

On the Choices of Strategic Alliances: Evidence from Venture-Backed Companies

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ABSTRACT

It is widely recognized that in addition to capital infusion, venture capital firms can help portfolio companies form strategic alliances. In this paper, we investigate whether venture capitalists use strategic alliances as substitute or complementary with respect to capital infusion. Furthermore, we examine whether venture capitalists use alliance formation as a means to mitigate risk from external environments. Our empirical results demonstrate that the count of strategic alliances is negatively related with venture capital infusion, but positively related with scope of VC syndication. We also provide evidences that venture capitalists help portfolio companies to form different types of alliances strategically to account for risk in product market and technology environment respectively.

EXECUTIVE SUMMARY

This paper provides the following implications to the practice of venture capitalists. First, the paper provides some implications to venture capitalists as to how they can deal with external risks, especially after they have committed to the capital investment. In the pre-investment stage, venture capitalists deal with external environmental risk factors through carefully screening the project, and negotiating contractual terms with entrepreneurs. We propose that, during later stage, facilitating strategic alliance formation may be a viable way for venture capitalists to deal with external risks. Secondly, since venture capitalists have a variety of components in their value-added services, including managerial experiences input, capital investment, and facilitating alliance formation, it is important to for VCs to be aware of the relationship among these components. This study finds that alliance formation and

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capital infusion are substitutes, which provides some guidelines for VCs to balance among components when designing the whole professional service offering. Thirdly, we find that the scope of VC syndication is positively related to alliance formation. Since alliances are used to deal with external risk after investment commitment, having syndication with other VCs will further mitigate the external risks.

INTRODUCTION

In the last two decades, venture capital industry has experienced an explosive growth, and has developed as an important intermediary in financial markets, which facilitates the start and growth of innovative firms with little hope to be financed by conventional investors (Gomper and Lerner, 2001). The rise of venture capital (VC) industry has coincided with a huge wave of innovation and entrepreneurial activities. Venture capitalists (VCs) are viewed as active investors who assume the monitoring role (Sapienza and Gupta, 1994; Lerner, 1995) and use their special knowledge to add value to their portfolio companies (Sapienza, Manigart and Vermeir, 1996; Gifford, 1997). Previous literatures have documented that in addition to capital infusion, venture capitalists also provide their portfolio firms with other value-added services including providing managerial expertise, recruiting executive managers and etc. However, limited attention has been put to the role of venture capitalists as intermediary to facilitate forming strategic alliances for their portfolio firms. This paper aims to examine how strategic alliance formation is used as part of venture capitalists' value-added services to their portfolio firms. Specifically, we attempt to answer two questions: 1) as part of the value-added services from VCs, is strategic alliances formation used as a substitute or complement to capital infusion? 2) do VCs facilitate alliance formation strategically to mitigate external risks from market and technology environments?

Previous literatures in alliances have documented the importance of inter-organizational network for small young firms. Eisenhardt and Schoonhoven (1996) argues that alliances enable small firms to gain access to resources, especially for firms "in vulnerable strategic positions either because they are competing in emergent or highly competitive industries or because they are attempting pioneering technical strategies". More important, affiliation with a prominent partner also certifies the quality of small new ventures since they usually have little trackable records. However, it is extremely difficult for small young firms to find appropriate alliance partners due to high searching cost arising from their limited experiences. As a consequence, helping their portfolio companies to form strategic alliance has been a critical component of functions of venture capitals. Recent study by Hsu (2006) has documented that VC-backed startups have significantly more alliances than a comparable set of startups without any venture capital infusion. However, knowledge is still scant on how venture capitalists, as a group of specialized investors, help their portfolio companies to form inter-firm relationship thus bridge these small firms to other valuable resources. Therefore, it is our attempt to ask the question of whether VCs use alliance formation as a substitute or a complement to the capital infusion.

From the point of view that VCs release financial resources to the entrepreneurs, they are facing risks from two sides: internal risk and external risk (Kaplan and Stromberg, 2003). The internal risk arises from the agency problem and asymmetric information between venture

capitalists and entrepreneurs. Alliance literatures have posited that alliances serve as a way to mitigate risks from external environments (Gulati, 1998). This study investigates whether venture capitalists use strategic alliance formation as a means to mitigate risks from external environments. Specifically, we aim to answer the question of whether different type of alliances is chosen strategically to mitigate risk from market and technology environment respectively.

The rest of this paper is organized as follows. Section 2 reviews related literatures and develops our hypotheses. Section 3 describes the data collection procedure and methodology issues. Section 4 presents our empirical results. Sections 5 will discuss the implications to practitioners.

RELATED LITERATURES AND HYPOTHESES DEVELOPMENT

Literatures in strategy have proposed the benefits of strategic alliances, including access to complementary assets, conserving resources, and obtaining new competencies (Gulati 1998). Especially, alliances are particularly important for start-up firms facing resource constraints because they can serve as a means for start-ups to access complementary resources, pool similar resources, and reduce risks. Besides overcoming resource constraints, strategic alliances are particularly important for start-ups because they can provide endorsement for the start-ups with limited trackable record. It is proposed that, faced with great uncertainty about the quality of start-ups, third parties rely on the prominence of the affiliates of those companies to make judgments about their quality (Stuart, Hoang, and Hybels, 1999). While as a rule, venture capitalists wish to take public the companies in which they invest as soon as they anticipate favorable valuations, they will be actively engaged in forming alliance for their portfolio firms.

Nonetheless, newly formed ventures also encounter disadvantage to form affiliations with other firms. The obstacles mainly come from the following three aspects: limited presence in the industry, expropriation concerns, and unknown quality and reputation. However, venture capitalists can help mitigate all above obstacles because their expertise and social network. On the whole, venture capitalists have both the motivation and capabilities to form strategic alliance for their portfolio firms. Nevertheless, essentially, capital is the most important resource since other resources such as critical employees and technologies can be bought by money (Davila, Foster and Gupta, 2003). By putting more money on advertisement, market channels, and R&D, certain barriers may be conquered. In addition, there exist significant costs associated with forming and managing alliances partnership. The potential conflicts among alliance partners may lead to negative consequence (Lorange and Roos, 1992). Therefore, venture capitalists may balance between their capital infusion and efforts in alliance formation. We thus predict a negative relationship between venture capital infusion and the number of strategic alliances. Hence, we propose that,

H1: The number of choices of strategic alliances is negatively related to total amount of venture capital investment received by portfolio companies.

Syndication of investment is another important feature of venture financing and is common in the practice of venture investment. The willingness of participation from other venture capitalists may function as a certification the project quality and a mechanism to share risk

(Pence, 1982; Lerner, 1994; Wilson 1968). Moreover, syndication investment can bring different kind expertise and different network connections to crucial players in the market. Because different venture capitalists may possess different information and expertise, venture-backed companies may benefit from enlarged scope of VCs' network and form more alliances with their alliances partners. For example, Brander, Amit and Antweiler (2002) documents that syndication of venture capitalists are formed to provide a wider range of value-added services through VCs' complementary management skills and shared social capital. Hence, we propose that,

H2: *The number of choices of strategic alliances is positively related to the total number of venture capital firms involved.*

Empirical evidence indicates that venture capitalists are more concerned about external environment relative to the agency problem since they have developed financial and contractual skills (Fiet, 1994). While we gain quite some insights on how venture capitalists deal with internal risks both empirically and theoretically, relatively little is known on how venture capitalists make strategic choices to account for challenge and risk from external environment (Kaplan and Stromberg, 2004).

In our paper, we argue that formation of strategic alliances may be a viable way to address the issues related to external risk. Research on strategic alliances has drawn from resources-based view of the firm (Das and Teng, 2000) and signaling theory (Gulati, Nohria and Zaheer, 2000). An increasing body of literature argues that alliances enable small firms to gain access to resources (Eisenhardt and Schoonhoven, 1996; Garayannis, Kassicieh and Radosevich, 2000). The alliance network may be especially important for these new ventures to obtain critical resources and capabilities in order to compete effectively in the increasingly dynamic and competitive economic environment (McEvily and Zaheer, 1999; Gulati, Nohria and A., 2000; Hitt, Ireland, Camp and Sexton, 2001). In the context of venture financing, Hsu (2004) documented that entrepreneurs are willing to pay more in order to affiliate with venture capital firms with high reputation in order to gain access to these additional valuable resources. Therefore, strategic alliances chosen by venture-backed companies may be an effective way to coping with risks arising from external environment since alliance partners provide not only valuable resources but also certification to these resource-constraint entrepreneurial ventures.

From the perspective of resource-based view, alliances are formed when organizations are in vulnerable strategic positions and in need of additional resources in order to compete effectively. Venture-backed companies are normally operating in environment with high level of dynamism and complexity arising from competition in product market and technology uncertainty. As argued by Eisenhart and Schoonhoven (1996), an organizations' strategic position leads to formation of specific type of alliances. Therefore, we argue that venture-backed companies will choose certain type of alliances agreement in response to their product market environment and technology environment.

Based on a firm's value chain, Ghemawt, Porter, and Rawlinson's (1986) functional taxonomy identify three alliances purpose: operations, marketing and technology development. In this paper, we highlight the choices of marketing and technology alliance for venture-backed firms to adapt for the competition in product market and uncertainty in technology environment. Marketing alliances normally aim at establishing brand and/or

securing new customer bases, while technological alliances aim at pursuing long-term risk sharing for research and development activities.

When market is highly competitive, it is critical for venture-backed firms to have access to resources such as brand name, distribution channel, customer bases, and sales forces. Thus, marketing alliances, which normally include cross-selling products, sharing loyalty programs and brand names, developing co-promotion programs and brand names, sharing distribution channels, and exchanging sales forces, will be considered as a means to obtain the critical resources. Hence, we propose:

H3: *The number of choices of **marketing** agreements is positively related to the level of environmental market competition.*

When the technology environment is particularly instable, the crucial success factor for venture-based firms is advancing technology and sharing of risk. Technology alliance, including cooperation in research and development activities, will provide such critical resources. Especially, when the uncertainty in technology stems from the uncertainty in technological standard, technology alliance enhances the possibility for alliance partners to establish the dominant design based on their own technology. Previous studies have found technology alliances are more beneficial in industries with rapid technological developments (Chan et al. 1997; Das et al 1998). Hence, we propose:

H4: *The number of choices of **joint R&D and tech-related** agreements is positively related to the level of environmental technology instability.*

DATA COLLECTION AND METHODOLOGY

Data Collection

In an effort to understand the strategic decision made by venture-backed companies, we need to obtain information about both the venture financing and alliances activities from two major sources: SDC VentureXpert and SDC JointVenture/StrategicAlliances databases.

VentureXpert is a private database of Venture Economics, which is a division of Security Data Company. Venture Economics gather quarterly reports from VC institutions and from major institutional investors on their portfolio holdings since 1960. SDC VentureXpert database provides detailed deal level financing information such as: (1) number of rounds of funding received; (2) average amount of funding received per round; (3) date of the first and the last round of funding; (4) number of venture capital firms involved; (5) companies' founding date. SDC JointVenture/StrategicAlliances dataset covers worldwide strategic alliances announcement from 1988 to present. It records detailed information on the date, type and participants of a certain strategic alliance announcement.

We match SDC VentureXpert and SDC JointVenture/Alliances dataset by company name and CUSIP. In order to be included in our sample, we require that alliance announcement should fall within the first and last round of financing for the corresponding venture-backed companies. After excluding firms with significant missing information, we obtain our final sample of 2505 venture-backed companies, which receive venture capital investment within the time period 1988-2001. After matching these two datasets, we collect information of strategic alliances activities of our sample firms on marketing agreement and joint R&D/Tech agreement. We do not have any information on the characteristics of alliances and their importance. Therefore, following Hsu (2006), we count the number for total strategic alliances and for each sub-category, the best available information, as our dependent variables

and take natural logs of the count in order to normalize the distribution. We calculate the total amount of venture capital received by portfolio companies and the total number of venture capital firms involved in the investment.

Measurement of Industry Characteristics

In our study, we are interested in external environment that is industry specific. Our sample covers 134 4-digital industries with a great variation as to that several industries have especially great numbers of venture-backed companies while some other industries have less. In consistence with previous studies (Aldrich, 1979; Dess and Beard, 1984; Sharfman and James W. Dean, 1991; Ensley, 2003), we try to develop objective measurements of industrial environment. In order to capture the market competition, we use the average market share change over a ten-year period as a proxy. As to the measurement of technology instability, Sharfman and Dean (1991) measured technological instability as the average number of patents in an industry. Ensley (2003) argue this measurement cannot capture the unpredictable changes, therefore extended this methodology to measuring technological instability by using the standard error of research and development intensity (Tosi, Aldag and Storey, 1973; Snyder and Glueck, 1982).

$$Y_t = b_0 + b_1RND + \varepsilon_t \dots\dots\dots(1)$$

Where Y_t = time, RND = researchdevelopment, ε = residual

The industry research and development (R&D) was regressed with year dummy for 1972 to 2002. We obtain the standard errors of the slope and then divide the standard errors by mean of industrial R&D.

EMPIRICAL RESULTS

In table 1, we provide a descriptive statistics and correlation matrix of all the variables that we use in the regression analysis. In order to test our hypotheses, we employ Ordinary Least Square (OLS) regression technique to conduct our analysis.

Table 2 presents the results and strongly supports our hypothesis. In all three model specifications, the coefficients of venture funding are negative and significant. However, larger firms may have more social connections and receive more venture funding, thus form more alliances. We are concerning whether our documented relationship is purely a size effect. Since we do not have much accounting information due to the data availability, we re-run the regression on sub-sample with sales information available as robustness check. Our results still hold after we control for the size effect. Hence, we conclude that strategic alliances are treated as substitute resources to venture capital financing, and thus, our hypothesis 1 is supported.

In all three models, the coefficient of number of VC firms is positive and significant at 0.01 level. This result validates our hypothesis 2. In general, this finding is consistent with the value-adding services provided by venture capitalists. Table 3 presents our results of OLS regressions relating the choices of strategic alliances to external environment of portfolio companies. In general, these results are consistent with our predictions. Hypothesis 3 is supported. We also predict that there is a positive relationship between choices of Joint R&D and Tech-related agreements and the technology instability, and this is just what we find. The coefficient of technology instability is positive and significant. In all three separate models, we find venture financing has a negative impact on the choices of specific type of alliances,

and the number of venture capital firms involved has a positive effect. These results can be viewed as a robustness check for our hypothesis 1 and hypothesis 2.

SO WHAT?

A large body of Existing literatures document that venture capitalists develop practice in dealing with internal risks arising from agency problem and asymmetry information. However, venture capitalists also concern about entrepreneurial firms' external environment (Fiet, 1994). This paper provides some implications to venture capitalists as to how they can deal with external risks, especially after they have committed to the capital investment. In the pre-investment stage, venture capitalists deal with external environmental risk factors through carefully screening the project, and negotiating contractual terms with entrepreneurs (Rosenstein, 1988; Gifford, 1997; Hellmann, 1998; Kirilenko, 2001). We argue that formation of strategic alliances may be a viable way for venture capitalists to account for environmental risks. Our empirical results seem to indicate that facilitating alliance formation serves as a substitute for capital infusion. Since venture capitalists have a variety of components in their value-added services, including managerial experiences input, capital investment, and facilitating alliance formation, it is important to for VCs to be aware of the relationship among these components. This study finds that alliance formation and capital infusion are substitutes, which provides some guidelines for VCs to design the components in their whole professional service offering. Thirdly, we find that the scope of VC syndication is positively related to alliance formation. Since alliances are used to deal with risk after investment commitment, having syndication with other VCs seems to further mitigate the external risks after the investment is committed.

SUMMARY AND CONCLUSION

In general, our results provide some novel insights on understanding venture capitalists' valuing-adding services. We document a negative relationship between the number of alliances and venture capital infusion. This result suggests that alliances are more of a substitute to the venture capital commitment. We also find that the number of alliances formed is positively related to the number of venture capital firms involved, which indicates that the scope of VCs' syndication contributes positively to alliance formation of venture-backed firms. In addition, our results demonstrate that VCs do make strategic choice as to the types of alliance based on risk from external environment. We find that venture-backed companies operating in environment with high market dynamism are more likely to form marketing agreement with their alliance partners, and venture-backed companies operating in environment with high level of technology instability are more likely to form technology-related alliance agreements.

References will be provided on request due to the page limitation.

Table 2: Venture Capital Infusion and Strategic Alliances

In all three regressions, the dependent variable is the total count of strategic alliances in logs. Standard errors are in parenthesis. As more control variables are added in, our sample size is also reduced.

Independent Variable	Dependent Variable: Number of Strategic Alliances		
	Model 1	Model 2	Model 3
Intercept	4.794*** (0.226)	3.878*** (0.264)	2.170*** (0.328)
Venture Funding in Logs	-0.241*** (0.015)	-0.228*** (0.015)	-0.182*** (0.016)
Number of VC Firms	0.053*** (0.005)	0.051*** (0.005)	0.048*** (0.005)
Establishment Concentration		2.241*** (0.698)	1.652** (0.727)
Employment Concentration		2.315*** (0.582)	1.935*** (0.599)
Age			0.251*** (0.025)
Industry Average MB Ratio			0.023*** (0.007)
Industry Average Tangible Ratio			-0.127 (0.068)
Number of Observations	2505	2505	2505
Adj R-Square	9%	10%	13%
F-Statistics	139.63***	80.83***	53.28***

***, ** significant at 1%, 5% level, respectively

Table 3: Choices of Strategic Alliances According to External Environment

The dependent variables are the count of marketing agreement and Joint R&D agreement in logs.

Independent Variable	Dependent Variable	
	Marketing Agreement	Joint R&D
Intercept	1.257*** (0.257)	0.956*** (0.281)
Average Market Share Change	0.003*** (0.004)	0.001 (0.001)
Technology Instability	0.737 (0.502)	4.763*** (0.548)
Employee Munificence	-0.661 (0.487)	0.809 (0.531)
Venture Funding in Logs	-0.117*** (0.012)	-0.131*** (0.013)
Number of VC Firms	0.032*** (0.004)	0.039*** (0.004)
Establishment Instability	1.179 (1.534)	-3.182 (1.676)
Revenue Munificence	0.102 (0.460)	0.568 (0.502)
Establishment Concentration	0.083 (0.585)	1.62388 (0.638)
Employment Concentration	1.161** (0.467)	2.148*** (0.509)
Age	0.194*** (0.019)	0.156*** (0.021)
Industry Average MB Ratio	0.004 (0.005)	0.016** (0.006)
Industry Average Tangible Ratio	-0.041 (0.05)	-0.056 (0.067)
Number of Observations	2505	2505
Adj R-Square	11%	13%
F-Statistics	25.88***	30.39***

***, ** significant at 1%, 5% level, respectively