VC and transaction characteristics, and  $Z_{i,t}$  represents acquirer characteristics. Definitions of all variables are shown in Appendix 1. Following Gompers, Kovner, and Lerner (2009), we include  $n_j$  as industry fixed effects to take into account the concentration of VC investment across industries. We also include year fixed effects,  $v_t$ , to control for varying economic conditions across time following Krishnan et al. (2011). Standard errors are clustered at the deal level. The regression results of Equation (1) are presented in Table 3.

[Insert Table 3 here]

In Column (1) of Table 3, we document that targets with syndicate backing have higher takeover premiums than individual-backed targets. The coefficient estimate on SYNDICATION is positive and statistically significant at 1%. Specifically, the sales multiple increases 13.62 times

when targets are syndicate-backed, *ceteris paribus*. In Column (2), we further control for acquirer characteristics and find consistent results. In particular, we find a larger effect of VC syndication on the sales multiple, which is 15.928 times. In Columns (3)-(4), we replace the dependent variable PREMIUM by ADJ\_PREMIUM and re-estimate Equation (1). Similarly, SYNDICATION positively affects adjusted sales multiple in both models, confirming that VC syndication improves transaction premiums. Our findings reject the selection hypothesis and support the value-added hypothesis that the inclusion of multiple venture capitalists will lead to better acquisition outcomes for target firms. These results coincide with the findings of Tian (2012) that VC syndication creates value for entrepreneurial firms, as it leads to a lower IPO underpricing and a higher IPO market valuation.

Regarding control variables, we find that targets which receive higher stock offers have better premiums, similar to Masulis and Nahata (2011). Acquisitions of targets that receive financing at later stages are traded at a discount relative to other targets as the coefficient estimates on ACQ\_STAGE and LATER\_STAGE are negative and significant on all our regressions (except for Column (1) of Table 3). DEAL\_SIZE is positively related to premiums, suggesting that large private targets may have more power in negotiating high offer price, which is consistent with the findings of Greene (2017) and Nguyen and Nguyen (2019) who utilize acquisitions of unlisted targets. We also document a positive effect of relatedness and acquirers' Q on takeover premiums.

### 3.2 VC Syndication and Time to Completion

In this section, we further examine the effect of VC syndication and the time to complete VC-backed mergers and acquisitions. We argue that if VC syndication adds value to target firms, syndicate-backed acquisitions will take more time to complete. This is consistent with the view of

Golubov, Petmezas, and Travlos (2012) that top-tier advisors are better skilled at advising and monitoring the target, and they will spend extra time negotiating the transaction terms more carefully. In order to test the effect of VC syndication on the time to completion, we use completion time as a measurement for negotiation efforts as reported in Grinstein and Hribar (2004). We first calculate TIME as a dummy variable that equals to one if the time to completion is greater than zero and zero otherwise. Second, we measure LOG(TIME) as the natural logarithm of the number of days between the announcement date and the effective date plus one. We estimate the following equation:

$$(2) \quad \text{TIME}/\text{LOG}(\text{TIME})_{i,t} = \alpha + \beta \text{SYNDICATION}_{i,t} + \gamma X_{i,t-1} + \delta Z_{i,t} + n_j + v_t + \varepsilon_{i,t}$$

We present the regression results of Equation (2) in Table 4. All model specifications are the same as Equation (1). We find that VC syndication spends more time examining transaction terms. As shown in Columns (1)-(2) of Table 4, the likelihood of spending one or more than one day to complete the transaction increases by 4.6% and 8.3%, respectively. Columns (3)-(4) show Tobit regressions of time to competition LOG(TIME) on VC syndication. The coefficient of LOG(TIME) is statistically significant at 5% and 1% in Columns (3)-(4), respectively, suggesting that syndicate-backed targets take longer time to complete the transaction than individual-backed targets. Overall, this evidence supports our argument that VC syndicates are diligent advisors who spend more time negotiating terms that benefit the target.

[Insert Table 4 here]

We also document results supporting the existing literature, i.e., deals with stock payment take more time to complete, small deals are completed faster than large deals, while acquirer size

and Q reduce the time to completion (Deng et al. (2013), Golubov, Petmezas, and Travlos (2012), Nguyen and Phan (2017)).

## 4. The Effect of VC Syndication on Acquisition Outcomes from Acquirer Perspectives

### 4.1 VC Syndication and Acquirer's Announcement Returns

In the previous section, the value-added hypothesis indicates that targets receive better premiums when they are syndicate-backed. We also document VC syndication as diligent advisors and spend more time negotiating transaction terms carefully. We predict that as the consequences of the targets benefiting from the acquisitions, acquirers' performance will be negatively affected in the short-term. To test this prediction, we regress acquirers' announcement returns on venture capital syndication as follows:

$$(3) \quad CAR_{i,t} = \alpha + \beta SYNDICATION_{i,t} + \gamma X_{i,t-1} + \delta Z_{i,t} + n_j + v_t + \varepsilon_{i,t}$$

where CAR is acquirer returns. We follow Masulis and Simsir (2018) and Masulis, Wang, and Xie (2019) and measure CAR as the total abnormal returns during the period (-2, 2) and (-5, 5), given 0 is the transaction announcement date. The main independent variable, SYNDICATION, equals to one if there is more than one VC firm invested in the target, and zero otherwise. Other variables are defined in Appendix 1. Standard errors are clustered at the deal level.

Table 5 shows the estimation results of Equation (3). Overall, we find that acquisitions of syndicate-backed targets generate lower returns for the acquirer. Column (1) shows that acquirer returns, CAR(-2, 2), are 1.7% lower when targets are syndicate-backed. The coefficient of SYNDICATION is also negative and statistically significant at 5% in Column (2) which incorporates acquirer characteristics as control variables. Results remain the same when we extend

the event window to eleven days and use CAR(-5, 5) as the dependent variable. Columns (3)-(4) show a reduction of 1.5% and 1.2% in acquirer returns when there is VC syndication in the target, respectively. Our findings suggest that VC syndication influences the price of acquisitions through careful deal-term negotiations which negatively affect the acquirer's short-term performance.

[Insert Table 5 here]

We also document in Column (1) that the effect of stock financing on acquirer returns is positive and statistically significant at 5%, supporting the view that equity offers in the acquisition of unlisted targets convey favorable information about the value of targets and acquirers (Slovin et al. (2005)), or informational rent extracted by the acquirer (Hege et al. (2009)). The effect, however, is not statistically significant in other specifications. DEAL\_SIZE is positive, but statistically significant in Columns (2)-(4), as in Nguyen and Nguyen (2019) and Slovin, Sushka and Polonchek (2005). In addition, the acquirer size, SIZE, is negatively related to acquirer returns. This evidence is consistent with the findings that small acquirers tend to perform better than large ones (Alexandridis et al. (2013), Moeller, Schlingemann, and Stulz (2004)). The coefficient estimates on LEVERAGE are positive and statistically significant, implying that a high level of debts positively improves acquirer returns.

## 4.2 VC Syndication and Acquirer's Long-term Performance

In the previous section, we propose that the acquirer's performance will be negatively affected in the short-term following the acquisition of a syndicate-backed target. In this section, we ask whether acquirers benefit from the value that VC syndication added to the target in the long-term. According to Hochberg (2012) and Tian, Udell, and Yu (2016), venture capitalists provide value-added services to portfolio firms when they transit from a private corporation to a

public corporation. Nguyen and Pham (2019) contend venture capitalists provide support for acquirers in both the short-term and long-term after the announcement through holding their shares. Moreover, VC firms keep holding shares of IPO firms instead of liquidating them, in order to influence the firms' long-term performance using their superior management skills (Jain (2001), Krishnan et al. (2011)). Based on these studies, we hypothesize that acquirers of syndicate-backed firms perform better over the long-term compared to individual-backed targets. We then examine the impact of VC syndication on the operating efficiency of acquirers as follows:

$$(4) \quad \Delta ROA (\Delta ADJ\_ROA)_{i,t} = \alpha + \beta SYNDICATION_{i,t} + \gamma X_{i,t-1} + \delta Z_{i,t} + n_j + v_t + \varepsilon_{i,t}$$

where the dependent variable,  $\Delta ROA$ , is the difference between the return on total assets of the acquirer at year 0 and year +3, given 0 is the fiscal year immediately prior to the announcement date.  $\Delta ADJ\_ROA$  is the difference between  $ADJ\_ROA$  in year 0 and 3. We use the similar-size matching technique by Barber and Lyon (1996) and Argrawala and Jaffe (2003) to measure  $ADJ\_ROA$ . Specifically, it is the difference between the acquirer's ROA and the average ROA of firms that operate in the same industry and have total assets ranging from +50% to +150% of the acquirer's total assets. The main independent variable,  $SYNDICATION$ , equals to one if there is more than one VC firm invested in the target, and zero otherwise. Other variables are defined in Appendix 1. The standard errors are heteroskedasticity consistent.

[Insert Table 6 here]

Table 6 report estimation results of Equation (4). Overall, we document that VC syndication improves the acquirer's long-term performance. In particular,  $SYNDICATION$  is positive and statistically significant at 1% in Column (1), suggesting that the acquirer's return on

total assets will increase 3.7% within 3 years from the announcement date if the target is syndicate-backed, *ceteris paribus*. The effect increases to 3.9% after controlling for acquirer characteristics as the coefficient estimate on SYNDICATION is statistically significant at 1% in Column (2). In Columns (3)-(4), the coefficients of SYNDICATION are also positive and statistically significant at 1%. The adjusted return on total assets of acquirers,  $\Delta\text{ADJ\_ROA}$ , increases 4.4% and 4.8%, respectively, when the target receives investment from multiple venture capitalists. In all specifications, we document a positive effect of financing at the acquisition stage, ACQ\_STAGE, on the acquirer's long-term performance, suggesting that investors attracted to this stage have superior skill and experience in managing acquirers.

Overall, in this section, we document consistent evidence that venture capital syndication adds value to entrepreneurial firms. In particular, targets receive higher premiums as VC syndication takes a longer period of time to negotiate and complete the deals. Although acquirers experience lower cumulative abnormal returns in the short-term when acquiring syndicate-backed targets, in the long-run, they demonstrate better operating performance as VC syndication continues value-added services.

## **5. The Effect of VC Syndication on Targets' Corporate Governance and Acquisition Payment Choice**

In previous sections, we reveal that VC syndication adds value to targets and acquirers that it positively affects acquisition outcomes, for targets at the time of announcement and acquirers in the long-term. In this section, we propose two possible explanation for the value creation of VC syndication. We first analyze the impact of VC syndication on the governance of target firms. We

then analyze the choice of payment to emphasize the strategic decision of VC syndication to influence the acquirer in the long-term.

### **5.1 VC Syndication and Targets' Corporate Governance**

Prior literature has documented venture capitalists create value by designing governance structures of portfolio firms. In particular, they serve on the board of directors (Barry et al. (1990)), appoint a new CEO and members to the board (Burchardt et al. (2016), Hellmann (1998)), and allocate control rights independent from cash flow rights (Gompers (1997), Kaplan and Stromberg (2003)). Furthermore, good governance structures often lead to entrepreneurial firms' better performance (Daily and Dalton (1992)). We then argue that VC syndication adds values by improving targets' governance structure. We take advantage of the VC-backed M&A database in VentureXpert which reports in details the governance of targets at the time they exit via acquisitions. The data is unique and enables us to obtain the full names of all executives, their position, and whether they are managing and/or non-managing members. We estimate the following equation:

$$(5) \quad GOVERNANCE_{i,t} = \alpha + \beta SYNDICATION_{i,t} + \gamma X_{i,t-1} + \delta Z_{i,t} + n_j + \nu_t + \varepsilon_{i,t}$$

We use four proxies for GOVERNANCE, namely, N\_BD is the number of directors on the target's board of directors; R\_NMNG\_EXE is the ratio between the number of non-managing executives and the total number of executives; N\_NMNG\_BD is the number of non-managing board members; and R\_NMNG\_BD is the ratio between the number of non-managing board members and the total number of board members. The main independent variable, SYNDICATION, equals to one if there is more than one VC firm invested in the target, and zero

otherwise. Other variables are defined in Appendix 1. Standard errors are clustered at the deal level.

According to our prediction,  $\beta$  is positive and statistically significant.

The estimation results of Equation (5) are presented in Table 7. In Column (1), the coefficient of N\_BD is positive and statistically significant at 1%, indicating that the number of directors increases by 1.071 when the target is backed by VC syndication, *ceteris paribus*, supporting the view that VC syndication is interested in appointing or sending more directors to advise and monitor the target. Also, we find that the ratio of executives who are non-managing increases significantly when the target is syndicate-backed. Specifically, in Column (2), the increase of 7.2% is statistically significant at 1%. In Column (3), we find that the number of non-managing directors increases by almost one member (0.974) when there are multiple VC investors in the target. Column (4) consistently shows that the ratio of non-managing board members is significantly larger (7%) when the target is syndicate-backed.

[Insert Table 7 here]

Our evidence indicates that VC syndication appoints more directors, hiring a larger ratio of non-managing executives and board members in the targets. Similar to our results, Brav and Gompers (1997) find that venture capitalists may design good management in portfolio firms that improve their long-term performance. Brickley, Coles, and Terry (1994) show that outsider directors serve the interest of shareholders. Hochberg (2012) finds that the boards of directors of IPO firms are more independent when they are VC-backed. Hart (1995) points out that non-managing directors can be considered as “delegated monitors” who oversee the management’s use of a firm’s resources.

## 5.2 VC Syndication and Method of Payment

In this section, we examine the effect of VC syndication on the method of payment in mergers and acquisitions. The prior literature suggests that venture capitalists prefer stock as the method of payment because it facilitates the strategy to offer value-added services (Nguyen and Pham (2019)). Indeed, strategic stock holding by venture capitalists during the post-exit period significantly benefits the performance of portfolio firms (Jain (2001), Krishnan et al. (2011)), indicating that stock payment is a potential channel for venture capitalists to influence the acquirer's performance. Moreover, venture capitalists often have large equity ownership in target firms, and in the event of an exit, they will form blockholding in the acquirer and improve its value (e.g., Adra and Menassa (2019), Slovin, Sushka, and Polonchek (2005)). Therefore, consistent with the value-added hypothesis, we argue that VC syndication prefers stock as the method of payment in VC-backed acquisitions. We construct two proxies for stock as the method of payment. STOCK is a dummy variable which equals to one if the transaction is financed by 100% stock, or zero otherwise. Furthermore, we calculate STOCK\_RATIO as the fraction of stock as the method of payment. We estimate the following equation to examine the relationship between VC syndication and the choice of stock as the method of payment in M&As:

$$(6) \quad STOCK (STOCK\_RATIO)_{i,t} = \alpha + \beta SYNDICATION_{i,t} + \gamma X_{i,t-1} + \delta Z_{i,t} + n_j + v_t + \varepsilon_{i,t}$$

We report the regression results of Equation (6) in Table 8. We find that VC syndicate-backed firms are more likely to receive all-stock payment and also a higher proportion of stock payment. Specifically, in Columns (1)-(2), we find that the likelihood of all-stock payment increases by 3.3% and 4.8% when the target is syndicate-backed, *ceteris paribus*. Since the proportion of stock is truncated at 0% and 100%, we employ Tobit regressions to eliminate

potential bias caused by the sample truncations. The results reveal in Columns (3)-(4) that syndicate-backed targets receive 14.3% and 10.6% more stock than individual-backed targets. The effects are statistically significant at 1%, which is consistent with our prediction.

[Insert Table 8 here]

The coefficients of other control variables are also consistent with the existing literature, i.e., a positive effect of deal size and acquirer's Q (Gompers and Xuan (2009), Nguyen and Pham (2019)), and a negative effect of relatedness, acquirer size (Eckbo, Makaew, and Thorburn (2018), Elnahas and Kim (2017), Nguyen and Nguyen (2019), Nguyen and Pham, (2019)). We also find a negative relationship between late-stage financing and stock offers in all specifications, suggesting that late-stage investors tend to cash out their investment immediately following the exit event.

### **5.3 VC Syndication and Acquirers' CEO-Shareholders Incentive Alignment**

In the previous section, we demonstrate that venture capitalists prefer stock as the method of payment through acquisitions. In this section, we explore how VC syndication can offer value-added services that lead to higher long-term performance of acquirers that we document earlier. The value-added hypothesis suggests that VC syndication is more capable of monitoring and advising (Brander, Amit, and Antweiler, 2002; Tian, 2012). We examine whether VC syndication can improve the acquirers' governance after acquisitions. We focus on CEO variable pay and CEO equity pay as these measurements represent the alignment between CEO's wealth and the benefits of stockholders (Bebchuk et al., 2011; Anderson and Bizjak, 2003). This alignment, as a result, improves the firms' long-term performance (e.g., Shleifer and Vishny, 1997; Deckop, Merriman, and Gupta, 2006). We estimate the following equation to study the effect of VC syndication on CEO-shareholder incentive alignment in the long-term:

$$(7) \quad CEO\_EQP(CEO\_VARP)_{i,t+3/t+5} = \alpha + \beta SYNDICATION_{i,t} + \gamma X_{i,t-1} + \delta Z_{i,t} + n_j + v_t + \varepsilon_{i,t}$$

where CEO\_EQP is the sum of the CEO's restricted stock grants and stock option grants scaled by CEO's total compensation measured three or five years after the announcement date. CEO\_VARP is measured as the difference between CEO's total compensation and salary scaled by CEO's total compensation measured three or five years after the announcement date. We report the results in Table 9.

[Insert Table 9 here]

We show that the coefficient estimates of SYNDICATION are positive and statistically significant in all model specifications, suggesting that VC syndication increases the incentive alignment between CEO and acquirers' shareholders in the long-term. In Columns (1)-(2), CEO equity (variable) pay in three years increases 12.8% (4.9%) if the target is syndicate-backed, *ceteris paribus*. Columns (3)-(4) extend the period of examination to five years. Similarly, VC syndication has a positive effect of 13.1% and 7.2% on the acquirers' CEO equity and variable pay in five years after the announcement, respectively.<sup>9</sup>

## 6. Further Tests

### 6.1 Heckman Two-step Selection Model

The effect of VC syndication on the outcome of M&As can be the result of promising targets attracting more VC firms (Lerner (1994b), Sorenson and Stuart (2001)), or it can be due to VC syndication's advisory efforts, or both. To separate VC syndication's selection effect from the

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<sup>9</sup> Some may argue that the long-term effect of syndication is found because acquirers with high CEO equity/variable pay tend to takeover syndicate-backed targets. We actually test the effect of syndication on CEO equity and variable pay at the announcement, but the effect is economically small and statistically insignificant.

influence of a VC syndication's value-added services in M&As, we exploit the Heckman (1979) two-step procedure to address the self-selection problem. We use N\_INT\_VCS as the instrument in the first step of the Heckman procedure. N\_INT\_VCS is measured as the natural logarithm of the number of VC firms having investments in the same location and industry with the target within three years prior to the announcement date.<sup>10</sup> We require that these venture capitalists have no investment in the target during the calculation period to truly reflect the interest of potential VC firms in the given target. We construct this measurement for two reasons. First, VC firms invest in companies where they have a better understanding, i.e., industry expertise (Lungeanu and Zajac (2016)). Second, target firms tend to attract venture capitalists who are near them where they can reduce time required for monitoring and advising (Bernstein, Giroud, and Townsend (2016), Kolympiris, Hoenen and Kalaitzandonakes (2018), Tian (2012)). The availability of VC firms that meet these criteria, means it is more likely that there will be a syndicated investment in the target. Then, we estimate a probit model to predict the likelihood of the target being backed by VC syndication as follows:

$$(7) \quad SYNDICATION_{i,t} = \alpha + \beta N\_INT\_VCS_{i,t} + \gamma X_{i,t-1} + \delta Z_{i,t} + n_j + v_t + \varepsilon_{i,t}$$

The estimation of the first step results is presented in Model (1) of Table 10. N\_INT\_VCS is positive at 0.13 and statistically significant at 1% with an average marginal effect of 0.03. This supports our argument that the higher the number of venture capitalists near the target and have

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<sup>10</sup> Our results remain robust when we search for VC firms in the same location and industry with the target within five years prior to the transaction announcement.

expertise in the target's industry, then the more likely the target will attract multiple venture capitalists or a VC syndicate.

[Insert Table 10 Here]

For the second stage of the Heckman Selection Model, we compute the inverse Mills ratio, IMR, for syndicate-backed targets from the first-step regression estimates. We include IMR as an additional control variable in the second-step regression of sales multiples, acquirer announcement returns and acquirers' long-term performance which are Equation (1), (3), and (4), respectively.

Model (2) of Table 10 shows that after controlling for self-selection, SYNDICATION affects PREMIUM significantly. The evidence suggests that the ratio between transaction value and total sales increases by 15.615 times when the target is syndicate-backed, *ceteris paribus*. Our results in Columns (3)-(4) confirm that SYNDICATION has a negative relationship with the acquirer's announcement returns, while it is positively related to the acquirer's long-term performance, consistent with our previous findings. Overall, our results are robust to the self-selection of VC syndication.

## 6.2 Propensity Score Matching

We take advantage of the binary nature of VC syndication and construct a sample of transactions that share similarities along many dimensions except for syndication. To create this closely-matched sample, we use propensity score matching (PSM) proposed by Heckman, Ichimura, and Todd (1998), (1997). Although PSM does not match firm deal characteristics perfectly, PSM generally alleviates differences in syndicate-backed and individual-backed targets which will help generate a more unbiased estimate of VC syndication. In particular, we estimate a

logit model predicting the likelihood of syndication. We then identify matches based on propensity scores from the logit regression, with replacement,<sup>11</sup> for each syndicate-backed target.

[Insert Table 11 Here]

We report the estimation results in Table 11. These results suggest that VC syndication is positively related to sales multiple and the acquirer's long-term performance, but it negatively affects the acquirer's announcement returns. Specifically, using the matched sample, we find that sales multiple increases by 11.652 times when the target is syndicate-backed, *ceteris paribus*. VC syndicate-backed targets reduce the acquirer returns, CAR(-2, 2), by 1.4 %, while it increases the difference of returns on assets ( $\Delta$ ROA) by 3.2%. Overall, our results remain robust and economically significant after we control for differences in firm deal characteristics.

### 6.3 Non-VC-backed Acquirers

According to Gompers and Xuan (2009), a common VC between the target and the acquirer is able to “bridge” the information gap between two firms. We are concerned that in our sample of VC-backed acquisitions, some transactions have a shared VC investor between the target and acquirer, and this could contaminate our conclusion on the relationship between VC syndication and acquisition outcomes. Indeed, Gompers and Xuan (2009) demonstrate that VC bridge-building conveys value-relevant information that significantly affects acquirer announcement returns, and the effect is more pronounced in situations where the problem of asymmetric information is more severe. If the common investor belongs to individual-backed or syndicate-backed targets, the

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<sup>11</sup> When we use matching without replacement, the sample size significantly drops but economic significance remains robust.

influence of VC syndication will be biased, even it is uncertain whether syndicate-backed targets have more or less likelihood of a common investor than individual backed targets.

Therefore, we propose the following approach to address the problem of VC bridge-building. From our main sample of VC-backed M&As, we create a restricted sample of non-VC-backed acquirers. In particular, we exclude transactions classified as “VC Company Acquired VC Company” and “VC Fund Acquired VC Company”. Consequently, 533 VC-backed acquirers are excluded. We re-estimate the regressions of sales multiple, the acquirer’s announcement returns, and the long-term performance on VC syndication. The regression results are provided in Table 12.

[Insert Table 12 here]

In Column (1) of Table 12, the coefficient of SYNDICATION is positive and statistically significant at 5%, suggesting that syndicate-backed targets receive more premiums than individual-backed targets, *ceteris paribus*. In Column (2), the results show that VC syndication in the target reduces the acquirer’s announcement returns by 1.3%, which is statistically significant at 10%. In Column (3), we find similar evidence that syndicate-backed targets lead to better acquirer long-term performance. The coefficient of SYNDICATION equals 0.049 and is statistically significant at 1%. Overall, our results remain robust after we consider VC bridge-building between targets and acquirers.

#### 6.4 Other robustness tests

Although we find a positive effect of VC syndication on targets’ sales premiums and the choice of stock payment, one may argue that this effect is mainly driven by the ownership of venture capitalists in the targets rather than the VC syndication itself. This argument usually holds

because VC syndication invests more and have a larger ownership proportion in target firms than individual VCs, so the results may not capture syndication but the proportion of holdings. We address this concern by employing a proxy of VC syndication ownership as an additional control variable measured as the total VC investments divided by the transaction value of the VC-backed firm at the M&A announcement date. In the untabulated results, we find robust evidence of VC syndication for targets' sales premiums and the choice of payment after controlling for VC syndication ownership.

## 7. Conclusions

Syndication has for decades been a common practice amongst venture capitalists. This research investigates the benefits of VC syndication on acquisition outcomes. We find syndicate-backed targets have higher sales premiums and spend longer time on the completion of the deals. Acquirers of syndicate-backed firms experience lower announcement returns, however, outperform those of individual-backed targets in the long-term. Our findings support the value-added hypothesis that VC syndication creates value for targets that benefit acquirers in the long-term. We propose three explanations for VC value creation. Venture capitalists improve the governance of targets before exiting via acquisition. Moreover, venture capitalists continue to hold stocks in acquirers by choosing stock payment and influence them during post-acquisition. During the post-acquisition period, VC syndication aligns the incentive of acquirers' CEO to their shareholders by increasing CEO equity and variable pay. Our results are robust to a battery of tests of endogeneity and sub-sample bias, confirming our earlier results of the positive consequences of VC syndication on acquisition outcomes. Collectively, we show that VC syndication creates value for not only entrepreneurial firms but also the acquirers of those in the long-term.



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## Appendix 1: Definition of Variables

| Variables   | Definition  | Source            |
|-------------|---|-------------------|
| SYNDICATION | A dummy variable is equal to one if there is more than one VC firm invested in the target and zero otherwise.   | SDC Venture Xpert |
| PREMIUM     | The ratio of the transaction value to the target's sales.   | SDC Platinum M&As |
| ADJ_PREMIUM | The difference between the target's sales multiple and the median of sales multiples of similar transactions. Similar transactions are identified as follows. For each VC-backed transaction, we search for all listed transactions that are announced two years before and after, have the value ranged between 50% and 150% its value, and share the same target industry (defined by the first 2 digits of the target's SIC code). | SDC Platinum M&As |
| TIME        | A dummy variable equals to one if the effective date is the same as the announcement date and zero otherwise.   | SDC Platinum M&As |
| LOG(TIME)   | The natural logarithm of one plus the number of days between the announcement date and the completion date.   | SDC Platinum M&As |
| CAR(-2, 2)  | The acquirer's cumulative abnormal returns between date -2 and 2, given 0 is the announcement date. Abnormal returns are generated from the market model for which parameters are estimated over the period of one year and CRSP value-weighted returns served as the market benchmark.   | CRSP (US)         |
| CAR(-5, 5)  | The acquirer's cumulative abnormal returns between date -5 and 5, given 0 is the announcement date.   | CRSP (US)         |
| ΔROA        | The difference of return on total assets between year 0 and year +3.  | Compustat         |
| ΔADJ_ROA    | The difference of adjusted return on total assets between year 0 and year +3. Adjusted return on total assets is the difference between the acquirer's ROA and the average ROA of firms that share the same industry and have the size of total assets ranging from +50% to +150% the size of the acquirer.   | Compustat         |

### *Transaction characteristics*

|             |   |                   |
|-------------|---|-------------------|
| STOCK_RATIO | The fraction of stock as the method of payment.   | SDC Platinum M&As |
| ACQ_STAGE   | A dummy variable equals to one if the target receives an investment at the "acquisition/buyout stage" and zero otherwise. | SDC Venture Xpert |

|  |   |                   |
|--|---|-------------------|
| LATER_STAGE                            | A dummy variable equals to one if the target receives a venture capital investment at the “later stage” and zero otherwise.   | SDC Venture Xpert |
| RELATEDNESS                            | A dummy variable equals to one if the first three digits of the target's SIC code are the same as the first three digits of the acquirer's SIC code and zero otherwise. | SDC Platinum M&As |
| DEAL_SIZE                              | The natural logarithm of the transaction value.   | SDC Venture Xpert |
| LEAD_VC AGE                            | The natural logarithm of the age of lead VC. The lead VC is defined as the VC with the largest investment in the target.  | SDC Venture Xpert |
| <b><i>Acquirer characteristics</i></b> |   |                   |
| SIZE                                   | The natural logarithm of the acquirer's total assets.   | Compustat         |
| Q                                      | The market value of assets divided by the book value of assets.   | Compustat         |
| LEVERAGE                               | The ratio of total debts to the total assets.   | Compustat         |

## Appendix 2: An Alternative Measurement of Venture Capital Syndication

This table shows robust tests for an alternative measurement of VC syndication. PREMIUM is the ratio between the transaction value and the target's sales. CAR(-5, 5) is the acquirer's cumulative abnormal returns between date -5 and 5, given 0 is the announcement date.  $\Delta$ ROA is the difference of ROA between year 0 and year +3, given 0 is the fiscal year right prior to the announcement date. LN(N\_VCS) is the natural logarithm of the number of venture capitalists backing the target. STOCK\_RATIO is the fraction of stock as the method of payment. ACQ\_STAGE is a dummy variable equals to one if the target receives an investment at the acquisition/buyout stage and zero otherwise. LATER\_STAGE is a dummy variable equal to one if the target receives an investment at the later stage and zero otherwise. RELATEDNESS is a dummy variable equal to one if the target's SIC is the same as the acquirer's SIC code and zero otherwise. DEAL\_SIZE is the natural logarithm of the transaction value. LEAD\_VC\_AGE is the natural logarithm of the lead VC's age. SIZE is the natural logarithm of the acquirer's total assets. Q is the acquirer's market value of assets divided by the book value of assets. LEVERAGE is the ratio of the acquirer's total debts to the total assets. Standard errors are clustered at the deal level (in parentheses). Symbols \*, \*\*, and \*\*\* indicate significance at the 10%, 5%, and 1% levels, respectively.

|                | PREMIUM                | CAR(-5, 5)           | $\Delta$ ROA        |
|----------------|------------------------|----------------------|---------------------|
|                | 1                      | 2                    | 3                   |
| LN(N_VCS)      | 7.777**<br>(3.174)     | -0.012**<br>(0.005)  | 0.023***<br>(0.008) |
| STOCK_RATIO    | 26.127**<br>(11.101)   | 0.009<br>(0.010)     | 0.005<br>(0.019)    |
| ACQ_STAGE      | -24.642***<br>(7.322)  | 0.002<br>(0.009)     | 0.024*<br>(0.014)   |
| LATER_STAGE    | -18.337**<br>(7.611)   | 0.002<br>(0.008)     | -0.001<br>(0.014)   |
| DEAL_SIZE      | 11.976***<br>(3.884)   | 0.007*<br>(0.004)    | -0.002<br>(0.007)   |
| RELATEDNESS    | 11.252*<br>(5.892)     | 0.004<br>(0.007)     | 0.013<br>(0.012)    |
| LEAD_VC_AGE    | -2.641<br>(5.126)      | -0.006<br>(0.005)    | 0.009<br>(0.009)    |
| SIZE           | -1.405<br>(3.566)      | -0.009***<br>(0.003) | -0.004<br>(0.006)   |
| LEVERAGE       | 4.642<br>(24.488)      | 0.041**<br>(0.019)   | 0.164***<br>(0.041) |
| Q              | 6.293***<br>(1.760)    | 0.001<br>(0.001)     | -0.003<br>(0.002)   |
| Intercept      | -78.095***<br>(25.556) | 0.083**<br>(0.040)   | -0.079<br>(0.052)   |
| Industry FE    | Yes                    | Yes                  | Yes                 |
| Year FE        | Yes                    | Yes                  | Yes                 |
| Obs.           | 523                    | 1,481                | 1,216               |
| R <sup>2</sup> | 0.29                   | 0.09                 | 0.18                |



**Table 1: Distribution of VC-backed M&As between 1990-2017 by Year and Industry**

This table reports the annual and industry distribution of VC-backed mergers and acquisitions announced between 1990 and 2017. Industries are defined based on 2-digit SIC code.

***Panel A: The distribution of VC-backed and syndicate-backed M&As by year***

| Year         | No. of VC-backed transactions | No. of syndicate-backed transactions | % of VC syndication |
|--------------|-------------------------------|--------------------------------------|---------------------|
| 1990         | 6                             | 4                                    | 66.7%               |
| 1991         | 4                             | 1                                    | 25.0%               |
| 1992         | 35                            | 25                                   | 71.4%               |
| 1993         | 36                            | 33                                   | 91.7%               |
| 1994         | 30                            | 24                                   | 80.0%               |
| 1995         | 50                            | 33                                   | 66.0%               |
| 1996         | 75                            | 49                                   | 65.3%               |
| 1997         | 84                            | 53                                   | 63.1%               |
| 1998         | 93                            | 69                                   | 74.2%               |
| 1999         | 157                           | 122                                  | 77.7%               |
| 2000         | 179                           | 141                                  | 78.8%               |
| 2001         | 113                           | 82                                   | 72.6%               |
| 2002         | 106                           | 81                                   | 76.4%               |
| 2003         | 120                           | 89                                   | 74.2%               |
| 2004         | 158                           | 135                                  | 85.4%               |
| 2005         | 156                           | 119                                  | 76.3%               |
| 2006         | 166                           | 125                                  | 75.3%               |
| 2007         | 162                           | 119                                  | 73.5%               |
| 2008         | 80                            | 55                                   | 68.8%               |
| 2009         | 77                            | 62                                   | 80.5%               |
| 2010         | 114                           | 79                                   | 69.3%               |
| 2011         | 138                           | 101                                  | 73.2%               |
| 2012         | 97                            | 68                                   | 70.1%               |
| 2013         | 79                            | 59                                   | 74.7%               |
| 2014         | 115                           | 90                                   | 78.3%               |
| 2015         | 68                            | 53                                   | 77.9%               |
| 2016         | 53                            | 34                                   | 64.2%               |
| 2017         | 63                            | 49                                   | 77.8%               |
| <b>Total</b> | <b>2,614</b>                  | <b>1,954</b>                         | <b>74.8%</b>        |

**Panel B: The distribution of VC-backed and syndicated-backed M&As by target's industry**

| Industry                                 | 2-digit SIC code | No. of VC-backed transactions | No. of syndicate-backed transactions | % of VC syndication |
|--|------------------|-------------------------------|--------------------------------------|---------------------|
| Business Services                        | 73               | 1,193                         | 958                                  | 79.9%               |
| Industrial Machinery & Equipment         | 36               | 242                           | 206                                  | 84.8%               |
| Chemical & Allied Products               | 28               | 193                           | 146                                  | 75.3%               |
| Instruments & Related Products           | 38               | 178                           | 132                                  | 74.4%               |
| Communications                           | 48               | 130                           | 91                                   | 69.5%               |
| Engineering & Management Services        | 87               | 109                           | 78                                   | 71.8%               |
| Industrial Machinery & Equipment         | 35               | 95                            | 72                                   | 75.3%               |
| Health Services                          | 80               | 91                            | 67                                   | 73.9%               |
| Wholesale Trade – Durable Goods          | 50               | 40                            | 23                                   | 57.5%               |
| Miscellaneous Retail                     | 59               | 36                            | 24                                   | 67.6%               |
| Oil & Gas Extraction                     | 13               | 27                            | 11                                   | 39.3%               |
| Printing & Publishing                    | 27               | 25                            | 15                                   | 57.7%               |
| Fabricated Metal Products                | 34               | 21                            | 6                                    | 27.3%               |
| Food & Kindred Products                  | 20               | 19                            | 11                                   | 57.9%               |
| Nondurable Goods                         | 51               | 16                            | 5                                    | 23.5%               |
| Rubber & Miscellaneous Plastics Products | 30               | 16                            | 4                                    | 31.3%               |
| Eating & Drinking Places                 | 58               | 11                            | 9                                    | 83.3%               |
| Miscellaneous Manufacturing Industries   | 39               | 10                            | 7                                    | 45.5%               |
| Primary Metal Industries                 | 33               | 10                            | 4                                    | 40.0%               |
| Transportation Equipment                 | 37               | 10                            | 4                                    | 70.0%               |
| Other                                    |                  | 145                           | 83                                   | 56.4%               |
| <b>Total</b>                             |                  | <b>2,614</b>                  | <b>1,954</b>                         | <b>74.8%</b>        |

**Table 2: Descriptive Statistics**

This table presents descriptive statistics of the full sample, and the subsamples of individual-backed and syndicated-backed transactions, respectively. SYNDICATION is dummy variable equals to one if there is more than one VC firm invested in the target and zero otherwise. CAR(-2, 2) is the acquirer's cumulative abnormal returns between date -2 and 2, given 0 is the announcement date. CAR(-5, 5) is the acquirer's cumulative abnormal returns between date -5 and 5, given 0 is the announcement date. PREMIUM is the ratio of the transaction value to the sales of the target. ADJ\_PREMIUM is the difference between the target's sales multiple and the median of sales multiples of similar transactions.  $\Delta$ ROA is the difference of the return on total assets (ROA) between year 0 and year +3, given 0 is the fiscal year right prior to the announcement date.  $\Delta$ ADJ\_ROA is the difference of adjusted ROA between year 0 and year +3 where adjusted ROA is the difference between the acquirer's ROA and the average ROA of firms that: firstly, share the same industry and secondly, have the size of total assets ranging from +50% to +150% the size of the acquirer. TIME is a dummy variable equal to one if the effective date is different from the announcement date and zero otherwise. LOG(TIME) is the number of days between the announcement date and the completion date. STOCK\_RATIO is the fraction of stock as the method of payment. ACQ\_STAGE is a dummy variable equal to one if the target receives an investment at the acquisition/buyout stage and zero otherwise. LATER\_STAGE is a dummy variable equal to one if the target receives an investment at the later stage and zero otherwise. RELATEDNESS is a dummy variable equal to one if the target's SIC is the same as the acquirer's SIC code and zero otherwise. DEAL\_SIZE is the natural logarithm of the transaction value. LEAD\_VC\_AGE is the natural logarithm of the lead VC's age. SIZE is the natural logarithm of the acquirer's total assets. Q is the acquirer's market value of assets divided by the book value of assets. LEVERAGE is the ratio of the acquirer's total debts to the total assets. All continuous variables are winsorized at the 1% and 99% levels.

|                  | All transactions<br>(2,614 Obs.) |         |          | Syndicate-backed<br>SYNDICATION=1 |         |          | Individual-backed<br>SYNDICATION=0 |         |          | Mean<br>differences<br>Column 4-7<br>10 |
|------------------|----------------------------------|---------|----------|-----------------------------------|---------|----------|------------------------------------|---------|----------|---|
|                  | Mean<br>1                        | SD<br>2 | p50<br>3 | Mean<br>4                         | SD<br>5 | p50<br>6 | Mean<br>7                          | SD<br>8 | p50<br>9 |   |
| PREMIUM          | 24.36                            | 67.83   | 3.13     | 29.43                             | 75.04   | 3.78     | 10.67                              | 39.80   | 1.97     | 18.76***                                |
| ADJ_PREMIUM      | 27.09                            | 74.00   | 2.05     | 31.40                             | 79.51   | 2.52     | 12.40                              | 48.35   | 1.02     | 19.00***                                |
| TIME             | 0.74                             | 0.44    | 1.00     | 0.76                              | 0.43    | 1.00     | 0.68                               | 0.47    | 1.00     | -0.08***                                |
| LOG(TIME)        | 2.68                             | 1.79    | 3.33     | 2.74                              | 1.75    | 3.37     | 2.50                               | 1.88    | 3.13     | -0.245***                               |
| CAR(-2, 2)       | 0.02                             | 0.12    | 0.01     | 0.01                              | 0.13    | 0.01     | 0.03                               | 0.12    | 0.02     | -0.02**                                 |
| CAR(-5, 5)       | 0.02                             | 0.10    | 0.01     | 0.01                              | 0.10    | 0.00     | 0.03                               | 0.10    | 0.02     | -0.01***                                |
| $\Delta$ ROA     | -0.05                            | 0.21    | -0.02    | -0.05                             | 0.21    | -0.02    | -0.06                              | 0.19    | -0.02    | 0.01                                    |
| $\Delta$ ADJ_ROA | -0.02                            | 0.22    | -0.01    | -0.01                             | 0.23    | 0.00     | -0.04                              | 0.20    | -0.01    | 0.02*                                   |
| STOCK_RATIO      | 0.29                             | 0.41    | 0.00     | 0.31                              | 0.42    | 0.00     | 0.23                               | 0.38    | 0.00     | 0.08***                                 |
| ACQ_STAGE        | 0.21                             | 0.41    | 0.00     | 0.15                              | 0.35    | 0.00     | 0.39                               | 0.49    | 0.00     | -0.25***                                |
| LATER_STAGE      | 0.22                             | 0.41    | 0.00     | 0.27                              | 0.44    | 0.00     | 0.08                               | 0.28    | 0.00     | 0.18***                                 |

|             |      |      |      |      |      |      |      |      |      |          |
|-------------|------|------|------|------|------|------|------|------|------|----------|
| DEAL_SIZE   | 4.25 | 1.58 | 4.32 | 4.24 | 1.55 | 4.32 | 4.26 | 1.67 | 4.32 | -0.02    |
| RELATEDNESS | 0.51 | 0.50 | 1.00 | 0.53 | 0.50 | 1.00 | 0.47 | 0.50 | 0.00 | 0.07***  |
| LEAD_VC AGE | 2.75 | 0.70 | 2.81 | 2.79 | 0.69 | 2.87 | 2.65 | 0.72 | 2.68 | 0.14***  |
| SIZE        | 6.26 | 1.80 | 6.12 | 6.27 | 1.80 | 6.13 | 6.21 | 1.79 | 6.08 | 0.06     |
| LEVERAGE    | 0.13 | 0.18 | 0.05 | 0.12 | 0.17 | 0.03 | 0.18 | 0.20 | 0.11 | -0.05*** |
| Q           | 4.04 | 5.13 | 2.42 | 4.26 | 5.42 | 2.51 | 3.34 | 4.02 | 2.13 | 0.93***  |

**Table 3: The Effect of VC Syndication on Target Acquisition Premiums**

This table reports linear regressions of target premiums on venture capital syndication. The main dependent variable, PREMIUM, is the ratio between the transaction value and the target's sales. ADJ\_PREMIUM is the difference between the target's sales multiple and the median of sales multiples of similar transactions. The main independent variable, SYNDICATION, is equal to one if there is more than one VC firm invested in the target and zero otherwise. A detailed description of other variables is presented in Appendix 1. Standard errors are clustered at the deal level (in parentheses). Symbols \*, \*\*, and \*\*\* indicate significance at the 10%, 5%, and 1% levels, respectively.

|                | PREMIUM                | PREMIUM                | ADJ_PREMIUM            | ADJ_PREMIUM            |
|----------------|------------------------|------------------------|------------------------|------------------------|
|                | 1                      | 2                      | 3                      | 4                      |
| SYNDICATION    | 13.620***<br>(4.567)   | 15.298**<br>(6.329)    | 17.026***<br>(6.072)   | 15.046**<br>(7.684)    |
| STOCK_RATIO    | 36.927***<br>(7.664)   | 26.651**<br>(11.115)   | 36.804***<br>(8.701)   | 31.064**<br>(12.179)   |
| ACQ_STAGE      | -25.537***<br>(5.780)  | -24.849***<br>(7.281)  | -30.275***<br>(7.432)  | -27.156***<br>(8.804)  |
| LATER_STAGE    | -8.722<br>(6.087)      | -16.925**<br>(7.523)   | -12.672*<br>(6.962)    | -19.360**<br>(8.456)   |
| DEAL_SIZE      | 11.913***<br>(2.300)   | 11.526***<br>(3.879)   | 13.873***<br>(3.018)   | 12.009**<br>(4.652)    |
| RELATEDNESS    | 10.549**<br>(4.666)    | 11.217*<br>(5.842)     | 11.068**<br>(5.389)    | 12.530**<br>(6.281)    |
| LEAD_VC_AGE    | -2.549<br>(4.321)      | -2.075<br>(5.086)      | -2.406<br>(4.963)      | -1.801<br>(5.243)      |
| SIZE           |                        | -1.317<br>(3.579)      |                        | 0.206<br>(4.214)       |
| LEVERAGE       |                        | 7.151<br>(24.349)      |                        | 4.004<br>(31.634)      |
| Q              |                        | 6.325***<br>(1.817)    |                        | 6.476***<br>(1.897)    |
| Intercept      | -71.408***<br>(19.078) | -86.668***<br>(25.691) | -93.671***<br>(26.139) | -98.457***<br>(34.002) |
| Industry FE    | Yes                    | Yes                    | Yes                    | Yes                    |
| Year FE        | Yes                    | Yes                    | Yes                    | Yes                    |
| Obs.           | 809                    | 523                    | 609                    | 421                    |
| R <sup>2</sup> | 0.21                   | 0.29                   | 0.21                   | 0.29                   |

**Table 4: The Effect of VC Syndication on the Time to Completion**

This table reports regressions of the time to complete an M&A transaction on venture capital syndication. TIME is a dummy variable equal to one if the effective date is different from the announcement date and zero otherwise. LOG(TIME) is the natural logarithm of the number of days between the announcement date and the completion date plus one. The main independent variable, SYNDICATION, equals to one if there is more than one VC firm invested in the target and zero otherwise. A detailed description of other variables is presented in Appendix 1. Standard errors are clustered at the deal level (in parentheses). Symbols \*, \*\*, and \*\*\* indicate significance at the 10%, 5%, and 1% levels, respectively.

|                                | TIME                | TIME                 | LOG(TIME)           | LOG(TIME)            |
|--------------------------------|---------------------|----------------------|---------------------|----------------------|
|                                | 1                   | 2                    | 3                   | 4                    |
| SYNDICATION                    | 0.046**<br>(0.021)  | 0.083***<br>(0.026)  | 0.224**<br>(0.108)  | 0.374***<br>(0.125)  |
| STOCK_RATIO                    | 0.155***<br>(0.023) | 0.065**<br>(0.027)   | 1.164***<br>(0.120) | 0.665***<br>(0.131)  |
| ACQ_STAGE                      | -0.017<br>(0.023)   | 0.025<br>(0.028)     | 0.073<br>(0.117)    | 0.245*<br>(0.135)    |
| LATER_STAGE                    | 0.041**<br>(0.020)  | 0.028<br>(0.023)     | 0.287***<br>(0.100) | 0.201*<br>(0.108)    |
| DEAL_SIZE                      | 0.113***<br>(0.005) | 0.127***<br>(0.010)  | 0.656***<br>(0.030) | 0.749***<br>(0.048)  |
| RELATEDNESS                    | 0.011<br>(0.016)    | -0.025<br>(0.020)    | -0.008<br>(0.084)   | -0.159*<br>(0.094)   |
| LEAD_VC_AGE                    | 0.006<br>(0.012)    | -0.006<br>(0.014)    | 0.062<br>(0.062)    | -0.011<br>(0.066)    |
| SIZE                           |                     | -0.029***<br>(0.007) |                     | -0.196***<br>(0.034) |
| LEVERAGE                       |                     | 0.014<br>(0.057)     |                     | 0.203<br>(0.271)     |
| Q                              |                     | -0.007***<br>(0.002) |                     | -0.056***<br>(0.011) |
| Intercept                      | 0.075<br>(0.341)    | 0.481**<br>(0.236)   | -1.107<br>(1.746)   | 0.82<br>(1.380)      |
| Sigma-Intercept                |                     |                      | 1.939***<br>(0.037) | 1.672***<br>(0.042)  |
| Industry FE                    | Yes                 | Yes                  | Yes                 | Yes                  |
| Year FE                        | Yes                 | Yes                  | Yes                 | Yes                  |
| Obs.                           | 2614                | 1568                 | 2614                | 1568                 |
| R <sup>2</sup> /Log likelihood | 0.22                | 0.21                 | -4673               | -2763                |

**Table 5: The Effect of VC Syndication on Acquirers' Announcement Returns**

This table reports linear regressions of acquirer returns on venture capital syndication. The main dependent variables, CAR(-2, 2) and CAR(-5, 5), are the acquirer's cumulative abnormal returns during the 5 and 11 window period, respectively. The main independent variable, SYNDICATION, equals to one if there is more than one VC firm invested in the target and zero otherwise. A detailed description of other variables is presented in Appendix 1. Standard errors are clustered at the deal level (in parentheses). Symbols \*, \*\*, and \*\*\* indicate significance at the 10%, 5%, and 1% levels, respectively.

|                | CAR(-2, 2)          | CAR(-2, 2)           | CAR(-5, 5)          | CAR(-5, 5)           |
|----------------|---------------------|----------------------|---------------------|----------------------|
|                | 1                   | 2                    | 3                   | 4                    |
| SYNDICATION    | -0.017**<br>(0.008) | -0.015**<br>(0.008)  | -0.015**<br>(0.006) | -0.012*<br>(0.006)   |
| STOCK_RATIO    | 0.020**<br>(0.010)  | 0.009<br>(0.010)     | 0.011<br>(0.008)    | -0.001<br>(0.008)    |
| ACQ_STAGE      | 0.008<br>(0.009)    | 0.003<br>(0.009)     | 0.007<br>(0.008)    | 0.006<br>(0.008)     |
| LATER_STAGE    | 0.000<br>(0.008)    | -0.001<br>(0.008)    | 0.005<br>(0.006)    | 0.004<br>(0.006)     |
| DEAL_SIZE      | 0.001<br>(0.002)    | 0.007*<br>(0.004)    | 0.000<br>(0.002)    | 0.006**<br>(0.003)   |
| RELATEDNESS    | 0.007<br>(0.007)    | 0.005<br>(0.007)     | 0.005<br>(0.005)    | 0.003<br>(0.006)     |
| LEAD_VC AGE    | -0.006<br>(0.005)   | -0.007<br>(0.005)    | -0.004<br>(0.004)   | -0.004<br>(0.004)    |
| SIZE           |                     | -0.009***<br>(0.003) |                     | -0.009***<br>(0.002) |
| LEVERAGE       |                     | 0.041**<br>(0.019)   |                     | 0.027<br>(0.017)     |
| Q              |                     | 0.001<br>(0.001)     |                     | 0.001<br>(0.001)     |
| Intercept      | 0.063<br>(0.040)    | 0.077*<br>(0.040)    | 0.004<br>(0.031)    | 0.009<br>(0.035)     |
| Industry FE    | Yes                 | Yes                  | Yes                 | Yes                  |
| Year FE        | Yes                 | Yes                  | Yes                 | Yes                  |
| Obs.           | 1,529               | 1,481                | 1,529               | 1,481                |
| R <sup>2</sup> | 0.07                | 0.08                 | 0.07                | 0.09                 |

**Table 6: The Effect of VC Syndication on Acquirers' Long-term Performance**

This table reports linear regressions of the acquirer's long-term performance on venture capital syndication. The main dependent variables,  $\Delta\text{ROA}$  is the difference of ROA between year 0 and year +3, given 0 is the fiscal year right prior to the announcement date.  $\Delta\text{ADJ\_ROA}$  is the difference of adjusted ROA between year 0 and year +3. The main independent variable,  $\text{SYNDICATION}$ , equals to one if there is more than one VC firm invested in the target and zero otherwise. A detailed description of other variables is presented in Appendix 1. Standard errors are clustered at the deal level (in parentheses). Symbols \*, \*\*, and \*\*\* indicate significance at the 10%, 5%, and 1% levels, respectively.

|                | $\Delta\text{ROA}$ | $\Delta\text{ROA}$  | $\Delta\text{ADJ\_ROA}$ | $\Delta\text{ADJ\_ROA}$ |
|----------------|--------------------|---------------------|-------------------------|-------------------------|
|                | 1                  | 2                   | 3                       | 4                       |
| SYNDICATION    | 0.037**<br>(0.014) | 0.039***<br>(0.014) | 0.044***<br>(0.016)     | 0.048***<br>(0.016)     |
| STOCK_RATIO    | -0.001<br>(0.018)  | 0.007<br>(0.019)    | 0.025<br>(0.020)        | 0.008<br>(0.020)        |
| ACQ_STAGE      | 0.032**<br>(0.013) | 0.024*<br>(0.014)   | 0.044***<br>(0.014)     | 0.028*<br>(0.015)       |
| LATER_STAGE    | 0.008<br>(0.014)   | 0.004<br>(0.014)    | 0.015<br>(0.017)        | 0.009<br>(0.016)        |
| DEAL_SIZE      | -0.004<br>(0.005)  | -0.002<br>(0.007)   | -0.017***<br>(0.005)    | 0.003<br>(0.008)        |
| RELATEDNESS    | 0.009<br>(0.012)   | 0.012<br>(0.012)    | 0.005<br>(0.013)        | 0.003<br>(0.013)        |
| LEAD_VC_AGE    | 0.012<br>(0.009)   | 0.01<br>(0.009)     | 0.011<br>(0.010)        | 0.008<br>(0.010)        |
| SIZE           |                    | -0.004<br>(0.006)   |                         | -0.029***<br>(0.007)    |
| LEVERAGE       |                    | 0.165***<br>(0.041) |                         | 0.182***<br>(0.046)     |
| Q              |                    | -0.003<br>(0.002)   |                         | -0.002<br>(0.003)       |
| Intercept      | -0.055<br>(0.047)  | -0.065<br>(0.054)   | -0.029<br>(0.061)       | 0.002<br>(0.060)        |
| Industry FE    | Yes                | Yes                 | Yes                     | Yes                     |
| Year FE        | Yes                | Yes                 | Yes                     | Yes                     |
| Obs.           | 1,217              | 1,216               | 1,169                   | 1,168                   |
| R <sup>2</sup> | 0.16               | 0.18                | 0.11                    | 0.14                    |

**Table 7: The Role of VC Syndication on Target's Board of Directors**

This table reports the impact of VC syndication on the target's governance. We construct four measures for the target's governance including: N\_BD, the number of board directors; R\_NMNG\_EXE, the number of executives who are not members of the target's management (non-managing board members) divided by the total number of executives; N\_NMNG\_BD, the number of non-managing board members; and R\_NMNG\_BD, the ratio between non-managing board members divided by the total number of board members. The main independent variable, SYNDICATION equals to one if there is more than one VC firm invested in the target and zero otherwise. The detailed description of other variables is presented in Appendix 1. Standard errors are clustered at the deal level (in parentheses). Symbols \*, \*\*, and \*\*\* indicate significance at the 10%, 5%, and 1% levels, respectively.

|                | N BD                 | R NMNG EXE           | N NMNG BD            | R NMNG BD            |
|----------------|----------------------|----------------------|----------------------|----------------------|
|                | 1                    | 2                    | 3                    | 4                    |
| SYNDICATION    | 1.071***<br>(0.161)  | 0.072***<br>(0.017)  | 0.974***<br>(0.143)  | 0.070**<br>(0.033)   |
| STOCK_RATIO    | 0.153<br>(0.182)     | 0.038**<br>(0.019)   | 0.205<br>(0.163)     | 0.02<br>(0.028)      |
| ACQ_STAGE      | -0.568***<br>(0.207) | -0.081***<br>(0.019) | -0.481***<br>(0.180) | -0.037<br>(0.039)    |
| LATER_STAGE    | 0.455***<br>(0.152)  | 0.004<br>(0.014)     | 0.311**<br>(0.138)   | -0.043**<br>(0.021)  |
| DEAL_SIZE      | 0.143**<br>(0.065)   | 0.003<br>(0.007)     | 0.088<br>(0.060)     | -0.028***<br>(0.010) |
| RELATEDNESS    | -0.023<br>(0.132)    | 0.002<br>(0.013)     | -0.041<br>(0.120)    | -0.003<br>(0.020)    |
| LEAD_VC_AGE    | 0.197**<br>(0.093)   | 0.008<br>(0.009)     | 0.192**<br>(0.087)   | 0.016<br>(0.015)     |
| SIZE           | -0.03<br>(0.051)     | -0.001<br>(0.005)    | 0.003<br>(0.046)     | 0.018**<br>(0.007)   |
| LEVERAGE       | -0.261<br>(0.410)    | 0.012<br>(0.040)     | -0.153<br>(0.378)    | 0.077<br>(0.052)     |
| Q              | -0.012<br>(0.016)    | 0.000<br>(0.002)     | 0.000<br>(0.015)     | 0.005***<br>(0.002)  |
| Intercept      | -2.050***<br>(0.642) | 0.161<br>(0.287)     | -1.984***<br>(0.583) | -0.084<br>(0.185)    |
| Industry FE    | Yes                  | Yes                  | Yes                  | Yes                  |
| Year FE        | Yes                  | Yes                  | Yes                  | Yes                  |
| Obs.           | 1,315                | 1,315                | 1,315                | 950                  |
| R <sup>2</sup> | 0.29                 | 0.22                 | 0.30                 | 0.42                 |

**Table 8: The Effect of VC Syndication on the Choice of Payment**

This table reports regressions of the method of payment on venture capital syndication. The main dependent, STOCK, is a dummy variable equal to one if the deal is financed by stock 100% and zero otherwise. STOCK\_RATIO is the fraction of stock as the method of payment. The main independent variable, SYNDICATION equals to one if there is more than one VC firm invested in the target and zero otherwise. A detailed description of other variables is presented in Appendix 1. Standard errors are clustered at the deal level (in parentheses). Symbols \*, \*\*, and \*\*\* indicate significance at the 10%, 5%, and 1% levels, respectively.

|                                | STOCK                | STOCK                | STOCK_RATIO          | STOCK_RATIO          |
|--------------------------------|----------------------|----------------------|----------------------|----------------------|
|                                | 1                    | 2                    | 3                    | 4                    |
| SYNDICATION                    | 0.033**<br>(0.016)   | 0.048**<br>(0.022)   | 0.143***<br>(0.022)  | 0.106***<br>(0.025)  |
| ACQ_STAGE                      | -0.118***<br>(0.017) | -0.099***<br>(0.025) | -0.771***<br>(0.019) | -0.418***<br>(0.022) |
| LATER_STAGE                    | -0.032*<br>(0.017)   | -0.031<br>(0.021)    | -0.139***<br>(0.017) | -0.149***<br>(0.020) |
| DEAL_SIZE                      | 0.013**<br>(0.005)   | 0.038***<br>(0.010)  | 0.062***<br>(0.005)  | 0.326***<br>(0.006)  |
| RELATEDNESS                    | -0.011<br>(0.014)    | -0.022<br>(0.019)    | 0.072***<br>(0.019)  | -0.103***<br>(0.022) |
| LEAD_VC_AGE                    | -0.003<br>(0.011)    | 0.007<br>(0.014)     | -0.080***<br>(0.008) | -0.01<br>(0.009)     |
| SIZE                           |                      | -0.023***<br>(0.008) |                      | -0.321***<br>(0.004) |
| LEVERAGE                       |                      | -0.003<br>(0.061)    |                      | -0.073<br>(0.056)    |
| Q                              |                      | 0.013***<br>(0.002)  |                      | 0.048***<br>(0.003)  |
| Intercept                      | 0.119<br>(0.181)     | -0.221**<br>(0.089)  | -7.518***<br>(0.024) | -6.567***<br>(0.028) |
| Sigma-Intercept                |                      |                      | 1.330***<br>(0.011)  | 1.127***<br>(0.009)  |
| Industry FE                    | Yes                  | Yes                  | Yes                  | Yes                  |
| Year FE                        | Yes                  | Yes                  | Yes                  | Yes                  |
| Obs.                           | 2,614                | 1,568                | 2,614                | 1,568                |
| R <sup>2</sup> /Log likelihood | 0.30                 | 0.40                 | -1,936               | -1,147               |

**Table 9: The Effect of VC Syndication on the Acquirers' CEO Pay**

This table reports regressions of CEO equity and variable pay on VC syndication. CEO\_EQP is the sum of CEO's restricted stock grants and stock option grants scaled by CEO's total compensation measured three or five years after the announcement date in Columns (1)-(3), respectively. CEO\_VARP is measured as the difference between CEO's total compensation and salary scaled by CEO's total compensation measured three or five years after the announcement date in Columns (2)-(4), respectively. The main independent variable, SYNDICATION equals to one if there is more than one VC firm invested in the target and zero otherwise. A detailed description of other variables is presented in Appendix 1. Standard errors are clustered at the deal level (in parentheses). Symbols \*, \*\*, and \*\*\* indicate significance at the 10%, 5%, and 1% levels, respectively.

|                | CEO_EQP             | CEO_VARP            | CEO_EQP             | CEO_VARP            |
|----------------|---------------------|---------------------|---------------------|---------------------|
|                | 1                   | 2                   | 3                   | 4                   |
| SYNDICATION    | 0.128**<br>(0.054)  | 0.049**<br>(0.023)  | 0.131**<br>(0.057)  | 0.072***<br>(0.028) |
| STOCK_RATIO    | 0.111**<br>(0.051)  | 0.044<br>(0.027)    | 0.106**<br>(0.053)  | 0.041<br>(0.029)    |
| ACQ_STAGE      | -0.051<br>(0.069)   | -0.031<br>(0.025)   | -0.094<br>(0.078)   | -0.052*<br>(0.028)  |
| LATER_STAGE    | -0.115**<br>(0.054) | -0.026<br>(0.020)   | -0.100*<br>(0.053)  | -0.018<br>(0.021)   |
| DEAL_SIZE      | -0.005<br>(0.025)   | 0.001<br>(0.010)    | 0.005<br>(0.026)    | 0.003<br>(0.011)    |
| RELATEDNESS    | 0.064<br>(0.042)    | 0.030*<br>(0.018)   | 0.066<br>(0.042)    | 0.035*<br>(0.019)   |
| LEAD_VC_AGE    | 0.051*<br>(0.030)   | 0.013<br>(0.014)    | 0.059*<br>(0.034)   | 0.019<br>(0.016)    |
| SIZE           | 0.069***<br>(0.016) | 0.050***<br>(0.008) | 0.068***<br>(0.017) | 0.055***<br>(0.008) |
| LEVERAGE       | -0.443**<br>(0.180) | -0.112*<br>(0.062)  | -0.255<br>(0.171)   | -0.086<br>(0.069)   |
| Q              | -0.011*<br>(0.006)  | -0.008*<br>(0.005)  | -0.01<br>(0.006)    | -0.007<br>(0.005)   |
| Intercept      | 0.057<br>(0.258)    | 0.581***<br>(0.089) | -0.083<br>(0.236)   | 0.520***<br>(0.103) |
| Industry FE    | Yes                 | Yes                 | Yes                 | Yes                 |
| Year FE        | Yes                 | Yes                 | Yes                 | Yes                 |
| Obs.           | 225                 | 536                 | 195                 | 415                 |
| R <sup>2</sup> | 0.39                | 0.27                | 0.44                | 0.34                |

**Table 10: Heckman Two-step Selection Model**

This table shows robustness tests for the sample selection problem using Heckman two-step procedure. PREMIUM is the ratio between the transaction value and the target's sales. CAR(-2, 2) is the acquirer's cumulative abnormal returns during the period (-2, 2). ΔROA is the difference of ROA between year 0 and year +3, given 0 is the fiscal year right prior to the announcement date. N\_INT\_VCS is the natural logarithm of the number of VC firms having investments in the same location and industry with the target within three years prior to the announcement date. SYNDICATION equals to one if there is more than one VC firm invested in the target and zero otherwise. A detailed description of other variables is presented in Appendix 1. Standard errors are clustered at the deal level (in parentheses). Symbols \*, \*\*, and \*\*\* indicate significance at the 10%, 5%, and 1% levels, respectively.

|                                | SYNDICATION          | PREMIUM                | CAR(-2, 2)           | ΔROA                |
|--------------------------------|----------------------|------------------------|----------------------|---------------------|
|                                | 1                    | 2                      | 3                    | 4                   |
| SYNDICATION                    |                      | 15.615**<br>(6.313)    | -0.015**<br>(0.007)  | 0.035**<br>(0.015)  |
| IMR                            |                      | -57.744**<br>(28.058)  | -0.035<br>(0.026)    | -0.014<br>(0.063)   |
| N_INT_VCS                      | 0.130***<br>(0.027)  |                        |                      |                     |
| STOCK_RATIO                    | 0.083<br>(0.119)     | 25.578**<br>(11.383)   | 0.000<br>(0.008)     | 0.012<br>(0.019)    |
| ACQ_STAGE                      | -0.595***<br>(0.124) | -6.778<br>(11.698)     | 0.02<br>(0.012)      | 0.034<br>(0.025)    |
| LATER_STAGE                    | 0.769***<br>(0.120)  | -32.270***<br>(10.789) | -0.003<br>(0.008)    | 0.003<br>(0.019)    |
| DEAL_SIZE                      | 0.043<br>(0.042)     | 11.017***<br>(3.754)   | 0.005*<br>(0.003)    | -0.005<br>(0.007)   |
| RELATEDNESS                    | 0.037<br>(0.085)     | 11.021*<br>(6.041)     | 0.002<br>(0.006)     | 0.014<br>(0.012)    |
| LEAD_VC_AGE                    | 0.148**<br>(0.060)   | -2.296<br>(5.144)      | -0.006<br>(0.004)    | 0.01<br>(0.010)     |
| SIZE                           | 0.040<br>(0.033)     | -2.873<br>(3.718)      | -0.009***<br>(0.002) | -0.004<br>(0.006)   |
| LEVERAGE                       | -0.424*<br>(0.235)   | 25.264<br>(25.854)     | 0.033*<br>(0.018)    | 0.164***<br>(0.045) |
| Q                              | 0.001<br>(0.011)     | 5.223***<br>(1.853)    | 0.001<br>(0.001)     | -0.002<br>(0.002)   |
| Intercept                      | -0.381<br>(0.668)    | -41.346<br>(38.428)    | 0.020<br>(0.046)     | -0.036<br>(0.083)   |
| Industry FE                    | Yes                  | Yes                    | Yes                  | Yes                 |
| Year FE                        | Yes                  | Yes                    | Yes                  | Yes                 |
| Obs.                           | 1,488                | 488                    | 1,405                | 1,161               |
| R <sup>2</sup> /Log likelihood | -658                 | 0.27                   | 0.07                 | 0.18                |



**Table 11: Propensity Score Matching**

This table shows robust tests for the subsample of non-VC-backed acquirers. PREMIUM is the ratio between the transaction value and the target's sales. CAR(-2, 2) is the acquirer's cumulative abnormal returns between date -2 and 2, given 0 is the announcement date.  $\Delta$ ROA is the difference of ROA between year 0 and year +3, given 0 is the fiscal year right prior to the announcement date. SYNDICATION equals to one if there is more than one VC firm invested in the target and zero otherwise. A detailed description of other variables is presented in Appendix 1. Standard errors are clustered at the deal level (in parentheses). Symbols \*, \*\*, and \*\*\* indicate significance at the 10%, 5%, and 1% levels, respectively.

|                | PREMIUM                | CAR(-2, 2)           | $\Delta$ ROA        |
|----------------|------------------------|----------------------|---------------------|
|                | 1                      | 2                    | 3                   |
| SYNDICATION    | 11.652**<br>(5.030)    | -0.014***<br>(0.004) | 0.032***<br>(0.009) |
| STOCK_RATIO    | 42.674***<br>(10.371)  | -0.011*<br>(0.006)   | 0.044***<br>(0.015) |
| ACQ_STAGE      | -27.933***<br>(6.060)  | 0.006<br>(0.007)     | 0.007<br>(0.014)    |
| LATER_STAGE    | -23.737***<br>(5.839)  | 0.006<br>(0.005)     | -0.005<br>(0.010)   |
| DEAL_SIZE      | 9.950***<br>(3.356)    | 0.009***<br>(0.002)  | -0.004<br>(0.005)   |
| RELATEDNESS    | 17.753***<br>(4.958)   | 0.016***<br>(0.004)  | 0.009<br>(0.010)    |
| LEAD_VC_AGE    | -4.315<br>(4.224)      | 0.001<br>(0.003)     | 0.000<br>(0.007)    |
| SIZE           | 1.582<br>(3.041)       | -0.011***<br>(0.002) | -0.001<br>(0.005)   |
| LEVERAGE       | -0.781<br>(21.841)     | 0.061***<br>(0.015)  | 0.077**<br>(0.036)  |
| Q              | 6.716***<br>(1.561)    | 0.002***<br>(0.001)  | -0.005**<br>(0.002) |
| Intercept      | -74.730***<br>(25.685) | -0.084**<br>(0.037)  | 0.044<br>(0.041)    |
| Industry FE    | Yes                    | Yes                  | Yes                 |
| Year FE        | Yes                    | Yes                  | Yes                 |
| Obs.           | 778                    | 2,268                | 1,858               |
| R <sup>2</sup> | 0.37                   | 0.14                 | 0.22                |

**Table 12: Subsample of Non-VC-backed Acquirers**

This table shows robust tests for the subsample of non-VC-backed acquirers. PREMIUM is the ratio between the transaction value and the target's sales. CAR(-2, 2) is the acquirer's cumulative abnormal returns between date -2 and 2, given 0 is the announcement date.  $\Delta$ ROA is the difference of ROA between year 0 and year +3, given 0 is the fiscal year right prior to the announcement date. SYNDICATION equals to one if there is more than one VC firm invested in the target and zero otherwise. A detailed description of other variables is presented in Appendix 1. Standard errors are clustered at the deal level (in parentheses). Symbols \*, \*\*, and \*\*\* indicate significance at the 10%, 5%, and 1% levels, respectively.

|                                | PREMIUM                | CAR(-2, 2)           | $\Delta$ ROA        |
|--------------------------------|------------------------|----------------------|---------------------|
|                                | 1                      | 2                    | 3                   |
| SYNDICATION                    | 14.496**<br>(7.359)    | -0.013*<br>(0.007)   | 0.049***<br>(0.016) |
| STOCK_RATIO                    | 22.169*<br>(12.121)    | -0.002<br>(0.009)    | -0.004<br>(0.020)   |
| ACQ_STAGE                      | -23.597***<br>(8.368)  | 0.01<br>(0.009)      | 0.025<br>(0.016)    |
| LATER_STAGE                    | -11.173<br>(8.645)     | 0.006<br>(0.007)     | -0.004<br>(0.015)   |
| DEAL_SIZE                      | 12.277***<br>(4.338)   | 0.007**<br>(0.003)   | -0.004<br>(0.007)   |
| RELATEDNESS                    | 10.832*<br>(6.549)     | 0.002<br>(0.006)     | 0.014<br>(0.013)    |
| LEAD_VC_AGE                    | -0.319<br>(4.858)      | -0.007<br>(0.004)    | 0.01<br>(0.010)     |
| SIZE                           | -3.487<br>(4.118)      | -0.010***<br>(0.003) | -0.005<br>(0.006)   |
| LEVERAGE                       | 2.375<br>(26.532)      | 0.043**<br>(0.020)   | 0.196***<br>(0.046) |
| Q                              | 6.045***<br>(2.138)    | 0.001<br>(0.001)     | -0.002<br>(0.003)   |
| Intercept                      | -68.166***<br>(26.035) | 0.052**<br>(0.026)   | -0.061<br>(0.064)   |
| Industry FE                    | Yes                    | Yes                  | Yes                 |
| Year FE                        | Yes                    | Yes                  | Yes                 |
| Obs.                           | 425                    | 1,203                | 1,006               |
| R <sup>2</sup> /Log likelihood | 0.29                   | 0.10                 | 0.20                |