E T&P

Firm Structure and Environment as Contingencies to the Corporate Venture Capital–Parent Firm Value Relationship

Varkey K. Titus Jr.
Brian S. Anderson

Corporate venture capital (CVC) is a valuable strategic tool associated with numerous innovative outcomes. However, less is known about whether CVC investing creates value for the investing (or parent) firm. Drawing from the attention-based view and contingency theory, we suggest that an increase in firm value from CVC investing is contingent on attentional mechanisms that discipline the selection of new investment opportunities. We posit that increases in firm value associated with CVC investing accrues to firms adopting specific operational structures and operating in particular environmental contexts. We find support for our research model in a sample of 95 companies between 2000 and 2008.

Introduction

Established firms often invest in external entrepreneurial ventures—termed corporate venture capital (CVC) investing—to gain awareness of and access to promising new resources and market opportunities (Benson & Ziedonis, 2009; Maula, Keil, & Zahra, 2013). Research shows that numerous firm outcomes are associated with these investments, including improved innovative performance (Dushnitsky & Lenox, 2005a; Wadhwa, Phelps, & Kotha, 2016), strategic capability experimentation (Keil, Autio, & George, 2008), and greater awareness of technological changes (Maula et al.). The notable growth in scholarly research on CVC investments may be partially attributed to the volume of venturing behaviors undertaken by firms each year—an estimated $5.5 billion were spent on CVC investments in 2014 in the United States, comprising approximately 10.9% of all money spent in venture capital investments (MoneyTree Report, 2015).

Please send correspondence to: Varkey K. Titus Jr., tel.: 402-472-9423; e-mail: vtitusjr2@unl.edu.

Despite empirical convergence around the proposition that CVC investments can contribute to the investing, or parent, firm's innovative pursuits, less is known about the conditions under which CVC investments enhance parent firm value. The literature offers two critical insights on this issue. First, Dushnitsky and Lenox (2006) found that the total dollar amount of CVC investments increased firm value when firms made CVC investments for strategic versus purely pecuniary gain. Second, Yang, Narayanan, and De Carolis (2014) found support for a U-shaped relationship between the level of CVC investment portfolio diversification and firm value creation. Both sets of findings point to the importance of "fit" between CVC investments and firm investment orientation (i.e., strategic rather than financial goals, focused investment portfolios that emphasize options logic, or diversified portfolios that emphasize net present value logic). Yet while CVC units reside within larger organizational contexts (Souitaris, Zerbinati, & Liu, 2012), and organizations themselves reside within larger environmental contexts, it is unclear how these contexts influence a firm's ability to derive value from their CVC investments. Scholars have long linked the efficacy of entrepreneurial strategies to organizational structure (e.g., Green, Covin, & Slevin, 2008; Rind, 1981), and environmental exigencies (e.g., Covin & Slevin, 1989), making the omission of these contingencies a notable gap in the venturing literature.

Broadly, we address the following research question: When are CVC investments associated with parent firm value creation? We explore two specific contingencies—one structural (internal to the firm) and the other environmental (external to the firm)—that create the conditions that facilitate the relationship between CVC investment and firm value. Drawing from the attention-based view (ABV; Ocasio, 1997, 2011), we conceptualize CVC investing as a strategic focus of managerial attention, pursued under the premise of "scanning the environment for novel technologies that either threaten or complement core businesses" (Dushnitsky & Lenox, 2006, p. 756). While this focus prompts action, it does not necessarily translate to improvement in firm value. We therefore supplement ABV with contingency theory (Drazin & Van de Ven, 1985), which has a tradition of linking the effectiveness of organizational action to specific structural and environmental conditions (Van de Ven, Ganco, & Hinings, 2013). We posit that increasing firm value from CVC investing activity is contingent on the presence of two specific attentional factors, which we refer to as attentional coherence mechanisms. Specifically, we suggest that attention to CVC investing per se does not materially increase firm value. Instead, CVC investing in the presence of two attentional coherence mechanisms facilitates investing in those CVC investment opportunities with the greatest potential strategic benefit, and hence value creation, for the investing firm.

In a 9-year panel of firms across 12 industries, we find an increase in value among those firms actively engaged in CVC investments with a concentrated operational structure and when operating in less munificent environments. Operational structure and environmental munificence are theoretically linked because they serve as bounds on managerial attention—one due to the nature of a firm's structure and the other due to the number of opportunities that may command managerial focus. Moreover, we find that a specific gestalt of the three factors together—CVC investments among firms with a concentrated operational structure and when operating in less munificent environments—result in the most significant increase in firm value. This three-way interaction is valuable because "elements of strategy, structure and environment often coalesce or configure into a manageable number of common, predictively useful types that describe a large proportion of high-performing organizations" (Miller, 1986, pp. 235–236). Our study extends the CVC conversation in a number of important ways.

Our first contribution is providing new understanding regarding the boundary conditions on a firm's ability to build firm value from its CVC investments. Prior research indicates that firm value creation is an appropriate focal-dependent variable for CVC research (Dushnitsky & Lenox, 2006; Yang et al., 2014), particularly given that firm value captures investor's current assessment, and more importantly their future expectation, of management's ability to create value from strategic actions (Brush, Bromiley, & Hendrickx, 2000). In consideration of the billions spent annually in CVC investments, whether investors perceive that such investments create firm value is a critical issue (Yang et al.). We add to this conversation by evaluating how elements of structure and environment influence the CVC investment–firm value relationship.

As noted by Narayanan, Yang, and Zahra (2009), the lack of theoretical grounding in the corporate venturing literature stymies researchers' ability to build from prior work and to contribute to issues of broad interest to strategic management and entrepreneurship scholars. A second contribution of this research is therefore to integrate attention theory and contingency theory to the venturing literature. We use these theories to explain why two specific contextual factors—one endogenous to the firm and one exogenous—function as attentional coherence mechanisms focusing managerial attention on those venturing opportunities of greatest potential strategic benefit, and hence create the situated attentional conditions for value creation from CVC investing.

Finally, as explained by Ocasio (1997, p. 202), "[a]n attention based view of the firm implies that the ability of the firm to adapt successfully to a changing environment is conditional on whether the firm's procedural and communication channels focus the attention of organizational decision makers on an appropriate set of issues and answers." Yet, as discussed by Ocasio (2011), scholars are just beginning to identify those attentional structures that translate behaviors into meaningful performance outcomes. We contribute to this conversation by supplementing the ABV literature with contingency theory, thereby providing a theoretical rationale for why the CVC investment–firm value relationship materializes under specific conditions. The third contribution of this paper then is to the ABV literature directly, positing that the joint consideration of concentration within the firm's operational structure and the firm's task environment creates the conditions under which attention-driven behavior stimulates performance gains.

Theoretical Development

The ABV, Contingency Theory, and CVC Investing

We ground our research model in the ABV, which posits that firm behavior is a function of what managers pay attention to and the contextual factors influencing attentional focus (Ocasio, 1997, 2011). The concept of attentional focus suggests that there is a limited number of issues managers focus on at any given time, and what managers focus on influences their actions (Simon, 1947). We posit that CVC investing is one of many strategic decisions competing for the limited attention of senior decision makers. Firms undertake CVC investments typically for strategic versus pecuniary reasons (Dushnitsky & Lenox, 2006), such as exploring new market opportunities (Wadhwa et al., 2016). For example, CVC investing provides access to new technologies (Allen & Hevert, 2007), allows the investing firm to explore promising but largely uncertain opportunities (Keil, Autio, et al., 2008), and facilities new inter-firm resource combinations while reducing strategic risk (Basu, Phelps, & Kotha, 2011).

However, as one of a myriad of corporate strategic choices, there is little *a priori* reason to predict that CVC investing is in and of itself a meaningful driver of firm value. As noted by Hitt, Ireland, Camp, and Sexton (2001), value creation from entrepreneurial activity is partially a function of the activity aligning with a firm's strategy—that is, whether the activity is *strategically* entrepreneurial. This point is particularly salient when one considers the high-variance and experimental nature of CVC investing (e.g., Keil, Autio, et al., 2008). While engaging in CVC investments implies managerial attention directed toward the activity, it does not imply that *effectiveness* necessarily follows; attention does not necessarily equate to success. This is consistent with contingency theory's notion that there is no "one best way" absent consideration of context (Lawrence & Lorsch, 1967). Thus, we must examine possible contingencies that promote fit between CVC investments and the larger organizational and environmental context, with fit defined here as the alignment of the strategic action with relevant contextual factors that accomplish managerial objectives. We therefore supplement ABV with contingency theory to theorize the structural and environmental contingencies wherein CVC investments create firm value.

Contingency theory posits that "...performance outcomes of an organizational unit are a result of the fit between the unit's external context and internal arrangement" (Van de Ven et al., 2013, p. 394). Within the context of the ABV literature, contingency theory offers insight regarding how a particular decision fits within the broader organizational context and for predicting the performance implication of that decision (Cho & Hambrick, 2006). Under the rubric of attentional perspective (Ocasio, 2011), the firm's institutional, economic, and social structures—both within and outside of the firm's boundaries—shape organizational attention, which in turn drives firm behavior. These exogenous and endogenous attention structures "regulate ... the interests and identities that guide decision-makers' actions and interpretation" (Ocasio, 1997, p. 195). This suggests that from the ABV and contingency perspectives, the context surrounding a decision is particularly salient to the outcome of that decision (Ocasio, 1997; Tosi & Slocum, 1984). We therefore focus on the attention structures conceptually likely to influence the value-creating potential of CVC investing—that is, to improve fit between strategy and context.

The Contingent Effect of Operational Concentration

The decision-making context frames managerial focus and attention (Nadkarni & Barr, 2008), and selectivity of managerial attention in consideration of contextual exigencies contributes to the performance outcomes of a given strategic decision (Garg, Walters, & Priem, 2003). To explore value creation for parent firms from CVC investments, we must therefore explicitly account for the contextual structural factors that facilitate conditions under which decision makers are more likely to make a value-producing decision (Garg et al.).

A firm's internal structure produces important and changeable data that vie for the time and attention of senior management (Garg et al., 2003). To that end, we focus on operational structure, defined as the extent to which a firm is more managerially concentrated or more diffuse in its business segment reporting structure. Firms with a concentrated operational structure centralize strategic decision-making authority among as few executives as it deems necessary (Burns & Stalker, 1961). Conversely, firms with a more diffuse operational structure delegate certain strategic decision-making authority to lower level executives operationally accountable for a specific segment of the firm's business

(Chandler, 1991). Operational structure does not capture the firm's specific organizational structure in terms of communication diffusion (Burns & Stalker). Rather, operational structure reflects how the firm has organized its business segments in terms of decision-making authority and are delineable by the extent to which the senior most executive is involved with the development of business unit strategy (Bartlett & Ghoshal, 1993; Galunic & Eisenhardt, 2001).

Senior executives in operationally concentrated firms are more likely to be involved in crafting business strategy below the corporate level (Chandler, 1991; Joseph & Ocasio, 2012), while operationally diffuse firms tend to have greater strategic decision-making decentralization (Donaldson, 1987). In operationally concentrated firms, senior executives have greater awareness of the strategic challenges facing their lower level businesses, and are more apt to direct organizational resources to capture emerging opportunities (Eisenmann & Bower, 2000). This attentional focus is a critical factor in value creation from CVC investing. The executive making the CVC investment decision is more aware of how such investments fit within the firm's broader strategic focus, and as such, the investment is more likely to create material new value for the firm (Basu et al., 2011).

We argue that operational structure is an attentional mechanism framing the interests and identities most salient to firm action (Ocasio, 1997). The more operationally concentrated the firm, the tighter the bounds on perceived opportunities, allowing decision makers to focus their attention on CVC activities that align with the firm's strategic objectives; hence, the greater the likelihood that CVC activity yields improvement in the firm's value. This broadly aligns with Hashai's (2015) assertion that managers make more effective decisions when they focus their attention on fewer product categories, rather than split among multiple categories. A study by Laureiro-Martínez, Brusoni, Canessa, and Zollo (2015) indicates that exploratory activities—which is how CVC investments are typically conceptualized (Schildt, Maula, & Keil, 2005)—may benefit from mechanisms that promote attentional control. Further, our argument is similar to Barnett's (2008) premise that the more internally focused an organization's attention structures, the more likely the organization will notice new opportunities congruent with the firm's current activities. The strategic purpose that focuses a firm's entrepreneurial initiatives relates to a strategically coherent portfolio of venturing activities that shares valuable linkages with the firm's existing operations, thereby increasing firm value (Van Doorn, Jansen, Van den Bosch, & Volberda, 2013). Hence:

Hypothesis 1: Increasing operational concentration strengthens the relationship between CVC investments and parent firm value.

The Contingent Effect of Environmental Munificence

Attentional structures exist both inside and outside of the firm's boundaries (Ocasio, 1997, 2011). For example, Nadkarni and Barr (2008) explored the role of industry context on managerial attentional focus, finding that firms in high-velocity industries focused greater attention on the competitive forces within the firm's specific task environment than firms in stable industries. Similarly, Kabanoff and Brown (2008) found that varying degrees of environmental munificence and environmental dynamism shifted managerial attention toward specific strategic typologies.

We focus here on environmental munificence, which is the extent to which the firm's task environment supports sustained growth with adequate resource availability (Dess & Beard, 1984). In contrast, less munificent environments are hostile, and firm growth largely

comes at the expense of rivals' market share and by aggressively entering new product-market domains (Rosenbusch, Brinckmann, & Bausch, 2011). Low-munificence environments heighten the need for careful deployment of organizational resources, as both the risk and the reward represented by a given option are elevated (Sirmon, Hitt, & Ireland, 2007). While there is some debate in the literature (e.g., Sahaym, Steensma, & Barden, 2010), operating in less munificent environments generally encourages entrepreneurial action (Covin & Slevin, 1989); a low-munificence environment corresponds to resource scarcity, which increases competitive pressure and spurs the entrepreneurial impetus (Castrogiovanni, 1991). Regarding CVC investments in particular, Basu et al. (2011) found that an industry's competitive intensity related positively to the quantity of CVC partnerships formed.

Concurrent with the observation of Covin and Slevin (1989) that firms operating in less munificent environments perform better as a result of their strategic entrepreneurial actions, we posit a similar contingent effect of CVC investing on firm value among firms in similar operating environments. Given the broad competitive impetus toward pursuing new entrepreneurial initiatives as munificence declines, we posit that less munificent environments frame managerial attention toward opportunities that the market perceives as valuable (Park & Mezias, 2005). As munificence decreases, the options for new growth and profitability deteriorate with the constriction of surplus resources and the general decline in extant opportunities (Dess & Beard, 1984). Thus, intra-industry competition increases (Keats & Hitt, 1988) and concomitant with the increase in competition is an increase in failure likelihood (Castrogiovanni, 1991). Hence, while the entrepreneurial impetus increases, so do the consequences for making a strategic mistake (Wiklund & Shepherd, 2011).

We posit that among firms actively engaged in CVC investments, low munificence creates a context of disciplined CVC investing, facilitating investment in those opportunities with the highest value-creation potential. Firms in more munificent environments "may be able to stumble along" without a clear attentional focus because environmental demands are modest and the consequences of a misstep are distal (Inkpen & Choudhury, 1995, p. 320). In resource-constrained environments, however, the context necessarily focuses managerial attention on those strategic investment opportunities that not only represent opportunities for new growth but also improve the firm's competitive positioning vis-à-vis its rivals. Further, the low-munificence context may signal management's long-term commitment to its CVC strategy (e.g., Park & Mezias, 2005). Operating in a low-munificence environment disciplines CVC investing activity toward those opportunities of the greatest potential strategic value, and hence create a favorable condition to improve the firm's broader value from its CVC investments. Thus:

Hypothesis 2: Decreasing environmental munificence strengthens the relationship between CVC investments and parent firm value.

Attentional Coherence

The preceding articulated the influence of a concentrated operational structure and low environmental munificence on the value-creating potential of CVC investments. Taken together, we suggest that these two factors act to jointly focus managerial attention—which we refer to as attentional coherence—on those CVC investments that represent strategic opportunities with the most probable benefit for the firm. In this section, we discuss why attentional coherence creates the conditions under which CVC investments most increase firm value. We propose that the gestalt of CVC investment, operational

concentration, and low environmental munificence are most likely to contribute to a firm's ability to create value from their CVC activities.

Operational structure and environmental munificence function as attentional structures that jointly facilitate attention toward opportunities that fit within a firm's overall strategic focus. Managers of operationally concentrated firms focus on CVC investments most closely related to the firm's core businesses. Further, when operationally concentrated firms operate in less munificent environments, managers are even more disciplined in their investing activity, spurred on by the impetus to seek new avenues for growth in a constrained market and to improve their competitive position (Covin & Slevin, 1989). As such, we expect operationally concentrated firms to create greater value from their external venturing strategies when they operate in resource-constrained (low-munificence) environments.

The lack of readily available resources and the consequences of a strategic mistake in low-munificence environments elevate the need for CVC investments to align with an organization's core businesses to improve firm value (Rawley, 2010). While firms in less munificent environments may be more likely to make CVC investments in general (Basu et al., 2011), a concentrated operational structure in less munificent environments further focuses managerial attention to CVC activity in such a way as to direct attention toward pursuing those CVC investments most complementary to the firm's existing operations. As poorly focused strategic actions can be detrimental to firms in low-munificence environments (Inkpen & Choudhury, 1995), operational concentration works in conjunction to best focus attention on those investment opportunities with the strongest overall fit with the firm's strategy.

In short, an environment of dispersed attention with many growth opportunities (e.g., operationally dispersed and high levels of environmental munificence) may yield a portfolio of dispersed CVC investments without clear strategic fit, while an environment of focused attention and limited growth opportunities (e.g., operationally concentrated and low levels of environmental munificence) encourages focused investments with tighter strategic fit. This joint, multiplicative effect between the firm's structure and environment creates the conditions under which CVC investments are most likely to significantly improve firm value. Stated formally:

Hypothesis 3: There is a three-way interaction effect between CVC investments, operational structure, and environmental munificence on parent firm value such that parent firm value increases most among firms with extensive CVC investments, that are operationally concentrated, and that operate in less munificent environments.

Research Design

Sample

We used Thomson Financial's Securities Data Company Platinum and VentureXpert databases, along with the North American Fundamentals Annuals and Historical Segments databases from COMPUSTAT to construct a panel of U.S. publicly traded firms making CVC investments in three broadly defined industries: information and communication technologies, chemicals, and medical and laboratory equipment from 2000 to 2008.[1] We restricted the sample to U.S. firms because CVC investments may entail different motivations internationally (Winters & Murfin, 1988). We chose our focal industries

---

1. The three-digit SIC codes for these industries are—ICT: 357, 366, 367, and 737; chemicals: 281, 282, 283, 286, 287, and 289; medical and laboratory equipment: 384 and 382.

because CVC activity is relatively common across industry participants and is consistent with comparable studies on CVC investments (Keil, Maula, Schildt, & Zahra, 2008; van de Vrande, Vanhaverbeke, & Duysters, 2009). Accounting for missing data on the focal variables, the final sample contained 406 firm-year observations from 95 companies. Table 1 contains the summary statistics and correlation matrix for our final sample.

Dependent Variable—Firm Value (Tobin's Q)

We measured firm value using Tobin's Q, which is a ratio of the firm's market value to the replacement cost of the firm's assets, and it is a frequently used proxy for firm value in the relevant literature (Li & Tallman, 2011). A Tobin's Q of 1.0 suggests that investors assess the company's value to be equal to its assets; investors see no value added by the firm's managers over and above that of the firm's resources. A ratio below 1.0 indicates that investors view managers as enacting strategies that are below the replacement value of the firm's underlying assets. A Tobin's Q value above 1.0 suggests overvaluation such that investors view managers as pursuing strategies that extract inordinate value from firm assets; a higher Tobin's Q indicates that investors view managers as making profitable investments with firm resources (Brush et al., 2000).

We chose Tobin's Q over other performance metrics for three reasons. Tobin's Q incorporates investors' valuation of the firm's future cash flows at time t, and is thus a forward-looking assessment of the firm's growth prospects accounting for its strategic behaviors at $t-1$, enhancing causal adjacency and minimizing serial correlation (Lang & Stulz, 1994). Building from the preceding, Tobin's Q implicitly accounts for both pecuniary and strategic performance accruing from CVC investing, increasing the salience of our findings, particularly in publicly traded firms where market valuation is a critical performance metric (Bettis & Prahalad, 1983). Last, Tobin's Q incorporates idiosyncratic strategic risk, facilitating comparisons across firms while being robust against accounting manipulations (Dushnitsky & Lenox, 2006).

We calculated Tobin's Q following Chung and Pruitt (1994) as Q = (MVE + PS + DEBT)/TA, where MVE is the firm's market value; PS is the liquidating value of its preferred stock; DEBT is the sum of its short-term liabilities and book value of long-term debt, less short-term assets; and TA is the book value of the firm's total assets. As with all our focal variables, we assessed for skewness and kurtosis, and winsorized to the ninety-ninth and/or first percentile, as appropriate (Wooldridge, 2010).

Independent Variables

CVC Investments. We measured CVC investments as the count by firm year of all minority equity investments by established firms in new ventures. Count measures have been used in CVC research (e.g., Keil, Maula, et al., 2008), as well as in similar literatures, such as acquisitions (e.g., Gamache, McNamara, Mannor, & Johnson, 2014). As with all predictor variables, we standardized the measure to facilitate interpretation. In analysis not presented here but available from the authors, we plotted the sample mean values of CVC investment activity and the sample mean value of Tobin's Q and found that CVC investments only loosely track firm value.

Operational Structure. We measured operational structure using a modified Herfindahl index. Frequently used as a market-share metric, scholars increasingly use the index to

Table 1

Summary Statistics and Correlation Matrix[†]

	Mean	Std. Dev.	Min	Max	1	2	3	4	5	6	7	8	9	10	11
1. Firm value	3.03	2.60	0.36	20.17											
2. Industry Q	2.83	1.16	0.70	13.90	0.32										
3. Env. dynamism	0.21	0.11	0.02	0.54	-8	-0.13									
4. Total sales	15,005.03	19,893.41	2.69	10,4286	-0.19	-0.10	0.19								
5. ROA	0.01	0.30	-3.85	0.31	0.10	0.05	0.03	0.15							
6. Sales growth rate	0.22	0.61	-0.57	5.56	0.30	0.12	0.04	-0.13	0.03						
7. R&D intensity	0.17	0.20	0.00	2.00	0.17	0.06	0.04	-0.28	-0.17	0.17					
8. Debt/equity ratio	0.27	1.09	-8.13	7.83	-0.12	0.02	0.02	0.05	0.04	-0.03	-0.26				
9. Financial slack	3,400.17	6,311.24	-3,3780	55,597	0.03	-0.02	0.24	0.45	0.16	-0.09	-0.05	-0.05			
10. CVC investments	3.71	12.00	0.00	189	0.08	0.05	0.03	0.17	0.08	-0.01	-0.04	-0.02	0.22		
11. Op. structure	0.64	0.31	0.16	1.00	0.25	0.05	-0.10	-0.42	-0.17	0.18	0.34	-0.10	-0.19	-0.03	
12. Env. munificence	32,085.28	19,198.89	-3,209	88,912	-0.04	0.20	0.06	0.13	0.02	-0.02	0.14	0.02	0.01	0.01	0.07

N = 406; Number of firms: 95.

[†]Nonindustry-adjusted, standardized, or transformed measures. Sales in millions. Correlations ±0.10 and greater significant at a minimum $p < .05$ level.

measure within-firm concentrations of product portfolios or firm operations (e.g., Acar & Sankaran, 1999; Danzon, Nicholson, & Pereira, 2005; Henderson & Cockburn, 1996). Just as market share reflects the concentration of an industry, so too does business segment sales reflect the concentration of a firm's operations. We measured operational structure using sales data for each business segment reported for each firm in each year of the study period.

It is important to discuss operational structure in the continuum context offered here and its relationship to a more classical diversification conceptualization (Robins & Wiersema, 2003). Before 1998, all publicly traded firms were required to report each industry in which the firm generated 10% or greater of its gross revenue. Such data formed the basis of the entropy and concentric indices popular in diversification research (Robins & Wiersema). Following the implementation of rule SFAS N.131 by the U.S. SEC in 1997, however, firms were required to report each *business segment* from which the firm generated 10% or more of its gross revenue, or that which comprised 10% or more of the firm's total assets.[2]

Under the rule change, a firm could organize its business segments according to industry, to market, to geography, or some mixture thereof, and could restructure those business segments at any time and as it saw fit.[3] Thus, under current accounting standards, it is not possible to delineate firm diversification along industry lines, as was historically the case. However, reported business segments reflect how the firm has structured its operations along the lines of independent profit and loss responsibilities and hence strategic control (Kumar, 2009). As such, we label the construct as operational structure, conceptualized along a continuum ranging from operationally concentrated on the high end, to operationally diffuse on the low.

To construct the variable for firm i at time t, we divided the amount of each reported business segment sales by the firm's gross revenue and then squared and summed the resulting values (Acar & Sankaran, 1999). Higher values indicate higher concentration of the firm's operations, while lower values reflect a diffuse operational structure.[4]

---

2. Quoting directly from the rule text, the Securities and Exchange Commission (SEC) defines a business segment as a within-firm operational entity that: "a) Engages in activities from which it may earn revenues and incur expenses (including revenues and expenses relating to transactions with other components of the same business); b) Whose operating results are regularly reviewed by the enterprise's 'chief operating decision maker' to make decisions about resources to be allocated to the segment and assess its performance; and c) For which discrete financial information is available."

3. For example, according to their 2008 10-K annual report, Wal-Mart Stores, Inc. organized their business segments along functional, market, and geographic lines: U.S. Discount Stores, U.S. Superstores, U.S. Neighborhood Markets, U.S. Sam's Clubs, and All International Units. In contrast, in 2003 Wal-Mart Stores had only three business segments all of which had the same industry participation as in 2008 but were operationally consolidated: Wal-Mart Stores (U.S. discount, supercenter, and neighborhood market stores), Sam's Club, and International.

4. As a validity check for our operational structure operationalization, we constructed a venture-level Industry Overlap variable on the assumption that operationally concentrated firms would tend to focus their CVC investment activity in industries that closely relate to their core business. In a procedure similar to that of Yang et al. (2014), using keyword analysis, we matched the four-digit industry code for each CVC investment reported in the VentureXpert database to the SIC code of the investing firm. (Note that the industry code reported in VentureXpert is a proprietary code from the database vendor, and does not necessarily follow the SIC convention, necessitating keyword analysis.) For each venture-investor pair appearing the data, we coded the variable as 4 if all four digits of the two industry codes matched, as 3 if three digits matched, and as 0 if two or fewer digits matched. We then averaged this value for each firm-year observation. We found a strong, positive correlation between our industry overlap variable and the firm's operational structure ($r = .23$, $p < .001$), suggesting that consistent with our conceptualization, operational concentration functions as a disciplining mechanism focusing CVC investment activity on opportunities closely related to parent firm's operations.

Environmental Munificence. We measured environmental munificence as the 5-year average growth in net industry sales (Keats & Hitt, 1988). To calculate our munificence measure, we used year variables as predictors with net industry sales for each industry at the two-digit SIC level as the dependent variable in a regression analysis with the following form: $y_t = b_0 + b_1 t + e_t$, where y = industry sales, t = year, and e = the residual. Consistent with Bergh and Lawless (1998), we used 5 years of data for each regression (e.g., 2002–2006 data predicted munificence in 2007). We used the regression slope coefficient to measure environmental munificence, which represents the average growth rate over the period with higher values indicating more munificent environments (Heeley, King, & Covin, 2006).

Control Variables

We employed nine control variables in our analysis. We first included *environmental dynamism*, or the extent to which the firm's task environment changes at an unpredictable rate, as environmental dynamism often correlates with corporate entrepreneurial strategy (Ireland, Covin, & Kuratko, 2009). We followed the procedure outlined by Keats and Hitt (1988) by averaging the standard errors of the slope coefficients from the equations used to calculate the environmental munificence variable. Higher standard errors reflect higher variance in industry returns and are therefore a proxy for uncertainty in industry profitability. As a further control for industry factors, following Dushnitsky and Lenox (2006) and Yang et al. (2014), we calculated and included the mean level of Tobin's Q for each industry (*industry Q*) in the sample.

We controlled for *firm size* using the firm's log transformed gross revenue, and we included two *performance* controls—return on assets and sales growth rate—to better isolate the value creation effect of CVC investments (Tong & Li, 2011). We further controlled for other known elements of a firm's entrepreneurial strategy at the corporate level—*research and development intensity* (R&D/sales), *firm leverage* (debt/equity ratio), and *financial slack* (current assets-current liabilities; Bradley, Aldrich, Shepherd, & Wiklund, 2011). As Benson and Ziedonis (2009) noted, a firm's innovation strategy may influence its use of CVC investments as a strategic mechanism.

Analysis and Results

Model Specification

We express our research model using the following equation:

$$
\begin{aligned}
Firm\,Value_{it} = {} & \alpha + \beta_1 CVC_{it} + \beta_2 OS_{it} + \beta_3 EM_{it} + \beta_4 CVC \times OS_{it} \\
& + \beta_5 CVC \times EM_{it} + \beta_6 OS \times EM_{it} + \beta_7 CVC \times OS \times EM_{it} \qquad (1) \\
& + \Lambda X_{it} + \delta_i + \gamma_t + \varepsilon_{it}
\end{aligned}
$$

In equation (1), we predict firm value for firm i at time t in a time-series cross-sectional model where CVC = CVC investments, OS = operational structure, and EM = environmental munificence. Please note that equation (1) also includes all possible lower order interactions to test our three-way interaction model (see Cohen, Cohen, West, & Aiken, 2003). In equation (1), X is a vector of our control variables with coefficient estimates Λ, δ is a firm-level fixed effect, γ is a year fixed effect, and ε is the residual term.

Table 2

Time-Series Cross-Sectional Model Results (DV: Firm Value)[†]

	Model 1		Model 2		Model 3		Model 4	
	β	S.E.	β	S.E.	β	S.E.	β	S.E.
Industry Q	0.400	(0.262)	0.248	(0.167)	0.230	(0.166)	0.225	(0.154)
Env. dynamism	−0.252	(0.234)	−0.496	(0.284)	−0.572*	(0.273)	−0.456	(0.261)
Total sales	−4.332***	(1.200)	−4.383***	(1.081)	−4.202***	(1.115)	−4.368***	(1.090)
Return on equity	1.871	(1.425)	−1.105	(1.555)	−1.174	(1.555)	−1.029	(1.474)
Sales growth rate	0.769	(0.541)	0.853	(0.542)	0.802	(0.539)	0.816	(0.512)
R&D intensity	−15.789***	(4.523)	−19.445***	(4.657)	−19.655***	(4.759)	−18.977***	(4.856)
Debt/equity ratio	0.152	(0.289)	−0.043	(0.323)	−0.066	(0.347)	−0.050	(0.350)
Financial slack	−0.058	(0.067)	−0.080	(0.059)	−0.079	(0.059)	−0.079	(0.064)
CVC investments			0.037	(0.080)	0.100	(0.066)	0.071	(0.045)
Op. structure			0.262	(0.258)	0.139	(0.248)	0.131	(0.248)
Env. munificence			−0.824**	(0.312)	−0.598*	(0.298)	−0.986*	(0.378)
CVC × OS					0.339**	(0.101)	0.200*	(0.084)
CVC × EM					−0.342*	(0.170)	−0.500**	(0.153)
OS × EM							−0.602**	(0.208)
CVC × OS × EM							−0.292*	(0.129)
Constant	5.148***	(1.321)	5.734***	(0.970)	5.741***	(0.989)	5.747***	(0.960)
Firm fixed effect	Yes		Yes		Yes		Yes	
Year fixed effect	Yes		Yes		Yes		Yes	
$R^2_{(Within)}$	0.443		0.504		0.535		0.566	
$R^2_{(Between)}$	0.026		0.024		0.024		0.018	
$R^2_{(Overall)}$	0.087		0.081		0.090		0.075	
$F_{(Model)}$	14.89***		10.42***		13.64***		10.35***	

*$p < .05$; **$p < .01$; ***$p < .001$.
N = 406; number of firms: 95.
[†]Year dummies omitted for parsimony. Standard errors beside coefficients in parentheses. CVC = corporate venture capital; OD = operational structure; EM = environmental munificence.

A significant Hausman test statistic suggested that a fixed effect specification was preferred over a random effect specification to control for unobserved heterogeneity (Wooldridge, 2010). Employing a firm-level fixed effect effectively accounts for omitted firm-level variables that may confound the relationship between CVC investing and firm value (Antonakis, Bendahan, Jacquart, & Lalive, 2010). The firm-level fixed effect would also account for idiosyncratic responses to industry-specific shocks, rendering industry adjustment of the focal variables unnecessary. We further included a year fixed effect to control for unobserved variance in firm value as a function of time (Gompers, Kovner, Lerner, & Scharfstein, 2008), and to control for contemporaneous correlation (Certo & Semadeni, 2006). We report all results using clustered standard errors and estimated all models using Stata 13.1 (StataCorp., 2013).

Hypotheses Tests

We present our hypothesis test results in Table 2, following Cohen et al. (2003) to build equation (1) cumulatively. Model 1 includes just the control variables, Model 2

Figure 1

Interaction of CVC Investments and Operational Concentration on Firm Value (With 95% CI)
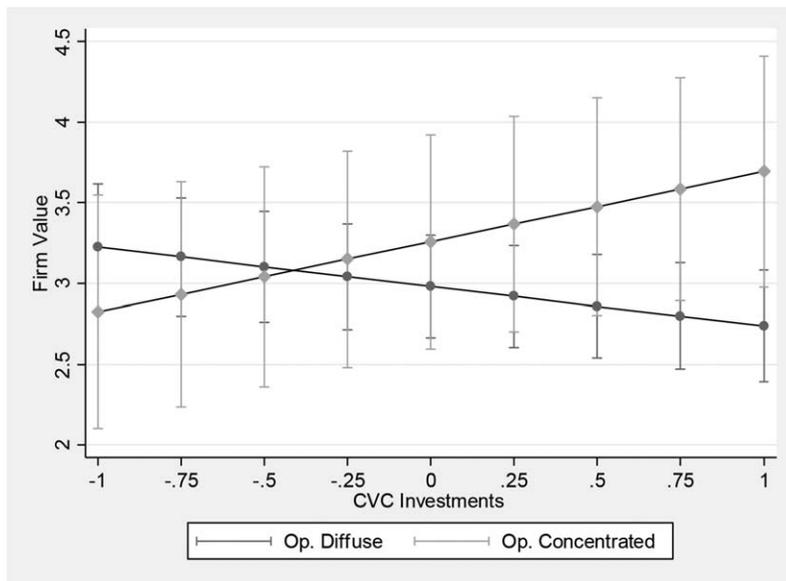
presents the main effect of CVC investments on firm value, Model 3 tests our two hypothesized two-way interactions with the three-way interaction absent, and Model 4 tests the full research model specified in equation (1). We report the log likelihood value to show improvement (decreasing log likelihood value) in model fit as we progress across the models.

As expected, we found no support for the main effect of CVC investments on parent firm value ($\beta = 0.046$, $p > .1$; all test statistics two tailed) in Model 2. Also as expected, we found support for our two, two-way contingency effects on the CVC investments–parent firm value relationship. The positive coefficient for the interaction between CVC investments and operational structure suggests that as hypothesized, parent firm value increases when operationally concentrated firms make CVC investments ($\beta = 0.337$, $p < .01$). Plotting this relationship in Figure 1 with a range of values between ±1 standard deviation (SD) of CVC investments and operational structure (see Cohen et al., 2003) and including a 95% confidence interval (CI) band shows a distinct improvement in firm value for active CVC investing and operational concentration. We evaluated the interaction further by estimating the average marginal effect of CVC investing on firm value across a range of operational structure values in Figure 2 (see Williams, 2012), again including a 95% CI band. Figure 2 corroborates our initial support for hypothesis 1, with the range of a significant interaction effect falling in any area where the CI band does not contain zero.

We found initial support for hypothesis 2, although further investigation suggests a more nuanced relationship among CVC investing, environmental munificence, and parent firm value. In Model 3, the focal interaction term was negative and significant, as expected ($\beta = -0.372$, $p < .05$). However, plotting the interaction effect and calculating

Figure 2

Average Marginal Effect of CVC Investments on Firm Value Across Level of Operational Concentration (With 95% CI)
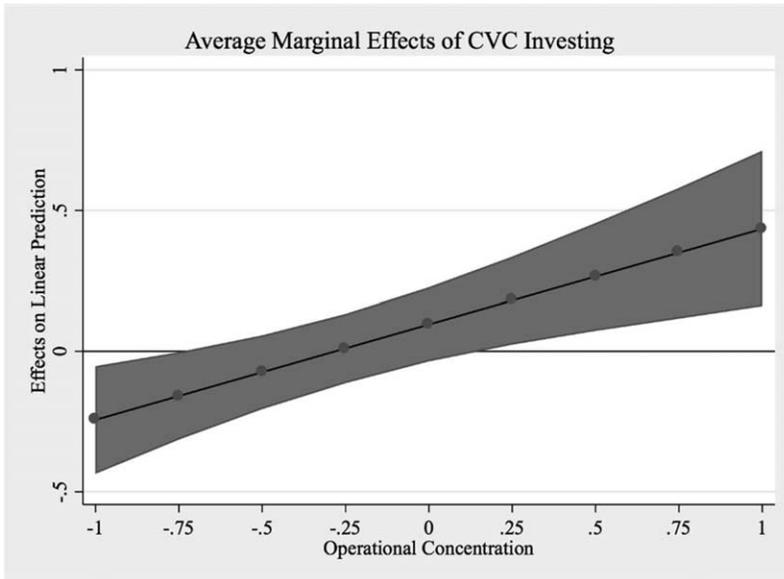
the average marginal effect, shown in Figures 3 and 4, respectively, suggest a weaker positive effect on parent firm value from CVC investments made by firms operating in less munificent environments. However, we did observe a significant weakening in firm value when firms made CVC investments in munificent environments—a finding we will address in greater detail in the discussion section.

Last, we find support for the three-way interaction proposed in hypothesis 3 ($\beta = -0.285$, $p < .05$). Because of the complexity interpreting three-way interactions from the coefficient estimates alone, we plotted the results in Figure 5 showing the relationship between CVC investment and firm value at different combinations of ± 1 SD of CVC investments, operational structure, and environmental munificence. As hypothesized, we observed an increase in parent firm value among firms making CVC investments, that are operationally concentrated, and that operate in less munificent environments. The CVC investment–parent firm value relationship is thus particularly contingent on the presence of mechanisms focusing managerial attention on strategically valuable investments. Further, and as reported in Table 3, we find substantial support for our preceding interpretation from simple slope comparisons testing for significant differences across all possible configurations.

Robustness Analysis

Given that we selected the sample industries based on an *a priori* expectation that constituent firms were more likely to make CVC investments, there is the possibility that

Figure 3

Interaction of CVC Investments and Environmental Munificence on Firm Value (With 95% CI)
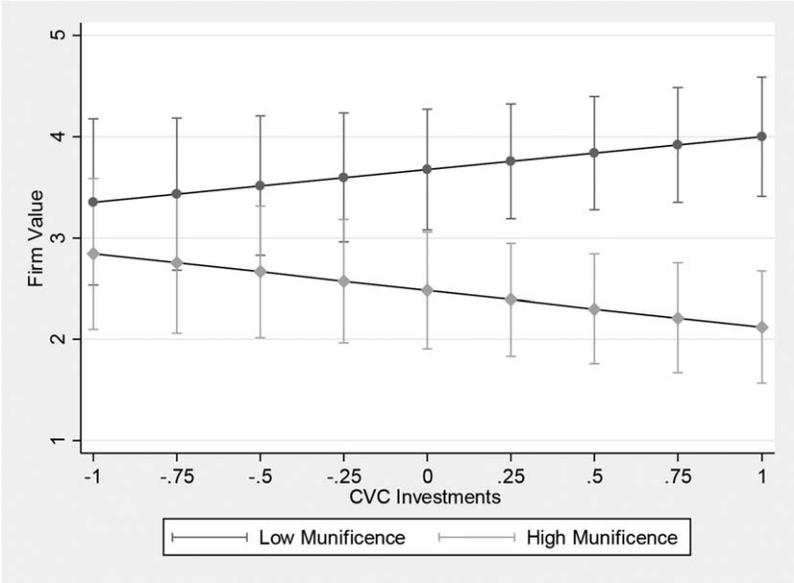
sample selection bias may be artificially inflating the parameter estimates of our focal research model. The censoring of firms in the sample based on their actual engagement in CVC activity exacerbates this possibility. To address this concern, we followed the Heckman (1979) selection methodology and constructed an inverse Mills ratio selecting on the basis whether Firm$_i$ in Year$_t$ made a CVC investment for all publicly traded firms within our sampled industries, with total employees, total cash, total assets, and net income as exclusion restrictions. Estimating each focal model while including the inverse Mills ratio and correcting the standard errors revealed no material change in the sign or significance of our reported results.

We next employed a two-stage least squares (2SLS) procedure to evaluate whether CVC investments correlated with the equation disturbance term. Our fixed effect specification should largely address concerns over unobserved variance influencing model results (see Antonakis et al., 2010). However, there is a possibility of endogeneity arising from other sources that pose a concern, including simultaneity between Tobin's Q and CVC investments. Importantly, if we can empirically rule-out endogeneity within the direct effect, there is no necessity—particularly given the potential for a spurious Type II error (see Semadeni, Withers, & Certo, 2014)—to estimate a 2SLS model with instruments for the interaction terms. We used as instruments for CVC investments the firm's capital intensity (property, plant, and equipment/sales) and the count of equity joint ventures made in the focal year. We expect capital intensity to negatively covary with CVC investments, because capital-intensive firms may be less likely to incur the additional cost of active CVC investments (Balasubramanian & Lieberman, 2010). We selected equity

Figure 4

Average Marginal Effect of CVC Investments on Firm Value Across Level of Environmental Munificence (With 95% CI)
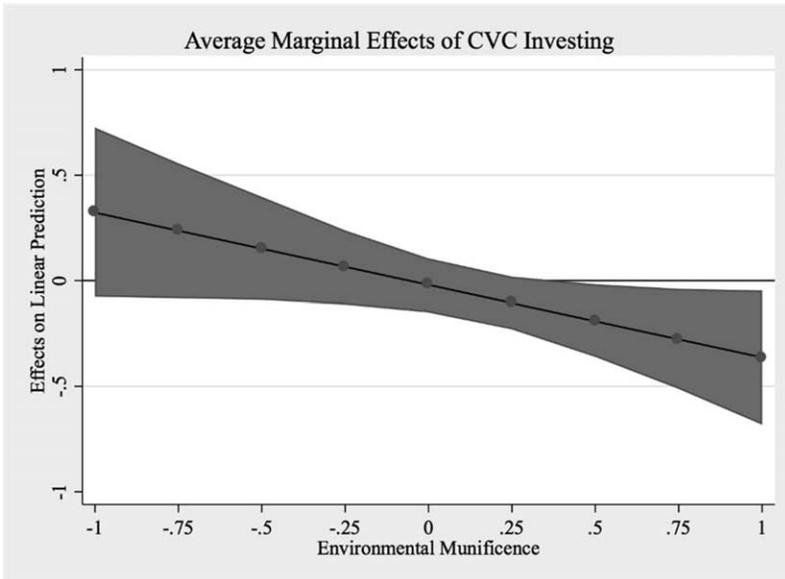
joint ventures on the basis that firms that make frequent CVC investments may also employ equity joint ventures (van de Vrande et al., 2009).

In the first-stage equation, our instruments were individually ($\beta = -0.697$, $p < .05$ and $\beta = 0.378$, $p < .001$, respectively) and jointly significant ($F = 4.86$, $p < .001$) predictors of the presumed endogenous variable (evidenced by a significant p value for the individual coefficients a significant F statistic for the model; see Stock, Wright, & Yogo, 2002). In the second stage equation, we observed nonsignificant test statistics for both the Sargan–Hansen test ($\rho = 1.211$; $p = 0.271$) and the Davidson–MacKinnon test ($\rho = 0.606$; $p = .437$). A failure to reject the null for the Sargan–Hansen test indicates that we properly excluded the instruments, suggesting that there is no material correlation between the focal endogenous variable and the equation disturbance term. A failure to reject the null for the Davidson–MacKinnon test indicates, however, that a noninstrumental variable estimator is preferred—the focal variable is not likely endogenous (for a discussion, see Wooldridge, 2010). In conjunction with the inverse-Mills ratio, we thus found little compelling evidence that endogeneity is a meaningful concern for our research model.

We conducted several additional analyses to probe the efficacy of our reported results. We first estimated a fixed-effect ordinary least squares (OLS) model to calculate variance inflation factors (VIFs); VIF values were below the recommended 10.0 cutoff (model $VIF < 2.6$; see Hair, Anderson, Tatham, & Black, 1998), mitigating concerns over nonessential multicollinearity. We then estimated our models absent the control variables to evaluate the possibility of a Type I error due to spuriousness and again observed no

Figure 5

The Joint Influence of CVC Investments, Operational Structure, and Environmental Munificence on Firm Value
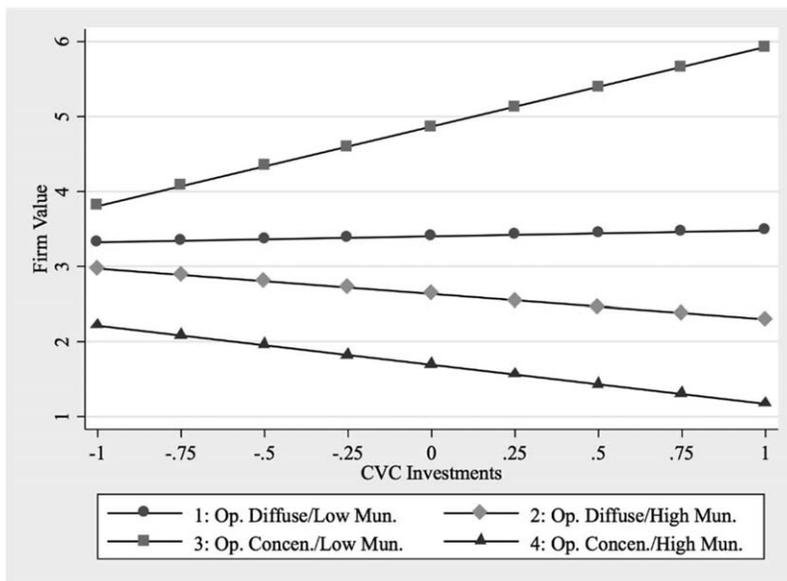

Table 3

Configurational Model Simple Slope Comparisons[†]

Pair comparisons	β	S.E.	$z - p$ Value	95% CI
2 vs. 1	−0.416	(0.320)	−1.30 − 0.194	−1.042 − 0.211
3 vs. 1	0.984	(0.237)	4.15 − 0.000	0.519 − 1.448
4 vs. 1	−0.601	(0.365)	−1.65 − 0.100	−1.317 − 0.115
3 vs. 2	1.399	(0.334)	4.19 − 0.000	0.745 − 2.053
4 vs. 2	−0.185	(0.366)	−0.51 − 0.612	−0.903 − 0.532
4 vs. 3	−1.584	(0.467)	−3.39 − 0.001	−2.501 − −0.668

[†]1: Op. Diffuse/Low Env. Munificence; 2: Op. Diffuse/High Env. Munificence; 3: Op. Concentrated/Low Env. Munificence; 4: Op. Concentrated/High Env. Munificence.

material difference from our reported results in terms of sign and significance. We further probed for outliers with standardized residuals greater than ±3 SD. Estimating our models absent these observations again revealed no material change to our reported results. We further tested for a 1-year lag in the main effect relationship, and the corresponding interaction effects. Similar to Dushnitsky and Lenox (2006), we observed no significant

relationship in the lagged models, suggesting a contemporaneous relationship between CVC investments and firm value in the presence of equally contemporaneous attentional structures.

Discussion

> We make equity investments in companies around the world to further our strategic objectives and to support our key business initiatives, including investments through our Intel Capital program. We generally focus on investing in companies and initiatives to stimulate growth in the digital economy, create new business opportunities for Intel, and expand global markets for our products (Intel Corp., 2007, p. 26).

> We make investments in privately held companies that develop technology or provide services that are complementary to our products or provide strategic value (Cisco Systems, Inc., 2007, p. 6).

The preceding excerpts from the annual reports for Intel and Cisco illustrate two companies that made aggressive CVC investments, were operationally concentrated, operated in low-munificence environments, and have high Tobin's Q. For these firms, making CVC investments is not solely a pecuniary mechanism, but rather a purposeful strategic behavior that enhances value when the firm's structure and environmental conditions facilitate managerial attention in a specific and strategic manner (Ireland et al., 2009). Our research model supports the preceding anecdotal observations—increasing parent firm value depends on the alignment of strategy, structure, and the environment. Such a finding carries important implications for strategy and entrepreneurship scholars.

Theoretical Implications

As is frequently noted in the venturing literature, there is a clouded picture of the main effect of CVC investments on corporate financial and market performance. For example, Dushnitsky and Lenox (2006) examined the influence of annual CVC investment on Tobin's Q, and found that firms making CVC investments tend to have higher values of Tobin's Q than noninvesting industry peers; further, the more money firms invest in CVC opportunities, the greater the parent firm's value when the investments are driven by strategic objectives. Conversely, Yang et al. (2014) found an insignificant relationship between a firm's level of CVC investing activity as measured by the size of the firm's CVC portfolio and Tobin's Q. Variance in operationalization and research design may explain some of the contradictory findings. However, another explanation may simply be that there is little theoretical rationale to expect that venturing behaviors *per se* improve value.

As Ocasio (1997) noted, factors within and outside of the firm frame the range of issues that managers pay attention to at any given time. These factors interact to form gestalts that further direct managerial attention toward more specific information (Barnett, 2008). Decisions influenced by these gestalts require a catalyst—an issue or problem facing the manager. In our model, the catalyst is the decision to pursue a CVC investment opportunity. There is, as has been noted (e.g., Dushnitsky & Shaver, 2009), no shortage of potential CVC investments, and firms may choose to make such investments on the basis of pecuniary reasons, strategic reasons, or some combination thereof. The question, then, is whether the attentional gestalt surrounding the decision encourages a strategic focus in venture investing or detracts from it.

Our findings indicate that while operational structure and environmental munificence jointly influence the CVC investment–parent firm value relationship, increases in valuation materialize only among operationally concentrated firms, with environmental munificence then moderating this relationship. In effect, firms pursuing CVC investments realize material positive valuation gains only when the firm is operationally concentrated and when the firm operates in a less munificent environment. That is, the CVC investment–parent firm value relationship is contingent upon an attentional gestalt focusing managerial attention toward opportunities with strong fit with the organization's strategic focus. The preceding supports Ocasio's (1997, p. 196) observation that the interaction of attention structures "provide the decision-makers with a structured set of interests and identities . . . [which] generate in turn a set of decision premises and motivations for action." In short, CVC investments are one of many possible entrepreneurial investment opportunities, but their ability to drive value depends on the coherence of attentional structures focusing managerial attention toward the most strategically relevant and value-enhancing CVC opportunities.

We may infer the importance of the preceding contingent effect from our comparison of the different configurational model slopes reported in Table 3. Table 3 shows whether the slopes representing the four possible configurations statistically differ from each other. A significant interaction effect coefficient indicates at least one possible slope differs from zero; making the comparison in Table 3 show whether the focal configuration—CVC investment activity, high operational concentration, and low environmental munificence (configuration #3)—significantly differs from the other possible configurations. Supporting the graphical depiction in Figure 5, we find that our hypothesized configuration was the only configuration that differed from all other possibilities. We may interpret this analysis as evidence for the joint contingent effect of attentional coherence. From an attentional theory perspective, it may not simply be the presence of an attentional coherence mechanism but a combination of mechanisms that are necessary to observe performance outcomes from engaging in a given strategic action.

It is notable, however, that our analysis also revealed a slight decrease in firm value when operationally concentrated, CVC investing firms operate in munificent environments. As shown in Figure 3, we found that operationally concentrated firms operating in low-munificence environments generally made more CVC investments per year than those operationally concentrated firms operating in more munificent environments. We propose two possible reasons for this finding, although we caution that this area necessitates additional research to draw substantive conclusions. We conjecture that when operationally concentrated firms operate in more munificent environments, managers may be less willing to incur additional risk via aggressive CVC investing because the opportunity cost is not as salient (Dess & Beard, 1984). This is because the various benefits ascribed to CVC investing—e.g., innovative and learning-related outcomes—are less critical in munificent environments (Sirmon et al., 2007).

Another possibility is that managers may act imprudently in munificent environments by, for example, overpaying for an acquisition target (Wan & Yiu, 2009). Given the observed negative trend between CVC investments and firm value in munificent environments, concentrated firms in munificent environments may make fewer but "bigger"—and hence riskier—bets in their CVC investments. For example, a firm may invest a large sum of money in one venture rather than make several smaller investments in multiple ventures. In short, absent the disciplining mechanism that environmental munificence provides, higher variance CVC investments may be equally likely to destroy firm value as to create it.

Thinking broadly about the implication on CVC research, our findings add to the growing recognition that undertaking CVC investments should be driven by strategic objectives, but that even still, absent a specific combination of elements, CVC investing

is unlikely to produce proximal, tangible economic outcomes from the investing firm. While additional contingency hypotheses may shed additional insight into the boundary conditions of CVC investment benefits, it is also possible that scholars have overlooked critical intervening mechanisms—mediators—that may be necessary to translate CVC investment activity into pecuniary benefits.

One such mediator may be absorptive capacity—a firm's ability to identify, assimilate, and exploit knowledge from the environment (Cohen & Levinthal, 1990, p. 589). Research indicates that absorptive capacity drives CVC investing (Dushnitsky & Lenox, 2005b), and subsequent learning from CVC investing is a direct, tangible benefit from making these investments (Dushnitsky & Lenox, 2005a). In the context of our model, we may combine absorptive capacity with operational concentration, for example, in a conditional indirect effect model. That learning results from CVC investing is rather straightforward, but learning in the presence of operational concentration may demonstrably accelerate, or amplify, this learning. For example, an operationally concentrated firm may be better able to assimilate and exploit relevant knowledge gleaned from CVC investment activity because of the greater focus, and hence depth of knowledge, on fewer strategic activities.

An analogous argument may be made for environmental hostility as an additional contextual effect. In this way, absorptive capacity becomes the proximal outcome from CVC investment activity, firm value the distal outcome, but the nature of this indirect effect changes as a function of the firm's operational concentration and its environmental munificence. Testing the preceding possibility necessitates a new study, but our finding of a contingent relationship between CVC investments and firm value we hope prompts new inquiry into the specific causal mechanisms, in conjunction with contingent effects, through which the strategic benefits resulting from CVC investments contribute to the investing firm's financial position.

Limitations and Future Research Directions

While our analysis is a conservative approach given the data available, our research design precludes the ability to draw a direct causal inference between CVC investments and firm value. One of the difficulties in this type of analysis is that a multitude of factors—some within the control of the firm and some exogenous to it—contribute to the valuation of publicly traded firms, and controlling for all possible confounds is both empirically and practically impossible. As such, readers should interpret our results through the lens of adding additional evidence to the venturing conversation regarding the theoretical and empirical support for the *a priori* notion that CVC investments independently drive performance.

Another limitation of our study is that we do not directly measure attentional focus. Our theoretical model is predicated on the notion that operational concentration and environmental munificence are attentional structures that influence the attentional focus of decision makers, and as such, CVC investments within the specified operational structures will be associated with firm value. However, we do not directly measure attentional focus, and this represents a promising opportunity for future research. We think one option may be the employment of policy capture and conjoint studies, where the researcher can isolate and manipulate managerial focus. Additionally, given the presence of observed contingency factors influencing the CVC investments–parent firm value relationship, we would certainly expect other such moderators within the broader nomological network, and such analyses represent fruitful extensions of our model. Finally, future research could explore the possibility that different attentional structures may direct managerial attention to different forms

of activities, or may influence the efficacy of those activities differently. For example, operationally diffuse firms may have greater success with international expansion activities than operationally concentrated firms, suggesting that operational diffusion is a better fit for certain contexts than operational concentration.

Conclusion

Venturing is a common firm behavior, though the benefit of venturing is a question without a simple answer. Our study suggests that making CVC investments, absent contingency considerations of fit within the context of structure and environment, are unlikely to manifest in satisfactory improvement to firm value. Thus, critical to adopting a CVC investment strategy is an understanding of the endogenous and exogenous contingencies that better focus managerial attention on those CVC investment opportunities having the greatest potential strategic benefit for the firm. It is our hope that this study furthers the conversation on the strategic basis for corporate venturing, and in doing so, spurs the investigation of new boundary conditions on the CVC investment–value relationship.

REFERENCES

Acar, W. & Sankaran, K. (1999). The myth of the unique decomposability: Specializing the Herfindahl and entropy measures? *Strategic Management Journal*, *20*(10), 969–975.

Allen, S. & Hevert, K. (2007). Venture capital investing by information technology companies: Did it pay? *Journal of Business Venturing*, *22*(2), 262–282.

Antonakis, J., Bendahan, S., Jacquart, P., & Lalive, R. (2010). On making causal claims: A review and recommendations. *The Leadership Quarterly*, *21*(6), 1086–1120.

Balasubramanian, N. & Lieberman, M.B. (2010). Industry learning environments and the heterogeneity of firm performance. *Strategic Management Journal*, *31*(4), 390–412.

Barnett, M.L. (2008). An attention-based view of real options reasoning. *Academy of Management Review*, *33*(3), 606–628.

Bartlett, C.A. & Ghoshal, S. (1993). Beyond the M-form: Toward a managerial theory of the firm. *Strategic Management Journal*, *14*(S2), 23–46.

Basu, S., Phelps, C., & Kotha, S. (2011). Towards understanding who makes corporate venture capital investments and why. *Journal of Business Venturing*, *26*(2), 153–171.

Benson, D. & Ziedonis, R. (2009). Corporate venture capital as a window on new technologies: Implications for the performance of corporate investors when acquiring startups. *Organization Science*, *20*(2), 329–351.

Bergh, D.D. & Lawless, M.W. (1998). Portfolio restructuring and limits to hierarchical governance: The effects of environmental uncertainty and diversification strategy. *Organization Science*, *9*(1), 87–102.

Bettis, R.A. & Prahalad, C. (1983). The visible and the invisible hand: Resource allocation in the industrial sector. *Strategic Management Journal*, *4*(1), 27–43.

Bradley, S., Aldrich, H., Shepherd, D., & Wiklund, J. (2011). Resources, environmental change, and survival: Asymmetric paths of young independent and subsidiary organizations. *Strategic Management Journal*, *32*(5), 486–509.

Brush, T.H., Bromiley, P., & Hendrickx, M. (2000). The free cash flow hypothesis for sales growth and firm performance. *Strategic Management Journal*, *21*(4), 455–472.

Burns, T. & Stalker, G.M. (1961). *The management of innovation*. London: Tavistock.

Castrogiovanni, G.J. (1991). Environmental munificence: A theoretical assessment. *Academy of Management Review*, *16*, 542–565.

Certo, S.T. & Semadeni, M. (2006). Strategy research and panel data: Evidence and implications. *Journal of Management*, *32*(3), 449.

Chandler, A.D. (1991). The functions of the HQ unit in the multibusiness firm. *Strategic Management Journal*, *12*(S2), 31–50.

Cho, T.S. & Hambrick, D.C. (2006). Attention as the mediator between top management team characteristics and strategic change: The case of airline deregulation. *Organization Science*, *17*(4), 453–469.

Chung, K.H. & Pruitt, S.W. (1994). A simple approximation of Tobin's q. *Financial Management*, *23*(3), 71.

Cisco Systems, Inc. (2007). *10-K Annual Report*. San Jose, CA: Author.

Cohen, J., Cohen, P., West, S.G., & Aiken, L.S. (2003). *Applied multiple regression/correlation analysis for the behavioral sciences* (3rd ed., Vol. 1). Mahwah, NJ: Lawrence Erlbaum.

Cohen, W. & Levinthal, D. (1990). Absorptive capacity: A new perspective on learning and innovation. *Administrative Science Quarterly*, *35*(1), 128–152.

Covin, J.G. & Slevin, D.P. (1989). Strategic management of small firms in hostile and benign environments. *Strategic Management Journal*, *10*(1), 75–87.

Danzon, P.M., Nicholson, S., & Pereira, N.S. (2005). Productivity in pharmaceutical–biotechnology R&D: The role of experience and alliances. *Journal of Health Economics*, *24*(2), 317–339.

Dess, G. & Beard, D. (1984). Dimensions of organizational task environments. *Administrative Science Quarterly*, *29*(1), 52–73.

Donaldson, L. (1987). Strategy and structural adjustment to regain fit and performance: In defence of contingency theory. *Journal of Management Studies*, *24*(1), 1–24.

Drazin, R. & Van de Ven, A.H. (1985). Alternative forms of fit in contingency theory. *Administrative Science Quarterly*, *30*(4), 514–539.

Dushnitsky, G. & Lenox, M.J. (2005a). When do incumbents learn from entrepreneurial ventures? Corporate venture capital and investing firm innovation rates. *Research Policy*, *34*(5), 615–639.

Dushnitsky, G. & Lenox, M. (2005b). When do firms undertake R&D by investing in new ventures? *Strategic Management Journal*, *26*(10), 947–965.

Dushnitsky, G. & Lenox, M.J. (2006). When does corporate venture capital investment create firm value? *Journal of Business Venturing*, *21*(6), 753–772.

Dushnitsky, G. & Shaver, J. (2009). Limitations to inter-organizational knowledge acquisition: The paradox of corporate venture capital. *Strategic Management Journal*, *30*(10), 1045–1064.

Eisenmann, T.R. & Bower, J.L. (2000). The entrepreneurial M-form: Strategic integration in global media firms. *Organization Science*, *11*(3), 348–355.

Galunic, D.C. & Eisenhardt, K.M. (2001). Architectural innovation and modular corporate forms. *Academy of Management Journal*, *44*(6), 1229–1249.

Gamache, D., McNamara, G., Mannor, M., & Johnson, R. (2014). Motivated to acquire? The impact of CEO regulatory focus on firm acquisitions. *Academy of Management Journal*, *58*(4), 1261–1282.

Garg, V.K., Walters, B.A., & Priem, R.L. (2003). Chief executive scanning emphases, environmental dynamism, and manufacturing firm performance. *Strategic Management Journal*, *24*(8), 725–744.

Gompers, P., Kovner, A., Lerner, J., & Scharfstein, D. (2008). Venture capital investment cycles: The impact of public markets. *Journal of Financial Economics*, *87*(1), 1–23.

Green, K.M., Covin, J.G., & Slevin, D.P. (2008). Exploring the relationship between strategic reactiveness and entrepreneurial orientation: The role of structure–style fit. *Journal of Business Venturing*, *23*(3), 356–383.

Hair, J.F., Anderson, R.E., Tatham, R.L., & Black, W.C. (1998). *Multivariate data analysis* (5th ed.). Upper Saddle River, NJ: Prentice-Hall.

Hashai, N. (2015). Within-industry diversification and firm performance—An S-shaped hypothesis. *Strategic Management Journal*, *36*(9), 1378–1400.

Heckman, J.J. (1979). Sample selection bias as a specification error. *Econometrica: Journal of the Econometric Society*, *47*(1), 153–161.

Heeley, M., King, D., & Covin, J. (2006). Effects of firm R&D investment and environment on acquisition likelihood. *Journal of Management Studies*, *43*(7), 1513–1535.

Henderson, R. & Cockburn, I. (1996). Scale, scope, and spillovers: The determinants of research productivity in drug discovery. *The Rand Journal of Economics*, *27*(1), 32–59.

Hitt, M.A., Ireland, R.D., Camp, S.M., & Sexton, D.L. (2001). Strategic entrepreneurship: Entrepreneurial strategies for wealth creation. *Strategic Management Journal*, *22*(6–7), 479–491.

Inkpen, A. & Choudhury, N. (1995). The seeking of strategy where it is not: Towards a theory of strategy absence. *Strategic Management Journal*, *16*(4), 313–323.

Intel Corp. (2007). *10-K Annual Report*. Santa Clara, CA: Author.

Ireland, R.D., Covin, J.G., & Kuratko, D.F. (2009). Conceptualizing corporate entrepreneurship strategy. *Entrepreneurship Theory and Practice*, *33*(1), 19–46.

Joseph, J. & Ocasio, W. (2012). Architecture, attention, and adaptation in the multibusiness firm: General Electric from 1951 to 2001. *Strategic Management Journal*, *33*(6), 633–660.

Kabanoff, B. & Brown, S. (2008). Knowledge structures of prospectors, analyzers, and defenders: Content, structure, stability, and performance. *Strategic Management Journal*, *29*(2), 149–171.

Keats, B. & Hitt, M. (1988). A causal model of linkages among environmental dimensions, macro organizational characteristics, and performance. *Academy of Management Journal*, *31*(3), 570–598.

Keil, T., Autio, E., & George, G. (2008). Corporate venture capital, disembodied experimentation and capability development. *Journal of Management Studies*, *45*(8), 1475–1505.

Keil, T., Maula, M., Schildt, H., & Zahra, S. (2008). The effect of governance modes and relatedness of external business development activities on innovative performance. *Strategic Management Journal*, *29*(8), 895–907.

Kumar, M. (2009). The relationship between product and international diversification: The effects of short-run constraints and endogeneity. *Strategic Management Journal*, *30*(1), 99–116.

Lang, L.H. & Stulz, R.M. (1994). Tobin's Q, corporate diversification and firm performance. *Journal of Political Economy*, *102*(6), 1248–1280.

Laureiro-Martínez, D., Brusoni, S., Canessa, N., & Zollo, M. (2015). Understanding the exploration–exploitation dilemma: An fMRI study of attention control and decision-making performance. *Strategic Management Journal*, *36*(3), 319–338.

Lawrence, P.R. & Lorsch, J.W. (1967). *Organization and environment: Managing differentiation and integration*. Boston: Graduate School of Business Administration, Harvard University.

Li, S. & Tallman, S. (2011). MNC strategies, exogenous shocks, and performance outcomes. *Strategic Management Journal*, *32*(10), 1119–1127.

Maula, M., Keil, T., & Zahra, S. (2013). Top management's attention to discontinuous technological change: Corporate venture capital as an alert mechanism. *Organization Science*, *24*(3), 926–947.

Miller, D. (1986). Configurations of strategy and structure: Towards a synthesis. *Strategic Management Journal*, *7*(3), 233–249.

MoneyTree Report. (2015). *Corporate Venture Capital Profile Thru 2015 Q3*. PricewaterhouseCoopers/National Venture Capital Association MoneyTree[TM] Report. Thomson Reuters.

Nadkarni, S. & Barr, P.S. (2008). Environmental context, managerial cognition, and strategic action: An integrated view. *Strategic Management Journal*, *29*(13), 1395–1427.

Narayanan, V., Yang, Y., & Zahra, S. (2009). Corporate venturing and value creation: A review and proposed framework. *Research Policy*, *38*(1), 58–76.

Ocasio, W. (1997). Towards an attention-based view of the firm. *Strategic Management Journal*, *18*(S1), 187–206.

Ocasio, W. (2011). Attention to attention. *Organization Science*, *22*(5), 1286–1296.

Park, N.K. & Mezias, J.M. (2005). Before and after the technology sector crash: The effect of environmental munificence on stock market response to alliances of e-commerce firms. *Strategic Management Journal*, *26*(11), 987–1007.

Rawley, E. (2010). Diversification, coordination costs, and organizational rigidity: Evidence from microdata. *Strategic Management Journal*, *31*(8), 873–891.

Rind, K.W. (1981). The role of venture capital in corporate development. *Strategic Management Journal*, *2*(2), 169–180.

Robins, J.A. & Wiersema, M.F. (2003). The measurement of corporate portfolio strategy: Analysis of the content validity of related diversification indexes. *Strategic Management Journal*, *24*(1), 39–59.

Rosenbusch, N., Brinckmann, J., & Bausch, A. (2011). Is innovation always beneficial? A meta-analysis of the relationship between innovation and performance in SMEs. *Journal of Business Venturing*, *26*(4), 441–457.

Sahaym, A., Steensma, H., & Barden, J. (2010). The influence of R&D investment on the use of corporate venture capital: An industry-level analysis. *Journal of Business Venturing*, *25*(4), 376–388.

Schildt, H., Maula, M., & Keil, T. (2005). Explorative and exploitative learning from external corporate ventures. *Entrepreneurship Theory and Practice*, *29*(4), 493–515.

Semadeni, M., Withers, M.C., & Certo, T.S. (2014). The perils of endogeneity and instrumental variables in strategy research: Understanding through simulations. *Strategic Management Journal*, *35*(7), 1070–1079.

Simon, H.A. (1947). *Administrative behavior: A study of decision-making processes in administrative organization*. Chicago, IL: Macmillan.

Sirmon, D.G., Hitt, M.A., & Ireland, R.D. (2007). Managing firm resources in dynamic environments to create value: Looking inside the black box. *Academy of Management Review*, *32*(1), 273–292.

Souitaris, V., Zerbinati, S., & Liu, G. (2012). Which iron cage? End- and exo- isomorphism in corporate venture capital programs. *Academy of Management Journal*, *55*(2), 477–505.

StataCorp. (2013). *Longitudinal/panel data reference manual*. College Station, TX: Stata Press.

Stock, J.H., Wright, J.H., & Yogo, M. (2002). A survey of weak instruments and weak identification in generalized method of moments. *Journal of Business & Economic Statistics*, *20*(4), 518–529.

Tong, T. & Li, Y. (2011). Real options and investment mode: Evidence from corporate venture capital and acquisition. *Organization Science*, *22*(3), 659–674.

Tosi, H.L. & Slocum, J.W. (1984). Contingency theory: Some suggested directions. *Journal of Management*, *10*(1), 9–26.

Van de Ven, A.H., Ganco, M., & Hinings, C. (2013). Returning to the frontier of contingency theory of organizational and institutional designs. *The Academy of Management Annals*, *7*(1), 393–440.

van de Vrande, V., Vanhaverbeke, W., & Duysters, G. (2009). External technology sourcing: The effect of uncertainty on governance mode choice. *Journal of Business Venturing*, *24*(1), 62–80.

Van Doorn, S., Jansen, J.J., Van den Bosch, F.A., & Volberda, H.W. (2013). Entrepreneurial orientation and firm performance: Drawing attention to the senior team. *Journal of Product Innovation Management*, *30*(5), 821–836.

Wadhwa, A., Phelps, C., & Kotha, S. (2016). Corporate venture capital portfolios and firm innovation. *Journal of Business Venturing*, *31*(1), 95–112.

Wan, W. & Yiu, D. (2009). From crisis to opportunity: Environmental jolt, corporate acquisitions, and firm performance. *Strategic Management Journal*, *30*(7), 791–801.

Wiklund, J. & Shepherd, D.A. (2011). Where to from here? EO-as-experimentation, failure, and distribution of outcomes. *Entrepreneurship Theory and Practice*, *35*(5), 925–946.

Williams, R. (2012). Using the margins command to estimate and interpret adjusted predictions and marginal effects. *The Stata Journal*, *12*(2), 308–331.

Winters, T. & Murfin, D. (1988). Venture capital investing for corporate development objectives. *Journal of Business Venturing*, *3*(3), 207–222.

Wooldridge, J.M. (2010). *Econometric analysis of cross section and panel data* (2nd ed.). Cambridge, MA: The MIT Press.

Yang, Y., Narayanan, V.K., & De Carolis, D.M. (2014). The relationship between portfolio diversification and firm value: The evidence from corporate venture capital activity. *Strategic Management Journal*, *35*(13), 1993–2011.

Varkey K. Titus Jr. is an assistant professor in the College of Business Administration, University of Nebraska, Lincoln, NE 68588, USA.

Brian S. Anderson is an assistant professor Department of Global Entrepreneurship and Innovation, University of Missouri–Kansas City, Kansas City, MO, USA.