Corporate venturing and value creation: A review and proposed framework

V.K. Narayanan, Yi Yang, Shaker A. Zahra

1. Introduction

Worldwide academic interest in corporate venturing (CV) has increased considerably over the past decade, generating a large number of empirical studies on its antecedents, forms, processes, and outcomes. This interest stems from researchers’ belief that CV can contribute significantly to the evolution of a firm’s corporate strategy (Ireland et al., 2001) by building new capabilities and businesses that enable renewal, foster strategic change and enhance a company’s profits and growth in domestic as well as international markets (Zahra and Hayton, 2008).

Growing worldwide interest in CV masks several important shortcomings in prior research, raising serious questions about its contributions to theory and practice. Notably, despite increasing recognition of CV around the globe, most research has been conducted in North American settings that might differ markedly from other parts of the world in the level of business development, strategic focus, and organizational priorities. CV research also remains fragmented, with studies rarely building on each other. Researchers have also employed various definitions of CV and related phenomena, which makes it hard to assess and compare findings across studies. Further, researchers have selectively focused on various elements of CV activities, instead of advancing a common and coherent framework that encourages systematic and cumulative scholarship.

Other shortcomings plague CV research. For example, cross-sectional studies have also dominated the CV literature, making causal inferences and explanations tenuous at best. Similarly, the rush to test hypotheses empirically has often led to misalignment of prior studies with key theoretical streams in the strategy and entrepreneurship fields. As a result, the bulk of CV research lacks theoretical grounding and fails to contribute to our understanding of organizational capability building that enables firm evolution. This gap in the literature is alarming because CV could be a source of companies’ heterogeneity, a major source of competitive advantage. Taken together, these limitations hamper developing robust theory-based conclusions about CV and its implications for value creation.

The absence of an organizing framework that maps out the various antecedents, processes and outcomes of CV activities further accentuates these problems and complicates the task researchers face when conducting their research or guiding practicing managers. In this paper, we address this shortcoming by proposing such an organizing and integrative framework. To do so, we analyze this literature over the past decade to identify its major themes and research findings setting the stage for greater coherence in future research on CV. We give special attention to the challenges and rewards of theory building in future CV research. Our review clearly shows that CV is an area of scholarly inquiry that has important implications for managerial practice.
research, setting the stage for producing cumulative and generalizable findings. This organizing framework also helps to identify the distinctive features of CV activities, by distinguishing them from other elements of a firm’s corporate strategy (e.g., diversification). These distinctive features could then become the focal point of future theoretical and empirical studies on CV.

To accomplish these objectives, the remainder of this paper is organized as follows. In the following section, we review the definitions of CV and its links to corporate entrepreneurship and corporate strategy. Once we have completed this task, we will explain the procedure we used to select the papers included in our review. We will then present an overview of the key findings distilled from analyzing and synthesizing prior studies. In the final section of the paper, we will discuss major findings from research on CV. Our discussion will cover the methodologies employed in prior studies as well as the theoretical developments necessary to clarify the distinctive domain and contributions of CV to value creation.

2. Corporate venturing and corporate entrepreneurship

Discussions of CV are usually framed within the larger and fast growing body of literature on corporate entrepreneurship (CE). CE research focuses on ways that companies could use to create new businesses that generate new revenue streams and create value for shareholders. Researchers have examined the various facets (components) of CE using data from companies in: the US (e.g., Zahra, 1996; Zahra and Hayton, 2008), Canada (Carrier, 1996; Hornsby et al., 2002), Denmark (Husted and Vintergaard, 2004), UK (Stopford and Baden-Fuller, 1994), Portugal (Morris et al., 1994), Slovenia (Antonic and Hisrich, 2001), Sweden (Brown et al., 2001), Finland (Keil, 2000, 2004), Russia, Ukraine and Bella Rouse (Filatotchev et al., 1999), and South Africa (Morris et al., 1994). Researchers use the term CE to refer to the development and implementation of new ideas in organizations (Hornsby et al., 2002) or capture “the sum of a company’s innovation, strategic renewal and corporate venturing” (Zahra, 1995: 227). As a component of CE, CV emphasizes the creation of new business within or outside the organization (Sharma and Chrisman, 1999). CV is closely linked to both innovation and strategic renewal. Some CV activities frequently build upon the firm’s innovations in new markets or by introducing new products. Other CV initiatives may lead to significant changes in a company’s business, strategy or competitive profile, renewing the firm’s operations. CV differs from two other dimensions of CE (innovation and renewal) primarily by its focus on the various steps and processes associated with creating new businesses and integrating them into the firm’s overall business portfolio.

Companies frequently use internal and external sources to gain access to ideas, discoveries, technologies, innovations, business practices, and even businesses that can fuel growth and enhance profitability (e.g., Keil, 2004; Sathe, 2003; Zahra, 2005). Consequently, we propose that “CV is the set of organizational systems, processes and practices that focus on creating businesses in existing or new fields, markets or industries—using internal and external means.” Internal means typically include innovation and new business incubation. External means usually include licensing, joint venturing, acquisitions, and corporate venture capital (CVC). Our proposed definition captures recent writings on the topic (e.g., Gompers and Lerner, 2000; Maula, 2001; Keil, 2000, 2004; Keil et al., 2008).

As a mode of CV, licensing means gaining access to other companies’ knowledge, innovations, technologies and discoveries in return for a fee (Zahra et al., 2005). Joint ventures refer to the formation of a new organizational entity by two or more existing companies to develop and/or commercialize new technologies or build various organizational skills such as R&D, marketing or production. Acquisitions refer to a company buying another to augment its market position, fill gaps in its portfolio or enter new markets. CVC refers to equity investments made by incumbents in start-ups to gain access to their innovations, technologies and other discoveries.

Existing research is especially spotty when it comes to external modes of CV. Though licensing, joint ventures (and alliances in general) and acquisitions are frequently mentioned, little theoretical or empirical work has articulated the distinctiveness of these activities within CV in terms of value creation. For example, companies use licensing to gain access to new technologies or patents. Consequently, its effect on business creation is often indirect and captured in the other strategic moves companies use (see, Zahra et al., 2005). Joint ventures and acquisitions have the same effect and are usually conducted for multiple reasons other than CV. As a result, reviewing the literature, it is not clear how researchers connect acquisitions to new business creation, the raison d’être of CV activities. Therefore, to avoid making flawed inferences, we will not review these modes here.

Researchers have also attempted to identify the various types of CV activities. However, there is little agreement among existing typologies. Using British case studies, Stopford and Baden-Fuller (1994) developed a typology of the different stages of CE, progressing from individual entrepreneurship (stage 1) to “starting a process of strategic renewal” and “embedding renewal” (stage 2) and then moving to “breaking the frame” (stage 3). They noted that progress across these stages was usually accompanied by shifts in the extent to which companies emphasized proactive behaviors, team orientations, success in developing capabilities that solved organizational problems, and success in building a learning capability. Other researchers have invoked an internal–external distinction on the basis of the focus of venturing (Ginsberg and Hay, 1994; Keil, 2000; Sharma and Chrisman, 1999). Still, another group of researchers have used an internal–external distinction based on whether the entrepreneurial ideas originate within the firm or outside it (Miles and Covin, 2002; Sykes, 1986). For instance, Miles and Covin (2002) identified four types of CV programs based on two criteria: (a) whether the entrepreneurial idea originated inside or outside the parent; and (b) whether there is an intermediary between the parent and the venture invested. Despite the insights that these studies have generated, little research effort has been devoted to refining and integrating proposed typologies.

Lack of clarity about the domain of CV and imprecise definitions have also made it hard to discern commonalities among prior studies to uncover generalizable findings. For example, researchers have examined the general phenomenon of CV as well as on CVC and spin-offs. As will be discussed shortly, CVC is any equity investment made by non-financial corporations in start-up companies, for both strategic and financial purposes (e.g., Maula, 2001). A spin-off typically refers to the formation of a new company based on a business idea developed within the incumbent’s organization being taken into a self-standing firm (Parhankangas and Arenius, 2003). As a result, several definitions and typologies of CVC and spin-offs currently exist but are rarely connected to the broader study of CV. Several important research issues have been also overlooked in

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3 Innovation means creating and commercializing products and technologies, providing financial and human resources for innovative projects, and maintaining an appropriate infrastructure for innovation. Strategic renewal refers to revitalization of a company’s business and changing its competitive profile. Innovation could induce renewal. Changing the firm’s business definition and strategic repertoire can have the same effect.
prior CV research, leading to a limited and perhaps biased view of
the contributions of CV to overall value creation.

3. Method of review

Having defined CE and CV and discussed their conceptual connec-
tions, we shift our attention to the literature on CV and its contribu-
tions. To gain insights into this literature, we conducted a systematic search to identify those studies that fall within the
domain of CE but involve CV activities. Building on the definitions
we have just presented and two prior reviews of the area (i.e.,
Sharma and Chrisman, 1999; Dess et al., 2003), we began to sepa-
rate them into a set of substantive categories. These labels were
extracted from prior studies, synonyms were combined, and sub-
categories were then subsumed under higher-level category labels
at increasingly higher levels of abstraction. We repeated this pro-
cess iteratively until the number of categories was small enough to
permit efficient exposition, while remaining fine grained enough
to make distinctions meaningful among categories.

3.1. Selections of journals reviewed and time frame

To ensure accuracy and comprehensiveness, we identified rel-
vant papers by systematically searching various outlets that
publish research on CE and CV. They included: Academy of Man-
agement Journal, Academy of Management Review, Proceedings of the
Academy of Management, American Economic Review, Administra-
tive Science Quarterly, Entrepreneurship: Theory & Practice, Journal
of Business Venturing, Journal of Finance, Journal of Marketing, Jour-
nal of Engineering and Technology Management, Journal of Financial
& Quantitative Analysis, Journal of Management Studies, Journal of
Product Innovation Management, Management Science, Organiza-
tion Science, Rand Journal of Economics, Research Policy, Strategic
Management Journal, as well as the 2002 special issue of Bab-
son Entrepreneurial Review. Our review covered the 1995 to 2004
period.4

3.2. Papers and domain identification process

Our first round of search yielded 386 papers, covering 18 cat-
gegories. Because our research interest lies in covering the major
findings in the CV literature over the past 10 years, we limited
the sample to empirical studies (including case studies). After
the second round of reviewing papers, only 288 empirical studies
remained. Next, papers dealing with only joint ventures, alliances
and acquisitions were excluded from further investigation because
these areas have already emerged as separate streams in the con-
temporary strategy literature. Similarly, because of the vast number
of papers on technology innovation, product development, diversi-
fication, technology acquisition, knowledge management and R&D
collaboration, we included such studies in our review only if they
contained a significant component of new business creation. In
addition, 10 studies dealing with independent venture capital were
excluded, reducing the number of relevant papers to 96. When
we examined the papers covering CE, we decided to exclude six
additional papers that only studied product innovation or strat-
egic renewal as parts of CE; three studies focused on individual
entrepreneurial characteristics; two studies covered the vantage
point of start-ups, and one study had a different definition of CE.
Given our interest in substantive issues, one paper that focused
predominantly on methodological issues was also excluded.5 This
process yielded 83 papers that fell into five of the original 18 cate-
gories, providing the foundation for our review.

Fig. 1 provides a breakdown of the papers included in our review
and analyses. Fig. 1 indicates that the number of papers on CV has
fluctuated over the past 10 years. Following an increase in research
publications until 1997, the volume of papers tapered off to less
than five papers annually between 1998 and 2001. In 2002, the
research interest in this area began rising again, and since then
more than 35 papers have appeared in the journals reviewed. This
renewed interest in the topic may reflect renewed corporate inter-
growth. Managers understand that pressures to increase
earnings can no longer be met by the restructurings that have dot-
ted the industrial landscape since the mid-1990s. New business
creation, therefore, has become an important means of creating
wealth by enabling companies to renew their operations and build
capabilities needed to compete in new markets. The globalization
of the CV phenomenon also might have contributed to this growing
interest. Companies in emerging economies (e.g., Slovenia) have
shown an interest in CV (Antonic and Hisrich, 2001). The inter-
national expansion of existing multinational companies has also
highlighted the need for CV (Birkinshaw, 1997; Zahra and Hayton,
2008), giving researchers an interesting setting in which to study
this phenomenon.

4 This time frame allows us to track the most recent research themes in this area,
so that the findings reflect current thinking on the topic as well as contemporary
corporate practice.

5 We included the study of Antonic and Hisrich (2001) because it validated
the measure of the intrapreneurship construct and examined its antecedents and
consequences as well.
Most CV-related articles have appeared in the *Journal of Business Venturing*, *Management Science*, and *Research Policy* (Fig. 2). These three journals alone accounted for 72% of the 83 studies covered in our review. Yet, despite an impressive body of empirical work, CV research seems to be underrepresented in mainstream general management journals. This might explain why researchers have failed to connect to mainstream theoretical streams in strategy, entrepreneurship, and management in ways that can enrich the growing CV literature. Similarly, research on CV has not been well represented in the entrepreneurship curriculum in most business schools. This has limited the impact of past CV research on shaping future managers’ understanding of the nature and consequences of CV activities.

Our review of published research over the past decade leads to two observations. First, entrepreneurial and venturing activities are not limited to for-profit organizations. Today, many non-profit organizations such as universities and government labs actively use venturing activities. The relationship between CV in for-profit and non-profit sectors also appears to be a growing trend in several countries. As a result, several papers have examined venturing in universities and other non-profit organizations (e.g., Chrisman, 1997; Colombo and Delmastro, 2002; Shane, 2002, 2004; Siegel et al., 2004; Steffensen et al., 2000). Second, although many papers used samples from the US, CV is a worldwide phenomenon. In our sample of papers, 23 studies used samples gathered from 14 countries other than the United States. These countries included: Belarus, Canada, China, Finland, France, Germany, India, Italy, Japan, Portugal, Russia, Slovenia, Sweden and Ukraine. These studies highlight the growing worldwide interest in CV. Though difficult to generalize the findings of these diverse studies, some interesting differences are common among countries, as reported later.

4. Overview of empirical works

The bulk of published empirical research on CV covers the private sector. Of the papers we have reviewed, 54 papers focused on the private sector in developed economies, primarily in the US (45 papers, 54.2% of the total sample of 83 papers). Therefore, to organize our presentation of key findings, we will first cover CV in the private sector, followed by research on these activities within non-profit organizations. Our review has identified 28 papers on CV in non-profit, focusing on technology commercialization mostly in universities. By examining the for-profit and non-profit-based studies, we can better appreciate and discern the influence of differences in organizational contexts between for-profit and non-profit sectors. Further, to ensure clarity, we will highlight areas of agreement and disagreement in findings across the two sectors.

4.1. CV in the for-profit sector

Fig. 3 presents a breakdown of the CV literature in the for-profit sector. This literature addresses CV in general as well as two other facets of CV: spin-offs and CVC. Some researchers have examined the spin-off phenomenon as an event where the initial outcomes of a specific CV activity can be seen. CVC is a relatively new area of research, showing the growing interest in understanding the role of these investments in today’s economy (Maula, 2001). CVC investments make it possible for new ventures to survive as well as develop and commercialize new products. These investments also enable incumbents to gain access to the technologies, business models, knowledge and skills of start-up companies. Incumbents can utilize this knowledge in innovation that can enhance renewal and new business creation.

Interest in spin-offs and CVC also mirrors the increasing sophistication of methods available for researchers to examine specific facets of CV closely, rather than studying overall CV programs which typically involve several activities. Spin-offs are useful in incubating new businesses that can become influential in developing and commercializing new technologies that frequently alter the dynamics of competition.

Researchers have studied the CV empirically at three levels: (a) the parent organization; (b) the venture unit; and (c) the new venture itself. Studies conducted at the parent level typically track the formal units established for this purpose without investigating
Table 1
Summary of theories and analysis levels employed in the CV literature for the for-profit sector.

<table>
<thead>
<tr>
<th>Research fields/theories</th>
<th>Level of analysis</th>
<th>Program</th>
<th>Venture</th>
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<tbody>
<tr>
<td>Management of innovation</td>
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<tr>
<td>Institutional entrepreneurship; social</td>
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<tr>
<td>construction; social network</td>
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<td></td>
<td>Dushnitsky and Lenox, 2005; Garud et al., 2002; Sarkar et al., 2001; Sedaitis, 1998</td>
<td>Birkinshaw, 1997</td>
<td>Lee et al., 2001; Sedaitis, 2000</td>
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<tr>
<td>Finance related</td>
<td></td>
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<tr>
<td>Agency theory; information asymmetry</td>
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<tr>
<td>Strategy &amp; organization</td>
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<tr>
<td>Organizational learning; resource based view</td>
<td>Ahuja and Lampert, 2001; Conceição et al., 2002; Sarkar et al., 2001; Zahra and Covin, 1995</td>
<td>Henderson and Leleux, 2002</td>
<td>Lee et al., 2001; Parhankangas and Arenius, 2003; Shrader and Simon, 1997; Sorrentino and Williams, 1995; Thornhill and Amit, 2001; Zahra, 1996</td>
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<tr>
<td>Othersa</td>
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<td>Management literature</td>
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<td>Antoncic and Hisrich, 2001; Carrier, 1996; Filatotchev et al., 1999; Hornsby et al., 2002; Matsuno et al., 2002</td>
<td>Miles and Covin, 2002</td>
<td>Abetti, 1997; Badguerahanian and Abetti, 1995; Dahlstrand, 1997; Hitt et al., 1999</td>
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<td>Finance literature</td>
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<td>Allen and Lumme, 1995; Gertner et al., 2002; Maxwell and Rao, 2003</td>
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</table>

Studies built upon prior literature but not very clear about theories.

specific ventures. These studies often examine the intensity of a company’s CV activities, employing standardized scales or counting the number of CV units created and supported by a corporation. Research conducted at the venture unit level of analysis has typically focused on specific CV activities. An illustrative study is Birkinshaw and Hill (2003) survey of 95 CV units across three continents to assess the extent to which the adoption of venture capital practices has enhanced CV performance. At the venture level, researchers have tracked specific ventures to understand the processes by which their activities unfold, typically employing case studies of single or multiple ventures within corporate settings. Hitt et al. (1999) have applied this approach in their longitudinal case study of the influence of organizational context on venture team success.

In Table 1, we have categorized the literature on CV according to the level of analysis and the theoretical frames used in the studies. Table 1 shows that most papers typically focus on the “parent” level of analysis. Researchers have also invoked numerous theories, reflecting their theoretical preferences and the research questions pursued. A close look into the theories used in prior studies suggests that no single, dominant theoretical approach seems to have guided past empirical analyses.

To ensure coherence in our analyses, we have organized the literature using a “context-CV characteristics-outcome” framework, including potential moderators and mediators. The empirical literature reviewed identifies several contextual forces, both external and internal, that predispose the firm to undertake CV and drive its characteristics. Researchers have also examined the relation between CV characteristics and various outcomes of these activities. Fig. 4 displays the resulting framework we developed by synthesizing the literature. Using this framework, we will review studies that examined CV characteristics and then review their connections to

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Fig. 4. CV model for the for-profit sector. Note: Please see Appendix A for the specific linkages and illustrative studies.
the organizational context and outcomes of these activities. Specific linkages and illustrative papers covering each linkage appear in Appendix A.

4.1. Research on CV characteristics

Two questions have captured prior researchers' attention regarding CV: (a) how different are corporate and independent ventures? and (b) if differences between these two venture types exist, how could they be explained? Empirical findings help to answer these two questions.

Shrader and Simon (1997) and Zahra (1996) have investigated how CVs differ from independent ventures (IVs). As Table 2 suggests, the typical CV relies on internal sources of capital, makes use of its parent's proprietary knowledge and technical/marketing expertise, and is related to the parent companies' product market strategy (e.g., low cost positioning) as well as technology strategy. CVs usually place relatively little emphasis on pioneering the development of new technologies but can be successful if the firm has basic research in its technology portfolio. This observation suggests that at the corporate level, CVs are seen as a source of business ideas for the parent's current corporate strategy or as an external source of R&D that builds new businesses to generate additional revenue streams and enhance growth. Therefore, compared with independent ventures, CVs often involve less risk and generate lower financial returns. Still, the value of CVs may lie in generating growth options that create opportunities for domestic and international expansion in existing and new markets. If this is true, then researchers' exclusive use of financial measures to assess the profitability of CVs to the exclusion of strategic considerations (e.g., diversification and growth) may not be appropriate.

Companies vary significantly in their use of CV, probably because of their different environments and other contextual variables (Badguerahanian and Abetti, 1995; Hitt et al., 1999; Zahra, 1991). These differences become evident in the number and types of CVs created and how they are linked to the incumbents' ongoing and existing businesses. Therefore, besides documenting key differences between corporate and independent ventures, researchers have sought to better understand the relationship of parent corporations and their CVs. Findings indicate that, at the parent level, CVs are developed to support the firm's existing technologies. As a result, CVs usually reflect the characteristics of their parents' technological resources, as in Sun Microsystems' sponsorship of its Java technology (Garud et al., 2002) and Intel's ecosystem investment strategy (Chesbrough, 2002).

At the venture level, research highlights the importance of the CVs' fit with (or relatedness to) the parent and this fit is usually defined along multiple dimensions. Research shows that CVs often display different levels of relatedness to their parent companies in terms of physical equipment, human resources, and marketing activities (Sorrentino and Williams, 1995). Given that some incumbents use CVs to enter markets or develop technologies that differ from what they are doing, CVs may or may not fit tightly with their parent economically and relationally (Thornhill and Amit, 2001). Some incumbents invest in CVs to explore emerging technologies that differ from those used by their firms, often without guarantees of successful financial returns. Given the need for these ventures to develop their own entrepreneurial cultures, without being constrained by prevailing control systems, they often have greater autonomy than existing units; this can severely limit the relational fit between CVs and the rest of the parent organization.

4.1.2. Context and CV activities

Variations in the characteristics of CVs often arise from different contextual factors (Zahra and Covin, 1995), possibly leading to different financial and non-financial outcomes. In this section, we will discuss the context and outcomes of CVs.

Both the environmental and intra-organizational contextual factors that could influence CVs have received attention in the literature, as indicated in Fig. 4. Research suggests that two external, environmental factors – technology-related factors and demand conditions – are related systematically to the characteristics of a firm's CV activities (Badguerahanian and Abetti, 1995; Zahra, 1996). This finding supports the predictions of Porter's positioning framework (Porter, 1980) and the technology management literature (Narayanan, 2001). In particular, technological opportunity is systematically related to the potential for CV (Badguerahanian and Abetti, 1995; Garud et al., 2002; Hitt et al., 1999). Technology and demand conditions also influence the firm's entrepreneurial activities (Antonic and Hisrich, 2001; Badguerahanian and Abetti, 1995). These activities usually focus on exploring emerging technologies, refining their performance, and making them ready for commercialization. In an era of continuous technological change, the need to win the race for standards can also stimulate technology-focused CV, as illustrated by research on Microsystems' sponsorship of Java technology (Garud et al., 2002).

Empirical evidence also indicates that CVs are sensitive to the intra-organizational context. Prior research shows that six contextual factors are related to intrapreneurship: the role of top management (Abetti, 1997; Badguerahanian and Abetti, 1995), corporate culture (Badguerahanian and Abetti, 1995), the organizational structure and process such as communication (Antonic and Hisrich, 2001; Keil, 2004), the use of rewards and controls (Antonic and Hisrich, 2001), corporate strategy profile (Carrier, 1996), and timing (Zahra, 1995). Predictably, top management support is essential for realizing the potential for CV as well as stimulating intrapreneurship and new business creation (e.g., Antonic and Hisrich, 2001). A key conclusion from this research is that CV is an element of corporate strategy (Carrier, 1996; Hitt et al., 2001).

Successful CV activities need an orchestrated organizational approach to ensure their effective and timely implementation. This approach requires having a supportive corporate culture (Badguerahanian and Abetti, 1995), promoting lateral communications (Antonic and Hisrich, 2001) and using strategic controls in evaluating intrapreneurial activities (Antonic and Hisrich, 2001). The firm's proclivity toward CV is also tied to timing, thus reflecting changing corporate goals, resources, skills and priorities. For instance, Zahra (1995) found that post-LBO companies increased their commitment to CV. By going private, companies usually change their goals and strategy. This change, in turn, promotes the
role of CV in building and assembling new capabilities that stimulate growth and improves profitability.

To summarize, both environmental and organizational contexts influence the CV strategy formation and implementation, as well as the potential for future CV actions (Fig. 4). Past studies show that industry-wide technology innovation is a key trigger for CV initiatives that complement and augment existing units and technologies (Garud et al., 2002). A supportive organizational context (e.g., supportive top management team and culture) also encourages CV activities (e.g., Badguerahanian and Abetti, 1995).

4.1.3. CV outcomes

Researchers have also analyzed the outcomes of CV at the parent and venture levels (Fig. 4). Some have studied the effect of the characteristics of a CV and its fit with (degree of relatedness) on the parent firm’s growth and profitability (e.g., Sorrentino and Williams, 1995; Thornhill and Amit, 2001). This focus is understandable because the relationship of CVs to their parents can significantly influence the corporate parent’s financial gains. At the parent level, some research has shown that entrepreneurial activities generate economic benefits for the parent corporation and improve its market performance (e.g., Antoncic and Hisrich, 2001; Garud et al., 2002; Matsuno et al., 2002; Zahra, 1995, 1996; Zahra and Covin, 1995). CVs, in particular, often yield several strategic benefits that include: learning, successful integration of a company’s operations, improved responsiveness, and successful standard setting (e.g., Birkinshaw, 1997).

To summarize, the literature shows that CV activities have a positive effect on a firm’s short-term economic benefits as well as its long-term strategic gains. Because many of the market and financial benefits take time to materialize (Zahra and Covin, 1995), if a short time span is considered when evaluating CVs these benefits may not be evident. This has led some researchers to employ measures that gauge intermediate outcomes of CV. For instance, some have used subjective measures to capture CVs’ short-term performance, supplementing traditional economic performance indicators. Given the range of strategic benefits associated with CV (e.g., learning and capability building), more creative measures are needed in future research.

4.1.4. Key moderators and mediators of the CV characteristics–outcome relationship

A fundamental question in CV research is: When do corporate ventures add value to their parent organizations? To address this question, a few studies have investigated the factors that moderate or mediate the relationship between CV characteristics and different organizational outcomes (Fig. 4). In particular, research has examined the firm’s external environment. For example, Zahra and Covin (1995) propose that CV is particularly useful when firms face a hostile environment, highlighting the moderating effects of environmental hostility. This finding indicates that incumbents’ efforts to stimulate innovation through CVs may yield economic benefits in hostile environments when tendencies to engage in cost cutting are the highest. Similarly, research has explored important internal contingencies. For example, Matsuno et al. (2002) found that the characteristics of the venture design (e.g., its organic structure and market orientation) mediate the link between CV characteristics and organizational outcomes such as market share, percentage of new product sales to total sales, and ROI. Overall, these research efforts underscore the need for more studies that identify key mediators and moderators of the CV characteristics—outcome relationship. Such research would improve theory building and provide well-grounded conclusions for managers interested in creating, evaluating and managing CV activities.

Attention to different levels of analysis helps us make sense of some seemingly contradictory findings with respect to the moderators and mediators, some of which also serve as contextual determinants of CV characteristics. However, once we look at the specifics, a clearer pattern of relationships emerges from prior findings. For instance, we have noted that some research shows that potential demand and technology factors define and influence CV characteristics and firms in hostile competitive environments gain the most from these ventures. Similarly, internal factors that are primarily controlled by top management influence CV (the structural and cultural factors of CV) and those under the control of CV managers seem to mediate the outcomes of CV efforts. The findings pertaining to the internal factors buttress the importance of differentiating the levels of analysis in future CV research, particularly at the ‘parent’ and ‘program’ levels.

Besides studying the broad characteristics of CV, researchers have given attention to CVC and spin-offs (see, Fig. 3). Given their theoretical and practical implications, we will now discuss these two areas.

4.1.5. Corporate venture capital

CVC is any equity investment made by non-financial corporations in start-up companies, for strategic and financial purposes (e.g., Maula, 2001). Over the past decade, CVC programs have sprung up around the globe. For example, from 2000 to 2002, corporations participated in more than 20% of the total equity investments in the US. Even after the US stock market crashed in 2000, CVC programs remained active players in the private equity market. Both the percent of deals with CVC participation and the percent of companies funded with CVC involvement stabilized at 16–18% in 2004. Likewise, European equity investments with corporate participation represented around 10% of overall investments in 2001 and 2002. To date, more than 130 Fortune 500 corporations have established CVC programs.

CVC is a key and popular component of CV activities. It focuses on giving the firm access to ideas that originate outside its boundaries (Miles and Covin, 2002; Zahra, 2005). CVC investments enable incumbents to connect themselves to start-ups and venture capitalists’ networks, gaining important knowledge about the sources and nature of forthcoming technological shifts. As such, CVC allows incumbents to address potential technological discontinuities that might transform their industries (Maula et al., 2003b).

Two major benefits accrue to companies from making CV investments: organizational learning (see also Yang et al., 2008) and social capital. First, Schildt et al., 2005 propose that, compared to non-equity venturing activities, CVC is conducive to exploratory organizational learning. Dushnitsky and Lenox (2005) also suggest that CVC is conducive to incumbents’ learning. CVC allows incumbents to observe and interact with different start-ups, promoting their ability to understand the changing dynamics that govern the market, technology and competition. Given that start-ups usually develop new technologies and use them in building new markets, this could improve incumbents’ learning about emerging technologies. These benefits, however, depend on the technological and industry fields in which incumbents invest their CVC funds. For instance, Dushnitsky and Lenox (2006) propose that CVC investments give incumbents a window into emerging technologies. Their research also concludes that CVC
investments add value when incumbents use them to harness novel technologies. Second, Maula et al., 2003b suggest that CVC is important for generating and replenishing social capital (the goodwill accumulated from the firm’s relationships with various stakeholders), facilitating the flow of knowledge from (and to) start-ups. This knowledge provides a foundation for incumbents’ learning. Maula et al., 2005 also observe that the staffs of the CVC units develop important knowledge and relationships that could expedite the efficient flow of information from start-ups to the incumbents’ operations. This enables incumbents to interpret, assimilate and use the information gained from CVC relationships.

Given the potential benefits associated with CVC, researchers have begun to study this issue closely (Fig. 5). Even though some CVC deals have also been prominent in the popular business press (e.g., Intel’s initiation of CVC), we could find only three empirical papers that addressed this topic. These studies highlighted three beneficial CVC characteristics: the process of resource transfer between parent and ventures; the investment approach used; and the (financial) investments made in ventures (Fig. 5), as discussed next.

As with other CV activities, technology factors and the variables related to the parent’s organizational context determine several aspects of the CVC process. Technology factors include technological opportunity and the strength of the intellectual property (IP) regime (Dushnitsky and Lenox, 2005). Technological opportunity also has a positive relationship on CVC investment, but stronger IP regimes have a negative effect.

Specific features of the organizational context considered in prior research are: resources and capabilities, the involvement and commitment of the business unit, and the structuring of the CVC program (Fig. 5). Dushnitsky and Lenox (2005) also reported that resources (i.e., cash flow and patent stock) are positively related to CVC investments. Similarly, Henderson and Leleux (2002) reported that the involvement of the business unit is positively related to the transfer of resources between the portfolio company (i.e., the CVC venture) and the parent. However, a business unit’s lack of commitment is a significant obstacle to resource transfer. Henderson and Leleux (2002) also found that if CVC managers had previous experience as a business unit manager, and if the CVC program was primarily responsible for venture investments, then resource transfer was more likely to materialize.

Still, CVC programs differ greatly and some prescriptive literature supports the need to structure CVC programs in a manner similar to VCs (e.g., Brody and Ehrlich, 1998). However, Birkinshaw and Hill (2003) found little empirical support for this prescription. In fact, Birkinshaw and Hill reported that a syndication approach to investment, as opposed to structuring the program, was positively related to CVC program performance.

In sum, prior research has explored several strategic benefits associated with CVC activities (e.g., Dushnitsky, 2004; Dushnitsky and Lenox, 2005; Keil, 2004), including stimulating technology innovation within investing corporations and leveraging their existing resources (Fig. 5). However, many issues remain. One area inadequately researched is how CVC activities interact with internal R&D activities. Further, it is still questionable whether independent VC firms are truly a possible archetype of “successful venturing” practices against which VCIs should benchmark themselves (e.g., Brody and Ehrlich, 1998; Chesbrough, 2002). Finally, measuring the short- vs. long-term value-added of CVC is problematic and researchers need to devise qualitative and quantitative schema that capture these efforts.

4.1.6. Spin-offs

A spin-off refers to creating a new business based on ideas and discoveries developed in the incumbent’s organization; this new business is then taken into a self-standing firm (Parhankangas and Arenius, 2003). Of the eight papers that studied spin-offs, four examined the phenomenon from the parent’s perspective while the other four focused on the spin-offs themselves. Papers that adopted a perspective parent-level explored the stock market reaction to the spin-off announcement. One paper suggested an announcement of a spin-off elicited a positive market response (Allen and Lummer, 1995). Similarly, spin-offs of unrelated ventures also elicited a positive response (Gertner et al., 2002). Seward and Walsh (1996) also showed that the CEO selection (inside vs. outside) was related to the wealth effects of spin-offs. Finally, there is some evidence of wealth transfer between stockholders and bond holders during spin-offs. Maxwell and Rao (2003) found that bond holders experienced negative returns in the month of the spin-off.

Two papers also examined spin-off performance. The type of CEO and board composition, stage and the strategy of the spin-off and its technology acquisition were identified as key determinants of this performance. For example, Chesbrough (2003) reported that spin-offs that had a higher percentage of venture capitalists on their boards were associated with higher financial performance than spin-offs with CEOs who were insiders of the parent.

As in the case of CVC, not all spin-offs are alike. Parhankangas and Arenius (2003) identified three distinct groups of corporate spin-offs: those developed using new technologies, spin-offs serving new markets and restructuring spin-offs. Parhankangas and Arenius (2003) also found that the three types differed in their: resource and knowledge sharing with the parent; timing of the separation; and direction and breadth of new product development activity. As predicted, spin-offs developed based on new technology focused on developing and commercializing leading-edge, new-to-market technologies. In contrast, the other two types of spin-offs emphasized exploiting existing technologies and/or busi-
nences. Spin-offs using new technologies as well as those serving new markets also developed and maintained close collaborations with their parent organizations.

The factors that trigger spin-offs also differ across spin-off types (Parhankangas and Arenius, 2003). Typically, spin-offs formed using a new technology are usually triggered by uncertainty. Spin-offs serving new markets are typically triggered by the unwillingness of the parent to support the diversification of the venture to the new market. Restructuring spin-offs occur when the parents reorganize by divesting the old businesses in mature or declining markets. Given our definition of CV, restructuring spin-offs do not really represent CV-related activity.

4.2. CV in the non-profit sector: the case of technology commercialization

The past decade has also witnessed growing financially motivated CV activity by the non-profit sector, accompanied by stronger and symbiotic relationships between the profit and not-for-profit sectors. Many non-profit organizations have encouraged research that can be embodied in a business enterprise to be spun-off. Since the 1980s, universities, hospitals and research institutes have spun off 4543 companies based on licenses, and 58.8% of all start-ups created were still operational by fiscal year 2004 (AUTM US Licensing Survey 2004).

The high survival rate of start-ups developed by non-profits may be attributed to institutional entrepreneurial efforts of those organizations. This included the existence of active technology transfer offices (Siegel et al., 2003; Siegel et al., 2004), venture development programs (Chrisman, 1997), and the development of science parks (Colombo and Delmastro, 2002). These supporting institutions give start-ups access to needed resources, advise their managers about different strategic options available, and link start-ups to existing networks that can influence their operations (e.g., suppliers, customers and VCs). These activities usually enhance start-ups' survival rates. CV in the non-profit sector has thus emerged as an important complement to the CV in the private sector.

In the studies we reviewed, the non-profit sector was represented mostly by universities but also included government agencies such as Small Business Innovation Research and Laboratories, which belong to the French National Institute for Agronomic Research. Overall, there were 19 papers related to university technology transfer and nine related to government agencies, with four specifically focused on government laboratories. We organized these papers within the context–characteristics–outcome framework, represented earlier. Contextual factors covered the developer or “sender” of the technology (e.g., university or government) and the recipient (e.g., a private firm), along with the linkages between the two. The knowledge hub in which the technology commercialization activities occurred was also a critical environmental factor. Finally, the outcomes of these transfers could be discussed at three levels: the sender of technology, the recipient of technology and the macro level outcomes such as industrial R&D, new technology creation and social benefits. Fig. 6 captures these variables.

4.2.1. Characteristics of CV activities in the non-profit sector

Characteristics of CV activities in the non-profit sector that received research attention (Fig. 6) included commercialization strategy and financing (e.g., Thursby and Thursby, 2002), knowledge transfer (e.g., Santoro and Chakrabarti, 2002), and spin-offs (e.g., Autio and Yli-Renko, 1998; Steffensen et al., 2000). Strategies used included equity participation and licensing. Financing focused on the source of the non-profit sector or VCs. Finally, many non-profit sectors encouraged spin-offs, as happens when professors start firms with the help of financing from many sources, including the university.

4.2.2. Context

The studies reviewed (Fig. 6) suggest that R&D intensive industries prompt firms to seek technology from universities and government agencies (Santoro and Chakrabarti, 2002), especially those firms that rely on external R&D (Thursby and Thursby, 2002) for their CV efforts. Not surprisingly, other firm-level antecedents in
the technology commercialization process in the non-profit sector included factors similar to those we have discussed earlier in the CV literature: organizational structure (Santoro and Chakrabarti, 2002) and corporate culture (Santoro and Gopalakrishnan, 2000; Siegel et al., 2003). For example, Santoro and Gopalakrishnan (2000) found the ‘stable and direction-oriented’ cultures, those with their high scores in consistency and sense-of-mission, facilitated the knowledge transfer necessary for effective technology commercialization. Santoro and Chakrabarti (2002) also found that more and larger firms with mechanistic structures prefer knowledge transfer and research support relationships with universities in order to build their competences. Conversely, smaller and more organic firms focus on problem solving through technology transfer and research relationships with universities. Clearly, these findings are similar to those reported in the case of CV activities. As a result, the non-profit sector would benefit from understanding the CV process in business firms, their primary customers.

Two major factors related to universities or government agencies emerged in our review as contextual determinants of the technology commercialization strategy: the characteristics of the technology transfer function and its resources and capabilities (Fig. 6). The size of the technology transfer office (TTO), age and experience, and the TTO expertise and policies are related to the strategy of commercialization used (Feldman et al., 2002). The resources and capabilities (e.g., intellectual property, quality of faculty, culture, reward systems, and social network) are also positively associated with the technology commercialization process (Colyvas et al., 2002; Di Gregorio and Shane, 2003; Jacob et al., 2003; Nicolaou and Birley, 2003a, 2003b; Shane, 2002; Zucker et al., 2002).

The link between the non-profit sector and business firms also significantly influences knowledge transfer (Fig. 6). For example, cooperation between universities and business firms is one of the most critical organizational factors influencing TTO activities (Meyer-Krahmer and Schmoch, 1998; Siegel et al., 2003). Santoro and Gopalakrishnan (2000) have also found that the trust between a firm and its university partner is conducive to the success of the knowledge transfer process. The geographic location also significantly influences the university–industry knowledge transfer (e.g., Owen-Smith et al., 2002).

It is clear that there are many similarities between profit and non-profit organizations when it comes to studying technology commercialization in terms of context and CV characteristics. Still, in the non-profit sector CV involves collaboration between the non-profit and profit sectors, and hence, is a far more complex phenomenon than CV in the private sector. This complexity arises from differing cultures, organizational practices and processes. This complexity is magnified by the diverse objectives of non-profit organizations, which are not usually well understood by profit-seeking corporations.

4.2.4. The role of knowledge hubs

A factor that distinguishes the literature on technology commercialization in the non-profit sector from that in the for-profit sector is the attention given to the influence of knowledge hubs, a topic studied in five papers (e.g., Lofsten and Lindelof, 2002). ‘Knowledge hubs,’ refer to an organizational presence in a given geographical location that hosts a cluster of firms, universities, government agencies and, in general, institutions that pursue science and technology activities in specific areas. These hubs constitute a nucleus of knowledge in these areas. Knowledge hubs include facilities and activities such as incubation programs, science parks, engineering research centers, and regional clusters. An organization’s presence in or connection to these hubs can give it access to knowledge, resources and valuable contacts to customers, suppliers and other stakeholders.

Empirical interest in studying knowledge hubs is understandable, given the widely acclaimed success of the Silicon Valley, North Carolina’s Research Triangle Park, or Route 128 in Boston. Some research suggests that the presence of a knowledge hub such as venture development programs and science parks influences the technology commercialization of non-profit organizations (Chrisman, 1997) as well as the performance and growth of their spin-offs (Colombo and Delmastro, 2002). The services and knowledge provided by these hubs enable these organizations and their spin-offs to build those capabilities needed to develop new technologies and take them to the market. They also help these organizations offset the limitations of their resources and experience in technology commercialization by providing essential complementary assets. Surprisingly, the role of knowledge hubs has not yet been examined carefully in the studies of CV in the profit sector.

4.3. CV in international settings

Though a significant number of studies have examined CV in the US, several empirical papers (n = 23) have investigated CVs in settings outside the US. These included: Japan and Israel; Europe (Finland, France, Germany, Italy, Portugal, and Sweden); and emerging economies (e.g., China, India, Russia, and Slovenia). These studies have examined CVs (including spin-offs) in both for-profit and non-profit sectors. A breakdown of the number of papers reviewed appears in Fig. 7.

The studies summarized in Fig. 7 mostly corroborate, but sometimes conflict with, the findings derived from the US context. Consistent with those studies conducted in the US, studies of CV outside the US (Fig. 7) corroborate the important influence of top management support on CV in Israel (Azulay et al., 2002), France (Badguerahanian and Abetti, 1995), and Slovenia (Antonic and Hisrich, 2001); the role of technological opportunity in promoting intrapreneurship in Slovenia (Antonic and Hisrich, 2001); and

4.2.3. Outcomes

The strategies that non-profits follow in their technology commercialization activities appear to be related to those organizations’ outcomes, in terms of the success of commercialization and TTO productivity (e.g., Bray and Lee, 2000; Thursby and Kemp, 2002). Some of the research reviewed in Fig. 6 shows that spin-offs generate economic and strategic benefits for firms and society (Steffensen et al., 2000). The relationship between the commercialization process and the outcomes of this process are moderated by the size of the firm and the effectiveness of the patents in protecting these organizations’ intellectual property (e.g., Harmon et al., 1997; Shane and Stuart, 2002).
Studies conducted outside North America (Fig. 7) also show cross-national differences in the contextual factors that drive the characteristics of CV activities. As shown in Table 2, some major differences are noteworthy. For example, technology and the demand for new products stimulated CV activities in Slovenia (Antonic and Hisrich, 1995). Further, the social environment was important in France (Badguerahanian and Abetti, 1995). However, neither of these factors was significant in the US-based samples. Further, with regard to organizational context, top management support was crucial for CV in the US, Israel (Azuay et al., 2002), France (Badguerahanian and Abetti, 1995) and Slovenia (Antonic and Hisrich, 2001). A case study of CV from Japan (Abetti, 1997) suggested that a new business in the early stages of development can flourish because of middle management efforts, even without top management support (Table 2). In addition, the role of the intrapreneur featured prominently in CV efforts in Japan (Abetti, 1997) and France (Badguerahanian and Abetti, 1995). Similarly, the role of organizational culture as a determinant of the CV process was strong and evident in France and Slovenia (Table 2). In France, an organizational culture that has valued decentralization and independence contributed to the success and then to the demise of the venture (Badguerahanian and Abetti, 1995). In Slovenia, competition-related and person-related values were significantly related to intrapreneurship (Antonic and Hisrich, 2001). These values were not as important or pronounced in the US context. The role of rewards and control in CV was significant in the US context, but not Slovenia (Antonic and Hisrich, 2001).

Finally, in contrast to research into the effect of contextual factors on CV, few studies have explored the relation between CV and the outcomes in settings outside the US. However, one study examined the behavioral outcomes of spin-offs in Russia. Specifically, Sedaitis (2000) reported that spin-offs initially had networks (that were characterized by high intensity) that would negatively impact their performance in a turbulent environment. Technology commercialization in the non-profit sector was more important in the US than in Japan (Spencer, 2001). Government support was also important for technology commercialization not only in the US (Archibald and Finifter, 2003) but also in emerging economies (Sedaitis, 2000) where companies had little experience.

Together, the findings reported in Table 2 indicate that both the institutional context (Peng, 2003) and national cultures (Hofstede, 1980) may influence companies’ proclivity to undertake CV, in a manner not captured in the typical single country’s studies. Given the growing interest in CV in developed and transitional economies, the role of the institutional context deserves more attention in future research. Researchers need to consider the context in which CV activities occur. For instance, the concept of CV may have different meanings in transitional economies. Indeed, in their study of privatized companies in Russia, Ukraine, and Belarus, Filatotchev et al. (1999) viewed CE as the entrepreneurial transformation of privatized enterprises during a special period of institutional transition. As these companies gain experience in promoting entrepreneurial activities, they may become proficient in nurturing particular CV efforts that enable them to build new capabilities and enter new businesses, enhancing their overall performance.

Overall, our review (Table 2 and Fig. 7) demonstrates that CV is becoming a worldwide phenomenon, frequently adopted to renew companies and revitalize their operations by inducing learning facilities capability building and stimulating new business creation. Still, the number of studies conducted outside North America is limited, even though the number of research contributions based on data collected from European companies is rising. The differences in the levels of details provided in these studies and their limited numbers also raise questions about the generalizability of their findings.

With the growing globalization of the world economy and the expansion of multinationals and emergence of companies that go international from inception, researchers have an important opportunity to probe the nature and different modes of CV and how these modes evolve over time. Multinationals often create new units that allow them to venture into market territories and explore new technological frontiers. Born global companies have been innovative in developing ways to overcome the liabilities of newness, smallness and foreignness as they probed and created markets and learned about diverse national cultures. By documenting these practices and changes them over time, researchers could identify emerging and changing forms of CV and show how national and organizational cultures interact to influence their success and failure.

5. Discussion

Research underscores the importance of CV for developing new business, learning and building new organizational capabilities that can promote companies’ survival, profitability and growth. Yet, this research has been fragmented, spotty in its coverage of important issues of interest, and non-cumulative in its findings. To promote greater coherence of future research and improve knowledge accumulation, we have organized major findings from these studies into a “context–CV characteristics–outcomes” framework; such framework has guided contingency theory research for decades (e.g., Hambrick, 1983; Hofer, 1975). Our analysis of the literature highlights three areas of CV that require further comment: CV as an element of corporate strategy; the heterogeneity of CV activities and programs; and the importance of multiple-levels of analysis. We address these three points in turn below.

5.1. CV as a key element of corporate strategy

Our review shows that three qualities set CV apart from other elements of corporate strategy, such as competitive positioning (Porter, 1980), or product or business diversification (Rumelt, 1974). Notably, besides product market or industry conditions, our review suggests that the technology context of the firm is an important antecedent for CV activity. In an era of technology emergence (Anderson and Tushman, 1990), where uncertainty is so high as to confound traditional strategy analysis (Porter, 1980), CV gains greater strategic importance in developing the firm’s capability building and determining the course of its evolution. While useful in different types of companies and industries, CV could be an important component of corporate strategy especially in high technology industries. Established companies in those industries could apply this approach to augment their search for new knowledge that could increase their innovativeness.

Further, CV activities appear to be sensitive to internal organizational issues such as autonomy of CV activity and organizational support, though this finding may be an artifact of research design. It is possible that in firms that have had longer experience with managing ongoing businesses, the principles for managing are so deeply embedded in managers’ mental models that they are taken for granted. However, CV focusing on starting businesses usually requires different organizational structures, arrangements,
and decision making processes. Most firms studied to date may have had limited experience with starting new businesses, surfacing organizational issues as important challenges. These issues might become less important as companies gain greater expertise in managing new ventures and integrating them into their business portfolios. Still, new CV programs have dynamics and challenges of their own and therefore may require different management and compensation systems.

CVs also yield strategic benefits that are not fully captured by the financial criteria typically employed in assessing the effectiveness of other elements of corporate strategy. Indeed, the effects of CV appear to be indirect and often center on inducing strategic change that unfolds over a longer time period than is common with other elements of corporate strategy. CV also enriches organizational learning that can promote innovation and risk taking activities. Further, CV can improve employee motivation and enrich the work environment by creating opportunities for employees and managers to apply their creativity. This creativity can enrich employee and organizational performance, strengthening the company's overall competitive standing and market performance (Zahra, 1991). To date, most published studies have not fully captured the non-financial effects of CV.

5.2. Heterogeneity of CV

CV programs vary significantly in their duration, objectives, and organization. For example, CV programs have been reported to be less stable in their funding and existence than independent venture capital firms (Gompers and Lerner, 2000). Companies typically initiate these programs at times of prosperity but discontinue them when market conditions are challenging. The slack resources devoted to other CV efforts frequently decline when the environment is challenging. The fact that CV activities differ in their resource needs creates an opportunity to study the potential substitutions that might exist among them. For instance, do companies that abandon CVC rely more on licensing? What are the implications of these substitutions?

The literature also indicates that some CV programs have strategic objectives while others pursue financial goals. Strategic objectives center on learning new technologies or new markets (e.g., Dushnitsky and Lenox, 2005), building options for acquiring target companies (e.g., McNally, 1997), and leveraging complementary assets or technologies (Keil, 2000). Some corporations consider their CV program a key link to the VC community, generating important deal flows and streamlining the internal venturing process (McNally, 1997; Winters and Murfin, 1988). Clearly, there is a need to study the non-financial goals of CV programs.

CV programs also have diverse organizational structures. Four such structures have been identified in the literature: independent pooled fund, independent dedicated fund, in-house managed fund, and ad hoc equity investment (e.g., McNally, 1997). Currently, we know little about the effects of these structures on CV programs' performance and value-added to the parent. Our review also indicates that CV programs have different objectives and structures. Yet, researchers continue to overlook these differences when theorizing on the effectiveness of these programs. Thus, it is not clear if and when CV programs are likely to pay off, financially or strategically. Incorporating these variables into future studies can enrich theory building and research findings.

5.3. Multiple-levels of analysis

As noted earlier, CV research covers three levels of analysis: the parent, program, and venture/investment levels. However, much of the CV literature does not explicitly distinguish among different levels of analyses. Therefore, we emphasize that to be meaningful, the general contingency framework utilized in this paper needs to be appropriately tailored to the level of analysis at hand.

Specifically, variables that constitute context, characteristics and outcomes depend greatly upon the specific level of analysis. Our distinction between programs and investments is similar to differentiating strategy and tactics. Each investment could be viewed as a tactical move, in which the firm's overall or corporate strategy is revealed in the "pattern in a stream of investments". This also means that as an element of corporate strategy, CV could be analyzed at the program level. Specifically, CV activities could provide an important window into how managers sequence the implementation of their chosen strategy to build organizational capabilities. Studying CV programs, however, does not mitigate the need for firms to examine investments in specific ventures for preferred outcomes or learn from their pattern of investments. These fine-grained analyses at the venture level could enhance the process of learning how to better manage and organize different types of ventures, staff their operations, devise effective compensation policies for their staff, and intervene when the venture runs into difficulties.

In addition, there is a need for the careful selection of CV outcomes and their measures both conceptually and operationally—that are appropriate to the level of analysis. At the parent level, more strategic and long-term financial outcomes may be appropriate. At the program level, managerially oriented outcomes appear to be the most important. Still, at the venture level, tactical outcomes (including relatively shorter term financial and strategic outcomes such as access to technology) are most relevant. The fact that CV activities unfold across three levels of analysis (parent, program and venture/investment) should encourage researchers to explore variables that fall "within" and "in-between" levels, influencing processes and outcomes. Further, researchers need to use theories that enable them to capture the within and in between levels of analyses. Indeed, CV research in general would benefit greatly from giving more attention to theory building, a task that requires understanding the relevant contextual variables. Theory building should be better aligned with creative research methods and designs to improve rigor and enhance the quality of findings. We discuss these issues next.

5.4. Methodological issues in CV research

Collectively, most papers we reviewed in this article used cross-sectional research designs, relying primarily on case studies or surveys. As shown in Table 3, for those studies conducted in for-profit sector organizations, surveys have been the dominant mode in collecting data on the program and venture levels of analysis. In contrast, case studies are more prevalent for studies of non-profit sector organizations (11 studies). Of the 84 papers reviewed, 14 used archival data sources. The dearth of archival data complicates replications other published studies and establishing the external validity of the findings. To be sure, case studies and surveys are helpful, but the use of archival data sources can heighten awareness of the various contextual variables that influence the results of CV activities. This problem is compounded by the fact that we could locate only two papers that employed a longitudinal research design. In one study, Hitt et al. (1999) tracked the role of top management team support during a CE process, whereas Zahra and Covin (1995) examined the positive impact of CE on company performance over time. The paucity of studies that use longitudinal research designs handicap efforts intended to understand why some CV programs fail and others succeed and add value. It is also hard to reliably establish causal relationships using data obtained via cross-sectional designs.
Table 3
Findings regarding CV activities in the US vs. other countries.

<table>
<thead>
<tr>
<th>Determinants</th>
<th>USA</th>
<th>Other developed countries</th>
<th>Emerging economies</th>
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<tr>
<td></td>
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<td>Japan</td>
<td>Europe</td>
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<td>Environment</td>
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<tr>
<td>Technology</td>
<td>+</td>
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<td>+</td>
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<tr>
<td>New product demand</td>
<td>0</td>
<td></td>
<td>+</td>
</tr>
<tr>
<td>Social environment</td>
<td></td>
<td></td>
<td>+</td>
</tr>
<tr>
<td>Organizational context</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Top management support</td>
<td>+</td>
<td>0</td>
<td>+</td>
</tr>
<tr>
<td>Role of Intrapreneur</td>
<td>0</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Culture/process</td>
<td>0</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Reward/control</td>
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<td></td>
<td>O</td>
</tr>
<tr>
<td>Relatedness between parent and venture</td>
<td>+</td>
<td></td>
<td>(∩) inverted-U shape relation</td>
</tr>
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</table>

Note: (+) positive relationship; (O) no significant relationship; (∩) inverted-U shape relation. Blank: not studied.

To recap, comprehensive analyses of the CV phenomenon within the context–CV characteristics–outcome framework are nearly absent. Thus, it is not possible to assess whether the significant results found in prior studies reflect the spurious correlations among the variables explored; i.e., correlations that might disappear when other relevant factors are considered and controlled for in the analysis. This leads us to urge future researchers to apply SEM-type analyses to examine the relationships as comprehensively as possible and determine the nature of the relationships of the variables of interest. The cross-sectional designs typically employed in CV research also preclude drawing causal inferences, and future work should therefore adopt longitudinal designs that better capture the causal dynamics among the relationships. Still, these methodological improvements should be guided by careful theory building.

5.5. Improving theory building

Our review also provides a window into the various theories that have guided the empirical research on CV. Three primary streams appear to have dominated prior research: management of innovation, strategic change and industrial organization (IO) economics. Predictably, research on the management of innovation and strategic change has helped researchers to anchor their hypotheses linking organizational context and CV characteristics, especially the role of top management, culture and structure. Similarly, the environmental dimensions – both as contextual factors and moderators – are usually anchored in IO or contingency theories of the organization. While all these streams display a wide range of theoretical perspectives, the conformity of CV-related findings to those arrived at in the literature provides some confidence that CV research is on track. Reviewing Table 1 underscores this important point. Researchers seem to invoke different theories but do not use them in building their predictions.

We believe that the focus on testing existing theories in the CV context has obscured the unique features of CV, both as an element of corporate strategy (program level) and a series of transactions (venture level). In particular, the lack of attention to theory development has made it hard to connect prior findings on CV to popular research streams in the fields of strategic management and entrepreneurship. To help remedy these shortcomings, below we discuss five theories that can improve our understanding of the CV phenomenon. We have chosen these theories because of their conceptual closeness to key CV research issues as well as their proven predictive track record across diverse settings.

5.5.1. Resource-based view of the firm

In developing our framework, we underscored the heterogeneity of CV processes within firms. This finding that can be clearly linked to the resource-based view (RBV) of the firm (Barney, 1991; Penrose, 1959). RBV can help to explain the heterogeneity of CV activities by connecting them to the resource base of the parent company whose resources often provide different motivations for pursuing CV activities. For example, how do CV activities of a technology leader differ from those of a laggard, with the follower aiming to exploit existing technological resources while the leader seeks to exploit new ones?

The abundance and diversity of resources may also influence how corporations organize their CV activities. For instance, a corporation with a large base of intellectual property (e.g., a large number of patents) is more likely to undertake internal than external CV activities. Similarly, with positive and well established reputations in their industries, corporations can easily attract deal flows and can thus more readily undertake independent CV operations than those firms with less favorable reputations (Keil, 2004). The incumbent’s resources may also affect the types of its target ventures in terms of the development stage (e.g., seeds, early stage, product development stage, etc.), technologies, and industries (e.g., substitute vs. complementary).

The RBV can also advance our knowledge of how CV activities generate strategic benefits for their parent companies. Applying the RBV, CV activities can contribute to the resource bases of the parent company in two areas: exploration of new resources and exploitation of existing ones (Chesbrough, 2002). Specifically, CV activities may help the incumbent to explore new fields by learning new technologies and entering new markets, leveraging their resources by promoting existing technologies and expanding market shares (Maula, 2001). Despite the focus on the role of CV in exploration especially with respect to technology (e.g., Dushnitsky and Lenox, 2005), other benefits of CV deserve greater attention. Researchers also need to investigate the strategic fit of diverse CV activities with the parent company’s resource bases, instead of assuming that all CV activities are homogeneous.

5.5.2. Diversification and transaction costs

Transaction cost economics (TCE) may also provide a theoretically sound logic that justifies the use of CV as an element of corporate strategy and its usefulness in explaining the scope of the firm and the appropriate degree of its diversification. In the case of specific acquisitions, Porter (1987) has proposed the three “essential tests” for successful diversification that would create shareholder value: the attractiveness test, the cost-of-
entry test, and the better-off test. Applying TCE, researchers could explain why companies pursue specific CV activities and how they establish an optimal portfolio that serves shareholders’ interests. CV leads to the creation of new businesses within or outside the organization (Sharma and Chrisman, 1999). Thus, numerous CV activities have been identified in the literature, from fully internalized business development (e.g., intrapreneurship), to semi-internalized arrangements (e.g., joint ventures), to equity investment outside the organizational domain (e.g., CVC) (Keil, 2000; Maula, 2001). Thus, the TCE theory could help in investigating how companies choose an optimal combination of different CV modes.

5.5.3. Options theory
As noted, CV programs frequently serve multiple strategic objectives, not simply economic (short run) goals. As a result, at the venture level, CV activities could be linked to option logic. In particular, CV activities can be viewed as the option building process (Hurry et al., 1992), which begins with a collection of shadow options derived from prior relationships between the parent firm and their newly created ventures. It is crucial that CV managers recognize the latent options and the underlying future opportunities. Applying this logic, researchers could address several questions such as how to organize CV activities so that an effective information flow exists to facilitate opportunity recognition. This theory can also be useful in investigating how corporations should evaluate their CV activities and create opportunities, highlighting the need for managerial flexibility on the part of the parent and the new CVs.

Further, the initiation of a given CV activity may create multiple real options. Examples include the option to default during staged development, growth options, and switching options for the parents. When a portfolio consists of multiple real options that interact with each other, their individual values may be sub-additive (McGrath, 1997; Trigeorgis, 1996; Vassolo et al., 2004) or super-additive (Vassolo et al., 2004). Applying real options theory, researchers could determine how to build the CV portfolio so that, as a whole, it would most benefit the corporate investors.

The real options associated with CV activities are analogous to the American-style Option,10 which can be exercised or abandoned before a particular expiration date. The option exercise can take different modes such as the acquisition of the venture, R&D alliance, joint programs for product development, or even escalation of further investment in the venture. Researchers should also identify the factors that determine the choice of the different exercising modes and the timing of companies’ exercising options.

5.5.4. Learning theory
One of the critical distinctions between CV as a program vs. being a set of transactions is the role of learning. Within a CV program, learning accumulates with experience from one venture to another, as well as vicariously from external sources (Maula et al., 2003a). Knowledge accumulation and transfer may be critical for the successful operation of the CV, processes that are the focus of the knowledge-base view of the firm.

In the context of CV, knowledge can be created at two levels: the venture and the program. At each level, learning may occur, either in the content or process of CV (Keil, 2004). For example, at the venture level, the corporation might build knowledge of new markets or new technologies thus gaining considerable insights into developing and managing these new ventures. Parallel to this learning, the corporation also learns how to obtain access to information about new markets and technologies, how to transfer it back, or how to integrate it into the knowledge base. At the corporate venturing program level, knowledge-related venture capital investment accumulates either through practice or by observing and analyzing others’ venturing activities. In doing so, the corporation learns how to organize its CV program effectively, possibly promoting learning. Reviewing the literature on CV, we are struck by the frequent mention of learning as a key benefit of CV. However, little systematic effort has been devoted to conceptualize and capture this learning. More theoretically grounded empirical studies should investigate how a firm builds CV capability through learning.

Interorganizational learning in which knowledge flows from the new corporate ventures to their parents is particularly important; this is usually one of the major strategic objectives of CV activities. In particular, given that they connect incumbents with start-ups, CV programs have been regarded as an effective instrument of external knowledge acquisition (e.g., Dushnitsky, 2004; Dushnitsky and Lenox, 2005). Chesbrough and Tucci (2004) have also reported that CVC investments effectively stimulate additional corporate innovation, rather than substituting for formal R&D activities. This finding provides indirect evidence of interorganizational learning in CV efforts. However, to date, few empirical studies have identified the interorganizational learning mechanisms used in the context of CVC. This creates important opportunities for researchers to identify the various mechanisms that companies use in transferring knowledge from their operations to the newly created ventures and vice versa.

5.5.5. Institutional theory
Our analysis of the different influences of various sets of variables across nations suggests that explanations of CV might benefit from the institutional theory. The regulative, normative and cognitive pillars of institutional theory (Scott, 1994) could perhaps explain the subtle influences of the institutional setting on CV, with the regulative focusing on the laws (e.g., intellectual property and bankruptcy laws) and governmental institutions; the normative emphasizing cultural elements (e.g., Hofstede, 1980); and the cognitive highlighting belief structures.

For example, in the US, “regulative pillars” (Scott, 1994) have evolved during the past decade. For example, both NCRA11 and the Bayh-Dole,12 Act have had an important influence on the way collaborative relationships among organizations, even competitors, can be conducted (Shane, 2004). How have these regulatory changes influenced the use of CV? Similarly, as Peng (2003) has argued, emerging economies have regulative (institutional) arrangements that differ from those in developed economies. What influences do these differences have on the way corporations organize their CV activities? What are the implications for CV outcomes? Because of the growing interest in CV in transitional economies, understanding the link to the institutional context may help us answer questions such as: How should one

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10 There are two major types of financial options: American-style Option and European-style Option. The American-style Option can be exercised at any time between the purchase date and the expiration date. European-style Option can only be exercised on the date of expiration (Fontanills, 2005).

11 The National Cooperative Research Act (NCRA) of 1984 was aimed at reducing the potential antitrust liabilities for research joint ventures. In 1993, the Congress of the United States amended and renamed the NCRA. Now it is known as the National Cooperative Research and Production Act (NCRP). The NCRA extended the coverage of the NCRA to production as well as research joint ventures.

12 In 1980, the Bayh-Dole Act was enacted in the United States, which gave universities, small businesses and non-profit organizations control of their intellectual property that resulted from federal funded research.
organize and manage CV activities in developed and emerging economies?

To reiterate, our review suggests that the CV literature has matured to the point where better theoretical grounding is essential for producing rigorous and valid empirical works. The theories we have just presented are by no means exhaustive; they simply illustrate the rich variety of promising issues to be explored in future research. As noted, researchers have tended to invoke different theories (see Table 4) but not use them well in building predictive and constructive suggestions.

5.6. Managerial implications

Our paper has several implications for managerial practice. Notably, it suggests that managers have a portfolio of CV activities from which they can choose to stimulate innovation, expand operations and achieve growth. Decisions as to which of these activities managers should pursue are made with an appreciation of the firm’s external environment and competitive strategy in mind (Keil, 2004). Strategy sets the parameters for the types of skills to be developed and how they could be built, using internal and external sources.

A portfolio approach to building capabilities requires managers to consider the complementarities and substitutions among various CV activities (Keil et al., 2008; Vassolo et al., 2004). Licensing technologies developed by other companies or using alliances might, for instance, substitute for some internal development. Recognizing and appreciating the tradeoffs among CV activities should enable managers to gain clarity about how fast and where to develop those capabilities that give their companies a competitive advantage and ensure superior performance. An important insight from prior research is that the portfolio of capabilities and corresponding CV activities are likely to change over time, reflecting the strategic challenges the company is facing. Therefore, managers need to periodically assess this portfolio and make necessary adjustments.

Making decisions about using external CV activities raises several additional challenges for managers. The first is to develop the absorptive capacity needed to capture, harvest and exploit the knowledge obtained from external sources. Companies that lack this capacity cannot fully appreciate the knowledge they are likely to obtain externally or how to use it to build capabilities. Building absorptive capacity requires investments in the firm’s intellectual capital and the systems that allow companies to recognize, identify, import and assimilate external knowledge.

Another managerial challenge is integrating the knowledge gained from external sources with that generated internally. This integration can be difficult because the content of externally developed knowledge might differ significantly from internal knowledge. In addition, these two types of knowledge can be at different stages of development, requiring further refinement. Knowledge integration, however, is a key source of combinative knowledge that can become the source of innovation, business creation and strategic variety. Attention to this integration makes it possible to conceive of different strategic options for business development. Integration could be achieved using cross-functional teams and task forces that consider where combining knowledge is feasible and how it is best achieved.

To gain the benefits associated with CV, managers need to balance short-term needs (e.g., filling voids in existing skill portfolios) with long-term objectives (e.g., learning and capability building) as well as between operational (e.g., efficiency) and strategic priorities (e.g., building new businesses that generate revenue streams). Achieving this balance requires clarity about the firm’s overall strategy and its industry’s evolutionary dynamics (Dess et al., 2003). It also necessitates resolving several conflicting forces that influence their company’s organizational structure (Ginsberg and Hay, 1994). Specifically, managers have to give new units autonomy and discretion in order to develop and grow (Keil, 2004). Yet, they need to keep these units connected to the rest of the organization in order to capture new knowledge and other skills they develop. This coordination and integration of new and established businesses could be achieved by restructuring the firm’s operations or by applying strategic controls (Zahra, 1991; Zahra et al., 2000). These controls rest on understanding the business setting as well as having clear performance parameters while giving managers discretion in meeting these goals. Thus, they differ from traditional controls that specify performance quotas and the ways to achieve them. Strategic controls give managers of new units some freedom to experiment, explore and learn. Clearly, capturing value from CV activities requires foresight on the part of managers. It also demands creativity in addressing the contradictory challenges associated with innovating and venturing into new territories.

6. Summary and conclusion

Over the past decade, a large body of empirical studies has examined the CV phenomenon in the for-profit and non-profit sectors. These studies have been conducted in different national contexts, improving our understanding of the key antecedents, processes and outcomes of the CV phenomenon. Researchers have focused on the strategic role of CV, while continuing to examine its financial contribution. CV is viewed as an important element of corporate strategy, not a mere investment opportunity. Another noteworthy shift in research is the growing attention to the national and organizational contexts of CV operations and how these variables influence the various outcomes of venturing activities. Researchers have also given attention to the portfolio of CV projects and programs and how their interrelationships could influence the gains companies achieve.

Our analysis and synthesis of prior studies show that with few exceptions, much of this research has been opportunistic and lacking in its theoretical grounding. Consequently, we have attempted to promote coherence in future analyses by offering an integrative, organizing framework. Longitudinal analyses that incorporate integrative models of CV and are grounded in theory are necessary. As our review suggests, much has already been accomplished, but many promising research opportunities lie ahead. For future research on CV to be cumulative and impactful in guiding scholarship and managerial action, there is a need for careful theory building.

Acknowledgement

We thank the anonymous reviewers and editors for their supportive and constructive suggestions.
## Appendix A

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### Context and characteristics of CVC

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### Context and characteristics of technology commercialization

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Moderators of technology commercialization

1. Size of the firm
2. Effectiveness of the patents
3. Knowledge related to non-profit organization
4. Outcomes related to firm
5. Spin-off – firm performance
6. Spin-off – social benefits

Characteristics of technology commercialization and outcome

1. Commercialization strategy – the success of technology commercialization
2. Commercialization strategy – TTO productivity/efficiency
3. Knowledge transfer – firm performance
4. Knowledge transfer – new technology diffusion
5. Spin-off – firm performance
6. Spin-off – social benefits

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