6-7-2014

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Recommended Citation  
Available at: http://digitalknowledge.babson.edu/fer/vol34/iss2/3
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Abstract

We add to the literature on corporate venture capital (CVC) by examining the effect of corporate parent heterogeneity on CVC activity, and specifically on the “paradox” of CVC, whereby startups avoid investment from corporate partners in the same industry. We draw on social capital theory to develop a model of corporate parent characteristics representing either potential benefits (i.e., social capital) or risks (i.e., social liability) to startups, which impact the likelihood of CVC investment. We argue that startups balance these risks and benefits when seeking a corporate partner, suggesting an interplay between social capital and liability as an underlying determinant of the strength of the paradox of CVC.

Introduction

In recent years corporate venture capital (CVC) has become an increasingly popular alternative to other corporate-level strategies as a way to encourage innovation (Dushnitsky, 2012). CVC has clear benefits for corporations, providing access to cutting edge technologies and entrepreneurial talent that stimulate learning and innovation (Dushnitsky, 2011; Schildt, Maula, & Keil, 2005). CVC also benefits startups by providing access to financial and developmental resources (Baum & Silverman, 2004; Fitza, Matusik, & Mosakowski, 2009). In fact, research has shown that CVC is superior to independent VC (IVC) in supplying many “value-add” resources, such as commercial credibility, commercial capacity, and technological support (Maula, Autio, & Murray, 2005).

Despite the potential benefits a CVC may offer an entrepreneur, research suggests a paradox whereby startups operating in the same industry as a CVC’s corporate parent are less likely to seek backing from that CVC, largely because of property protection concerns (Dushnitsky & Shaver, 2009). While the extant literature has examined environmental and entrepreneurial firm characteristics influencing the likelihood of a CVC investment relationship (Dushnitsky & Shaver, 2009; Katila, Rosenberger, & Eisenhardt, 2008), it has not systematically assessed whether the paradox is sensitive to corporate parent characteristics. Rather it assumes that, outside of industry affiliation, all corporate parents are equal and therefore all CVCs offer the same potential benefits or risks to startup companies. While this is a reasonable simplifying assumption based on the scope of past examinations, organizational research suggests that firms are not homogenous (e.g., Hannan & Freeman, 1977; Scott, 1981). Indeed, there is great structural and strategic variation among different firms, indicating the need to examine how differences among CVCs and their corporate parents may impact CVC activity, and specifically the paradox referred to above.

Drawing primarily on social capital theory, we investigate the effect of three potential strategic benefits—access to resources, industry insights, and endorsement potential—and two components of misappropriation risk—inclination and ability to imitate—on the likelihood of a CVC

Frontiers of Entrepreneurship Research 2014
investment relationship between firms in the same industry. We argue that these characteristics represent the social capital or liabilities of a given CVC, since they play a vital role in attracting or repelling potential entrepreneurial partners. Whereas misappropriation risk exacerbates the paradox of CVC, potential strategic benefits enable corporations to overcome it and effectively achieve their strategic intentions. Further, because startups will simultaneously consider benefits and risks when deciding whether to engage with a particular CVC, we argue that social capital and liabilities interact for an overall effect on CVC activity.

The paper begins with a brief review of CVC, including an overview of the paradox of CVC and its relevance to corporations pursuing CVC as a way to encourage innovation. It then applies social capital theory to the context of CVC in order to generate hypotheses regarding specific characteristics of the corporate parent that are likely to affect CVC activity. Methodologies for examining the proposed relationships are then delineated and results are summarized. It concludes by outlining implications for research and practice and discussing several areas for future research.

**Background**

CVC is a unique form of investment in which large corporations provide funding for young startups, either directly or through third-party entities. As with other VCs, CVCs add value to startups beyond financing, such as providing access to resources and potential partners, helping in the development of products and technologies, and providing a positive endorsement effect (De Clercq, Fried, Lehtonen, & Sapienza, 2006; Heeley, Matusik, & Fitza, 2012; Maula et al., 2005). Research even suggests that CVCs are superior to IVCs in providing certain value-add benefits, such as “commercial building” activities such as building commercial credibility, commercial capacity, and technological support (Maula et al., 2005). Such benefits not only positively affect the growth of startups, but also impact the future value of these firms. For instance, research has shown that CVC-backed companies tend to have a higher value at the time of their IPO than non-CVC-backed companies (Heeley et al., 2012; Stuart, Ha, & Hybels, 1999).

Despite the potential benefits of CVC, the extant literature suggests many reasons why startups may avoid engaging in investment relationships with CVCs. Dushnitsky and Shaver (2009) refer to the “paradox of CVC,” whereby startups avoid engaging with corporate partners in the same industry because of misappropriation hazards. Unlike other financial intermediaries like banks or IVCs, which invest for purely financial reasons, CVCs invest in order to access new ideas and technologies to drive innovation (De Clercq et al., 2006). This is problematic for startups in the same industry because such motivations could encourage corporate parents to misuse intellectual or other proprietary resources (De Clercq et al., 2006; Dushnitsky & Shaver, 2009; Katila et al., 2008). In addition to misappropriation, startups may avoid CVC investment because relationships with a particular corporate investor constrain access to complementary resources from alternative partners, who are likely to be direct competitors of the CVC parent company (Park & Steensma, 2012). Similarly, startups may avoid CVC investment because of difficulty exiting the relationship, since CVCs have a disincentive to sell portfolio companies to competitor firms, which are the most likely bidders (Shane, 2010). Finally, startups may avoid CVC because of a fundamental goal misalignment—that is, many startups enter the market with the intention of challenging large, established corporations (Shane, 2010). Such a mentality puts CVCs at a severe disadvantage to alternative financial intermediaries in terms of attracting entrepreneurial partners.
These disincentives are problematic for corporations engaging in CVC as an innovative strategy, since they often repel high-potential startups. Indeed, startups with the most to offer a corporate parent in terms of relevant or novel knowledge and/or technologies are likely to be the firms that most avoid CVC, since they have the most to lose from misappropriation. It follows, then, that corporate parent characteristics, which indicate potential benefits or risks to startups, are an important driver of CVC activity. Yet, the extant literature has largely overlooked these effects, taking an environmental or an entrepreneurial firm perspective and essentially assuming that all CVCs and corporate parents are perceived the same way. For example, taking an environmental approach, Dushnitsky and Shaver (2009) examined the effect of intellectual property protection (IPP) regime on CVC activity, finding that CVC investment relationships are more likely within regimes that better protect intellectual property. Taking an entrepreneurial firm approach, Katila et al. (2008) emphasized the role of resource dependence on the likelihood that young firms would engage with large corporate sponsors, showing that startup resource needs and defense mechanisms affect ties between startups and corporations.

While these and similar studies have been important to understanding some of the intricacies of CVC activity, even the authors performing these studies have indicated the need to examine the phenomenon from the perspective of the corporate parent (see Dushnitsky & Shaver, 2009). Indeed, the simplifying assumption of CVC homogeneity has been a necessary component of previous studies, as it has ensured a clear focus on either environmental or entrepreneurial firm factors; however, in reality, firms are not homogenous. Rather, general research on organizations and environmental ecology indicates high structural variability among firms (Hannan & Freeman, 1977; Scott, 1981). With this in mind, it is likely that differences among corporate partners would impact the likelihood of CVC activity. Therefore, a more systematic analysis of corporate parent characteristics is important to the study of CVC activity. In the next section, we outline a social capital approach to CVC activity as a starting point for providing such an analysis.

**Theory & Hypotheses**

In the organizational sciences, social capital has been defined as the context-specific goodwill available to individuals or organizations which facilitates collaborative activities (Adler & Kwon, 2002). For a CVC firm, social capital consists of characteristics that increase the likelihood of a CVC investment relationship (Adler & Kwon, 2002; De Clercq et al., 2006). At the same time, social capital theory also suggests that some characteristics may be social liabilities, reducing the likelihood of a CVC investment relationship (Weber & Weber, 2011). In this section, we outline several characteristics that increase social capital or social liability and present hypotheses about their direct and interactive effects on CVC activity, particularly as it relates to the paradox of CVC. The theoretical model is depicted in Figure 1.

**Social Capital—Potential Strategic Benefits**

In the context of CVC, social capital consists of characteristics that increase the likelihood of a CVC investment relationship. For a CVC firm, social capital is enhanced by the potential strategic benefits it offers to startups. In this section we present three such benefits—access to resources, industry insights, and endorsement potential—and discuss how different levels of each affect the likelihood of a CVC investment relationship.
First, access to resources is likely to affect whether a startup will engage with a given CVC. Startups often lack the resources needed to compete effectively with more established firms (Demsetz, 1982; Siegfried & Evans, 1994), including those needed to grow or develop the business (Brody & Ehrlich, 1998; De Clercq et al., 2006) as well as social networks that provide future partnership opportunities and access to additional resources (Chang, 2004). Such resources are costly and/or take a long time to develop, thus young firms often partner with more established firms to gain access to them, rather than developing them independently (Katila et al., 2008). It follows that, when seeking such partnerships, variations in resource endowments will differentiate alternative partners. Resources such as access to markets, manufacturing capabilities, distribution channels, and R&D support make a CVC an attractive investment partner (Brody & Ehrlich, 1998; De Clercq et al., 2006). Further, though there is a degree of complementarity that may drive startups to pursue alternative corporate sponsors (Gompers & Lerner, 2000; Park & Steensma, 2012), the sheer breadth of resources is also important to the relationship because it enhances future prospects for growth and development. In order to judge potential access to resources, startups are likely to use heuristics such as the size of a given firm’s network.

Second, industry insights are likely to increase the social capital of a corporate partner vis-à-vis a startup firm. Scholars often argue that one of the major incentives to partner with VC firms above traditional financial intermediaries (e.g., banks) is the added value in terms of expertise and coaching (Baum & Silverman, 2004; Fitza et al., 2009). CVCs are in a unique position even among VC firms to provide coaching to young firms. Unlike IVCs, which depend on research or investing experience to provide advice, CVCs have first-hand knowledge gained from operating within the industry (Cox & Katila, 2011). Further, while IVCs are typically generalists, corporations have very specialized market and/or technical expertise from competencies accumulated over time, intensive market research, and extensive customer relationships (Maula et al., 2005). This specialized knowledge is invaluable for startups, which typically start by operating in more specialized markets (Roberts, 1991). Yet, some CVCs will be perceived as having more expertise to pass down to portfolio firms than others. Given this, CVCs with corporate parents that are perceived as more knowledgeable will be more attractive investment partners. In this case, startups are likely to use heuristics such as management’s experience as indicators of the potential value that may be gained from engaging in a CVC investment relationship.

Third, along with the direct benefits of CVC, startups may also gain benefits by simply being affiliated with a particular CVC. This “endorsement effect” is likely to be a major differentiator within CVC investment relationships because it increases the credibility of the startup for consumers and/or potential partners. Although young firms may suffer from a liability of newness (Maula et al., 2005), CVCs can add credibility to young firms in terms of commercial credibility and future viability (Stuart et al., 1999). This idea is well supported in the literature on corporate venture capital. For example, in the biotechnology industry, where it is difficult for industry outsiders to judge the potential of a new technology, Stuart et al. (1999) showed that investment by reputable pharmaceutical corporations provided a signal of “attractive prospects” to outsiders. Similarly, using primary data from CVC-backed firms in various high-technology industries, Maula and colleagues (2005) found that CVCs were superior even to IVCs in helping young firms attract new domestic customers. Given these findings, it follows that CVCs with a greater potential “endorsement effect” will be more attractive partners to startups. Here, young firms are likely to use reputation and brand recognition to differentiate prospective investment partners.
Altogether, social capital, as manifested in terms of potential strategic benefits, is a major driver of CVC activity. The greater the potential benefits, the more attractive a CVC will be to a startup, increasing the likelihood of a CVC investment relationship. Further, the effect of these characteristics is likely to extend to the paradox of CVC. For any given CVC investment, the greater the potential strategic benefits, the more likely a startup will be to overlook industry overlap in that investment relationship. Formally:

Hypothesis 1: Greater potential strategic benefits from the corporate parent firm to the startup in terms of a) access to resources, b) industry insights, and c) endorsement potential will increase the likelihood of a CVC investment relationship between firms in the same industry.

Social Liability—Misappropriation Risk

In contrast to social capital, research also suggests the existence and relevance of social liabilities, which impede interorganizational relationships (Weber & Weber, 2011). In the context of CVC, such liabilities would manifest as corporate parent characteristics that increase a CVC firm’s perceived ability and inclination towards imitation. In this section, we briefly outline each component and discuss how each exacerbates the paradox of CVC.

First, the inclination to imitate gets at the fundamental agency problem of CVC, which stems from the motives of corporations pursuing a CVC strategy. Unlike other investors, which invest for purely financial reasons (i.e., return on investment), CVCs invest primarily to secure strategic benefits for the corporate parent (De Clercq et al., 2006), such as exploiting potential synergies or gaining a foothold in emerging technologies. Empirical research provides evidence for this tendency, showing the CVCs are more likely than alternative financial intermediaries to recognize technological discontinuities (Maula, Keil, & Zahra, 2003) and to engage in explorative learning (Schildt et al., 2005). These tendencies are problematic for startup firms, since they increase monitoring, reporting requirements, and the potential for misappropriation of proprietary resources (De Clercq et al., 2006). Further, these inclinations intensify as CVCs invest in startups closely related to the corporate parent’s primary business, which they are incentivized to do (De Clercq et al., 2006; Dushnitsky & Shaver, 2009).

Beyond industry overlap, which is representative of the paradox of CVC, corporate parent firms may also be more inclined to misappropriate startup resources in order to achieve specific strategic goals related to growth into new or existing markets. For example, a corporate parent in a broad technology sector may invest in a niche technology in say, biotechnology, in order to increase its competencies in that market. Such tendencies may often be perceived by startups by examining the stated preference of a particular CVC in terms of investment partners. Linking this back to the previous scenario, for example, the CVC of the technology firm would likely have a stated preference to invest in biotechnology firms. While this may provide information for startups in terms of selecting a relevant corporate partner, then, it also adds another layer to the paradox of CVC because it may dissuade startups from engaging with a particular CVC.

Second, the ability to imitate is also an important factor affecting CVC activity, in general, as well as the paradox of CVC, specifically. Even if a corporate parent is inclined to misappropriate resources or knowledge from a startup, if it is constrained to do so, the risk of misappropriation is reduced. Dushnitsky and Shaver (2009) use this idea as a motivation for their study on the
effect of IPP regime on CVC activity, as has already been described. However, we argue that factors beyond the environment may constrain or allow for greater misappropriation. Research on interorganizational alliances is suggestive of such factors. Within this literature, governance and structural considerations are seen as the mechanisms that control opportunistic behavior and encourage cooperation (Gompers & Lerner, 2000; Oxley, 1997). CVC parallels alliances as an interorganizational activity requiring an exchange between parties; therefore, we argue that CVC structural considerations are likely to influence perceptions of misappropriation risk. Pre-investment, entrepreneurs are likely to assess aspects of the parent-CVC structure to determine how embedded the corporate parent is in the CVCs daily operations. CVCs with more embedded corporate parents (e.g., through the ownership structure of the CVC) will be less attractive to startups because such embeddedness increases the corporate parents ability to imitate.

Combined, inclination and ability to imitate represent the risk of misappropriation for a startup. As with strategic benefits, the level of risk varies among CVCs, affecting the likelihood of a CVC investment relationship, particularly between firms in the same industry. Formally:

**Hypothesis 2:** Higher misappropriation risk from the corporate parent firm as indicated through perceived a) inclination and b) ability to imitate will reduce the likelihood of a CVC investment relationship between firms in the same industry.

**Balancing Risks and Benefits**

Although both strategic benefits and misappropriation risk are likely to have independent direct effects on CVC activity, they are also likely to interact. This is because startups will not make decisions based solely on any one factor, either exclusively considering benefits without regard for risks or exclusively considering risks without regard for benefits. Rather, entrepreneurs are likely to balance potential benefits and risks before engaging with a CVC. This idea is consistent with the general literature on decision-making, which shows that individuals assign values to potential gains or losses and weight each appropriately when making decisions under risk (Kahneman & Tversky, 1979). In the context of CVC, startups are likely to assign weights to potential strategic benefits and misappropriation risks before engaging with a CVC. On one hand, while a CVC may bring several strategic benefits to a startup, the risk of misappropriation will reduce the likelihood of a CVC-investment relationship at a given level of potential benefits. At the same time, startups may be willing to make tradeoffs in terms of risk in order to gain more strategic benefits. Therefore, startups will take on more risk as the potential benefits increase. Formally:

**Hypothesis 3:** Misappropriation risk will reduce the positive effects of strategic benefits from the corporate parent firm on the likelihood of a CVC investment relationship between firms in the same industry. However, this relationship will be more pronounced for CVCs providing lower strategic benefits than for CVCs providing higher strategic benefits.

**METHODS**

**Data & Sample**

Data for the study is drawn primarily from Venture Economics database, which contains comprehensive data on venture capital activity collected from surveys of portfolio companies, government filings, and the investment banking community, among other sources (Dushnitsky...
Supplemental data is drawn from multiple sources, including Compustat, Risk Metrics, industry surveys, and company and fund websites. The initial sampling frame includes all CVC deals in the U.S. between 2008 and 2012, excluding those with CVCs categorized as diversified banks or insurance companies, since the nature of those firms' investments is inconsistent with traditional CVCs (Park & Steensma, 2012). We restrict our sample to US-based ventures because of the high presence of IVCs and other financial intermediaries as alternatives to CVCs (Dushnitsky & Shaver, 2009). With more alternatives, the potential strategic benefits or misappropriation risks become more of a factor influencing the likelihood of a CVC investment relationship. Further, the U.S. is characterized by high levels of entrepreneurial activity, increasing the potential for corporations to target startups as a means of enhancing innovative outcomes (Kortum & Lerner, 2000). We limit our analysis to the five-year window from 2008 to 2012 to encourage a large sample size while simultaneously reducing the impact of cyclical activity that may confound the relationships under investigation. CVC activity has been found to be highly cyclical—it boomed during the dot-com bubble and then fell off between about 2001 and 2008, but has flourished in recent years (Ackerman, 2011; Gompers, 2002; Shane, 2010). From the initial sampling frame, we omit deals for which relevant independent variables are missing and unavailable through supplemental data sources. The final sample consists of 652 deals between 439 startups and 75 CVCs (nested within 65 unique corporate parent firms).

Variables & Measures

Dependent variable: The dependent variable, industry overlap, is the presence of industry overlap between a CVC’s corporate parent and the startup company in a given CVC deal, assessed using two-digit NAICS codes. The variable takes the value (1) if there is overlap between the corporate parent and the startup and (0) otherwise. The use of NAICS codes at the two-digit level is justified based on both theoretical and methodological reasons. First, two-digit codes are theoretically appealing because they are a conservative measure of overlap. Startups are likely to be conservative when assessing the risk associated with a potential CVC partner, tending to see any overlap at all as a potential hazard. Second, the use of two-digit codes allows for better dispersion between the values in the dependent variable than alternative coding (e.g., three-digit coding) and generates adequate sample sizes to ensure robust statistical results.

Independent variables: Independent variables include the three aspects of social capital and two components of social liability described above. In terms of social capital, we use measures that represent heuristics startups are likely to use when determining the potential strategic benefits of engaging with a corporate partner. Access to resources is assessed using the strength of the corporate parent’s network, calculated as the total number of a parent firm’s board interlocks, averaged over the five-year period, as reported in Risk Metrics. Industry insights is assessed using parent firm executives’ experience as advisors, calculated as the combined number of years that inside directors have served on the board, averaged over the five-year period, also from Risk Metrics. Endorsement potential refers to the reputational benefits of being affiliated with a particular parent firm, which may be assessed using brand strength. In practice, this is commonly done by comparing firms across business rankings, such as the Fortune 500. However, since not all corporate parents in the sample are included on a single list, we are unable to use these rankings directly. Instead, we build an inter-sample ranking by taking the average revenue for each parent firm over the five-year period and assigning a rank to each firm based on that value. The measure represents a reasonable proxy for ranking firms, since a startup examining potential corporate partners will only compare...
those corporations with active CVCs (rather than all corporations on, say, the Fortune 500) and because the sample essentially includes all active CVCs for the years under investigation, meaning that the ranking is comprehensive.

In terms of social liability, we measure both the inclination and ability of the corporate parent to imitate the startup, again using heuristics that entrepreneurs are likely to use to evaluate each. **Inclination to imitate** is assessed by using its stated preference for partners. These preferences are listed, at a broad level, in Venture Economics. For example, a CVC may state its preference to invest in “biotechnology,” “semiconductors,” or “internet specific” ventures. In order to assess overlap between this preference and the startup’s industry, we examined all startup NAICS codes and assigned any relevant codes to their respective broad category. We then create a dichotomous variable taking the value of (1) if overlap exists and (0) otherwise. **Ability to imitate** is assessed by examining the nature of the parent-CVC relationship. Specifically, while some corporate parents create subsidiaries through which to invest in startup firms, others invest directly. Direct investment makes it easier for the corporate parent to extract knowledge or other resources from the startup than investment through a subsidiary, since the startup will be forced to deal directly with the corporation in any and all interactions rather than going through a “middle man.” To account for this, we create a dichotomous variable taking the value of (1) if the corporate parent invests directly in the startup and (0) if the corporate parent invests through a subsidiary CVC.

**Control Variables:** We control for a number of variables that are likely to impact CVC activity, in general, as well as the likelihood of industry overlap in a given CVC investment relationship. First, we account for two startup characteristics that CVCs would use to select potential portfolio companies—deal criteria and startup quality. Deal criteria are accounted for through the use of Venture Economics as a primary data source, since all ventures listed in the database are vetted and considered investment grade (Dushnitsky & Shaver, 2009). The quality of the startup is assessed following the methods used by Gompers and Lerner (2000), where the variable **quality** takes the value of (1) if the startup went public or was acquired and (0) otherwise. Second, it is necessary to control for the likelihood that a CVC and startup will be aware of one another and that the CVC will be able to invest in a startup (given capital availability), since each has a constraining effect on the likelihood of a CVC investment relationship. To account for visibility, **distance** is calculated in two steps, following methods used by Dushnitsky and Shaver (2009). We first calculate two distances for each investment relationship: (a) the distance between the startup and the CVC and (b) the distance between the startup and the corporate parent. We then take the lower of the two distances and log-transform it to account for the fact that the relationship between geographic distance and transportation costs is non-linear. To account for capital availability, we include the variable **fund size**, using a five-value categorization from Venture Economics (i.e., 0-25 million, 25.1-50 million, 50.1-100 million, 100.1-250 million, and 250.1-500 million). Finally, we control for environmental characteristics effecting CVC activity in terms of the intellectual property protection (IPP) regime. IPP Regime refers to the nature and effectiveness of controls to protect intellectual property in a given industry; which may influence the likelihood that a startup will seek CVC funding. IPP varies by industry and past research has shown that it is a significant predictor of CVC activity (Dushnitsky & Shaver, 2009), making it an important control. To account for the variance in industry IPP, we follow the common practice in the literature of assessing the efficacy of patents, using manager scores of patent effectiveness by building on the Yale and Carnegie Mellon surveys on innovation (Dushnitsky & Shaver, 2009; Heeley et al., 2012). The variable **IPP rating** is dichotomous, taking the value of (1) for responses indicating weak IPP regimes and (0) for strong IPP regimes.
Results

Descriptive statistics and correlations for all variables used in the study are provided in Table 1 (N = 652). We examined the potential for multicollinearity by calculating variance inflation factors (VIFs). VIFs for all variables included in the analysis are below 7, indicating that coefficients for each analysis are interpretable and statistical tests of those coefficients are reliable.

Given the dichotomous nature of the dependent variable, we used logistic regression to examine the likelihood that industry overlap exists in a given CVC deal. We estimated three models using maximum likelihood estimation in Stata 13. We also used robust standard errors, clustering by corporate parent firm to account for the nested nature of the data. Results of the logistic regression models are summarized in Table 2, including logistic coefficients and fit statistics. Model 1 represents the baseline model, including only control variables; Model 2 adds the independent variables accounting for social capital and liabilities of the corporate parent; and Model 3 adds the interaction terms between the independent variables.

The first set of hypotheses deals with the effect of various strategic benefits (i.e., social capital) on the likelihood of overlap in a CVC investment relationship. These relationships are represented in Model 2. First, as predicted, the coefficient for access to resources is positive and statistically significant (β = 0.137, p<0.01). The corresponding odds ratio is 1.15, indicating that one additional board tie increases the odds of industry overlap in a CVC investment relationship by an average of 15%. These results provide strong support for H1a. Second, also as predicted, the coefficient for industry insights is positive and statistically significant (β = 0.036, p<0.05). The odds ratio corresponding to industry insights is 1.04, suggesting that one additional year of experience as an advisor for parent firm executives increases the odds of industry overlap in a CVC investment relationship by an average of 4%. These results provide support for H1b. Finally, the coefficient for endorsement potential is positive and statistically significant (β = 0.062, p<0.001). In this case, a positive coefficient is contrary to the prediction, since it indicates that a lower rank (e.g., moving from rank 1 to rank 2) increases the likelihood of industry overlap in an investment relationship. Specifically, the odds ratio is 1.06, indicating that, on average, moving one position lower in the rankings increases the likelihood of industry overlap by 6%. Consequently, the results provide evidence contradicting H1c. However, these results may simply be a function of the proxy used to measure endorsement potential. Since the ranking is based on revenue values, it essentially suggests that larger firms are less likely to attract startups in the same industry. However, alternative measures of brand strength may yield different results.

The second set of hypotheses relates to the effect of two aspects of misappropriation risk (i.e., social liabilities) on the likelihood of overlap in a CVC investment relationship. These relationships are also represented in Model 2. Contrary to expectations, the coefficient for inclination to imitate is not statistically significant (β = 0.346, p=0.645). Thus, the results provide no evidence to support H2a. However, the coefficient for ability to imitate is statistically significant and negative (β = -0.784, p<0.10). The odds ratio corresponding to the coefficient is 0.46, suggesting that, as compared to investment through a subsidiary CVC, direct investment from a corporate parent reduces the odds of industry overlap in a CVC relationship by an average of 54% percent. These results provide support for H2b.
The final hypothesis predicts interactive effects between social capital and social liabilities on the likelihood of industry overlap in a CVC relationship. The interactive effects between each of the independent variables are represented in Model 3. Of the five interaction terms tested, only the coefficient for the interaction between *industry insights* and *ability to imitate* is statistically significant ($\beta = -0.179$, $p<0.001$). The plot of the interaction is displayed in Figure 2 and shows that, for firms that invest through subsidiaries (i.e., low ability), the likelihood of industry overlap increases as manager experience increases. However, for parent firms that invest directly in startups (i.e., high ability), the likelihood of overlap is near zero regardless of manager experience. This suggests that managerial experience has a stronger effect when there are fewer risks associated with a potential investment partner.

Beyond the individual coefficients, it seems relevant to note that Model 3, which includes the interaction terms, provides significantly better fit than Model 2, which excludes the interaction terms $[\chi^2(6) = (-2LL_{M2}) - (-2LL_{M3}) = 800.803 - 760.958 = 39.844, p<0.001]$. Further, in terms of the r-squared values, Model 3 explains approximately 15.2% of the variance in the dependent variable, while Model 2 explains 10.7%. Therefore, while the individual interaction terms are not very significant, some degree of interaction does seem to exist between social capital and social liabilities. Overall, though, the results provide no compelling evidence for H3.

**Discussion**

This study examines the effect of corporate parent characteristics on the likelihood of a CVC investment relationship between firms in the same industry. In so doing, it addresses an important gap in the literature on CVC activity, which has typically taken either an environmental or startup firm perspective and assumed homogeneity among corporate sponsors. It draws on social capital theory to present various potential strategic benefits that comprise the social capital of CVCs as well as two aspects of the perceived risk of misappropriation comprising social liability. It argues that startups will use heuristics to judge the potential strategic benefits or misappropriation hazards based on their knowledge of the corporate parent which, in turn, impact the likelihood of a CVC investment relationship and the strength of the paradox of CVC. In this section we outline some of the major implications of the study for theory and practice. We conclude by presenting a few limitations, which inform potential areas for future research.

**Theoretical & Practical Implications**

This study makes several contributions to theory and practice. First, it represents the first systematic study of the relationship between corporate firm characteristics and the “paradox of CVC.” Although some of the benefits outlined have been identified previously, the extant literature largely treats CVCs as homogenous, ignoring how variation in corporate parent characteristics affects CVC activity. Also, while the risk of misappropriation has been suggested numerous times in the extant literature, we are not aware of any studies that directly test the effect of this risk on CVC activity. Based on the results of the study, this analysis justifies the continued use of this concept as an underlying factor for the paradox of CVC. Second, the theory outlined here demonstrates the complexity of the relationships and interrelationships between CVC firm characteristics and CVC activity, indicating the need for practitioners to develop the right “mix” of social capital and for researchers to consider multiple factors when performing future analysis on CVC-related phenomena. While not all of the relationships were supported, the paper provides a
strong theoretical discussion regarding the tradeoffs that startups are likely to make between risks and benefits when entering CVC investment relationships. Finally, given the increasing popularity of CVC as a means of stimulating interorganizational learning and innovation (Dushnitsky, 2011; Schildt et al., 2005), the study presents implications for practitioners, who may draw on its results to inform strategies to increase social capital (e.g., reputation management, implementation of particular structures or governance controls to reduce risk perceptions, etc.).

Limitations & Future Directions

Despite the potential contributions of this study, it is not without limitations. First, while it does control for startup characteristics related to the decision criteria of the CVC (i.e., investment grade and quality), the study necessarily excludes other characteristics that may impact CVC activity, such as resource dependence and defense mechanisms. These characteristics are not readily measurable through secondary data, but would be observable through primary data collection. Future research could build on this and previous studies by examining characteristics of both the corporate parent and entrepreneurial venture simultaneously, to determine how they interact. Second, the study argues that startups will be willing to make tradeoffs between risks and benefits partnering with a particular CVC, but that argument may be overly simplistic, since it assumes rationality and perfect information. Behavioral theory would suggest that individuals are not always economically rational nor is information perfectly distributed in markets. Rather, individuals are boundedly rational based on available information and cognitive biases (Cyert & March, 1963; Gavetti, 2012) and also maintain different risk propensities (Kahneman & Tversky, 1979). An interesting area for future research may therefore be to introduce behavioral theory to the present analysis, since relationship formation is based on decision-making under uncertainty. Finally, although there is justification for each measure used (i.e., based on the argument that they are likely heuristics that an entrepreneur would use to gauge the potential benefits or risks of partnering with a particular CVC), they are somewhat crude. In particular, the ranking used to assess endorsement potential may get more at firm size than brand strength. Alternative measures may actually be more relevant or aligned with the theoretical constructs of interest and may yield different results than those presented here. Future research could examine alternative measures or refine those developed here to further examine the relationships proposed in this study.

Conclusion

This study provides an alternative perspective for examining the paradox of CVC by suggesting several corporate parent characteristics that affect the likelihood of a CVC investment relationship. Results suggest the relevance of various aspects of social capital and social liability in driving CVC activity. The study therefore adds to the literature on CVC by bringing corporate parent characteristics to the forefront of empirical analysis and demonstrating complex relationships between these characteristics, which must be managed in order for corporations to attract high potential entrepreneurial partners and help them achieve their strategic goals.

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References


**Figure 1. Proposed Model**
Figure 2. Interaction between Industry Insights and Ability to Imitate

Table 1. Descriptive Statistics & Correlations

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Note: Correlations with absolute value greater than 0.077 are statistically significant at p<0.05.
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Note: †p<0.10; *p<0.05; **p<0.01; ***p<0.001