

Components and Interactions of Venture Ecosystems: A Focus on Korean Case Studies

Chae-Yoon Lim*, Yun-Young Kim**

ABSTRACT

This study analyzes the establishment of venture companies and the interaction of venture ecosystem components (the core factors of venture ecosystems) with a focus on venture companies, venture capital, and the return market. Government support policies are understood as a catalyst for the venture ecosystem and this study will analyze the implications of government involvement by identifying the role of government policies in the venture ecosystem. According to the results of the empirical analysis with data on confirmed venture businesses by the Small and Medium Business Administration (SMBA), policies that provide direct support to venture companies did not have a significant influence on the establishment of new ventures. However, new investments by venture capital show a statistically significant positive effect and signify that the new investment is an important factor in vitalizing the establishment of new venture businesses and that the economic conditions of the return market have a positive effect. The establishment of venture businesses responds to the changes in real and vertical markets with greater resilience compared to government policies. Given the unique nature of the Korean venture ecosystem that responds to the market with greater resilience than government policies, there must be increased efforts to recover the confidence of the capital markets for venture capital in order to promote improved efficiency.

KEYWORDS: venture ecosystem, venture companies, venture capital, return market, venture support policy, venture creation

* Team Leader, Small & Medium Enterprises Policy Team, New Growth Engines Research Center, Science and Technology Policy Institute, lcy@stepi.re.kr

** PhD Candidate, Technology Management Economics and Policy Program, Seoul National University, fire1010@stepi.re.kr

1. INTRODUCTION

The establishment of a venture company signifies the creation of new jobs. This leads to pure job creation within the national economy that has resulted in a subsequent increase of social and political interest in venture companies. Accordingly, studies on various aspects of the environmental factors that influence the formation of venture businesses have been conducted (Gartner 1985; Bruno and Tyebjee 1982; Pennings 1982; Williamson 1975; Porter 1980). A number of studies reveal that it is difficult for venture companies to exist and grow independently. The studies show that they evolve through interactions with components of various economic and political systems (Spilling 1996). The ecosystem concept is currently being adopted in order to understand the activities and nature of venture companies as well as explore the direction for policies on venture businesses.

The “Venture Ecosystem” is a concept that regards the venture company of a particular region and its venture environment as a single system that underlines the interaction between venture businesses and their environment. Countless venture businesses are born and continue to grow, while many that fail to adapt to the environment, collapse. This fierce competition and natural selection of the venture industry are similar to the principle of the survival of the fittest in the natural ecosystem.

Venture businesses operate based on new technology and ideas where the market determines the success or failure of a venture company. However, the majority of current studies focus on the debate of the components of the venture ecosystem at a conceptual level with a lack of empirical discussion on the roles of each component and the impact of their interaction. Although past research emphasized the importance of the interaction between components of the venture ecosystem, there is almost no in-depth analysis on their interaction mechanism.

This study analyzes the establishment of venture companies in the interaction of venture ecosystem components (the core factors of venture ecosystems) with a focus on venture companies, venture capital, and return market. Government support policies are understood as the catalyst of the venture ecosystem and this study will analyze the implications of government involvement by identifying the role of governmental policies in the venture ecosystem.

2. PAST THEORIES AND RESEARCH HYPOTHESES

In a study of 525 middle-sized U.S. companies, Clifford and Cavanagh (1988) stated that if one percent of existing small-and-medium size enterprises (SMEs) grew to become middle-sized companies with revenues of more than 25 million dollars, the U.S. economy would double its current size. This study shows the significant impact on the national economy by venture companies that undergo the birth-growth-maturation process and transform into middle-sized companies. In addition, this process is accompanied by the participation and interaction of various interest parties. Such interaction acts as a factor that strengthens or weakens the venture ecosystem. In general, the core components of a venture ecosystem include venture companies, venture capital, and return market.

Venture companies are the main players of the venture ecosystem and the source of the creation of added value (Seung-Hwa Jeong and Young-Geun Choi 2008). As for venture capital, they are institutions that generate profit by investing in a venture businesses that function as the investor of funds composed of professional investors to assist in the creation and expansion of a venture business (Black and Gilson 1998).

Venture capital is equipped with broad market knowledge (gathered using their information networks) and investment capital (procured from the capital market) given to venture businesses that exchange their capital and knowledge into investment shares that equal the value of the venture company. The return market refers to the stock market, namely the KOSDAQ, and the merger and acquisition (M&A) market. It transforms the intangible value accumulated in venture businesses and venture capital into tangible value called “capital”.

In general, venture businesses refer to high risk – high profit companies with names such as “New Technology Based Firms” or “University Technology Based Firms” based on technological innovation. In Korea, technology-based businesses were first founded by the staff of the Korea Advanced Institute of Science and Technology (KAIST) during the 1980s, which was when the term “venture company” was first coined. The Act on Special Measures for the Promotion of Venture Companies was established in August 1997. As a result, the term “venture company” began to be widely used with the implementation of the venture certification system on incumbent SMEs and start-ups.

During the initial nurturing stage, businesses in which venture capitals had a more than 10% stake (more than 20% for CB investments) were acknowledged as venture companies and this is seen as having stimulated the rapid expansion of demand for venture capital in the early phase of the venture company promotion policy. The number of companies certified as ventures from 1998 through 2005 rose from 2,042 to 9,732. The quantitative change in Korean venture businesses is presumed to be in relation to changes in government policies and terms of certification. A number of studies have found that changes in the social structure and cultural characteristics are the conditions in the initial stage that stimulate the start-up of venture companies and influence enterprising activities (Seung-Hwa Jeong and Young-Geun Choi 2008). Government policies have a significant impact on the establishment of businesses (Carree et al. 2002).

Hypothesis 1: *The number of new venture companies is in proportion to government support policies*

Korean venture capital began with the enactment of the Act on Support for Small and Medium Enterprise Establishment and the Act on Financial Assistance to New Technology Businesses in 1986 that provided the foundation for the establishment of investment capital and new technology financial companies. The chief function of venture capital is to provide financing from the market as an agent to resolve the information asymmetry between the market and venture businesses. Bruno and Tyebjee (1982) proposed the availability of venture capital as an environmental factor that influenced the startup rate of venture businesses.

Venture capital has a powerful incentive to increase the value of the company they invest in because this enables them to generate fund profits that are shared by the investors of the fund (Sahlman 1990). Venture capital share with the venture businesses the compensation and punishment that accompany success and failure to become a community that works progressively for the success of the company. The increase of the availability of venture capital inspires entrepreneurship and acts as an incentive to create venture businesses.

Hypothesis 2: *The number of new venture businesses is in proportion to new investments by venture capital*

At the end of 1999, the amount of transactions exceeded one trillion Korean won in the KOSDAQ market, which was set up in 1996. In March 2000, the KOSDAQ Index¹ reached 2,834.40 points², recording remarkable growth in only three years. However, the onset of the collapse of the IT bubble triggered a crash in the stock market. The low profitability of IT companies caused market confidence to fall sharply, leading to a prolonged economic recession, and finally hitting bottom in August 2004 as the Index fell to 324.71 points³. However, the KOSDAQ market built on this experience. At the time of establishment in June 1996, the aggregate value of listed stock stood at 8 trillion Korean won with 343 listed companies and an annual transaction of 1 trillion Korean won. Yet, it underwent explosive growth in ten years, and the aggregate value of listed stock stands at 63 trillion Korean won, 831 listed companies and an annual transaction of 446 trillion Korean won. According to a study by Jeng and Wells (2000), the size of venture capital funds and initial public offerings (IPO) have a positive correlation. It may be understood that the factor that strengthens an IPO also strengthens venture capital investments and structural factors strengthen the relation of the two. In addition, preceding research shows that there is a correlation between movements in the stock market and the size of venture capital investments (Seung-Hwa Jeong and Young-Geun Choi 2008). A bull market increases investments from venture capitals that stimulate potential entrepreneurs to set up new businesses.

Hypothesis 3: *The number of new venture companies is in proportion to the economic conditions of the return market*

3. DATA AND MODEL

The data used for this study include data on confirmed venture businesses by the Small and Medium Business Administration (SMBA), current data on venture capital investments by the National Venture Capital Association (NVCA), data on companies listed on the KOSDAQ by the KOSDAQ Listed Companies Association (KOSDAQ CA) and financial data of companies by the National Information & Credit Evaluation, Inc. (NICE). A total of 6,702 businesses were analyzed, and 38,716 observatory data from 1997 to 2005 were used as samples. Out of the total sample, 952 companies were venture businesses, among which 170 businesses received venture capital investment (17.9%), 145 technology assessment companies (15.2%), 104 research and development investment companies (10.9%), and 165 new technology development companies (17.3%).

The regression analysis approach was adopted to analyze the relation between the founding of venture companies and the venture ecosystem components. In order to take the number of venture start-ups as a dependent variable, the Start-ups Index (monthly average) was used as a proxy variable. The Start-ups Index is comprised of 80 samples from January 2000 to August 2006. All time series variables utilized in the analysis were based on monthly data from January 2000; however, the data on

¹ Change of KOSDAQ Unit: When the KOSDAQ market firstly opened in 1996, the base unit was 100 which is used to multiply the stock price rate of the standard time and comparison time; however, the unit was changed from 100 to 1,000 on January 26 2004. 1,000 since January 26 2004.

² Yonhap News, October 12, 2008

³ Yonhap News, October 12, 2008

the number of newly listed companies and the Business Survey Index using lag variables were from 1997 and 1999, respectively.

Government support policies: Venture companies experience great difficulty in acquiring funding in the initial stage of establishment because of the difficulty to undertake technology assessments and resolve information asymmetry issues due to limited experience. The government should focus financial and institutional support in this initial phase because many businesses face the danger of failing early in their establishment. As for the impact of government support policies on the establishment of venture businesses, the announcements of Venture Company Promotion Measures on December 24, 2004 and the Venture Company Revised Promotion Measures on June 13, 2005 were used as dummy variables. The value of the dummy variable of companies founded after the policy announcement was “1 (One)” and opposite “0 (zero)”.

New venture capital investments: The market action of a venture capital is a repetition of financing – investment-return on investment; as a result, the job of discovering and investing in promising companies is the most important venture capital role. The investment of venture capital is an important phase where venture capital connects with venture businesses. In addition, the interaction between venture businesses and venture capital is most active during the investment process. Furthermore, this study utilized the new investment by venture capital to identify their roles in the venture ecosystem.

Size of newly listed companies at the KOSDAQ: The return on investment (the last phase of the circulation process in the venture ecosystem) is when the venture investor makes a sale of the business and collects the profits. Collecting profits from an investment can be based on both IPO and sales; however, the IPO is almost the only method in Korea. The explosive growth of Korean venture businesses and venture capitals (until the first half of 2000) was caused by the stock market, in particular, the KOSDAQ. This is why this study used the number of newly listed companies to identify the impact of the economic conditions of the KOSDAQ market on the establishment of venture companies. In determining the number of newly listed companies, all variables with a lag from $t-3$ to t , have been considered.

4. RESULTS

In order to understand the interaction between components of the venture ecosystem, the effect of the components on the number of new venture start-ups variable has been processed through a regression analysis and the results are illustrated in Table 1. The dummy variable of venture company promotion measures that represent government policy, show a statistically insignificant positive (+) value, whereas the dummy variable of venture company revised promotion measures show a statistically insignificant negative (-) value. This can be explained by showing that no special correlation exists between the direct support policies of the government and the establishment of new ventures. New investments by venture capital shows a statistically significant positive (+) value and signifies that the new investment is an important factor in vitalizing the establishment of new venture businesses; as a result, Hypothesis 2 cannot be rejected.

The time series variables that represent the economic conditions of the return market have positive

(+) values, but only the variable of the number of listed companies during t and t-3 are statistically significant. Considering that a time lag exists between the time when a potential entrepreneur makes the decision to establish a company and the time of the actual establishment of the company, it may be confirmed that the quantitative size of new start-ups change with the changes in the KOSDAQ market within a certain time lag. This means that Hypothesis 3 may not be rejected. It can also be interpreted as meaning that decisions on the opportune time for establishing businesses are made based on information dealing with short-term market situations. A study of the factors that have an impact on the establishment of ventures by each point in time show that the economic conditions of the return market at the time of establishment have the greatest influence.

TABLE 1 Effects of Venture Ecosystem Components on the Establishment of Ventures

	Variables	(1)	(2)	(3)
Government	Dummy variable for venture company promotion measures	0.10 (0.06)	-	-
	Dummy variable for venture company revised promotion measures	-0.05 (0.07)	-	-
Venture Capital	New investments by venture capital	-	0.03 (0.02)*	-
Return Market	t No. of listed companies	-	-	33.00 (12.34)***
	t-1 No. of listed companies	-	-	14.35 (14.98)
	t-2 No. of listed companies	-	-	5.46 (14.84)
	t-3 No. of listed companies	-	-	28.65 (12.30)**
Controlled Barriers	t-1 Business survey index	0.007 (0.003)	-	-
	t Venture index ⁴	-	0.20 (0.05)***	-
	Autoregressive coefficient	0.09 (0.17)	0.32 (0.12)	-
	Constant	7.77 (0.25)***	6.28 (0.68)***	4100.29 (122.66)***
	No. of samples	80	80	80

Note: Significant on the *** 1% Significance level, ** 5% Significance level, * 10% Significance level.
() parentheses show standard error.

5. CONCLUSION

The Korean venture ecosystem has undergone remarkable growth in only 10 years. Throughout the recent decade, the number of manufacturing businesses established were 21,831 in 1997, when the venture policy was initially adopted, growing 2.4 times to 52,587 in 2005, while the size of venture capital investments rose almost seven times from an annual average of 90 billion Korean won to 600 billion Korean won. This study examined the interactions in the venture ecosystem through an empirical analysis. Empirical analyses were conducted on policy announcements on measures to promote venture businesses, size of new investments by venture capital, and the number of listed companies on the KOSDAQ, in order to identify the ecosystem components that influenced the es-

⁴ Venture index: Calculated based on venture company stocks among companies listed on the KOSDAQ. The aggregate value of a listed stock at the time of comparison (=Aggregate value of listed stock at time of calculation)/Aggregate value of listed stock at basis time (Aggregate value of listed stocks on 1998. 1. 31)*1,000.

establishment of venture companies.

According to the results of the empirical analysis, policies that provide direct support to venture companies did not have a significant influence on the establishment of new ventures. The Korean venture ecosystem was formed under a central government directive. From the initial phase of the venture policy, the government focused on expanding the quantitative size of venture companies. Accordingly, rather than adopting the general concept of high risk-high profit ventures, venture companies were more broadly interpreted to include innovative SMEs among existing SMEs and technology-based start-up companies that were certified by the government itself. This was the result of recognition by the government that it had to develop an economic breakthrough to revitalize the economy during the 1997 Asian financial crisis, and a part of its efforts to reorganize the high-cost low-efficient industrial structure that had been continuously criticized since the 1990s. Therefore, the government's venture policy developed into various forms, such as the installation of a system to support the establishment of new businesses and financial support to assist incumbent SMEs suffering from a lack of funds. Furthermore, rather than the creation of a venture ecosystem in the true sense, the government provided more comprehensive support to SMEs and start-up businesses that resulted in the dispersion of policy measures and impaired efficiency. Although a venture ecosystem was not formed in the true sense, the government managed to build the basic system as it tried to create a SME-venture ecosystem with limited resources; however, it failed to be fully effective. This led to the duplication of support measures and inefficiency problems that called for the revision of the policy direction.

According to the research analysis, the increase of new investments by venture capital increases the establishment of new venture businesses. This is synonymous with the results of the study by Bruno and Tyebjee (1982) that found that the changes in the availability of venture capital had a significant impact on the quantitative change of new business start-ups; however, the actual effect on the establishment of new business was insignificant. The likely reason is because the role of Korean venture capital is not as significant in the venture ecosystem. This is a characteristic unique to the Korean venture environment as venture capital does not have sufficient financing sources in the private sector and ventures can acquire funding through various policy funds in addition to venture capital.

The empirical analysis revealed that the changes in the economic conditions of the KOSDAQ market had a significant effect on the quantitative changes in the establishment of new businesses. Potential entrepreneurs may have determined the growth potential of a start-up company based on the current market information. The KOSDAQ market has played a critical role in the return market for domestic venture businesses and venture capitals. The role of the return market is to transform the initial flow of knowledge in the venture ecosystem into ultimate corporate value and it is the most important factor that reinforces the vitalization of establishing businesses known for the flow of energy in the venture ecosystem.

Based on empirical analysis, this study proposes tailored measures that promote the Korean venture ecosystem. First, the establishment of venture businesses responds to the changes in real and vertical markets with greater resilience compared to government policies. Therefore, future venture company policies should be able to respond to changes in the market with greater flexibility (rather than through government intervention) that enhance the qualitative level of infrastructures needed during the business establishment period and the initial stages of the business. Furthermore, the definition and certification qualifications of venture businesses must be made more market friendly and clarify those that are subject to the policies.

The government must create a strategy to develop promising middle-sized companies by providing concentrated support for the selective capital and technologies necessary for the growth of venture

businesses. Second, although venture capital exists as the agent for resolving the information asymmetry between the capital market and venture businesses, the modification in the venture capital market will require the expertise of venture capitalists as well as the establishment of confidence in the capital market. However, the confidence of the capital market in venture capital still shows little sign of recovery after the collapse of the venture bubble.

Given the unique nature of the Korean venture ecosystem that responds to the market with greater resilience than government policies, there must be more efforts to recover the confidence of the capital market for venture capital in order to promote them. This will require efforts to strengthen the individual expertise of venture capitalists and improvements to the system, so that more talented people can develop careers and continue to be recruited by venture capital. Third, based on the decade of growth, the KOSDAQ market acts as a key motivator in the venture ecosystem. A prime example of this is the simultaneous movement in the establishment of many companies and changes in the KOSDAQ market. Considering that potential entrepreneurs acquire information on starting businesses through the return market, the government should reinforce conditions for listing and exiting conditions to enhance the soundness of the return market and avoid the distribution of distorted information.

The growth of the venture ecosystem will require the vitalization of individual factors and promotion measures for the overall ecosystem. Although this study was limited by a focus exclusive to business start-ups in the complex growth of the venture ecosystem, it shows the need for more in-depth empirical research in revitalizing the venture ecosystem.

REFERENCES

- Black, B. & Gilson, R. "Venture capital and the structure of capital markets: banks versus stock markets." *Journal of Financial Economics* (1998), Vol. 47, pp. 243-277.
- Bruno, A. V. & Tyebjee, T. T. (Eds.) "*The environment for entrepreneurship*." Englewood Cliffs, NJ, Prentice-Hall, 1982.
- Carree, M., Van Stel, A., Thurik, R. & Wennekers, S. "Economic development and business ownership: an analysis using data of 23 OECD countries in the period 1976-1996." *Small Business Economics* (2002), Vol. 19, pp. 271-290.
- Clifford, D. & Cavanagh, R. "*Winning Performance*." Bantam, 1998.
- Gartner, W. B. "*A framework for describing new venture creation*." 1985
- Jeng, L. & Wells, P. "The determinants of venture capital funding: evidence across countries." *Journal of Corporate Finance* (2000), Vol. 6, pp. 241-289.
- Jeong, S. H. & Choi, Y. G. "Academic research: Development Process of the Korean Venture Industry." *Venture Management Study* (2008), Vol. 11, pp. 101-120.
- Pennings, J. "Organizational birth frequencies: An empirical investigation." *Administrative science quarterly* (1982), Vol. 27, pp. 120-144.
- Porter, M. E. "*Competitive strategy: techniques for analyzing industries and competitors*." New York, Free Press. 1980.
- Sahlman, W. "The structure and governance of venture-capital organizations." *Journal of Financial Economics* (1990), Vol. 27, pp. 473-521.
- Spilling, O. "The entrepreneurial system: On entrepreneurship in the context of a mega-event." *Journal of Business research* (1996), Vol. 36, pp. 91-103.
- Williamson, O. E. "*Markets and hierarchies: analysis and antitrust implications*." New York, Free Press, 1975.