CORPORATE VENTURING GOVERNANCE, KNOWLEDGE FLOWS AND PERFORMANCE

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CORPORATE VENTURING GOVERNANCE, KNOWLEDGE FLOWS AND PERFORMANCE

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ABSTRACT
This study investigated how governance structure in corporate venturing (CV) impacts knowledge flows between a parent company and its new ventures. Based on agency theory, we proposed that autonomy and incentive scheme may stimulate or eliminate agency behaviors of CV programs in the knowledge transfer process, and ultimately influence the performance of new ventures. Using a sample of 61 companies in Japan and the United States, we found that autonomy may stimulate agency behaviors of CV programs by discouraging them to participate in the knowledge transfer process. On the contrary, the strategic-based incentive scheme may mitigate such agency behavior and encourage knowledge flows in CV activity. In addition, we also found the moderator effects of CV objectives on these relationships.

INTRODUCTION
Over the past three decades, companies have shown significant interest in corporate venturing (CV) as a means of achieving strategic renewal, building organizational capabilities and creating value for shareholders (Narayanan, Yang & Zahra, 2009). Business interest in CV has stimulated academic interest in the topic, resulting in a growing body of literature. In particular, CV has been viewed as an important source of new knowledge that helps the parent either leverage the existing core businesses or build new businesses with growth potential (e.g., Keil, 2000; Maula, 2001; McNally, 1997; Schildt, Maula, & Keil, 2005). However, as Birkinshaw (2005) pointed out, most CV programs are themselves startups. Different from well-established existing business units, CV units are usually operated under inexperienced management with the purpose of discovering new business domains. Thus, how to govern CV activity and improve its performance is a challenge facing the corporate parents.

In this study, we attempt to address this research question from the knowledge-based view. We argue that knowledge transfer between the corporate parents and their new ventures provides an essential building block of new competencies that will eventually lead to better performance (e.g., Zahra, Neilsen & Bogner, 1999; Zahra, Sapienza & Davidsson, 2006). Furthermore, we link the governance issues such as autonomy and incentive scheme to the knowledge transfer process. Grounded in the agency theory, we suggest that different control mechanisms may trigger or hinder agency behaviors in the knowledge transfer process, and finally influence the knowledge flows between the parents and their new ventures.

The paper is organized as follows. In the next section, we first define CV activity, and then elaborate on the relationships between CV governance, knowledge flows and new venture performance. In the third section, we lay out the data and methods to examine the hypotheses. A concluding section hints at the results, and offers potential implications.
THEORY AND HYPOTHESES

Knowledge Flows in CV Activity

CV is a manifestation of corporate entrepreneurial efforts leading to the creation of new business within or outside the organization (Sharma & Chrisman, 1999), as well as being linked to innovation and strategic renewal (Zahra, 1995). CV activity may follow innovations that exploit new markets or new products; they also may lead to significant changes in an organization’s business or strategy or its competitive profile (Narayanan, Yang & Zahra, 2009).

In the past three decades, CV activity has been prevalent in corporations. Typically, a parent company creates an organizational unit/program in charge of investing in and developing new businesses. Although such CV programs may take many forms, their critical common mandate is to act as an approach to innovation (Birkinshaw & Hill, 2005) either by exploiting existing resources or by exploring new domains. In fact, CV programs provide a learning vehicle for new knowledge that helps the parent better capture the values of both existing assets and entrepreneurial ideas. For example, a number of studies have suggested that CV activity such as CVC investments can help the parent company update its knowledge base and stimulate internal technology innovation (e.g., Dushnisky & Lenox, 2005a, 2005b).

On the other hand, new businesses need knowledge from their parent companies to facilitate the venturing process. With years of investments in knowledge accumulation, the parent companies possess huge knowledge stocks related to R&D, marketing, human resources management, etc. Knowledge flows from the parent will provide a wide range of supports to its new businesses at both the operational level such as technological and marketing supports (Maula, Autio & Murray, 2003) and the strategic level such as missions and visions. Thus, knowledge sharing between the parents and their new ventures are critical to the success of CV activity.

Governance Structure and Knowledge Flows

Corporate parents normally delegate the task of new venture development to their CV programs, and moreover depend upon their venturing branches to collect and deliver knowledge from new businesses. On the other hand, knowledge flow to a new venture from its parent is mostly controlled by the CV program as well. Some researchers have observed that CV programs often involve other business units in the new business development (e.g. Henderson & Leleux, 2002). The involvement of other business units in new business development contributes to knowledge flows between new ventures and their parents (Dushnisky & Lenox, 2005a). However, the extent to which other business units can be engaged in this process is largely determined by CV programs’ judgment and efforts. Thus, we argue that CV governance structure such as autonomy and incentive scheme may stimulate or mitigate agency behaviors in the knowledge transfer process, and influence the knowledge flows between new ventures and their parents.

Autonomy and Knowledge Flows. According to the agency theory, autonomy is typically associated with managerial discretion, low task programmability, and ambiguous cause-effect relationships, all of which give rise to information asymmetries (Eisenhardt, 1988; Gerhart & Milkovich, 1990; Gomez-Mejia, 1992; Rajagopalan & Finkelstein, 1992). Thus, high levels of autonomy may stimulate agency problems unless other controlling mechanisms exist, whilst the low level of autonomy helps the principals better monitor and verify agent behaviors, thereby tightly controlling the agency problem.
CV activity exhibits a range of autonomy levels. At one extreme, a new business can function as an independent firm. There is little exchange of personnel between the parent and the new venture unit, no need for the parent’s approval of an investment, and no formal reporting relationship. At the other extreme, a new venture unit can be tightly controlled by the parent. In addition to a regular exchange of personnel, the new venture unit may also participate in the formal planning and budgeting system of the parent and directly compete with existing units for resources. In the context of CV activity, loose control from the parent may allow corporate venturing managers to quickly respond to the changes in the environment; however, as discussed before, the high level of autonomy creates information asymmetries, and makes the parent difficult to monitor CV units’ agency behaviors. For example, most of the learning tasks are largely carried out by CV managers through working closely with the parent and other existing business units. It is possible that CV managers may pursue personal financial interests by sacrificing the learning tasks that require efforts and commitment but may not be directly related to their performance and personal financial rewards. Close oversight of corporate new ventures may mitigate CV managers’ such agency behavior, and help the parents obtain the desired knowledge. So, we propose that:

**H1: The autonomy of the new businesses are negatively related to the knowledge flows between the parent and its new businesses**

**Incentives and Knowledge Flows.** How to provide agents incentives so that they behave in the principals’ interests has long been discussed in the literature of agency theory (e.g. Eisenhardt, 1989). It is believed that an appropriate compensation package would align the agents’ interests with those of the principals, and then limit the agency problems (e.g. Jensen & Meckling, 1976). In general, compensation systems can be classified into two groups: behavior-based and outcome-based. Numerous studies have argued that outcome-based incentive schemes are more appropriate when agent behaviors are costly or difficult to observe due to information asymmetry (Conlon & Parks, 1990). In addition, incentive schemes signal the principle’s objectives and directly influence the actions and behavior of their agents (Galbraith & Merrill, 1991).

Typically, CV activity generates both financial and strategic outcomes. A financial outcome-based compensation would encourage CV managers to pursue financial success of new ventures, rather than fulfill strategic objectives of CV activity. As a result, less knowledge will be transferred back to the parents. To chase their personal financial success, CV managers may be even reluctant to transfer knowledge back to the parents when new ventures may be in the competition with existing business units.

In contrast, a strategic outcome-based incentive scheme would motivate CV managers to better serve the strategic objectives because it connects CV managers’ income with the parent’s long-term performance. Thus, we would expect that under the strategic outcome-based incentive scheme, CV managers are willing to facilitate knowledge transfer from the new businesses to the parents, and are dedicated to the longstanding strategic contribution to their parent companies. On the other hand, the strategic outcome-based incentive scheme would also discourage CV managers’ commitment to the new businesses, in particular when they are competing with the existing core business units (Alvarez & Barney, 2001).

**H2a: The financial-based incentive scheme will encourage knowledge inflow from the parent to the new businesses.**
H2b: The strategic-based incentive scheme will encourage knowledge outflow from the new businesses to the parent.

CV Objectives and Knowledge Flows. The center of agency theory is the question of how the principals can ensure that their agents act in the principal’s interests and not in their own. The conflicts may arise due to adverse selection (Akerlof, 1970; Eisenhardt, 1989) and moral hazard (Eisenhardt, 1989; Jensen & Meckling, 1976). Recently, Hendry (2002) pointed out that in addition to adverse selection and moral hazard, agency problems more be derived from the principals’ incompetence. For example, facing “multitasking” (Holmstrom & Milgrom, 1991), principals may be unable to clearly specify their complex or multifaceted objectives in the contract. So, the agents may not have the ability to meet their principal’s objectives even though they are honest and dutiful (Hendry, 2002).

CV activity represents a typical example of “multitasking” activity and has demonstrated a wide range of strategic objectives (e.g., Braody & Ehrlich, 1998; Keil, 2000; Maula, 2001). The parent company can use CV activity to stimulate its innovation rate and develop its knowledge base, technologies, products and processes (e.g. Dushnitsky & Lenox, 2005a), or to stimulate demand for their technologies and products (Keil, 2000), or to build options to acquire companies (e.g. McNally, 1997), or to proactively shape the market (Keil, 2000). In general, these objectives can be summarized into two major categories: (1) improving the capture of value from existing assets for the purpose of exploitation and (2) improving the capture of value from new ideas for the purpose of exploration. Through exploitation, parent companies are able to exploit traditional assets such as world-class manufacturing skills, extensive distribution networks, or strong brand awareness. Through exploration in the new territories, CV activity can provide a learning vehicle to both market level and venture specific knowledge.

With multiple objectives (exploitation vs. exploration), the parent companies sometimes struggle with the priorities of different strategic goals, and fail to deliver well-defined long-standing missions for their new businesses. It is one of the reasons why many CV efforts went unsuccessful (Brody & Ehrlich, 1998). Compared to exploitation, exploration of new technology/market seems to be a more important objective for CV activity as it helps the parent to learn new technologies and simulate internal innovativeness. This argument is supported by the result from the Ernst & Young Corporate Venture Capital Survey on 40 global leading CVC programs in 2002. Thus, CV managers’ agency behaviors may be mitigated by clearly defined CV objectives toward exploration. For example, when a CV activity is clearly claimed to develop new competencies and gain access to new technology, new market or new materials, CV managers may feel obliged to transfer knowledge associated with these new domains back to the parent even when they have high level of autonomy to operate the new businesses. In addition, the financial-based incentive scheme may not be enough to encourage knowledge inflows to the new businesses because knowledge transferred from the existing businesses may be irrelevant to the conditions of new territories. On the contrary, the strategic–based incentive scheme may become more relevant because the incentive scheme is congruent with the objectives. Thus, we propose:

H3a: The negative relationship between the autonomy of the new businesses and knowledge flows between the parent and its new businesses may be mitigated when the new businesses are mainly engaged in exploration.

H3b: The positive relationship between the financial-based incentive scheme and knowledge inflow from the parent to the new businesses may be mitigated when the new businesses are mainly engaged in exploration.
H3c: The positive relationship between the strategic-based incentive scheme and knowledge outflow from the new businesses to the parent may be strengthened when the new businesses are mainly engaged in exploration.

Knowledge Flows and New Venture Performance

On the side of new ventures, knowledge inflows (i.e., technological and marketing knowledge) from the corporate parents may help them grow quickly. Corporate new ventures typically are formed based on brilliant new ideas and innovative technologies. However, new business development is a complex and multi-disciplinary process. New ventures typically don’t have the broad range of skills, expertise, and capabilities to accomplish this task alone (Deeds & Hill, 1996; Teece 1986). On the contrary, the parents typically possess knowledge stocks related to R&D, marketing, human resource management, etc.. In addition, some corporate parents are leaders in the marketplace, and so new ventures can learn the best practices by observation and benchmarking. Thus, knowledge inflows from the parents may complement the inexperience of new ventures (Block & MacMillan, 1993; Pisano, 1994; Teece, 1986), thereby enhancing their performance.

Knowledge outflows from new ventures may also relate to their performance. The literature has suggested that intraorganizational knowledge flows are reciprocal (Schulz, 2003). When a new venture sends its new knowledge to the parent, it provides clues about its operations and market information. In the case of exploitation, the more knowledge a new venture sends to other business units, the more the others are aware of the relevance of their knowledge for the new venture, and they will become more motivated to share the knowledge when it is relevant (Schulz, 2003). In the case of exploration, new ventures open a window over new technology/market for their parents. Knowledge outflow back to the main businesses will be integrated into the parents’ knowledge base, thereby enhancing the strategic importance of new ventures. In both cases, knowledge outflow will lead to successive resources inflows into new ventures and then improve their performance.

H4a: The knowledge flows between the parent and its new businesses are positively related to the performance of the new businesses.

However, knowledge inflows from the parents may not always improve their new ventures’ performance, especially when CV activity is aimed at exploring new markets/technologies. First, knowledge transferred from the existing businesses may be irrelevant to the conditions of new territories. Furthermore, knowledge inflows from the parents may localize their new ventures’ learning activity. In exploitation, local search can make learning more efficient and increase reliability of average performance; however, such learning tendency may reduce deviation of performance that is essential in exploration activities (Levinthal & March, 1993). All of the analysis leads to:

H4b: The knowledge inflow from the parent is negatively related to the performance of the new businesses when the new businesses are mainly engaged in exploration.
METHODS

Data Collection and Sample

Survey instruments were used to collect data for major constructs. The relevance and clarity of the questions were examined using a pilot survey with five CV managers and five experts in CV activity (i.e., consultants and researchers). The target companies were collected from Fortune Global Companies. First, we selected large technology-based companies in the US and Japan. We excluded the service- or finance-related companies in order to maintain a consistency in our sample. Then, using the Hoover’s database, we identified managers in charge of: (1) business planning/business venturing, (2) product development, or (3) chief technology officer. The letters with our survey website URL were mailed or emailed to these managers. By the fall of 2007, 74 surveys had been received, out of which 61 surveys were from Japanese companies and 13 from the United States. Sixty-one surveys with complete data were used in the regressions.

Below are the descriptive statistics for the 74 responding companies. On average, these companies had US$ 10.1 billion sales in 2007. These companies have on average 15 full-time staff members in support of new businesses. For the last 5 years, these companies have conducted 9.3 feasibility studies, from which 3.3 new businesses were started. From these 3.3 new businesses, 2.7 businesses were on-going upon the survey time. Responding companies reported that 37.2% of these on-going businesses were “strategically” successful, and 22.4% of these were “financially” successful. This result is consistent with that of Little’s survey on European technology-based companies in 2002.

Measures and Data Analysis

The purpose of this study is to examine the impacts of CV governance structure on knowledge flows between the parent and the new businesses as well as the performance of CV activity. The measures were either newly developed for the study or adopted from the literature. To increase the reliability of the survey data, multi-item scales were used to measure a majority of the constructs, including incentive schemes (2 items), autonomy (6 items), knowledge inflow (3 items), knowledge outflow (3 items), objectives of exploration (8 items), and new venture performance (3 indicators). The inter-item reliabilities were tested using Cronbach’s alpha, and the factor analysis and correlation matrices were used to examine the validity of the measures. This section describes how each variable was measured and the rationale associated with each measurement.

New venture performance. In the literature, firm performance is typically measured by accounting indicators (e.g., ROE), strategic indicators (e.g., market share, sales growth) or market value. However, this information is usually unavailable for new businesses within corporations. Thus, we designed a set of questions to ask the respondents to subjectively assess the performance of new businesses. Specifically, the respondents were asked the extent to which their new businesses’ performance satisfies the expectation for the last five years in sales growth, profit, and return on equity. The items were rated on a 5-point scale ranging from 1 = Very dissatisfied to 5 = Very satisfied. Responses to the 3 items were averaged to provide a score of new business performance. The mean of the scale is 2.28 and the inter-item reliability is 0.88.

Knowledge flows. Based on Schluz (2003), knowledge flows were categorized into three general domains: knowledge related to sales and marketing, knowledge related to technology, and knowledge related to strategy. Schluz’s scales (2003) demonstrated strong convergent and
discriminant validity. For knowledge inflows to new businesses from the parent, the respondents were asked to indicate the extent to which they agreed with the following statements: (1) The parent company and the existing businesses provide a great deal of knowledge about sales and marketing to the portfolio companies (e.g., knowledge about advertisement, public relations, service delivery); (2) The parent company and the existing business units provide a great deal of technological knowledge to the portfolio companies (e.g., knowledge about R&D, information systems, production process); and (3) The parent company and the existing business units provide a great deal of strategic knowledge to the portfolio companies (e.g., knowledge of competitors, suppliers, government regulations). For knowledge outflows from new businesses to the parent, three similar items were asked. These items were measured using a 7-point Likert scale ranging from 1 = Strongly disagree to 7 = Strongly agree. Both of the scales had strong internal consistency ($\alpha = .82$, and $\alpha = .89$, respectively).

In order to validate the measures of knowledge flows in both directions, a factor analysis of the 6 items was conducted. When the items were entered in the factor analysis, two factors emerged. The first factor was comprised of the three items stating knowledge inflows to new businesses from the parent. Responses to the 3 items were averaged to provide a score that represented the knowledge inflows to new businesses and the mean is 4.732. The second factor was comprised of the three items stating the knowledge outflows from new businesses to the parent. Responses to the 3 items were averaged to provide a score that represented the knowledge outflows from new businesses and the mean is 4.239. An average of the 6 items was also created to represent the knowledge flows between new businesses and the parent and the mean is 4.464.

**Autonomy.** There are three primary dimensions which were used to evaluate the autonomy of a CV program: 1) strategic objective, 2) staffing, and 3) the decision-making process. Two items assessed the autonomy of determining the investment objective. These items were, “Strategic objectives are determined by the parent company and existing businesses” and “Strategic objectives are determined by the unit or project actually in charge of new businesses”. Two items assessed the staffing autonomy. The two items included, “Staffing decisions in the unit or the project in charge of new business must be approved by your parent company and existing businesses” and “A unit or project in charge of new businesses has the authority to hire anyone it needs”. Finally, two items were used to examine the autonomy of the investment decision making process, including “All investments made by new businesses must be approved by the parent company or existing businesses” and “The unit that is in charge of new businesses has the authority to make investment decisions on its own”. These items were measured using a 7-point Likert scale ranging from 1 = strongly disagree to 7 = strongly agree. A factor analysis was conducted on all 6 autonomy items. The first factor was comprised of five items. One item with much lower loading was deleted. The inter-item reliability of the remaining five items is 0.677.

**Incentive scheme.** In order to measure the characteristics of incentive scheme, respondents were asked: (1) the extent to which the compensation and incentive scheme for the managers who are actually running new businesses was dependent upon the financial returns of the new businesses. A similar question was asked regarding the strategic benefits. The items were rated on a 5-point scale ranging from 1 = Not at all to 5 = Always.

**Objectives.** To measure whether CV objectives have been well-defined toward exploration, the respondents were asked to indicate the importance level of eight objectives including develop new core competencies, gain access to new product-related technologies, gain access to new manufacturing process-related technologies, strengthen the ability to innovate, retain or gain “high potential employees”, gain access to new markets, gain access to new materials/parts/subsystems,
and identify market trends. The items were rated on a 5-point scale ranging from 1=not important at all to 5=very important. The reliability of the scale is 0.861 and the mean of the 8 items is 3.85.

Controls. Two controls were used in the study: (1) the size of parent company measured by the number of employees reported by the respondents, and (2) the number of full-time employees in support of new business development.

RESULTS

Table 1 presents the intercorrelations among the variables in the study. The correlations between the independent variables ranged from -.282 to .638. Larger than desirable correlation was found between the financial-based incentive and the strategic-based incentive ($r=0.638$, $p<0.01$). To investigate potential multicollinearity problems, variance inflation factors (VIFs) were examined in the regressions and all of VIFs for these two variables were less than 2, which is substantially below the rule-of-thumb cutoff of 10 for multiple regression models (Netel, Wasserman, & Kutner, 1985).

Table 2 presents the results of the linear regressions examining the impacts of autonomy, incentive schemes, and CV objectives on knowledge flows between new businesses and the parent. The full-time employees in support of new business development as control was negatively related to knowledge flows between new business and the parent ($p<0.05$). Our results supported Hypothesis 1, which proposed that the autonomy level is negatively related to knowledge flows. The coefficients of autonomy were all negative and significant when knowledge outflows was used as the dependent variable ($\beta=-1.96$, $p<0.05$). The results regarding incentive schemes also provided evidence in support of Hypothesis 2b, which proposed positive impacts of strategic-based incentive on knowledge outflows from new businesses to the parent ($\beta=2.785$, $p<0.05$). In addition, strategic-based incentive schemes also encouraged knowledge inflows to new businesses as well ($\beta=2.877$, $p<0.05$). With respect to the impact of financial-based incentive schemes, the coefficients were significant but the signs were opposite to what we expected. Thus, Hypothesis 2a was not supported.

Our results also showed significant moderator effects of objectives on the relationships between autonomy, incentive schemes and knowledge flows. The interaction between autonomy and objectives was significant when knowledge outflows was used as the dependent variables ($\beta=2.395$, $p<0.05$); however, the interaction became insignificant when either knowledge inflows or knowledge flows was used as the dependent variables. Thus, Hypothesis 3a was partially supported. Our results suggested that objectives moderate the relationship between the financial-based incentive and knowledge inflows ($\beta=3.906$, $p<0.01$) and the relationship between the strategic-based incentive and knowledge outflows ($\beta=-3.108$, $p<0.05$). We further drew the interaction plots to examine the directions of the moderator effects (see Figures 1 and 2) and the results were consistent with our Hypothesis 3a but opposite of Hypothesis 3c.

Table 3 presents the results of the linear regressions examining the impacts of knowledge flows on new business performance. The results failed to support Hypothesis 4a, which expects positive relationships between knowledge flows and new business performance. Neither did the result support the moderator effects of exploration objectives on the relationships.
DISCUSSION

Learning new knowledge has been regarded as one of the most important objectives of CV activity (e.g., Schildt, et al., 2005). Through the theoretical lens of agency theory, we examined how the governance structure such as autonomy and incentive schemes influenced knowledge flows in CV activity. Consistent with Hypothesis 1, the results suggested that with a high level of autonomy, CV managers may be less motivated to promote knowledge transfer between new businesses and the parent. Particularly, autonomy would discourage them to transfer knowledge from new businesses to the parent as knowledge transfer requires efforts and commitment that may not lead to personal benefits. However, when a CV activity has a clear objective to explore new technology, new market or new materials, the negative impact of autonomy on knowledge flows was dramatically alleviated. This finding suggested that with clear objectives, CV managers may feel obliged to transfer knowledge associated with these new domains back to the parent. This finding supported Hendry’s argument (2002) that some of the agency problems may arise from the principal’s incompetency rather than the agent’s self-interest.

Consistent with Hypothesis 2b, the results suggested that strategic-based incentive schemes would encourage knowledge outflows from new businesses to the parent. In addition, such incentive schemes will also encourage knowledge inflows to new businesses from the parent and the existing business units. Opposite to Hypothesis 2a, our finding revealed a negative impact of financial-based incentive schemes on knowledge flows. These results emphasize the importance of strategic-based incentive schemes in CV activity. In addition, corporations should be cautious when using financial incentives to motive CV managers if the strategic benefits are the major objectives.

This study failed to provide evidence in support of the positive relationship between knowledge flows and new business performance. This result is inconsistent with the extant literature, and may be due to the limitations in research method and sample selection. The use of surveys as a method of data collection can be considered a limitation to the study as self-report questionnaires have the potential for allowing response bias to affect the results. For example, the corporate respondents may exaggerate the knowledge flows from the parent to new businesses, and underestimate the knowledge flows from new businesses to the parent. In addition, the sample size is relatively small and so the generalization of the major findings should be cautious.

The study primarily investigated the impacts of incentive scheme, autonomy, and objective. However, there are other factors that also influence the knowledge transfer processes in CV activity. For example, Henderson and Lelux (2002) reported that the involvement of the existing business unit was positively related to the transfer of resources between the CV ventures and the parent, whereas existing business unit’s lack of commitment is a significant obstacle to resource transfer. Thus, future research should extend this line research to other factors. In particular, the relationship between new business units and existing business units deserves further investigation.

CONCLUSIONS

This study investigated how governance structure in corporate venturing (CV) impacts knowledge flows between a parent company and its new ventures. Using a sample of 61 companies in Japan and the United States, we found that autonomy may stimulate agency behaviors of CV programs by discouraging them to participate in the knowledge transfer process. On the contrary, the strategic-based incentive scheme may mitigate such agency behavior and encourage knowledge flows in CV activity. In addition, we also found the moderator effects of
CV objectives on these relationships. This study made several contributions to the literature. First, we extend the prior literature of corporate venturing by revealing the impacts of both the knowledge inflows and outflows on the success of corporate new ventures. Second, by linking the governance structure such as autonomy and incentive scheme to knowledge flows, the study may advance our knowledge on how to manage knowledge flows across organizational units—one of the essential topics in the knowledge-based view. The finding may also give directions on how to govern and improve CV activity.

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REFERENCES


Table 1: Correlation Matrix

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<th>1</th>
<th>2</th>
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<th>4</th>
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<th>7</th>
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<th>10</th>
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<td>1. Performance</td>
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<td>2. Knowledge flows</td>
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<td>3. Knowledge inflows</td>
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<td>4. Knowledge outflows</td>
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<td>.479**</td>
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<td>5. Autonomy</td>
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<td>-.090</td>
<td>.030</td>
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<td>6. Financial incentive</td>
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<td>.107</td>
<td>.083</td>
<td>.241*</td>
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<td>7. Strategic incentive</td>
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<td>.020</td>
<td>.031</td>
<td>.004</td>
<td>.239*</td>
<td>.638**</td>
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<td>8. Exploration obj.</td>
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<td>.111</td>
<td>.276*</td>
<td>-.064</td>
<td>.182</td>
<td>.248*</td>
<td>.226</td>
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<td>9. # of employees</td>
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<td>-.282*</td>
<td>-.128</td>
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<td>-.123</td>
<td>.067</td>
<td>.043</td>
<td>.106</td>
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</table>

* Correlation is significant at the 0.05 level (2-tailed). ** Correlation is significant at the 0.01 level (2-tailed).
Table 2: Results of Linear Regressions Examining the Effects of CV Governance Structure on Knowledge Flows

<table>
<thead>
<tr>
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<th>Knowledge Inflows</th>
<th>Knowledge Outflows</th>
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<tr>
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<td>Model 1</td>
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<td># of employees</td>
<td>.036</td>
<td>.087</td>
<td>.098</td>
</tr>
<tr>
<td># of full-time employees in new business development</td>
<td>-.301*</td>
<td>-.278*</td>
<td>-.324*</td>
</tr>
<tr>
<td>Autonomy</td>
<td>-.180</td>
<td>-.130</td>
<td>.046</td>
</tr>
<tr>
<td>Financial incentive</td>
<td>.104</td>
<td>-3.400*</td>
<td>.134</td>
</tr>
<tr>
<td>Strategic incentive</td>
<td>.040</td>
<td>2.877*</td>
<td>-.011</td>
</tr>
<tr>
<td>Exploration obj.</td>
<td>.326*</td>
<td>.298</td>
<td>-.106</td>
</tr>
<tr>
<td>Autonomy × Obj.</td>
<td>-.076</td>
<td></td>
<td>2.395*</td>
</tr>
<tr>
<td>Financial × Obj.</td>
<td>.396**</td>
<td></td>
<td>2.578</td>
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<tr>
<td>Strategic × Obj.</td>
<td>-3.180*</td>
<td></td>
<td>-3.108*</td>
</tr>
<tr>
<td>N</td>
<td>61</td>
<td>61</td>
<td>61</td>
</tr>
<tr>
<td>Adjusted R²</td>
<td>.057</td>
<td>.142</td>
<td>.219</td>
</tr>
<tr>
<td>ΔR²</td>
<td>.138</td>
<td>.108*</td>
<td>.024</td>
</tr>
<tr>
<td>F-value</td>
<td>2.856</td>
<td>2.686**</td>
<td>2.901**</td>
</tr>
</tbody>
</table>

*** Significant at the .001 level
** Significant at the .01 level
* Significant at the .05 level
Table 3: Results of Linear Regressions Examining the Effects of Knowledge Flows on New Business Performance

<table>
<thead>
<tr>
<th></th>
<th>Model 10</th>
<th>Model 11</th>
<th>Model 12</th>
<th>Model 13</th>
<th>Model 14</th>
<th>Model 15</th>
<th>Model 7</th>
</tr>
</thead>
<tbody>
<tr>
<td># of employees</td>
<td>0.027</td>
<td>0.022</td>
<td>0.025</td>
<td>0.030</td>
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<td>-0.039</td>
<td>-0.077</td>
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<td>-0.068</td>
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<tr>
<td>Autonomy</td>
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<td>-0.178</td>
<td>-0.188</td>
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<td>-0.187</td>
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<td>Financial incentive</td>
<td>0.284†</td>
<td>0.297†</td>
<td>0.276</td>
<td>0.312†</td>
<td>0.300†</td>
<td>0.304†</td>
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<tr>
<td>Strategic incentive</td>
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<td>0.165</td>
<td>0.140</td>
<td>0.150</td>
<td>0.139</td>
<td>0.176</td>
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<td>-0.131</td>
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<td>0.074</td>
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<tr>
<td>Knowledge outflows</td>
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<tr>
<td>Knowledge flows</td>
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<td>0.046</td>
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<td>Know. in. × Obj.</td>
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<tr>
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<td>0.110</td>
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<td>Know. flow × Obj.</td>
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<td>0.149</td>
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<tr>
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<td>57</td>
<td>57</td>
<td>57</td>
<td>57</td>
<td>57</td>
<td>57</td>
</tr>
<tr>
<td>Adjusted R²</td>
<td>0.088</td>
<td>0.074</td>
<td>0.063</td>
<td>0.067</td>
<td>0.057</td>
<td>0.069</td>
<td>0.069</td>
</tr>
<tr>
<td>ΔR²</td>
<td>0.02</td>
<td>0.007</td>
<td>0.014</td>
<td>0.008</td>
<td>0.015</td>
<td>0.017</td>
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<tr>
<td>F-value</td>
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<td>1.477</td>
<td>1.587</td>
<td>1.434</td>
<td>1.600</td>
<td>1.531</td>
</tr>
</tbody>
</table>

*** Significant at the .001 level  ** Significant at the .01 level  * Significant at the .05 level  † Significant at the .1 level
**Figure 1. Autonomy x Exploration Objectives**

- Low exploration
- High exploration

**Figure 2. Strategic Incentive x Exploration Objectives**

- Low exploration
- High exploration