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Voluntary Disclosure of Corporate Venture Capital Investments

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Abstract

In this paper we investigate drivers of corporate venture capital investment announcements. Using a comprehensive sample of investments made by corporate venture capital programs of publicly listed US corporations, we find that about 2/3 of the investments are publicly announced. Consistent with voluntary information disclosure theories, we find that a public announcement is less likely when the startup is in the seed-stage, but more likely when the parent company is large, spends heavily in internal R&D and capital expenditures, has high leverage ratio, and faces more information asymmetry problems. These results are robust to controlling for syndicate size and structure. We further examine the stock price reaction to announcements. On average, the abnormal return of announced deals is around 2.1% at announcement date. Controlling for endogeneity of the announcement decision, we find that parent companies facing most severe asymmetric information problems enjoy highest abnormal returns.

Keywords: information disclosure; public announcements; corporate venture capital

1. Introduction

In innovation-driven industries, corporations invest heavily in research and development (R&D) in order to maintain their leadership in their current market or to become one in new markets in the future. Corporations are often silent about their current R&D projects, in order to provide as little information to competitors as possible. Otherwise it could affect their future competitive position in the market. For instance, Apple keeps secret its new products until they are publicly announced at the annual fair. Any announcement done earlier would reveal which market the corporation intends to be active in the future and adjust their own corporate strategy accordingly. Interestingly, other corporations make clear announcements as a way to strategically communicate to investors and thereby influence anticipations (Narayanan, Pinches, Kelm and Lander, 2000). Disclosing privately-valuable information can provide worthwhile signals to the market, even though some of this information may also be valuable to competitors (Bhattacharya and Ritter, 1983).

When investments in innovative ideas take place in form of external investments such as venture capital (commonly called corporate venture capital [CVC]), an announcement may take place. This potentially reveals valuable information to investors as well as to competitors.[1] CVC programs have become integral parts of innovation activities of many large corporations such as 3M, Adobe Systems, AT&T, Cisco, Dell, General Electric, Intel, Johnson & Johnson, Microsoft, Novartis, Oracle, Siemens, Walt Disney, Xerox, and many more.[2] It allows these corporations to access innovative ideas outside their firm boundaries, next to developing their own R&D projects internally. CVC programs make direct equity investments into startup firms, mostly in business areas that are similar

[1] For instance, Intel Capital, Intel's CVC program, officially announced on September 6, 2005 its $16 million investment in Grisoft, a leading manufacturer of the AVG antivirus program (Source: Intel News Release "Intel Capital To Acquire $16M Stake In Grisoft, A Leading Security Software Company" at http://www.intel.com/pressroom/archive/releases/2005/20050906corp.htm ; viewed on May 2, 2013). According to Intel's official press release, "Intel will work to help Grisoft improve security on computing platforms for small businesses and consumers."

[2] Dushnitsky (2012) offers a comprehensive survey of research on corporate venture capital, as well as a discussion on the different forms of CVC. In terms of importance of the phenomenon, Basu, Phelps, and Kotha (2011) report that around 17% of the Fortune 500 companies (the top 500 U.S. companies annually ranked by revenue) relied on CVC investments during the 1990–2000 period. Taking an international perspective, Da Gbadji, Gailly and Schwienbacher (2012) find that 29% of the Fortune Global 500 companies had active CVC programs during the 2008–2011 period.

to those of the parent company or not too distant away. While some are managed internally in form of business unit, others are structured as subsidiary and thus as a separate legal entity (Dushnitsky, 2012).

In this paper, we examine what drives corporations that run a CVC program to announce their CVC investments publicly. Several theories argue that information disclosure may be strategic decisions of corporations and thus affect the likelihood of having an announcement (Bhattacharya and Ritter, 1983). One of the crucial factors that we investigate is the extent of information asymmetry that the parent company faces with the market for its current activities (Ferreira and Rezende, 2007; Fishman and Hegerty, 2003), as disclosing this information may help reduce the asymmetry. Further, we explore whether the parent company's dependence on debt affect announcement decisions. According to Perotti and von Thadden (2005), companies which rely more on debt are less likely to disclose critical information, since banks can collect this information through monitoring the borrower. In contrast, companies which rely more on equity will disclose more, since they are more depend on equity investors, who rely on corporate disclosure to price shares. A third factor arising from the voluntary disclosure theories is firm size (Diamond and Verrecchia, 1991), where larger corporations are expected to benefit more from disclosure because they rely more on the participation of institutional investors for whom liquidity of shares is more important. In contrast, shares of smaller firms tend to be held proportionately more by retail investors, who value liquidity less than institutional investors.[3]

So far, little is known on what affects voluntary disclosure of relevant corporate information by managers.[4] Generally, studies take information disclosure as an exogenous event, such as a major M&A deal or the decision to go public. A noticeable exception is the study by Maskara and

[3] Beuselinck, Deloof and Manigart (2008) find that private equity investors foster information disclosure in the companies they invest in. However, they do not examine the extent to which investor characteristics affect disclosure policy.

[4] The literature in the area of accounting offers some insights, often using the decision to adopt specific reporting standards as a mean to study voluntary disclosure (see Verrecchia, 2001, for a detailed discussion). Other studies relate to disclosing financial accounting ratios (e.g., Skinner, 1994).

Mullineaux (2011), who shows that some corporations decide not to disclose information on syndicated loan approvals. Those that convey positive information to the market are more often disclosed. More recently, Chemmanur and Tian (2013) show that many corporations do not inform the market in advance on upcoming dividend cuts. Those who do are motivated by preparing the market about the bad news; however, this is mainly done by firms with temporary financial difficulties only. Relatedly, Balakrishnan, Billings, Kelly and Ljungqvist (2013) show that voluntary information disclosure by managers affect liquidity of shares and thus the cost of equity capital. Bhattacharya and Ritter (1983) find that under certain conditions, the gain resulting from lower cost of capital outweighs the potential disadvantage of disclosing information to competitors.

To perform the analysis, we select from the VentureXpert database a random sample of 1000 CVC investments done by US public corporations during the time period 2002-2012 (out of a full sample of 2588 CVC investments). Using the Factiva database, we then manually collect information on which of these investments have been publicly announced and at which exact date. We find that about 2/3 of these investments have been publicly announced, while 1/3 not. Half of the announcements occur exactly on the day the agreement is signed. Two third are announced within an event window of [-1,+1] days of the agreement date. Interestingly, we observe little differences between the sample of announced investments and unannounced investments; the only statistically significant difference relates to seed investments, as such investments are less often present in the sub-sample of un-announced investments. This is consistent with prior discussion that these are more difficult to assess by outsiders and “riskier” signals. Similarly, we find little differences between the two sub-samples with regards to characteristics of the parent companies.

We find that several characteristics of investments and parent companies allow understanding the motivations of parent companies to publicly announce their CVC investments. One crucial factor is the extent to which parent companies are subject to information asymmetry problem. Consistent with related theories, we find that companies facing severe information asymmetry problem have greater need to communicating any good news to the market. Next, larger parent companies

(measured in market capitalization) are more likely to make announcement. This is consistent with theoretical prediction of Diamond and Verrecchia (1991) that argue that larger firms benefit more from disclosing private information, since they rely more on market liquidity than smaller firms. We further document that parent companies that invest more in internal R&D or have larger capital expenditures (in $ amounts, not as a fraction of total assets) are more likely to announce. This is consistent with the idea that they may have competitive advantages and thus fear less competition.

As extension, we examine the impact of syndicate size and structure on the disclosure probability. In many cases, the CVC parent company is not the sole investor. Since each investor may have its own incentives affecting their disclosure policy, we test our main predictions on the subsample of investments that are not syndicated; i.e., those where the parent company is the sole investor. Within this reduced sample of 122 deals, we find that the impact of information asymmetry, size and leverage of parent company is even larger than in the full sample. Moreover, the three effects are also present in the other subsample of syndicated investments, although weaker than what we observe in the non-syndicated subsample. In terms of syndicate structure, we find that information disclosure is more likely when an independent VC firm participates in the syndicate, in line with the idea that they need to communicate more as they depend on regular fundraising.

We further investigate how the stock market reacts to these announcements. We find that CVC investment announcements lead to an increase in the stock price, with an average cumulative abnormal return of 2.0% over the [-2,+2] window after controlling for other relevant factors. The effect is however mostly driven by announcements done by parent companies that face severe information asymmetry problems.

We contribute to several strands of literature. First, the theoretical literature on voluntary information disclosure derives different empirical predictions (see Section 2 for a discussion). To the best of our knowledge, many of them remain untested (notably Ferreira and Rezende, 2007, Fishman and Hegerty, 2003, and Perotti and von Thadden, 2005). We empirically test recent theories

in the context of CVC investment announcements. Second, we contribute to a better understanding on how investors perceive the disclosure of information. Given their rather small size compared to the parent companies, the value effect of these announcements are more likely to capture insights into the future strategic orientation of parent company. In contrast, most studies on M&As and corporate investments into larger companies focus on value generated by operating and financial efficiency (see Eckbo, 2010, for a comprehensive survey). Third, we complement the literature on the impact of CVC investments on startup firms. Existing studies typically focus on the divestment stage to measure impact, notably in connection with information asymmetry. For instance, Megginson and Weiss (1991) show that VC investments enable reduction of information asymmetry, which leads to lower underpricing at the IPO. More recently, Masulis and Nahata (2011) find that VC-backed companies are purchased at higher premium by acquirers, leading to announcement returns of 3% higher for the acquirer than for targets that are not VC-backed. We complement these studies, since some of the returns may already be incorporated in stock prices at time of investments. CVC investments offer a neat testing ground, since there we observe announcement effects.

The remainder of the paper is structured as follows. The next section presents various theories of strategic information disclosure and testable hypotheses for empirical setting. Section 3 describes the data and offers summary statistics on the sample. Section 4 examines determinants of announcement decisions. Section 5 investigates stock price reactions following CVC investment announcements. Section 6 discusses robustness and extensions. Section 7 concludes.

2. Theories of Strategic Information Disclosure and Testable Hypotheses

Several theories offer guidance as to why corporations may strategically decide to disclose voluntarily valuable information early on to the market. As underlying framework, these theories assume the presence of informational asymmetries in which managers know something outsiders

(e.g., equity investors) do not know. Signaling theory (Ross, 1977; Myers and Majluf, 1984) argues that managers may signal such information to the market, notably through financing and investment decisions. In this strand of literature however, decisions acting as signal is always observed.

More recently, theoretical contributions on strategic information disclosure show that corporations may decide to disclose valuable information to affect product market outcome.[5] They extend the traditional view on corporate disclosure that primarily focused on financial information as a way to reduce information asymmetry. Thus, it is not the decisions in isolation that acts as signal but also the fact that the financing or investments decision is announced. The more recent studies on the topic argue that information disclosure may be extended towards corporate strategy, which offers hint about future orientations of the corporation. For instance, Ferreira and Rezende (2007) present a theoretical framework where a corporation may strategically disclose information on innovation activities as a means to signal commitment to this specific project (empirical evidence is provided by Narayanan, Pinches, Kelm and Lander, 2000). Such an announcement may become a credible signal if reputation (e.g., in form of career concerns) is at stake in the event the corporation withdraws its commitment to the project later on. In this case, the corporation would not be able to credibly signal to the market anymore in the future. Therefore, corporations only announce innovation projects they are confident to pursue further, others are left unannounced. This may also lead partners of the corporation to do strategy-specific investments. In the context of syndicated loans, Maskara and Mullineaux (2011) find that corporations that are more affected by information asymmetry tend to announce their loans. They argue that such an announcement may lower information asymmetry. In our context of CVC investments, if any announcement also provides a signal for the overall quality of the other assets, the parent company may opt for announcing its CVC investments. This then leads to a positive link between the parent company's level of information asymmetry and the probability of announcements.

[5] An early contribution to the product market channel is the work done by Bhattacharya and Ritter (1983).

Consistent with these arguments on information asymmetry, Diamond and Verrecchia (1991) develop a theoretical framework in which they show that particularly large firms are more likely to disclose private information, since they benefit most due to the fact that their shares are held by institutional investors that trade larger blocks of shares for which the price impact is larger. The authors argue that retail investors, who hold proportionately more shares in smaller firms, are less affected by such liquidity problems. This leads to the testable hypothesis that the probability of observing public announcement is positively related to the size of the parent company.

However, not all the CVC investments are likely to offer the same signal quality. Following the reasoning above, we expect later-stage investments to be more often announced than early-stage investments, where do-ability of projects is often uncertain. A similar empirical prediction can be derived from Fishman and Hegerty's (2003) study that shows that projects that are more difficult to value by outsiders are less likely to be disclosed voluntarily. Given the significantly larger risk, early-stage investments are more difficult to assess by outsiders.

Other firm characteristics of the parent company may further impact the decision to announce CVC investments. Perotti and von Thadden (2005) argue that banks prefer a lower level of disclosure than equity holders, since banks can also monitor companies privately. This allows them to obtain the information privately. In contrast, equity holders rely on public announcements to obtain the information. Thus, corporations with higher leverage (thus, relying more on bank finance) may be less inclined to make announcements of CVC investments that can lead to information leakage to other relevant parties. We therefore expect the parent company's leverage ratio to be negative related to the likelihood of having an announcement.

In Section 4, we test the different predictions with respect to information asymmetry, stage of development, firm size, and leverage. To control for possibly other sources of company heterogeneity, we include in our multivariate analysis further company characteristics.

3. Data and Sample Statistics

To examine our research question, we extracted from the VentureXpert database a random sample (i.e., sampling without replacement) of 1000 investments done by corporate-affiliated US venture capital firms during the time period 2002-2012 from a pool of 2588 CVC investments extracted from the database. To constitute our random sample, we only consider CVC firms that are held by public parent companies, thereby excluding private ones. We only consider We use VentureXpert to collect investment-level information on deal characteristics such as round amount, round number, number of investors participating in the considered round, investment stage of development and investment date (i.e., the date in which the contract is signed and reported in VentureXpert). We then manually search through the profiles of the CVC firms mentioned in VentureXpert and using other online sources to identify the ultimate parent company of the CVC firm or program. This search is needed, since VentureXpert reports the name of the CVC firm, but this is often a subsidiary of the parent company only.

As a next step, we identify which of these investments were publicly announced and, if they were, on which day. To this end, we use the Factiva database to search each of our 1000 investments for whether it was announced either by the CVC firm (or program), parent company or start-up company by searching for their names in Factiva. Our search window is six months prior to the investment date and three months post investment date. Overall, less than 3% of the cases we have identified involve multiple announcement dates. In the event of multiple announcement dates, we use the earliest date to the investment date as announcement date. We consider an investment is announced if any article in the Factiva database mentions the investment. We do not use any coded algorithm to search for announcements. Rather we read the news obtained on Factiva to search any announcement manually, as a way to minimize measurement errors. For deals that have not been publicly announced, we use the investment date as the event date for our event-study analysis. Note that CVC investments are generally not reported in SEC filings 8-K for their “materiality”, since parents companies are very large compared to the size of these investments. To ensure that this is

indeed the case, we manually checked 30% of our publicly announced CVC investments (based on Factiva) for information disclosed in the 8-K filings of the parent companies; not a single CVC investments is reported in the SEC filings. This supports the notion that these announcements are not forced but voluntary.

Finally, to determine the likelihood of deal announcements and the performance as measured by cumulative abnormal return (CAR), we use various parent company characteristics. We collect accounting data and stock prices information of the parent companies from Compustat and CRSP databases. This includes information on market value of the parent company (measured as the product of stock price and number of common shares outstanding), current assets, total assets, capital expenditure, cash, long term debt, current liabilities, net income, property plant and equipment, sales, working capital and research and development.

To measure information asymmetry of the parent company, we create a composite index following Maskara and Mullineaux (2011). The index is constructed using six common information asymmetry benchmarks. The first is analyst forecast errors, measured as the absolute difference between analysts predicted earnings and actual earnings. The second is dispersion of analyst opinions, measured as the standard deviation of analysts' forecasts of annual EPS in the last month prior to earning announcement. Analyst forecast errors and dispersion of analysts opinions are standardized by share price and collected from IBIS database. Third, is volatility of abnormal returns around the earnings announcement, measured as the standard deviation of 3-days abnormal returns around earnings in the five years preceding deal announcement. Fourth is residual volatility measured as the standard deviation of market adjusted daily stock returns in the year of deal announcement. Fifth, is parent company age, measured as the number of years since the first firm observation in Compustat. Sixth and final is bid-ask spreads measured as the average ratio of the difference between the daily bid and ask closing prices to the midpoint of the bid and ask closing prices. This measure is also similar to Chung and Zhang (2009). The information asymmetry index is calculated by grouping firms in our sample into quartiles based on each of the six measures in the year a deal is

announced. Similar to Gomes and Philips (2010) and Maskara and Mullineaux (2011), we compute the information index as the average of the quartile ranking of a firm based on the six information measures.

In addition to this index, we use market-to book-ratio of the parent company (denoted *Market-to-Book Ratio*) as alternative measure of information asymmetry, since it captures the extent to which the parent company faces growth opportunities. Such opportunities are an important source of information asymmetry due to greater potential of insider information (see Gao, 2011, among many others). In our empirical analysis we consider the company's market-to-book ratio as well as its ratio adjusted for industry median market-to-book ratio (*Excess Market-to-Book Ratio*). These measures are calculated using CRSP and Compustat data.

--- TABLE 1 ABOUT HERE ---

Tables 1 and 2 present summary statistics of our sample. Table 1 focuses on characteristics of CVC investments, while Table 2 on characteristics of parent companies. In both tables, we provide statistics for the full sample of 1000 observations (Panel A), the sample of announced CVC investments (Panel B), and the one of un-announced CVC investments (Panel C). Out of the 1000 CVC investments considered in this study, we find that 635 investments were announced compared to 365 investments that were not announced.[6]

The average round amount for the full sample is $16.50 million (median of $10.0 million), but there is significant variation. Also, the amount tends to be large due to the fact that a substantial part of the investments are in ventures at the expansion and later stage of development, where the amounts involved are a multiple of those at the early stage. Given that on average 4.849 investors in the syndicate, the average amount provided per investor is $3.40 million. We further observe great variation in the development stage at which these investments take place. 4.8% are seed-stage

[6] In Appendix 1, we show summary statistics on the CVC investment characteristics of the random sample of 1000 observations relative to the population of 2588 observations in VentureXpert. We find no statistical difference between the two groups, which confirms that our sample is representative.

investments, 22.3% early-stage investments, 35.0% expansion stage investments, 26.8% later-stage investments and the rest investments in other stages. There is no meaningful difference in these values between announced and unannounced CVC investments. The only exception is the proportion of seed-stage investments that is higher for the sample of unannounced investments (7.1% versus 3.5%).

--- TABLE 2 ABOUT HERE ---

In terms of parent company characteristics (Table 2), we also observe very little differences between corporations that announce investments and corporations that do not announce. We find significant differences for two of our main variables of interest, namely *Information Asymmetry Index* and *Market-to-Book Ratio* (as well as *Excess Market-to-Book Ratio*). These measures relate to the degree of information asymmetry of the parent company. The other statistically significant difference relates to working capital. The rationale is however unclear and not statistically significant anymore in the multivariate analysis. We observe no meaningful difference along the other variables of interest; i.e., R&D Expenses, CAPEX, and (Book) *Leverage* (defined as the ratio of long term debt over total asset). Furthermore, we find no substantial differences between the two subsamples with respect to industry classification. As reported in Appendix 2, we find that most of the parent companies are concentrated on the business equipments sector (based on the Fama-French 12 industry classification of parent companies), regardless of whether the deals are announced (57% of the cases) or un-announced (48%). However, this difference is not statistically significant, nor differences for any other sector group reported.

--- APPENDIX 2 ABOUT HERE ---

Panel A in Table 2 further allows providing summary statistics on parent companies that manage a CVC program. Compared to a more representative sample of Compustat firms (Faulkender and Petersen, 2006), our sample of parent companies tend to be larger and hold more intangible assets.

4. Determinants of Announcement Decisions

In this section, we investigate what affect announcement decision. In line with our theoretical discussion, we examine factors pertaining to the parent company, the investment itself and general market conditions. Table 3 provides Logit regression results, where the dependent variable is a dummy variable equal to one if the CVC investment was announced, and zero otherwise. Coefficients reported are marginal values so that they can be interpreted as changes in probabilities. In all our regressions, we include industry (based on the Fama-French 12 industry classification) and year dummies and use clustered standard errors at the year level.

--- TABLE 3 ABOUT HERE ---

First, we find support for our prediction that parent companies with larger information asymmetry problems are more likely to announce their investments. This is consistent with the signaling story of Ferreira and Rezende (2007) in that it serves as a commitment devise and enables a reduction of the information asymmetry (consistent with finding of Maskara and Mullineaux, 2011, on syndicated loans). The effect is economically meaningful: a one-standard deviation increase in the *Information Asymmetry Index* leads to an increase by 7.3% (= 0.684 x 0.1068) in the probability of having the CVC investments being announced. Similarly, our alternative measure of information asymmetry, *Market-to-Book Ratio*, shows the same sign and is statistically significant. These are typically the companies for which early investments are crucial, as they rely more on innovation to sustain their future growth. Our results also indicate that parent companies with strongest growth opportunities within their industry sector (the variable *Excess Market-to-Book*) are more likely to announce their deals. This implies that not only higher growth opportunities increase the likelihood of announcing CVC investments but also when the parent company enjoys higher growth opportunities than industry average. In terms of economic significance, a one-standard deviation increase in the variable *Excess Market-to-Book Ratio* leads to a 9.3% (= 1.691 x 0.0551) increase in the likelihood of

observing an announcement of the CVC investment. For *Market-to-Book Ratio*, the corresponding increase is even more remarkable; i.e., a 32.7% (= 3.59 x 0.091) increase in the probability of announcing.

Second, we find that larger corporations (measured by market capitalization of equity) are more likely to publicly announce their CVC investments. This finding is in line with the prediction of Diamond and Verrecchia (1991), who argue that larger firms have greater incentives to disclose such price-relevant information due to their greater reliance on institutional investors as shareholders (for which liquidity issues are more important than for smaller shareholders). Moreover, we find a positive link for corporations that spend more extensively in internal R&D and make larger capital expenditures.[7] In unreported results, we further find that internal R&D and capital expenditures only affect announcement decision when considering dollar amounts; results disappear if scaled by total assets. This indicates a scale effect rather than relative importance of these expenses. The finding that larger firms are more likely to announce their CVC investments is consistent that they have a greater need to do so (Diamond and Verrecchia, 1991) and that they are more closely covered by analysts, increasing the chances to observe a public announcement.

Third, leverage negatively impacts the probability of having the investment announced. Perotti and von Thadden (2005) argue that debt-financed firms need less to disclose information, since banks can obtain this information themselves in the course of their monitoring activities. Thus, announcing the investment would not affect their cost of debt financing. Our results support this prediction.

Forth, seed-stage investments are less likely to be announced. This is consistent with our theoretical discussion above that these investments are more difficult to value or understand their ultimate impact on the parent company's future strategic orientation. The impact is economically important,

[7] The fact that announcements are more likely for larger corporations contradicts the suspicion that such investments must be announced for being "material events", as argued by Maskara and Mullineaux (2011) in their Hypothesis 2. This would lead to a purely mechanical effect. An important difference with our study is that Maskara and Mullineaux (2011) examine syndicated loans that involve much larger amounts, often ranging well over $250 million. The material impact on capital structure is likely to be more substantial than for CVC investments in start-up companies (where the impact on the balance sheet is rather marginal).

since seed-stage investments have a probability of being announced that is lower by 17.7% compared to the base group (that is the group of *Other Stages*) in Model I. Taken in isolation (i.e., when only including the dummy *Seed Stage*, while excluding all the other stage dummies), the reduction in probability of announcement for seed-stage investments is even stronger, namely 19.89% (result not reported in Table 3). Early-stage, the next stage of development, is however not significant, just like all the other development stages.

Finally, we show in Model VI results when including all the main explanatory variables inside a single specification. Note that the three variables of size (market value, R&D and CAPEX) are strongly correlated; this may explain why their significance level goes down when estimated jointly. However, the effect of information asymmetry remains significant. Also, its economic significance (i.e., the magnitude of the coefficient, since we report marginal effects) remains largely unaffected.

Our control variables are generally not significant. If they are statistically significant, it only occurs for some of the specifications but not across all of them. Thus, results for our control variables do not appear robust. However, their inclusion allows showing robustness of our main factors.

5. The Impact of Deal Syndication and Organizational Structure of CVC Program

In this section, we explore further potential factors that may impact the propensity of CVC programs to disclose publicly their investments. In Section 5.1, we explicitly control for the fact that most investments are syndicated and that other syndicate members may have their own incentives to disclose information. In Section 5.2, we examine whether the organizational structure of the CVC program affects announcement decisions, since externally managed programs may have other motivations than internally management ones to make announcements.

5.1 The Impact of Syndicate Size and Structure

In many cases, the amount invested is provided by a set of investors and not only the parent company's CVC program. This is also the case in our sample. As reported in Table 1, the average number of investors in our sample is 4.849, thus on average 3.849 investors other than the CVC program of the parent company. These investors may face other incentives in terms of information disclosure, especially if these are independent VC firms. In this section, we examine whether the size and structure of the syndicate impacts the probability of having a CVC investment announced.

--- TABLE 4 ABOUT HERE ---

Since it is enough that at least one investor decides to disclose, one might expect the probability to increase in the syndicate size. We test this prediction by performing our analysis on two separate subsamples, one for investments that only involve the parent company's CVC program and one for the syndicated investments. We expect our predictions discussed in Section 2 to be most relevant in the second subsample. Results are reported in Table 4. Overall, 122 investments from our sample are not syndicated, while 878 are syndicated. We find that results are generally stronger for the subsample of non-syndicated investments (for the leverage effect in Panel B and the size effect in Panel C), which offers support to our predictions. In any case, results remain significant. Still, these estimations should be considered with caution since syndicate size may itself be affected by the disclosure policy of the parent company. Indeed, a firm that does not want to disclose at all its CVC investments may decide not to syndicate in the first place. Therefore, results reported in Table 4 should be viewed as complementary to earlier results.

--- TABLE 5 ABOUT HERE ---

Next, we examine the impact of the structure of syndicates, by controlling for the possible heterogeneity in the syndicate members. Most of the venture capital is provided by independent VC firms that are not affiliated to a specific corporation or financial institution. These different types of VC players are likely to have different incentives schemes in terms of information disclosure policy. For instance, Gompers (1996) shows that independent VC firms are likely to "grandstand" at times

they need to raise new funds. This is likely to affect also the way the amount of information they disclose to the market on their current investments. To capture specificities of independent VC firms, we construct a variable that corresponds to the fraction of independent VC firms participating in the syndicate. In the VentureXpert database, they are categorized as fund type "PRIV". We then include this additional variable in our regressions, which we denote *Independent VC Participating*. Based on the discussion above, we expect this variable to have a positive effect on the likelihood ot having an announcement. Results are reported in Table 5. Our main results on the impact of information asymmetry, reliance on debt finance and size remain unchanged. However, we find that the presence of independent VC firms positively affects the disclosure probability. This is consistent with the idea that they have their own disclosure policy and may find it worthwhile to communicate on their investments, potentially due to its impact of fundraising.

5.2 The Impact of the Organizational Structure of CVC Programs

Another, related issue is the structure of the CVC program itself. While some programs are structured as internal organization, others are separate in form of a distinct legal identity (even though it is controlled by the parent company, since it will generally be a fully-owned subsidiary). In other words, some CVC programs are structured as internal programs, others externally managed. The choice of organizational structure could impact the likelihood of making an announcement. In particular, one could expect that externally managed programs are more likely to make public announcements, in order to show presence and attract interest. As argued by Gompers and Lerner (1998), CVC programs depend on the continued interest of top management and thus need to be more visible in order to secure long-term interest of the parent company's management. This is particular important when the corporate link is more distant, as it is the case for externally managed programs. Admittedly, the categorization of internal versus external program is difficult to realize. However, one simple way to perform this categorization is by comparing the name of the CVC

program in the VentureXpert database with the name of the parent company. In case of a separate legal entity (thus, an external program rather than an internal business department), one expect two different names. Otherwise, the program is expected to be an "internal" program, as it is not structured as a separate legal entity. In Table 6, we adopt this categorization and offer an analysis of the impact of the organizational structure of CVC programs on the disclosure probability. The constructed dummy variable is denoted *External CVC*. We find that externally managed programs lead to more announcements. This is consistent with the idea that such programs have greater incentives to attract attention of the market and the parent company, as its relationship with top management is not as immediate as for internally managed programs.

--- TABLE 6 ABOUT HERE ---

Relatedly, the incentives to disclose may be driven by the degree of organizational complexity of the parent company. In less hierarchical structures, CVC managers can more easily communicate in an informal way to the management of the parent company. In more hierarchical structures however, informal communication may be more difficult. To shed light into this specific channel, we explore whether information disclosure is more likely when the parent companies has a more hierarchical organization. As proxy, we use the number of industries it is active by counting the number of industries reported in the COMPUSTAT Segment database. We consider companies that are active in more industries (based on the categorization "STYPE = BUSSEG") to be more likely to have more complex organizational structures. As second proxy, we use the same database to assess whether parent companies are selling internationally (using "STYPE = GEOSEG"). In unreported results, we find that information disclosure on the CVC investment is more likely when the parent company is more diversified (more industry segments) and operates internationally. However, the result is only statistically significant for industry segments (at 5% level). Combined with the previous results, these findings strengthen the notion that announcements are more likely when communication with the parent company is less formal due to its organizational complexity.

6. Stock Price Reactions to CVC Investment Announcements

In this section, we examine whether CVC investments generate stock market reactions when they are announced. We rely on the CAR/AR methodology, using the market model as reference for calculating abnormal returns (following Brown and Warner, 1985). This methodology is widely used in event-studies, which is also the empirical framework we use in the section. Following the literature (Brown and Warner, 1985, Gao, 2009, Masulis and Nahata, 2011, and others), we use the [-10,+10] window for calculating CAR but also perform robustness checks with other windows. Again, we use year-level clustered standard error in the regressions. The parameters of the market model are estimated over a 100 days window ending 16 trading days before the announcement day. The S&P 500 value weighted Index is used as benchmark of the market portfolio. We require at least 50 daily stock returns in the estimation period to estimate parameters that are used to calculate CAR/AR. The fact that our estimation period ends 16 days before the announcement day is to avoid bias in the parameters estimations due to changes in firm characteristics around the deal announcement day. This approach is consistent with the previous studies that follow a well established methodology (Brown and Warner, 1985).

--- FIGURE 1 ABOUT HERE ---

Figure 1 presents a histogram of our sample.[8] It indicates that 314 out of the 635 publicly announced investments are announced at the investment date reported in VentureXpert. Taking a window of [-1,+1] days difference between the announcement day and the investment date of VentureXpert, we find 64.4% of our announced sample. Only very few are announced before (those with positive values on the x-axis), but many later (negative values).

[8] The fact that about half are announced at the same time as the investment date in VentureXpert can also be attributed (at least in part) to the way information is collected for the construction of the VentureXpert database. Indeed, some of the information stems from public announcements. Presumably, VentureXpert then reports the announcement date as the investment date. However, this does not affect our analysis, since we are primarily interested in the announcement date and not the investment date reported by VentureXpert.

--- FIGURE 2 ABOUT HERE ---

Figure 2 shows the ARs during the window of [-10,+10] days for announced and unannounced CVC investments. For unannounced investments, we use the contract date as event date (T = 0). This approach is motivated by our earlier findings that 2/3 of the deals that are announced are announced within a narrow window of [-1,+1] days (see Figure 1). Results are also reported in Panel A of Table 7 for both subsamples. Overall, we find a positive stock price reaction at date of announcement, with an AR of 2.12% on average (statistically significant at 1%). In contrast, the average AR for the subsample of unannounced investments is 0.52%. The difference in average AR between the two subsamples is statistically significant at 1% level. In Panel B of Table 7, we report summary statistics on CARs for different windows. The average [-2,+2] CAR for the subsample of announced investments is 2.63%, and for the subsample of unannounced investments -0.57%. The difference is statistically significant at 1% level. This indicates that parent companies who announce their CVC investments benefit from these announcements. As evidenced in the previous section however, the sample of announced investments is not random but the result of strategic choices of parent companies.

--- TABLE 7 ABOUT HERE ---

To obtain a more insightful picture of these differences, we run multivariate regressions on CARs for the [-10,+10] window. This analysis helps understanding which factors affect CARs of CVC investments announcements. Estimation results based on Heckman selection 2SLS are provided in Table 8. The selection equation (lower panel) estimates the probability of deal announcement (Logit regressions), while the outcome equation (upper panel) estimates the determinants of cumulative abnormal returns for the [-10,+10] window. The selection equation follows the base specification (Model I) in Table 3.

--- TABLE 8 ABOUT HERE ---

The Wald test of exogeneity yields a value of Chi-squared of 3.12, which means a p-value of 0.0784. This indicates that the announcements are endogenous, and thus justifies the use of two-stage model. This finding is important, since studies on announcement effects typically assume exogeneity. In the case of CVC investments, we find this is not true.

--- TABLE 9 ABOUT HERE ---

Table 9 shows robustness along other windows of analysis. It confirms robustness of our results for shorter windows: [-2,+2], [-3,+3] and [-4,+2].

7. Concluding Remarks

This paper examines the announcement effects of CVC investments by controlling explicitly for the endogenous nature of the decision to announce such investments. CVC investments by large corporations appear a valuable setting for testing different theories of voluntary information disclosure, since the size of these investments is not a "material event" and thus are not subject to compulsory reporting at the SEC. Moreover, these investments are likely to offer insights into strategic re-orientation of parent companies due to their highly innovative nature.

Consistent with several empirical predictions of these theories, we find that CVC investments are more likely to be publicly announced if the parent company of the CVC program exhibits larger degrees of information asymmetry and growth opportunities, is larger and has greater leverage. Moreover, investments that are still at the seed stage are less likely to be disclosed.

More generally, our results stress the endogenous nature of public announcements by listed companies, making it a strategic decision. While listed corporations are required to report "material events" such as acquisitions by filing an 8-K document at the SEC, other corporate decisions do not need to be reported. Still, they may vehicle important information about the company's future.

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Figure 1: Timing of CVC Investment Announcements

This figure reports the number of announcements (y-axis) in our sample of 635 publicly announced CVC investments according to the timing of announcement. The x-axis is the difference in days between announcement date and investment date (i.e., the investment date *minus* announcement date, leading to a *negative* value when the announcement is made after the investment date). For the investment date, we take the date as reported in VentureXpert database. We consider an investment to be announced if any news was found in Factiva. Out of our sample of 635 announced investments, this figure shows that 314 investments are announced on the same day as the investment date reported in VentureXpert, while 132 investments are announced 7 days or more after the investment date.

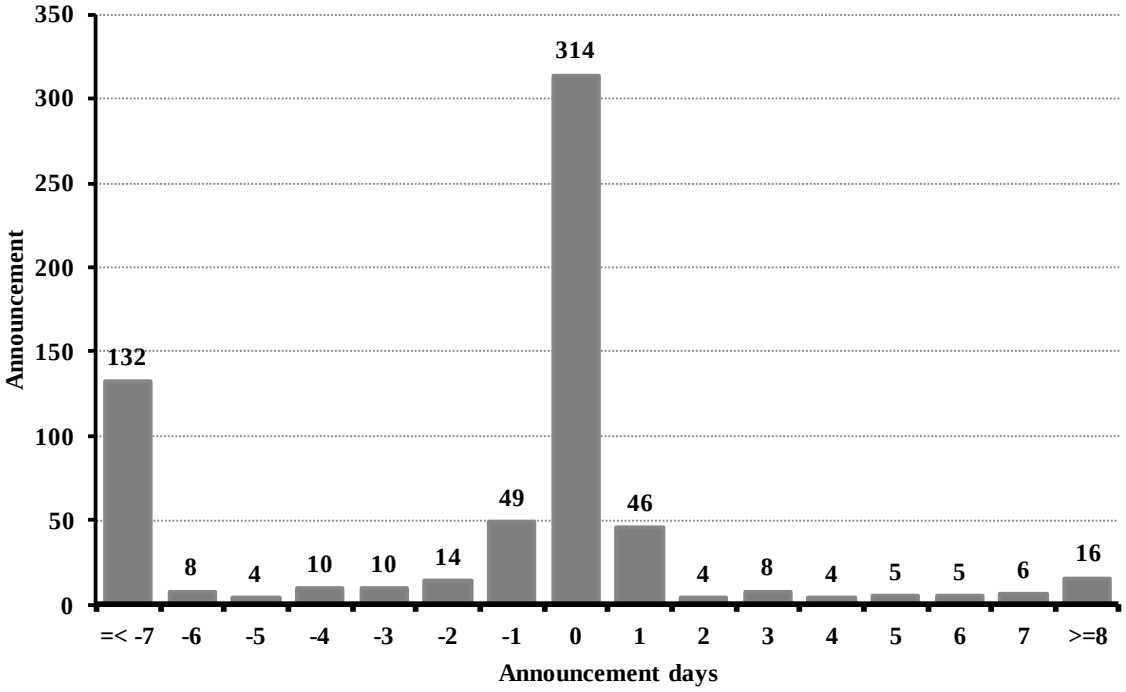

Figure 2: Average Abnormal Returns for CVC Investments

This figure shows the average abnormal returns for announced and unannounced deals. The average abnormal returns are computed using market model over the [-10,+10] window around the announcement date (event). Announcement dates are based on the performed Factiva searches. For deals that are not announced on Factiva, we use investment round date as the event date (as reported in VentureXpert).

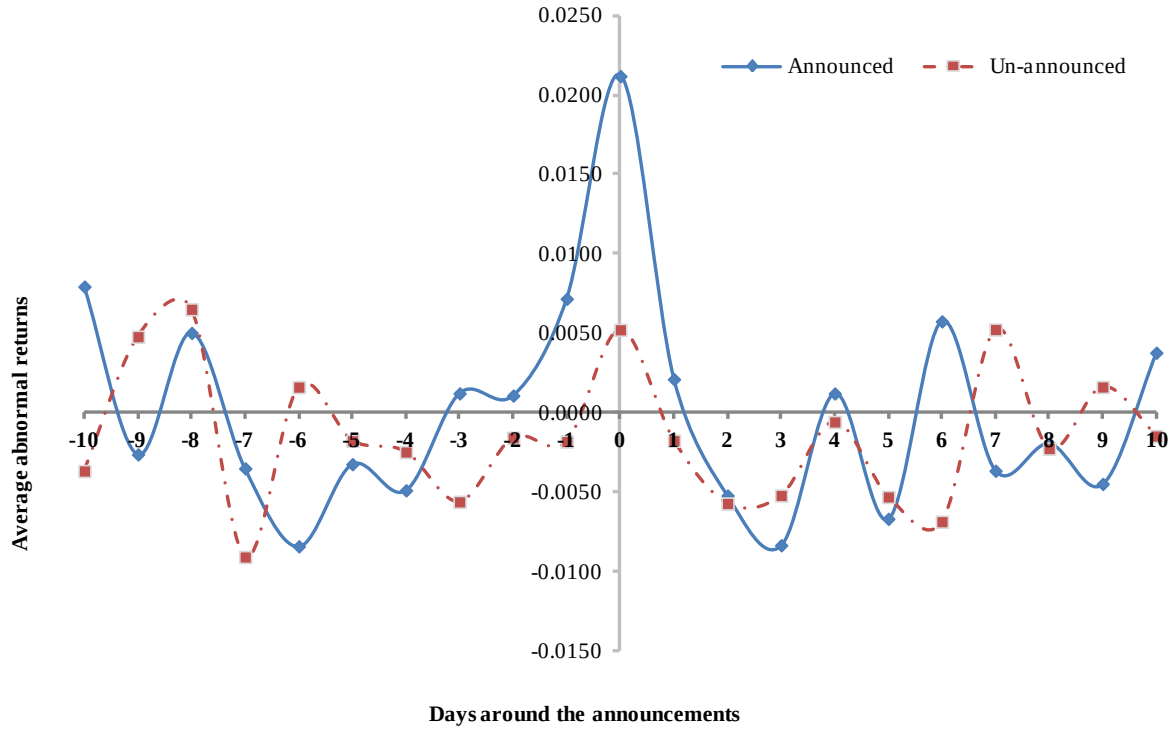

Table 1: Summary Statistics of CVC Investments

This table shows the descriptive statistics of CVC investment characteristics. Panel A shows the statistics for the random sample of 1000 investments. Panel B shows the statistics for the announced investments, and Panel C for the un-announced investments. The variable *Round Amount* reports the size of the total amount (in $ thousands) invested in the given financing round. *Round Number* is the sequence of the financing round. *Number of Investors* is the number of investors involved in the given round financing. *Seed Stage*, *Early Stage*, *Expansion Stage*, *Later Stage* and *Other Stages* are dummy variables taking a value of one for each corresponding financing stage, and zero otherwise. Panel C also provides significance level of difference in means tests between values from Panels B and C. Significance levels: ***,**,* indicates 1% 5% and 10% respectively (n.s. for > 10%).

Panel A: Full sample	**Characteristics of CVC Investments**				
	Mean	Median	Std. Dev.	Min	Max
Round Amount	16495.53	10000	25976.63	1.0000	460000
Round Number	3.4181	3.0000	2.4251	1.0000	20.0000
Number of Investors	4.8492	4.0000	3.3900	1.0000	26.0000
Seed Stage	0.0481	0.0000	0.2141	0.0000	1.0000
Early Stage	0.2230	0.0000	0.4171	0.0000	1.0000
Expansion Stage	0.3500	0.0000	0.4770	0.0000	1.0000
Later Stage	0.2681	0.0000	0.4432	0.0000	1.0000
Other Stages	0.1090	0.0000	0.3121	0.0000	1.0000
Number of observations	**1000**				
Panel B: Announced Investments					
Round Amount	17526.7	10210.51	28116.10	1.1671	460000
Round Number	3.4571	3.0000	2.4791	1.0000	14.0000
Number of Investors	4.8301	4.0000	3.5681	1.0000	26.0000
Seed Stage	0.0351	0.0000	0.1832	0.0000	1.0000
Early Stage	0.2140	0.0000	0.4111	0.0000	1.0000
Expansion Stage	0.3570	0.0000	0.4802	0.0000	1.0000
Later Stage	0.2881	0.0000	0.4530	0.0000	1.0000
Other Stages	0.1040	0.0000	0.3052	0.0000	1.0000
Number of observations	**635**				
Panel C: Un-announced Investments					
Round Amount	14790.41$^{n.s.}$	9413.01	21924.80	1.0000	21323
Round Number	3.3521$^{n.s.}$	3.0000	2.3280	1.0000	20.0000
Number of Investors	4.8821$^{n.s.}$	4.0000	3.0590	1.0000	26.0000
Seed Stage	0.0710**	0.0000	0.2580	0.0000	1.0000
Early Stage	0.2390$^{n.s.}$	0.0000	0.4271	0.0000	1.0000
Expansion Stage	0.3380$^{n.s.}$	0.0000	0.4741	0.0000	1.0000
Later Stage	0.2340$^{n.s.}$	0.0000	0.4240	0.0000	1.0000
Other Stages	0.1180$^{n.s.}$	0.0000	0.3230	0.0000	1.0000
Number of observations	**365**				

Table 2: Summary Statistics of Parent Companies

This table shows the descriptive statistics of parent company characteristics. Panel A shows the statistics for the full sample, Panel B for the announced CVC investments and Panel C for the un-announced CVC investments. *Market value* is market value of the CVC parent company; i.e., stock price at the end of the calendar year (one year prior to the investment) multiplied by number of shares outstanding. *Current Assets, Total Assets, Leverage, CAPEX* (capital expenditure), *Cash, Long-Term Debt, Current liability, Net Income, PPE* (i.e., Property, Plant and Equipment - Net), *Sales, Working Capital, R&D Expenses* are all accounting variables for the parent company. *Current Assets, CAPEX, Cash, Current Liabilities, PPE* and *R&D Expenses* are scaled by *Total Assets*. *Information Asymmetry Index* is an index measuring the level of information asymmetry in the parent company; more details are provided in Section 3. The index is computed the same way as in Maskara and Mullineaux (2011). *Market-to-Book Ratio* is the market-to-book ratio of the parent company. *Excess Market-to-Book Ratio* is the value of *Market-to-Book Ratio* in excess of industry median market-to-book ratio. All Compustat variables are measured in the year prior to the investment date. Panel B also provides significance level of difference in means tests between values from Panels B and C. Significance levels: ***,**,* indicates 1% 5% and 10% respectively (n.s. for > 10%).

Panel A: Full sample	**Characteristics of Parent Companies**				
	Mean	Median	Std. Dev.	Min	Max
Market Value (in $ thousands)	100594.40	81538.92	87143.54	13.7111	476115.50
Current Assets / Total Assets	0.4421	0.4422	0.1811	0.0311	0.9810
Total Assets (in $ thousands)	74306.47	46784.00	175065.00	9.58	3211484.00
CAPEX / Total Assets	0.0600	0.0400	0.0410	0.0000	0.3200
Cash / Total Assets	0.1201	0.1000	0.0910	0.0000	0.8210
Leverage	0.1250	0.0570	0.1411	0.0000	0.9810
Long-Term Debt (in $ thousands)	16832.36	2049.00	106029.90	0.00	3038147.00
Current liabilities / Total Assets	0.2112	0.1811	0.1001	0.0300	0.6910
Net Income	4308.73	3160.00	5597.27	-38732.00	104821.00
PPE / Total Assets	0.2201	0.1801	0.1301	0.0000	0.8911
Sales	34087.86	30141.00	34289.02	0.0000	255112.00
Working Capital	8883.96	7311.85	9235.60	-6528.00	43845.00
R&D Expenses / Total Assets	0.0801	0.0901	0.0512	0.0000	0.6701
Information Asymmetry Index	2.5573	2.2920	0.6840	1.0631	5.1012
Excess Market-to-Book Ratio	1.6862	1.5722	1.6911	-1.0160	7.5160
Market-to-Book Ratio	3.5901	3.3601	1.9810	0.9800	11.9112
Number of observations	**1000**				

Table 2 continue

Panel B: Announced deals					
Market Value (in $ thousands)	101754.50[n.s.]	85563.13	84682.34	18.9810	476115.50
Current Assets / Total Assets	0.4401[n.s.]	0.4311	0.1801	0.0301	0.9810
Total Assets (in $ thousands)	80344.98[n.s.]	47143.00	202470.20	9.5801	3211484.00
CAPEX / Total Assets	0.0601[n.s.]	0.0510	0.0401	0.0000	0.3210
Cash / Total Assets	0.1201[n.s.]	0.1011	0.0911	0.0000	0.8201
Leverage	0.1010**	0.0531	0.1180	0.0000	0.9401
Long-Term Debt (in $ thousands)	19659.83[n.s.]	2049.00	129621.20	0.0000	3038147.00
Current liabilities / Total Assets	0.2010[n.s.]	0.1701	0.1001	0.0302	0.5601
Net Income	4512.91[n.s.]	3247.00	5980.99	-16855.00	104821.00
PPE / Total Assets	0.2210[n.s.]	0.1901	0.1302	0.0000	0.8911
Sales	35225.85[n.s.]	30146.00	34074.99	0.0000	195341.00
Working Capital	9714.80**	8260.34	9801.81	-6528.00	43845.00
R&D Expenses / Total Assets	0.0831[n.s.]	0.0921	0.0501	0.0000	0.6721
Information Asymmetry Index	2.6390**	2.3792	0.6671	1.0632	5.1012
Excess Market-to-Book Ratio	1.8430**	1.7721	1.6330	-0.8161	7.5160
Market-to-Book Ratio	4.290**	4.1211	1.6901	2.0000	11.5300
Independent VC	0.4666**	0.5000	0.2769	0.0000	0.8888
External CVC	0.03571	0.0000	0.1858	0.0000	1.0000
Number of observations	**635**				

Panel C: Un-announced deals					
Market Value (in $ thousands)	98481.43	72753.59	91565.36	13.71	476115.50
Current Assets / Total Assets	0.4310	0.4400	0.1901	0.0311	0.8921
Total Assets (in $ thousands)	63542.92	44224.00	109945.20	26.09	795337.00
CAPEX / Total Assets	0.0500	0.0411	0.0401	0.0001	0.1701
Cash / Total Assets	0.1212	0.1001	0.0901	0.0001	0.4601
Leverage	0.1340	0.0851	0.1300	0.0000	0.9901
Long-Term Debt (in $ thousands)	11778.15	2022.00	35838.81	0.0000	360681.00
Current liabilities / Total Assets	0.2101	0.1810	0.1000	0.0611	0.6901
Net Income	3944.77	3117.00	4825.09	-38732.00	23931.00
PPE / Total Assets	0.2202	0.1801	0.1311	0.0010	0.6810
Sales	32059.40	29321.00	34622.82	8.7212	255112.00
Working Capital	7391.52	6536.74	7917.90	-5223.00	43845.00
R&D Expenses / Total Assets	0.0800	0.0901	0.0510	0.0001	0.2911
Information Asymmetry Index	2.4151	2.2512	0.6901	1.1451	4.3350
Excess Market-to-Book Ratio	1.4122	1.3970	1.7571	-1.0161	4.3810
Market-to-Book Ratio	2.3201	1.9401	1.8401	0.0702	9.0601
Independent VC	0.4244	0.5000	0.2527	0.0000	0.8750
External CVC	0.0315	0.0000	0.1749	0.0000	1.0000
Number of observations	**365**				

Table 3: Shows the results of Logit regressions. The dependent variable is a dummy taking a value of one if CVC or parent company announced the deal and 0 otherwise. *Information Asymmetry Index* is an index measuring the level of information asymmetry in CVC parent company. The index is computed the same way as in Maskara and Mullineaux (2010). *Excess Market-to-Book Ratio* is the market to book ratio of the CVC parent company in excess of industry median market to book ratio. *Market to book ratio* is the market to book ratio of CVC parent company. *Leverage* is measured as long term debt divided by total asset. *ln(Market Value)* is the logarithm of market value of the CVC parent company. *ln(R&D Expenses)* is the logarithm of research and development expenses. *ln(CAPEX)* is the logarithm of capital expenditure expenses. *ln(Long-Term Debt)* is the logarithm of long term debt. *Negative NI* is a dummy variable taking a value of one if the parent company has a negative net income and zero otherwise. *Sales Growth* is a change in sales for the parent company. *Seed Stage, Early Stage, Expansion Stage* and *Later* Stage are dummies. All Compustat variables are measured in a year prior to the announcement. *Other Stages* is used as the base dummy in the regression. The coefficients reported are marginal effects. We control for industry and year effects. Significance levels: ***,**,* indicates 1% 5% and 10% respectively.

Variables	Model I		Model II		Model III		Model IV		Model V		Model VI		Model VII		Model VIII	
	Coeff.	P-value	Coeff.	P-value	Coeff.	P-value	Coeff.	P-value	Coeff.	P-value	Coeff.	P-value	Coeff.	P-value	Coeff.	P-value
Information Asymmetry Index	0.1068***	(0.0000)													0.0601**	(0.0250)
Market-to-Book Ratio			0.0911***	(0.0000)											0.3932***	(0.0000)
Excess Market-to-Book Ratio					0.0551**	(0.0120)									0.0270***	(0.0010)
ln(Market Value)							0.0152***	(0.0040)							0.3270	(0.1540)
ln(R&D Expenses)									0.0124**	(0.0150)					0.3100	(0.7120)
ln(CAPEX)											0.0155*	(0.0900)			0.0210	(0.2780)
Leverage													-0.0450***	(0.0000)	-0.4681***	(0.0000)
ln(Long -Term Debt)	-0.0009	(0.8500)	0.0210***	(0.0010)	0.0117**	(0.0380)	0.0013	(0.8790)	0.0025	(0.7370)	-0.0035	(0.9510)			0.4961***	(0.0000)
Negative NI	-0.0364	(0.5600)	-0.1061*	(0.0550)	-0.0885*	(0.0990)	-0.1013*	(0.0980)	-0.0655	(0.2280)	-0.0747	(0.3640)	-0.0482	(0.3500)	-0.0540	(0.4880)
Sales Growth	0.0004	(0.1450)	0.001***	(0.0010)	0.0004	(0.1970)	0.0005*	(0.0980)	0.0005	(0.1200)	0.0005	(0.1260)	0.0005*	(0.0970)	0.0000	(0.5840)
Seed Stage	-0.1770**	(0.0300)	-0.1350	(0.1600)	-0.1728**	(0.0280)	-0.1487*	(0.0770)	-0.1613*	(0.0760)	-0.2435**	(0.0370)	-0.2441**	(0.0130)	-0.046*	(0.0810)
Early Stage	-0.0261	(0.2230)	-0.0020	(0.9690)	-0.0202	(0.1800)	0.0099	(0.5140)	0.0010	(0.2970)	-0.0891	(0.2550)	-0.0539	(0.4530)	0.0190	(0.7280)
Expansion Stage	0.0224	(0.5090)	0.0400	(0.4230)	0.0193	(0.4030)	0.0457	(0.8230)	0.0416	(0.6170)	-0.0421	(0.5420)	0.0031	(0.4220)	0.0100	(0.8490)
Later Stage	0.0648	(0.9220)	0.0830	(0.1300)	0.0632	(0.8050)	0.0763	(0.8870)	0.0764	(0.9740)	-0.0002	(0.9300)	0.0448	(0.2570)	0.0260	(0.6390)
Constant	-0.4781	(0.7770)	-0.2801*	(0.0810)	0.1793	(0.1910)	-0.2907	(0.9290)	0.3333	(0.1070)	0.7868*	(0.0590)	0.2090*	(0.0640)	0.2660*	(0.0780)
Likelihood Ratio	**-613.32**		**-540.79**		**-612.32**		**-580.53**		**-621.2**		**-619.07**		**-388.65**		**-560.79**	
Number of observations	**1000**		**1000**		**1000**		**1000**		**1000**		**1000**		**1000**		**1000**	

Table 4: The Impact of Syndicate Size on Disclosure

This table shows results of Logit regressions on the probability of announcement separately for the subsamples of investments that are not syndicated (i.e., there is only one investor, which is the parent company's CVC program) and investments that are syndicated (i.e., at least one other investor participated in the financing round). Panel A shows the results of information asymmetry, Panel B the results of leverage and Panel C the results of size effect. The dependent variable is a dummy taking a value of one if the parent company announced the CVC investment, and 0 otherwise. All other variables are defined in Table 3. *Other Stages* is used as the base dummy in the regression. The coefficients reported are marginal effects. We control for industry and year effects. Significance levels: ***,**,* indicates 1% 5% and 10% respectively.

Panel A: Information asymmetry	Model I: No syndicated investments		Model II: Syndicated investments only	
	Coefficient	P-value	Coefficient	P-value
Information Asymmetry Index	0.1121**	(0.0100)	0.1390***	(0.0000)
ln(Long-Term Debt)	-0.0165	(0.1870)	-0.0006	(0.9230)
Negative NI	0.0631	(0.3350)	-0.0391	(0.6010)
Sales Growth	0.3748**	(0.0220)	0.0005	(0.1330)
Seed Stage	-0.4185**	(0.0150)	-0.1186	(0.2800)
Early Stage	-0.2362*	(0.0890)	-0.0325	(0.4710)
Expansion Stage	-0.1379	(0.2350)	0.0749	(0.1090)
Later Stage	0.1142	(0.4300)	0.1121	(0.1660)
Constant	0.2271	(0.8340)	-1.0959**	(0.0450)
Number of observations	**122**		**878**	
Panel B: Leverage				
Leverage	-0.5095**	(0.0130)	-0.3329***	(0.0010)
Negative NI	0.0004	(0.9970)	-0.0434	(0.5190)
Sales Growth	0.3678**	(0.0310)	0.0005*	(0.0960)
Seed Stage	-0.4560***	(0.0050)	-0.1671	(0.1580)
Early Stage	-0.2126	(0.1420)	0.0121	(0.7650)
Expansion Stage	-0.1433	(0.2090)	0.0627	(0.2410)
Later Stage	0.0909	(0.5640)	0.0984*	(0.0590)
Constant	3.6871***	(0.0010)	1.4269***	(0.0010)
Number of observations	**122**		**878**	
Panel C: Size				
ln(Market Value)	0.0415***	(0.0030)	0.0209***	(0.0000)
ln(Long-Term Debt)	-0.0180	(0.2370)	0.0029	(0.6950)
Negative NI	-0.0200	(0.8480)	-0.1235*	(0.0920)
Sales Growth	0.3097*	(0.0750)	0.0006*	(0.0740)
Seed Stage	-0.4351**	(0.0160)	-0.0862	(0.4540)
Early Stage	-0.1756	(0.2560)	0.0599	(0.2010)
Expansion Stage	-0.1577	(0.2270)	0.1046	(0.1660)
Later Stage	0.0770	(0.6710)	0.1286**	(0.0270)
Constant	-1.5086	(0.1940)	-0.9623*	(0.0540)
Number of observations	**122**		**878**	

Table 5: The Impact of Independent VC Participating in the Syndicate

This table shows results of Logit regressions on the probability of announcement when independent VCs are participating in the syndicate. The dependent variable is a dummy taking a value of one if the parent company announced the CVC investment and 0 otherwise. *Independent VC Participating* is the percentage of private VCs in the syndicate. All other variables are defined in Table 3. *Other Stages* is used as the base dummy in the regression. The coefficients reported are marginal effects. We control for industry and year effects. Significance levels: ***,**,* indicates 1% 5% and 10% respectively.

	Model I		Model II		Model III	
	Coefficient	P-value	Coefficient	P-value	Coefficient	P-value
Information Asymmetry Index	0.1208***	(0.0000)				
Size			0.0181**	(0.002)		
Leverage					-0.0994***	(0.0000)
Independent VC Participating	0.1455**	(0.0180)	0.1523**	(0.0020)	0.1489**	(0.0180)
ln(Long-Term Debt)	-0.0002	(0.9740)	0.0023	(0.7600)		
Negative NI	-0.0249	(0.6940)	-0.1134*	(0.0600)	-0.0560	(0.3290)
Sales Growth	0.0002**	(0.0029)	-0.0005**	(0.0340)	0.0001	(0.5860)
Seed Stage	-0.1926*	(0.0720)	-0.1558	(0.1620)	-0.3381**	(0.0050)
Early Stage	-0.0488	(0.4640)	-0.0070	(0.8910)	-0.1332	(0.1210)
Expansion Stage	-0.0114	(0.6030)	0.0167	(0.7710)	-0.0672	(0.4740)
Later Stage	0.0346	(0.2550)	0.0475	(0.4580)	-0.0197	(0.8300)
Constant	-0.8657*	(0.0580)	-0.6866	(0.1620)	0.3560*	(0.0550)
Likelihood Ratio	-613.68		-573.91		-519.97	
Number of observations	**999**		**999**		**999**	

Table 6: The Impact of Syndicate Structure on Disclosure

This table shows results of Logit regressions on the probability of announcement when the VC is external managed. The dependent variable is a dummy taking a value of one if the parent company announced the CVC investment, and 0 otherwise. *External CVC* is a dummy variable taking a value of 1 if the CVC program is structured as a separate legal entity (subsidiary), and 0 otherwise. All other variables are defined in Table 3. *Other Stages* is used as the base dummy in the regression. The coefficients reported are marginal effects. We control for industry and year effects. Significance levels:

	Model I		Model II		Model III	
	Coefficient	P-value	Coefficient	P-value	Coefficient	P-value
Information Asymmetry Index	0.1129***	(0.0000)				
ln(Market Value)			0.0162**	(0.0010)		
Leverage					-0.0956***	(0.0000)
External CVC	0.0786**	(0.0180)	0.0555*	(0.0920)	0.0636**	(0.0210)
ln(Long-Term Debt)	-0.0014	(0.8240)	0.0012**	(0.0010)		
Negative NI	-0.0571	(0.3340)	-0.1177	(0.8690)	-0.0719	(0.1390)
Sales Growth	0.0005	(0.1340)	0.0005**	(0.0420)	0.0005*	(0.0960)
Seed Stage	-0.1877**	(0.0490)	-0.1550*	(0.0760)	-0.3343**	(0.0040)
Early Stage	-0.0311	(0.4640)	0.0072	(0.1260)	-0.1091	(0.1880)
Expansion Stage	0.0244	(0.6030)	0.0475	(0.8760)	-0.0310	(0.4740)
Later Stage	0.0641	(0.2550)	0.0763	(0.3620)	0.0109	(0.8300)
Constant	-0.7125*	(0.0540)	-0.4759	(0.2040)	0.3630*	(0.0760)
Likelihood Ratio	-613.68		-580.91		-5241.32	
Number of observations	**1000**		**1000**		**1000**	

***,**,* indicates 1% 5% and 10% respectively.

Table 7: Average Abnormal Returns around the Event Date

Panel A shows average abnormal returns for CVC investments that are announced (first column) and un-announced (second column). The average abnormal returns are computed using the market model (Brown and Warner, 1985). The last column gives the t-test of the difference in means tests between announced and un-announced average abnormal returns. Panel B shows statistics on the cumulative abnormal returns over the [-10,+10] days window around the event date, as well as results of the difference in means test between the two subsamples. Significance levels: ***, **, * indicates 1%, 5% and 10% respectively.

Panel A: Average Abnormal Returns

Days around the event	Announced	Un-announced	Diff-test
-10	0.0079	-0.0037	1.7370*
-9	-0.0026	0.0048	-3.0368**
-8	0.0050	0.0065	-0.6106
-7	-0.0035	-0.0091	-5.1708***
-6	-0.0084	0.0016	-4.1074***
-5	-0.0033	-0.0018	-2.0639**
-4	-0.0049	-0.0025	-3.0294**
-3	0.0012	-0.0056	-1.8128*
-2	0.0011	-0.0016	-0.2187*
-1	0.0072	-0.0018	2.1841**
0	0.0212	0.0052	6.5440***
+1	0.0021	-0.0018	0.1307*
+2	-0.0052	-0.0057	-4.4922***
+3	-0.0084	-0.0052	-5.5676***
+4	0.0012	-0.0006	0.2466
+5	-0.0067	-0.0053	-4.9229***
+6	0.0057	-0.0069	-0.4673
+7	-0.0037	0.0052	-3.6442***
+8	-0.0020	-0.0023	-1.7313*
+9	-0.0045	0.0016	-2.5008**
+10	0.0038	-0.0015	0.9341

Panel B: Cumulative abnormal returns over various windows.

	Announced	Un-announced	Diff-test
CAR [-2,+2] Mean (p-val)	0.0263(0.0000)	-0.0057(0.0000)	8.4359***
CAR [-3,+3] Mean (p-val)	0.0191(0.0000)	-0.0166 (0.0000)	1.0234
CAR [-4,+2] Mean (p-val)	0.0226 (0.0000)	-0.0139 (0.00000)	-5.6695***
CAR [-10,+10] Mean (p-val)	0.0032 (0.0442)	-0.035 (0.0000)	-13.0222***
Number of observations	**635**	**365**	

Table 8: Stock Price Reaction to Information Disclosure

This table shows Heckman estimation. The variable *Announced Dummy* equals one if the investment was announced, and zero otherwise. The other variables are defined in Tables 2 and 3. Lambda is the Inverse Mills' Ratio that corrects for possible sample selection biases in the outcome equation. We control for industry and year effects. Significance levels: ***,**,* indicates 1%, 5% and 10% respectively.

	Outcome equation: Dep. Var.= CAR [-10,+10]		**Selection equation**: Dep. Var.= Announced Dummy	
Variables	Coefficient	P-value	Coefficient	P-value
Announced Dummy	0.0074***	(0.0000)	-	-
ln(Round Amount)	0.0016*	(0.0820)	-	-
ln(Total Assets)	0.0021**	(0.0350)	-	-
Information Asymmetry Index	0.0111***	(0.0020)	0.1061***	(0.0010)
ln(Long-Term Debt)	0.0008	(0.2920)	-0.0010	(0.5200)
Negative NI	0.0030	(0.7670)	-0.0367	(0.5290)
Sales Growth	0.0001	(0.5340)	0.0004	(0.2910)
Lambda (Inverse Mills' Ratio)	-0.0077	(0.1160)	-	-
Seed Stage	-	-	-0.1750**	(0.0200)
Early Stage	-	-	-0.0266	(0.1830)
Expansion Stage	-	-	0.0240	(0.5420)
Later Stage	-	-	0.0679	(0.6130)
Constant	0.0243	(0.1020)	-0.2856	(0.1870)
Number of observations	**1000**		**1000**	

Table 9: Stock Price Reaction to Information Disclosure for Different CAR Windows

The table shows similar regressions as Table 5 but with different windows of CAR measurements. The variable *Announced Dummy* equals one if the investment was announced, and zero otherwise. The other variables are defined in Tables 2 and 3. Lambda is the Inverse Mills' Ratio that corrects for possible sample selection biases in the outcome equation. We control for industry and year effects. Significance levels: ***,**,* indicates 1%, 5% and 10% respectively.

Variables	Model I [-2,+2]		Model II [-3,+3]		Model III [-4,+2]	
	Coefficient	P-value	Coefficient	P-value	Coefficient	P-value
Announced Dummy	0.0201***	(0.0000)	0.0189***	(0.0000)	0.0156***	(0.0000)
ln(Round Amount)	0.0036*	(0.0520)	0.0018*	(0.0610)	0.0019	(0.1660)
ln(Total Assets)	0.0035**	(0.0390)	0.0008	(0.5580)	0.0026**	(0.0420)
Information Asymmetry Index	0.0111**	(0.0120)	0.0208***	(0.0000)	0.0190***	(0.0000)
ln(Long-Term Debt)	0.0021	(0.1800)	0.0004	(0.4960)	0.0010	(0.2520)
Negative NI	-0.0022	(0.1390)	0.0043	(0.9830)	0.0030	(0.1200)
Sales Growth	0.0001	(0.6980)	0.0001	(0.6640)	0.0001	(0.7720)
Lambda (Inverse Mills' Ratio)	-0.0397*	(0.0970)	-0.0076	(0.5410)	-0.0196	(0.2340)
Constant	0.0186	(0.2650)	0.0060	(0.2190)	-0.0427	(0.4780)
Number of observations	**1000**		**1000**		**1000**	

APPENDIX 1: Comparison of the VentureXpert Sample and our Random Sample

The table shows the descriptive statistics of CVC characteristics. Panel A shows the statistics for full sample of CVC during 2002 through 2012 extracted from VentureXpert. Panel B shows the statistics of the random sample during the same period. Panel B also provides significance level of difference in means tests between values from Panels A and B. Significance levels: ***,**,* indicates 1% 5% and 10% respectively (n.s. for > 10%).

Panel A: Full sample	**Characteristics of CVC Investments**				
	Mean	Median	Std. Dev.	Min	Max
Round Amount	16650.44	10000	30069.91	1.0000	585000
Round Number	3.3401	3.0000	2.3841	1.0000	20.0000
Number of Investors	4.8081	4.0000	3.4882	1.0000	26.0000
Seed Stage	0.0561	0.0000	0.2290	0.0000	1.0000
Early Stage	0.2202	0.0000	0.4141	0.0000	1.0000
Expansion Stage	0.3641	0.0000	0.4810	0.0000	1.0000
Later Stage	0.2633	0.0000	0.4402	0.0000	1.0000
Other Stages	0.0970	0.0000	0.2961	0.0000	1.0000
Number of observations	**2588**				
Panel B: Random sample					
Round Amount	16479.28$^{n.s.}$	10000	25964.76	1.0000	460000
Round Number	3.4191$^{n.s.}$	3.0000	2.4261	1.0000	20.0000
Number of Investors	4.8461$^{n.s.}$	4.0000	3.3922	1.0000	26.0000
Seed Stage	0.0482$^{n.s.}$	0.0000	0.2140	0.0000	1.0000
Early Stage	0.2230$^{n.s.}$	0.0000	0.4171	0.0000	1.0000
Expansion Stage	0.3501$^{n.s.}$	0.0000	0.4772	0.0000	1.0000
Later Stage	0.2682$^{n.s.}$	0.0000	0.4430	0.0000	1.0000
Other Stages	0.1091$^{n.s.}$	0.0000	0.3120	0.0000	1.0000
Number of observations	**1000**				

APPENDIX 2: Summary Statistics on Industry Classification of Parent Companies

This table shows the distribution of our sample by industry using the Fama-French 12 industry classification of parent companies. Panel A shows the distribution of announced investments, while Panel B shows the distribution of un-announced investments. Panel B also provides significance level of difference in means tests between values from Panels A and B. Significance levels: ***,**,* indicates 1% 5% and 10% respectively (n.s. for > 10%).

Panel A: Announced deals					
	Mean	Median	Std. Dev.	Min	Max
Consumer Non-Durables	0.0095	0.0000	0.0971	0.0000	1.0000
Consumer Durables	0.0127	0.0000	0.1120	0.0000	1.0000
Manufacturing	0.0428	0.0000	0.2025	0.0000	1.0000
Oil, Gas, and Coal Extraction and Products	0.0143	0.0000	0.1187	0.0000	1.0000
Chemicals and Allied Products	0.0206	0.0000	0.1422	0.0000	1.0000
Business Equipment	0.5689	1.0000	0.4956	0.0000	1.0000
Telephone and Television Transmission	0.0919	0.0000	0.2891	0.0000	1.0000
Utilities	0.0032	0.0000	0.0563	0.0000	1.0000
Wholesale, Retail, and Some Services	0.0475	0.0000	0.2130	0.0000	1.0000
Healthcare, Medical Equipment, and Drugs	0.1094	0.0000	0.3123	0.0000	1.0000
Money Finance	0.0238	0.0000	0.1525	0.0000	1.0000
Other	0.0555	0.0000	0.2291	0.0000	1.0000
Number of observations	**635**				
Panel B: un-announced deals					
Consumer Non-Durables	$0.0225^{n.s.}$	0.0000	0.1486	0.0000	1.0000
Consumer Durables	$0.0028^{n.s.}$	0.0000	0.0531	0.0000	1.0000
Manufacturing	$0.0394^{n.s.}$	0.0000	0.1949	0.0000	1.0000
Oil, Gas, and Coal Extraction and Products	$0.0169^{n.s.}$	0.0000	0.1291	0.0000	1.0000
Chemicals and Allied Products	$0.0085^{n.s.}$	0.0000	0.0917	0.0000	1.0000
Business Equipment	$0.4761^{n.s.}$	0.0000	0.5001	0.0000	1.0000
Telephone and Television Transmission	$0.1408^{n.s.}$	0.0000	0.3484	0.0000	1.0000
Utilities	$0.0113^{n.s.}$	0.0000	0.1057	0.0000	1.0000
Wholesale, Retail, and Some Services	$0.0451^{n.s.}$	0.0000	0.2078	0.0000	1.0000
Healthcare, Medical Equipment, and Drugs	$0.1493^{n.s.}$	0.0000	0.3569	0.0000	1.0000
Money Finance	$0.0282^{n.s.}$	0.0000	0.1657	0.0000	1.0000
Other	$0.0592^{n.s.}$	0.0000	0.2362	0.0000	1.0000
Number of observations	**365**				