Financing for Young Hi-Tech Enterprises in Korea

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Abstract

New venture creation has been considered an important measure for recovering from economic decline and for creating more job opportunities in Korea since the mid-1990s. Under the newly enacted special law to foster entrepreneurship, the number of venture firms has dramatically increased and currently over 10,000 venture firms are registered with the Small and Medium Business Administration of the Korean government. Although venture firms represent only a small percent of the firms in Korea, their roles and contributions to the Korean economy are remarkable. Korean venture capital firms were not well developed until the mid-1990s because of several reasons, including restrictive financial legislation and lack of advanced investment skills to evaluate risky venture firms and manage their portfolio companies. Some venture capitalists trained in advanced countries recently started their businesses armed with new approaches and skills and several successful harvesting cases from earlier investment into new ventures accelerate fund raising and investment. However, the less developed security exchange market has been a hindrance for new venture growth. In addition, the problems of lack of fresh ideas and approaches and insufficient social infrastructure for creating new technology-based ventures remain unsolved. This study provides an overview of the current status of venture capital and financing for young hi-tech enterprises in Korea. Finally, some policy directions to support entrepreneurship are suggested.

Keywords: Korean new technology-based firms, Korean new ventures, venture capital, technological entrepreneurship

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1. Introduction

New venture creation has become a distinctive characteristic around the world. Some scholars call this phenomenon the 'Silent Revolution', which will become a major buzz-word in the 21st century [41]. On the different economic and social environment, each government has geared to encourage entrepreneurship and developed diverse policy instruments for new venture creation [20, 30].

Also in Korea, new venture creation has been considered an important measure for recovering from economic decline and for creating more job opportunities since the mid-1990s. The economic and technological environment in Korea has changed too rapidly for timely adaptation. Korea has lost its competitiveness in labor-intensive industries as real wages rose more rapidly than in other developing countries such as China and ASEAN countries including Indonesia, Malaysia, the Philippines, Thailand and Vietnam. In addition, advanced countries were reluctant to transfer their high technology to Korea trying to enter high tech industries where technological capabilities are one of key success factors. This unfavorable environment forced the Korean government to bring about a major policy change. As a result, the creation and stimulation of small and medium-sized enterprises (SMEs), particularly technology-based firms, has been considered one of the top-priority policy instruments to cope with the economic difficulties.

Although some Korean new technology-based firms were founded in the 1980s, the number of new venture have been more accelerated by young entrepreneurs from universities, researchers from government research institutes, and laid-off employees from other firms as economic conditions deteriorated in the late 1990s. These dramatic changes in economic and social environment more favorable than previous decades were derived from the interactive results of the recent economic crisis around Asian countries, government efforts to support small venture firms rather than large firms, and enthusiastic entrepreneurs and venture capitals to invest and take risks on small venture companies. According to a recent survey on the worldwide entrepreneurial activity, Korea is one of the top countries where many adults are involved in some kind of business start-up [32].

In this paper we will show the current status of entrepreneurship in Korea and focus on financing issues for young hi-tech enterprises in Korea. This study provides an overview of the current situation of new ventures, venture capital, and several policy measures concerning entrepreneurship in Korea. Section 2 of the paper illustrates the characteristics of new venture development and deals with the characteristics and the roles of Korean venture firms, while section 3 provides an overview of venture capital industries in South Korea. Finally, some policy directions to foster and sustain entrepreneurship in Korea and other developing countries are suggested.

2. New Ventures in Korea

2.1 The Development and Current Status of Korean Ventures

Emergence of Venture Firms [1]

Korean governmental efforts to promote SMEs date back to the late 1970s. The government established several institutions, such as the Small and Medium Industries Promotion Corporations (SMIPC), the Korea Trade Promotion Corporations (KOTRA), and SME-related R&D centers [18]. It also enacted a special law, the Small and Medium Enterprise Formation Act in 1986, to support general and technology-based SMEs systematically and to establish the first venture capital firm. Under these special laws to support the creation of new

[1] It is difficult to clearly define venture firms and distinguish them from other SMEs. In this study, venture firms are understood as 'new technology-based firms' or 'high-tech SMEs'.

ventures, the number of new technology-based firms (NTBFs) increased substantially during the 1980s and 1990s. About 1700 ventures firms represented only less than two percents of the 97,000 Korean SMEs in the manufacture sectors in 1996. Although venture firms represent only a small proportion in terms of the number of firms, their roles and contributions to the Korean economy have been remarkable. During the financial economic crisis in 1998, the Korean ventures performed more than 70% sales growth and 25% job creation, although traditional SMEs and large firms recorded negative or similar performance.

These new firms also have played important role in the development of Korean high-tech industries. In the 1980s, the earlier NTBFs have a disproportionate importance to the creation and development of Korea's high-tech industries, such as TriGem in the computer manufacturer, Qnix in the printer business, Taeil Precision Co. in electronic and computer equipment, and Medison in medical equipment. They focused on the assimilation of technologies transferred from foreign countries through formal and informal way and the substitution of imported high-tech products with relatively low-price ones developed by internal R&D centers and technological cooperation with other public research institutes. Although a number of new small ventures had been shaken out by competition with foreign and local large companies under unfavorable business environment for NTBFs, it was possible for new ventures to succeed in the Korean economic structure dominated by the conglomerates.

Recently these successful venture firms established Korea Venture Business Association (KOVA) to represent their interests, the first business association related to NTBFs in Korea. Through the KOVA, NTBFs have influenced the government to adopt a new policy for promoting and fostering entrepreneurship. Although the unstable and inefficient Korean capital market made many SMEs bankrupt in the 1990s, the number of NTBFs has continuously increased and the fertilization of the KOSDAQ market, whose function is similar to that of NASDAQ, boosted new venture creations. In 1996, it was estimated that approximately 1,700 venture firms were in operation and the total sales of these firms reached 11 trillion won (US $13 billion) and the number of employees reached 78 thousand persons [15].

Government Driven Entrepreneurship

Since the financial crisis in the late 1997, the Korean government has put great emphasis on new venture promotion and enacted another special law to promote entrepreneurship. For administrative purposes, the Korean government confines venture firms to those firms satisfying one of the following four conditions:

1) The share of venture capital exceed 10%,
2) R&D investment exceed 5% of total sales,
3) A major portion of sales are based on their intellectual properties and the commercialization of government-oriented technology development projects in basic research,
4) A new start-up with prospecting technological and commercial opportunities evaluated by government and public agencies.

This governmental definition of 'venture firm', which is much wider than the generally accepted concept in developed countries [6, 9], appears to be highly unique in the world. Under these definitions of ventures, the number of start-ups and SMEs designated as venture firms has increased from 2042 in 1998, 4934 in 1999, and to 9827 in the end of 2000. These rapid increases of Korean venture firms rely on the specific characteristics in defining and confining venture firms led by Korean government. According to the definition on the Korean venture firms, both of traditional SMEs and new venture, typically called as start-ups, could become venture firms when they satisfy one of above conditions. Of the Korean venture firms, 60 % of are less than five years from inception and half of them were founded within last three years. Although there were more traditional SMEs than new start-ups in 1998, new young ventures now become major group in Korean venture firms reflecting on the importance of new ventures to develop and sustain entrepreneurship in Korea.

As of December 1998, 2042 ventures firms were registered with the Small and Medium Business Administration. Table 1 shows the trends and the portion of venture firms per type. As the growth rate of new ventures appears to be accelerating, there are more than ten thousand active venture firms in Korea at the July of 2001. Venture firms in which venture capitals have invested are slightly decreasing from 24% in 1998 to 17% in 2000, contrast to the dramatic increase of venture firms by assessment from 9% in 1998 to 48% in 2000. The explosion of new venture creation has been driven by the economic structure reforms, extensive restructuring of other small and large firms, and government policies to promote new ventures since 1998.

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Table 2 shows that the significant number of Korean venture firms, 46% of all venture firms, are in the information processing, telecommunications, electric and electronic sectors, despite 29% of venture firms in the machinery and metal sector in 1998. The proportion of firms in information and telecommunication industries is increasing rapidly from 31% in 1998 to 42% in 2000.

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2.2 Characteristics of Korean Venture Firms

The early Korean NTBFs have developed and manufactured products that were already in the growth or mature stage in advanced countries in terms of product life cycle. They have substituted high-priced foreign imported products with their lower-cost domestic products. Although the ratio of products at the emerging stage in advanced countries increased from 8% in 1986 to 14% in 1997, there are few innovative products to be sold in the global, especially advanced countries, market. Because most of the Korean new ventures suffer from a lack of knowledge on advanced technology, international market information, and managerial capabilities, they focus much of their efforts on the development of new products or services for domestic market. Even though they develop innovative products or services, they have little chance to grow in small market for innovative new products in Korea as well as they hardly utilize complementary resources, such as financial resources, distribution channels, and brand images, when they enter into and compete in the global market. Venture firms always have difficulty in financing to develop and commercialized new products quickly obsolescent by other new technologies.

Table 3 compares several characteristics of venture firms, traditional small firms, and large firms. From 1997 to 1999 when Korea was in the financial crisis, the performance of venture firms is extraordinary higher than those of SMEs and large firms in terms of growth and profitability. In 1997, the average number of employees of venture firms is almost triple that of traditional SMEs. The R&D/sales ratio of venture firms is 33 times higher than small firms and 16 times higher than large firms. Also the sales growth rate and profit rate of venture firms are 71% and 4% in 1998, while SMEs and large firms recorded negative and minor growth. Although the definition of venture firms is unclear, the available evidence suggests that the sales growth rate and profitability of venture firms are higher than those of traditional SMEs and large firms in Korea.

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On average, founders of venture firms were 43.7 years old and, somewhat younger than the founders of general SMEs, who were 48.8 years on the average [26]. Although the age and management experiences of the founder are important factors influencing venture creation, the importance of these factors is less significant compared with innovative business ideas and risk-taking attitude of entrepreneurs. [10, 24, 25, 34]

The founders of high-tech new ventures typically have advanced educational backgrounds and sophisticated technological knowledge, because many of them worked for research institutes, universities, and R&D department of the larger firms. Recently more than 70% of Korean entrepreneurs are from private sectors and more entrepreneurs in public sector, especially research institutes, found new ventures (See Table 4). In the past, graduates with high degrees preferred more stable jobs in universities and research institutes, but currently well-trained young engineers prefer to start their own businesses based on their experience and knowledge of technology.

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2.3 Problems and Future Directions of Venture Firms

The Korean government categorizes venture firms eligible for benefits and supports them under the special laws. That could be regarded as the inevitable choice for the Korean government to transform economic structure rapidly, but the realignment of industrial policy may also cause inefficiency in resource allocation. Even though there are still debates among policy makers and industrial experts on the appropriate extent of government's policies for venture firms, active government support on venture firms has been one of the important policy directions in Korea.

Most venture firms founded by entrepreneurs with technological backgrounds emphasized R&D or product development so that they have a higher percentage of R&D to sales ratio compared with SMEs and large firms. However, they have difficulty in launching these products they developed into the market. After experiencing or learning the difficulty of successful market entry, numerous ventures with technical capabilities have recognized the importance of understanding the market and the needs of the customer. Market-related knowledge, such as customer contact and access to distribution channels, is a critical success factor in a competitive market and a challenging problem to grow continuously. [12, 14] Another problem of Korean venture firms to grow is the small domestic market size so that Korean ventures are looking for opportunities to enter into foreign markets.

Despite of NTBFs' highly contribution to economic development, entrepreneurs have to solve many problems along with the growth of new venture and overcome the risk of failure. The less entrepreneurial environment has developed in society, the more entrepreneurs should challenge numerous problems causing failure. This failure rate can be reduced by addressing the main weaknesses, through management training and financial assistance, and through the development of sales channels. But a more desirable direction would be to create a habitat that rewards risk taking and does not punish failure. This needs drastic changes in culture and financial systems. Despite of some criticisms on the implementation system, it is generally understood that the supporting programs for ventures will contribute to job creation, economic revitalization, and economic wealth in South Korea.

3. Venture Capital in Korea

3.1 Venture Capital: Source of investment

Financing is one of the most important factors to develop and sustain entrepreneurship and one of major problems that entrepreneurs have in the entrepreneurial processes. Talented entrepreneurs and sufficient venture capitals to invest into these business opportunities could make virtuous cycle of entrepreneurship. The SMIPC study [39] shows that the main difficulties experienced by start-ups are: (1) raising funds; (2) dealing with the complex administrative requirements necessary for the establishment of new firms (including finding a suitable factory location). Other problems are the lack of skilled workers, product development, finding customers, and the development of business ideas.

Figure 2 illustrates the configuration of financing sources along the developmental stage of venture firms. Through the growth of venture firms, individual angels, venture capital firms, commercial bank and the stock market can be the major resources for financing after rapid the growth stage and stability stages. [7, 8] The capital market's structure and status is one of the pillars for fostering entrepreneurship. Especially, the early stage in the needs of seed money attracts government policies to trigger entrepreneurship. In the R&D stage, venture firms can reduce the financial risk from the development and commercialization of their products by participating in the government R&D projects driven by diverse government departments. In addition to financial benefits, they can utilize technological information and facilities in the government research institutes. For instance, the Development Project for Industrial-based Technology (DPIT) operated by MOCIE is targeted for the increase of local firms' technological capabilities and support innovative R&D projects. The Korean Small Business Innovation Research (KOSBIR) program similar to the SBIR program in the United States is promoted since 1999.

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There are different types of venture investors in terms of investment goals, timing of investment, contract terms and control mechanisms between venture investors, and other resources that invested ventures can marshal from investors. Individual and angels investors provide seed money in early-stage ventures as well as invaluable resources like general advice on management and specialized know-how with industrial experiences. Also Korean government gave these investors new tax incentive designed to encourage angel investment.

Venture capital firms were established to promote the creation of new ventures, particularly technology-based ventures. There are two types of venture capital firms operating in Korea. The first type is the New Technology business Financing Companies (NTFCs). NTFCs provide comprehensive financing support for small and medium-sized enterprises with equity investments, loan financing, leasing, and factoring services. The second type, the Small Business Investment Companies (SBICs), focuses on equity investment during the early stage of a company's development.

The first venture capital firm in Korea was K-TAC (Korea Technology Advancement Company), established to help to commercialize the R&D results of KIST (Korea Institute of Science and Technology) in 1974. Afterwards, three more venture capital firms began businesses under the jurisdiction of the Ministry of Finance. These initial NTFCs were neither traditional financial institutes nor current venture capital firms. They usually provided diverse financial services with equity-based investment and non-equity-based financial services. Because of the historical background and initial operation strategies, the diverse finance services of Korean initial venture capital firms have been unique and supported venture businesses in an integrated manner and to compensate for the unfavorable environment of venture capital activities.

Under the jurisdiction of the Ministry of Science and Technology (MOST), the Korea Technology Banking Corporation (KTB) was initially established as the Korea Technology Development Corporation (KTDC), a result of the Korea Technology Development Corporation Act of 1981. Through the joint efforts of the Korean government, the International Bank for

Reconstruction and Development (IBRD), and the Korean business and financial communities, KTDC was incorporated with the mandate of promoting the development of technology-intensive industries and with providing private enterprises with sufficient financing resources for their technology developments. KTB also raises capital through the issuance of the Technology Lottery Bond (TLB). The contribution of TLB, utilized as a research loan with low interest rates to the creation of NTBFs has been unsatisfactory such that KTB has a plan to change these funds from loan capital to venture investment partnership funds for selected, prominent NTBFs.

The Ministry of Trade and Industry (MOTI) enacted the Small and Medium Enterprise Formation Act in 1986, which led to the emergence of over 67 small business investment companies (SBICs) as of 1998. These investment companies target and support venture firms younger than 13 years from the inception. For SBICs, the portion of investment assumes about 40% of total financing activities. As venture capitalists experience some difficulties investing in firms at the initial stage, investment losses are increasing. Among NTFCs and SBICs, KTB maintains a substantial share of the Korean venture capital industries. Currently, KTB's market share in terms of financing balance comprises 47 percent, with the remainder being shared by the other three NTFCs and SBICs. Table 5 shows the financing activities of the early Korean venture capital firms. Their equity-based investment has increased at a rapid pace, despite the stable growth of non-equity-based investment. The KTB, a leader in Korean venture capital firms, have aggressively invested into venture firms and changed its strategies from the stable financial operation to risky equity-based investment for higher returns.

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Among financing activities of NTFCs and KTB, the investments is only 8% of non-investment that all of the early Korean venture capital firms have preferred and served more stable financial services. Given the fact that capital on loan and the financing through venture funds, NTFCs in Korea seems to have similar characteristics to general financial institutions but few of them successfully changed their strategies.

Fortunately, some venture capitalists trained in advanced countries started their businesses armed with new approaches and skills, and several success cases in venture financing began to appear. With the explosive growth of the KOSDAQ market, numerous venture capital firms have been newly set up and a number of angel funds were established for gaining higher returns. The number of venture capital firms established by successful venture firms, large conglomerates, and financial institutes, the number of venture funds, and the amount of venture funds have incredibly increased within in a shout time span, as shown in Table 6.

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There were about 50 venture capitals since the mid 1980s when the venture capital firms were formally introduced in Korea. As the growth of KOSDAQ market and venture firms are mushroomed, many new venture capital firms were incorporated. There are 145 venture capital firms registered with the SMBA in 2000. Of Korean VCs, two-thirds of them started their operation just within three years and more than one hundred new venture funds were formed and nearly three trillion won poured into the new venture investment. Also the amount of total venture investment has rapidly increased from $ 1 billion in 1997 to $2 billion in 2000.

Another sources of private equity market is the informal capital market and angel investor. The boundary of angel investors is vague and exact statistics on the informal venture capital market cannot calculate. Korean individual angels have invested their capital into venture firms through angel funds since 1999. These angel funds have been established at a rapid pace and invested into many venture firms until 2000.

In addition to the quantitative development of Korean venture capital market, there was a qualitative progress in the way of financing and investment. When we investigate only the financing patterns of NTFCs, the ratio of equity-based investment on the stable financing services, such loan and lease, has grown from 7% in 1996 to 32% in 2000. (See Table 5) More than 80% of invested venture firms have been less than three years and venture capital firms have provided business services, for example strategic consulting and recruiting talented-employees, to their portfolio firms. These changes are driven by the fierce competition between venture capital firms to find and invest into prospecting new ventures and get higher returns from investing earlier ones in Korea.

3.2 KOSDAQ Market: Harvest of Venture Investment

There are various avenues of harvest strategy, the realization of the efforts and investment by entrepreneurs, angel investor, and venture capital firms typically through Initial Public Offering (IPO) in a stock market and M&A in advanced countries. [31, 40, 41] However, there are few options by which a Korean venture can realize a harvesting from its value creation process. Stringent listing requirements on the Korea Stock Exchange market prevented SMEs and ventures from obtaining efficient access to the market until mid 1990s. In an effort to significantly increase liquidity on the OTC market and to provide venture firms with a greater capacity to raise funds, the Korean Securities Dealers Automated Quotation System (KOSDAQ) commenced activity in July 1996. Like the NASDAQ market in the United States, investors are able to access stock information as well as execute trades over on-line computer systems located at any securities company. From 1997 to 2000, the number of companies listed on the KOSDAQ market increased from 359 to 604. Also total market capitalization of all of firms in the KOSDAQ rose to 29 trillion Won (US $ 22 bil.), while they were valued 7 trillion Won (US

$ 5 bil.) with 4 billion won daily average trading value in 1997.

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The rate of venture firms in the KOSDAQ has increased from 34% in 1998 to 40% in 2000 and the transactions of venture firm's stock have portion of 71% of all transactions in the KOSDAQ and was two hundreds times more than those of previous year. Through the rapid growth and expansion of KOSDAQ market, the number of firms in the KOSDAQ market has reached nearly 90% of the number of firms listed in KSE.

The prodigious growth of the KOSDAQ market was accomplished by the global rise of Internet and information technology industries, especially in the NASDAQ market, and Korean government's policy to promote SMEs and venture firms including alleviation of registration requirements to promote external growth. As a result of the impressive growth from the latter half of 1999, the KOSDAQ market has become a rival for the 44 year-old Korea Stock Exchange (KSE) in less than 4 years. In the first quarter of 2000, the KOSDAQ market has surpassed KSE in terms of daily average trading value and, therefore, has provided the best opportunity for a high share price in IPO. The fluctuation of KOSDAQ market in Figure 2 shows the boom and collapse of venture firms in recent years. The stock market should be a vehicle of the positive feedbacks, successive circulation of new venture creation, venture capital firms' investment flow, and harvesting through the stock market. To allow stable growth, the KOSDAQ market should attract the participation of institution and foreign investors rather than individuals who are dominating in the current KOSDAQ market and prefer short-term investments.

In the current environment of rapid technological change, Korean new ventures with technical skills in specialized sectors, like computer and telecommunications industries, have increasing chances to form strategic alliances with larger domestic companies or with foreign MNCs. For example, Appeal Telecom Co, Ltd., founded in August 1994 and specialized in the wireless handset manufacturing, had recorded a dramatic sales growth from US $11 million in 1995 to US $ 161 million in 1998. In 1998, Motorola acquired the equity of Appeal Telecom Co. with distinctive technical capabilities to reinforce its technological leadership in the Korea wireless telecommunications industry. Through this strategic alliance, Appeal Telecom could get stable financial and sufficient marketing base for internationalization. Strategic partnerships for complementary resources have been alternative means for both partners to adapt the uncertain market environment and to respond to rapidly changing technological environment [13]

3.3 Problems and Future Directions of Venture Capital

Although there was a progress of venture capital industries in Korea, most of Korean venture capital firms are still early stage of development and have many problems. First, Korean venture capitalists have little experience on investing in risky NTBFs and managing their invested new ventures. To get much higher gains from venture investment, venture capitalists could foresight and the changes in the future of specialized target industries, evaluate potential business opportunities, and give advice to invested firms for increasing value. It takes time for young Korean venture capital firms to understand risky venture firms, manage their portfolio companies with right guide on right time, and harvest their venture investment to get higher returns.

Second, Korean venture capital firms are not familiar with equity-based investments due to the past practice of capital operation centering on loans. Also venture capitalists with specialized industry experiences in the specialized sectors were too rare to evaluate new ventures' opportunities. Generally venture capital firms have little capabilities and investment decision criteria to find and determine the appropriate value of new ventures.

Third, there exists a missing link in financing depending on the growth stage of venture firms. At present, it is hard to find appropriate financing resources at the start-up stage and initial growth stage. Public venture capital should take the lead in this field where private venture capital is unwilling to take part. Public investment funds initiated by governments and public institutions could provide alternative financing sources for risky new ventures and would-be entrepreneurs.

Fourth, all of Korean venture capital firms are in the form of corporations and have low performance in fund raising from large companies, financial institutions, and especially foreign institutions. The definition of a "fund" at the international level should be introduced. A number of Korean venture capital firms focused on the financial operations of large companies rather than venture capital activities. Also venture capital firms based on their own capital rather than venture funds from outside investors have preferred more stable financial operations and invested in just known and stable NTBFs These investment patterns made venture capital firms hard at additional investments, such as second and third round investment, for NTBFs with need of staged financing. Korean venture capitals could raise venture investment partnership funds from a diverse source of public and private sectors in local and global market.

Fifth, harvest options for venture capital firms, such as M&A and IPO, have not been developed properly expect the KOSDAQ market. This problem is one of the reasons for Korean venture capital firms to prefer more stable operation of their investment rather than risky investments. There were little harvest options in small Korean M&A market and the unstable KOSDAQ market.

4. Conclusions

This study provides an overview of the development history and the current status of new ventures, venture capital, and several policy measures concerning entrepreneurship in Korea.

Through the longitudinal observation on the impetus and the development process of entrepreneurship in Korea, some salient characteristics are: 1) the impetus, triggering mechanisms, and sources of new venture creation have been changing rapidly, 2) the government has played a key role during the development process of venture firms. 3) a unique business model for Korean NTBFs has not yet been developed.

Based on a situation analysis, this paper suggests further policy directions to sustain entrepreneurship in Korea, especially focusing on various venture financing and harvesting mechanisms and internationalization.

■ **Various financing sources and skillful venture capitalists**

Smooth financing should be accomplished through the mutual role of public venture capital, private venture capital, corporate capital, and angel investors for each growth stage in terms of financing. To be successful, investors should form various venture funds in sources and in size. They should also learn to deal with the differences between a venture's growth stages with different level of financing. In addition, it is necessary to rearrange laws and regulations to accelerate various harvest methods such as merger/acquisitions and to make the KOSDAQ market more active in order to assure the development of venture firms. The accumulation of the business evaluation ability of venture capital is also needed for the sound growth of venture capital and new ventures. Recruiting able venture capitalist in the short-term and nurturing Korean venture capitalist overseas in the long-term would be an effective solution.

■ **Internationalization**

Since the domestic market does not provide enough challenge for venture firms, the necessity to enter the overseas market is felt. But, this is difficult due to a lack of market information. In addition, systematic financial infrastructure for the domestic venture firms has not been sufficiently established. Thus, a system in which society shares the possible losses caused by the failure of businesses with high risk in the domestic market has not yet been properly developed.

Accordingly, Korea should try to link the domestic venture firms planning to enter United States to the infrastructure of manpower and the system of Silicon Valley as a short-term perspective, and to support a policy to nurture domestic venture firms based on Silicon Valley. [35] Active utilization of Korean American knowledge in the US is one good way to connect Korean ventures to the social and financial infrastructure of that country. Also, new business models linking foreign business activities to those of Korea should be developed.

Entrepreneurship in specific region or country heavily rely on the dynamic activities among major players and fundamental infrastructure in the business community. Recently there are increasing interests on the habitat – industrial district or clusters for entrepreneurship- where all entrepreneurs and new ventures need to survive have grown over time. This habitat includes individuals, diverse business organizations, and their networks and interactions. [44] Silicon Valley is the most dynamic habitat for innovation and entrepreneurship with favorable business environment for entrepreneurs and new ventures as well as collective learning among many specialists within regional networks. [35, 44]

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We suggest eight pillars to be crucial to the habitat for entrepreneurship. The habitat for entrepreneurship includes two building blocks: key players and infrastructure as shown in the Figure 3. Universities and Research institutes are the sources of entrepreneurs and technological innovation and create and disseminate new knowledge within the system. Venture capitalists extensively search prospecting new ventures and invest many resources into them for gaining higher profit. Entrepreneurs and new ventures need many excellent services of specialized service providers on the specific fields like law and account. All key players have specialty on their fields and interact with each other to create and share their knowledge. Infrastructure is also important to foster and sustain entrepreneurship in the habitat. Government, capital market, dense and open business networks among key players within habitat and around global market, and social culture like risk taking and tolerance on failure can build favorable business environment that all key players operate within.

During last three years Korea government have contributed to initiating entrepreneurship of all key players, however, paid relatively little attention to build infrastructures in the habitat. Quantitative growth of entrepreneurship in Korea, it is time that Korean government's role should be changed from direct support on each key player to indirect support for building social infrastructure and systems to sustain entrepreneurship in the habitat.

In this paper, we report on current situation and major characteristics of Korean entrepreneurship including venture firms, venture capitals, and infrastructures to support other. Entrepreneurship in Korea has been rapidly changed after active involvement of government and also has grown quantitatively one of dynamic countries within short time periods. Other countries to promote entrepreneurship in their countries can learn from not only the successful cases in advanced countries but also experiences in the others. Current situation and development history of Korea is one of good cases how government can play an initiative role to promote entrepreneurship.

References

1. Abetti, P. A. (1992), 'Planning and Building the Infrastructure for Technological Entrepreneurship', *International Journal of Technology Management*, Vol.7, Nos.1/2/3, pp.129~139.
2. Bae, Zong-Tae (1994), *Establishment Policies and Operating Principles of KAIST Technology Business Incubator*, KAIST [in Korean].
3. Bae, Zong-Tae (1994), 'Planning and Principles for the Construction of S&T Industrial Parks: The Korean Approaches,' Paper presented at *the APEC Seminar on Development Strategies of Science and Technology Industrial Parks in Asia and the Pacific*, Beijing, China.
4. Bank of Korea (2000), *Financial Statement Analysis for 1999*, The Bank of Korea.
5. Block, Z. and MacMillan, I. C. (1993), *Corporate Venturing*, Boston, MA: Harvard Business School Press.
6. Bollinger, L., Hope, K. and Utterback, J. M. (1983), 'A Review of Literature and Hypotheses on New Technology-Based Firms', *Research Policy*, Vol.12, pp.1~14.
7. Brophy, D. J. (1997), 'Financing the Growth of Entrepreneurial Firms' in D. L. Sexton and R. W. Smilor, (eds), *Entrepreneurship 2000*, Chicago, Upstart Publishing Company, pp.5~27.
8. Bygrave, W. D. and Timmons, J. A. (1992), *Venture capital at the Crossroads,* Harvard Business School Press.
9. Cooper, A. C. (1971), 'Spin off and Technical Entrepreneurship', *IEEE Transaction on Engineering Management*, Vol.18, pp.2~6.
10. Cooper, A. C., Gimeno-Gascon, F. J., and Woo, C. Y. (1994), 'Initial human and financial capital as predictors of new venture performance', *Journal of Business Venturing*, Vol.9, pp.371~395.
11. Delapierre, Michel, B. Madeuf, A. Savoy (1998), '*NTBF – the French Case*', *Research Policy*, Vol.26, pp.989-1003.
12. Dodge, H. R., Fullerton, S., and Robbins, J. E. (1994), 'Stage of the Organizational Life Cycle and Competition as Mediators of Problem Perception for Small Businesses', *Strategic Management Journ*al, Vol.15, pp.121~134.
13. Hagedoorn, J. (1990), 'Organization Modes of Inter-firm Co-operation and Technology Transfer', *Strategic Management Journal*, Vol.10, No.1, pp.17~30.
14. Kazanjian, R. K. (1988), 'Relation of Dominant Problems to Stages of Growth in Technology-based New Ventures', *Academy of Management Journal*, Vol.31, No.2, pp.257~279.
15. KOVA (1997), *Promoting Entrepreneurial Activities for Korean Venture Business*, Korea-

USA Venture Forum [in Korean].

16. KOVA (1998), *Current Status of Venture Firms*, Korea Venture Business Association [in Korean].
17. KTDC (1991), *The Role and Future Directions of Korean Venture Industry*, Korea Technology Development Corporation.
18. Kim, Linsu (1997), *Imitation to Innovation: The Dynamics of Korea's Technological Learning*, Boston, Massachusetts: Harvard Business School Press.
19. Lalkaka, Rustam (1997), *Supporting the Start and Growth of New Enterprises*, NY: United Nations Development Programme.
20. Lalkaka, Rustam and Abetti, Pier A. (1999), 'Business Incubation and Enterprise Support Systems in Restructuring Countries', *Creativity and Innovation Management*, Vol.8, No.3, pp.197~209.
21. Laranja, Manuel, M. Fontes (1998), 'Creative Adaption: the Role of New Technology Based Firms in Portugal', *Research Policy*, Vol. 26, pp.1023-1036.
22. Licht, Georg, E. Nerlinger (1998), 'New Technology-Based Firms in Germany: A Survey of the Recent Evidence', *Research Policy*, Vol.26, pp.1005-1022.
23. Mathews, J. A. (1997), 'A Silicon Valley of the east: Creating Taiwan's Semiconductor Industry', *California Management Review*, Vol.39, No.4, pp. 26-54.
24. Miller, D. (1983), 'The Correlates of Entrepreneurship in Three Types of Firms', *Management Science*, Vol.29, pp.77~91.
25. Miller, D. and Friesen, P. H. (1982), 'Innovation in Conservative and Entrepreneurial Firms: Two Models of Strategic Momentum', *Strategic Management Journal*, Vol.3, No.1, pp.1~25.
26. MTCI (1997), *Present Condition and Development Direction of Venture Firms*, Ministry of Trade, Commerce, and Industry [in Korean].
27. Moon, Byung-whan, (1998), *Successful Ventures*, Seoul: Arthur Media [in Korean].
28. National Statistical Office (1998), *Report on Mining and Manufacturing Survey: Whole Country*, National Statistical Office.
29. NBIA (1997), *Business Incubation Works,* National Business Incubation Association.
30. OECD (1998), *Fostering Entrepreneurship*, Paris, Organisation for Economic co-operation and Development.
31. Petty, J. W. (1997), 'Harvesting Firm Value: Process and Results' in D. L. Sexton and R. W. Smilor, (eds.), *Entrepreneurship 2000*, Chicago, Upstart Publishing Company, pp.71~94.
32. Reynolds, P. D., Hay, M., Bygrave, W. D., Camp, S. M., and Autio, E. (2000), *Global Entrepreneurship Monitor: 2000 Executive Report*.
33. Rice, M. P. and Matthews, J. B. (1995), *Growing New Ventures, Creating New Jobs*, Westpost, CT: Quorum Books.

34. Sandberg, W. R. and Hofer, C. W. (1987), 'Improving new venture performance: the role of strategy, industry structure, and the entrepreneur', *Journal of Business Venturing*, Vol.2, No.1, pp.5~28.
35. Saxenian, A. (1996), *Regional Advantage: Culture and Competition in Silicon Valley and Route 128*, Harvard University Press.
36. SMBA (1999), *Survey of Venture Firms*, Small and Medium Business Administration [in Korean].
37. SMBA (2000), *Survey of Venture Firms*, Small and Medium Business Administration [in Korean].
38. Smilor, R. W. and Gill, M. D. (1986), *The New Business Incubator*, Lexington, MA; D.C. Heath and Company.
39. SMIPC (1995), *A Study on the Creation and Success of Small and Medium-sized Firms,* Small and Medium Industries Promotion Corporations [in Korean].
40. Stevenson, H. H., Roberts, M. J., and Grousbeck, H. I. (1994), *New Business Ventures and the Entrepreneur*, Fourth Edition, Burr Ridge: Irwin.
41. Timmons, Jeffery A. (1990), *New Venture Creation: Entrepreneurship for the 21st Century*, Revised Fourth Edition, Burr Ridge: Irwin.
42. Timmons, J. A. and Sapienza, H. J. (1992), 'Venture Capital: The Decade Ahead', in D. L. Sexton and J. D. Kasarda, (eds.), *The State of the art of Entrepreneurship*, Boston, PWS-KENT Publishing Company, pp.402~437.
43. Tornatzky, L. G., Batts, Y., McCrea, N. E., Lewis, M. S., and Quittman, L. M. (1996), *The Art & Craft of Technology Business Incubation*, Athens, Ohio, National Business Incubation Association.
44. Lee, C., Miller, W. F., Hancock, M. G., Rowen, H. S. (2000), *The Silicon Valley Edge: a Habitat for innovation and entrepreneurship*, California, Stanford University Press.

<Table 1> Types of venture firms registered with SMBA: 1998~2000

	Dec. 1998	May 1999	Dec. 1999	May 2000	Dec. 2000	Jul. 2001
VC investment	494 (24%)	606 (19%)	845 (17%)	1215 (17%)	1624 (17%)	1515 (15%)
High R&D ratio	584 (28%)	937 (30%)	917 (18%)	1140 (16%)	1301 (13%)	1189 (11%)
Intellectual propriety & Governmental R&D Project	766 (38%)	1263 (40%)	1708 (35%)	1910 (27%)	2195 (22%)	2039 (20%)
Prospecting venture by evaluation	198 (9%)	338 (11%)	1464 (30%)	2845 (40%)	4707 (48%)	5688 (54%)
Total	2042 (100%)	3144 (100%)	4934 (100%)	7110 (100%)	9827 (100%)	10431 (100%)

Source: SMBA data

<Table 2> Industry distribution of Korean venture firms

	Info & Telecom.	Machinery	Electric & Electronic	Textile & Chemical	Medical /Bio.	Others	Total
No. of firms in Dec. 1998 (%)	636 (31%)	600 (29%)	310 (15%)	24 (13%)	139 (7%)	110 (5%)	2042 (100%)
No. of firms in Dec. 2000 (%)	4118 (42%)	2011 (20%)	1206 (12%)	1130 (11%)	658 (7%)	704 (7%)	9827 (100%)

Source: SMBA (1999, 2000)

<Table 3> Comparison of venture firms, general small firms, and large firms: 1997~1999

		Venture firms*			Small firms in general**			Large firms**		
		1997	1998	1999	1997	1998	1999	1997	1998	1999
Number of firms		2042	4934	7117	91324	79633	90993	821	682	714
Average Sales [a]	Won mil.	7400	4700	4700	2200	n.a	n.a.	281600	n.a.	n.a.
	US $ mil.	5.2	3.9	4.1	1.6	n.a	n.a.	199	n.a	n.a.
Average no. of employees		59	35	37	20	21	21	1016	1015	961
Sales growth rate (%)		36.83	71.2	21.9	7.02	-2.01	10.79	12.92	1.97	6.58
Operating Income to Sales (%)		19.4	n.a	n.a	4.98	5.15	5.23	9.72	6.53	7.38
Ordinary Income to Sales (%)		n.a	4.0	7.23	0.40	0.55	2.92	-0.67	-2.91	1.01
R&D/sales ratio (%)		24.1	33.7	7.1	0.63	0.62	0.47	1.56	2.02	1.77

Note: Each year the venture firms were surveyed the performance of previous year.

SMEs and Large firms are only in manufacturing sectors.

One US dollar to Korean Won is 1415 in 1997, 1208 in 1998, and 1138 in 1999.

Sources: * SMBA (1999, 2000), ** Bank of Korea (2000), National Statistical Office (1998)

<Table 4> Prior experience of venture founders

Prior Experience		Number (ratio)			
		1990	1997		2000
Private	Manufacturing department	31 (79.5%)	75 (65.8%)	7 (6.1%)	4911 (70.3%)
	R&D department			41 (36.1%)	
	Sales department			12 (10.5%)	
	Top manager			25 (21.9%)	
Public	R&D institutes	1 (2.6%)	12 (10.5%)		906 (9.2%)
	Universities	2 (5.1%)	6 (5.3%)		540 (5.5%)
Others		5 (12.8%)	11 (9.6%)		1470 (15.0%)
Total		39 (100%)	114 (100%)		9827 (100%)

Source: MTCI (1997), KTDC (1991), SMBA (2000)

<Table 5> Financing activities of the early Korean venture capital firms

		1996	1997	1998	1999	2000
Investment [Won bil.]	KTB	170 (201)	274 (194)	244 (202)	609 (536)	623 (494)
	NTFCs	93 (110)	187 (132)	191 (158)	436 (383)	402 (319)
	Total	262 (311)	461 (326)	435 (360)	1046 (919)	1025 (813)
Non-Investment [Won bil.]	KTB	2108 (2498)	2412 (1705)	1620 (1341)	962 (846)	504 (400)
	NTFCs	1353 (1603)	1959 (1384)	1385 (1146)	3603 (3166)	2686 (2132)
	Total	3461 (4101)	4371 (3089)	3005 (2488)	4565 (4011)	3190 (2532)
Comparison of financial services in total amount (Investment/Non-investment)		7.6 %	10.5 %	14.5 %	22.9 %	32.1 %

Note: the figures in the parenthesis are US $ in million

<Table 6> current status of Korean angel and venture capital firms

		1997	1998	1999	2000
Venture Capital	No. Venture capital firms	61	72	95	145
	No. Total Venture funds	79	92	144	294
	No. Investment Deals	1872	1782	2457	4778*
	New investment fund [Won bil.]	832 (588)	900 (745)	1254 (1095)	2035 (1565)
	Total investment amount [Won bil.]	1489 (1052)	1318 (1091)	1486 (1298)	2180 (1677)
Angel	No. Angel funds	n.a.	n.a	11	41*
	No. Angel investors	n.a.	n.a	2033	28875
	No. Total Portfolio firms	n.a.	n.a	255	1291
	Total investment amount [Won bil.]	n.a.	n.a	56 (49)	549 (436)

Note: the figures in the parenthesis are US $ in million, *as of October 2000

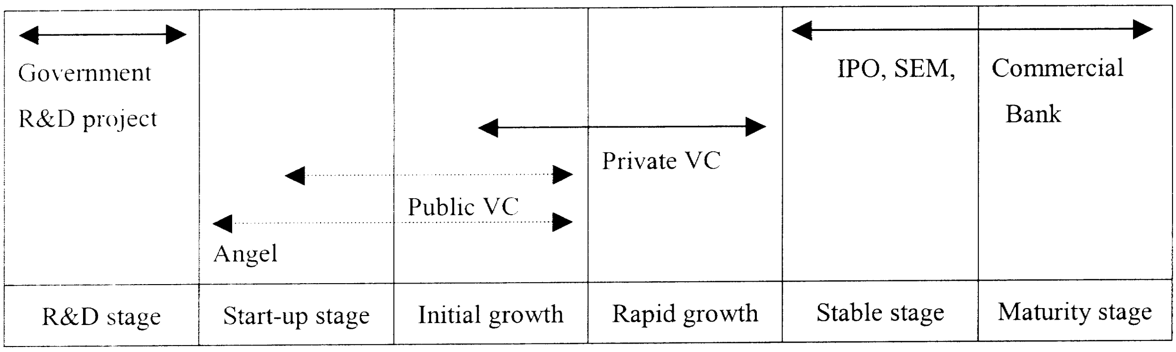
Source: Korea Venture Capital Association (KVCA), SMBA internal data

< Table 7 > Current status of the Korean stock market: KOSDAQ vs. KSE

			1997	1998	1999	2000				2001	
						Mar.	Jun.	Sep.	Dec.	Mar.	Jun.
KOSDAQ	No. of firms	Venture firms	-	114 (34%)	173 (38%)	159 (32%)	191 (36%)	224 (38%)	244 (40%)	249 (41%)	277 (45%)
		SMEs	298 (83%)	154 (47%)	145 (32%)	182 (37%)	168 (31%)	196 (33%)	200 (33%)	221 (36%)	216 (35%)
		Large Firms	61 (17%)	63 (18%)	77 (17%)	81 (17%)	88 (16%)	91 (15%)	96 (16%)	99 (16%)	99 (16%)
		Others	-	-	58 (13%)	70 (14%)	91 (17%)	78 (13%)	64 (11%)	41 (7%)	24 (4%)
		Total	359 (100%)	331 (100%)	453 (100%)	492 (100%)	538 (100%)	589 (100%)	604 (100%)	610 (100%)	616 (100%)
	Daily Average Trading Value	Won bil.	4	5	429	4115	3189	1134	1139	1671	1650
		US$ mil.	3	4	375	3714	2860	1017	884	1258	1269
	Total Market Value	Won bil.	7069	7892	98704	77452	65079	47043	29016	38192	45360
		US$ mil.	4996	6533	86204	69903	58367	42191	22511	28759	34892
KSE	No. of Firms		776	748	725	723	710	706	704	699	693
	Daily Average Trading Value	Won bil.	556	660	3482	3653	3427	2008	1612	1615	1818
		US$ mil.	392.9	546.4	3041	3296.9	3073.5	1800.9	1250.6	1216	1398
	Total Market Value	Won bil.	70989	137798	349504	304647	295819	224065	188041	208747	237797
		US$ mil.	50168	114071	305244	274952	265309	200955	145881	157189	182921
Comparison of two stock market (KOSDAQ/ KSE)	No. of firms listed on the market		46.3 %	44.3 %	62.5 %	68.0%	75.8 %	83.4 %	85.8 %	87.3 %	88.9 %
	Daily Average Trading Value		0.7 %	0.8 %	12.3 %	112.6 %	93.1 %	56.5 %	70.7 %	103.5 %	90.8 %
	Total Market Value		10.0 %	5.7 %	28.2 %	25.4 %	22.0 %	21.0 %	15.4 %	18.3 %	19.1 %

Note: The number of others means the number of mutual funds in the KOSDAQ market since 1999.
Sources: KSE and KOSDAQ data

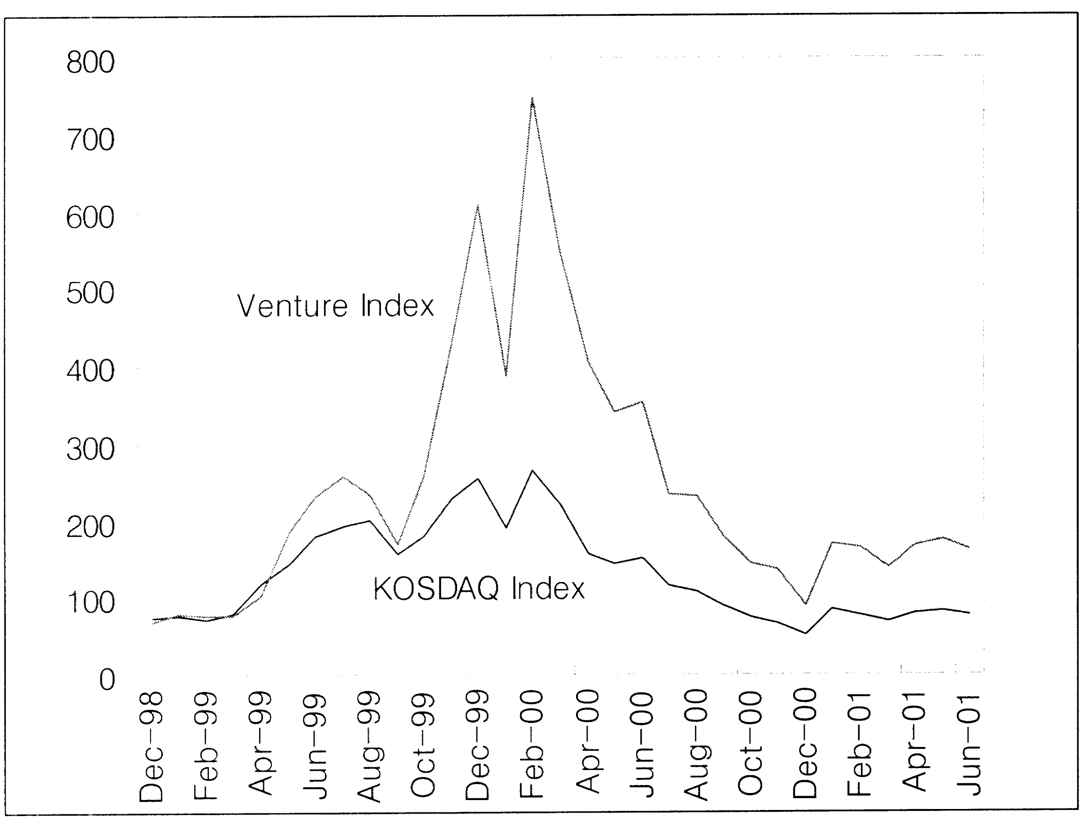
<Figure 1> Change of financing sources along venture growth



Note: 1) - - -(dotted arrow) denotes that this financing source is inactive in Korea

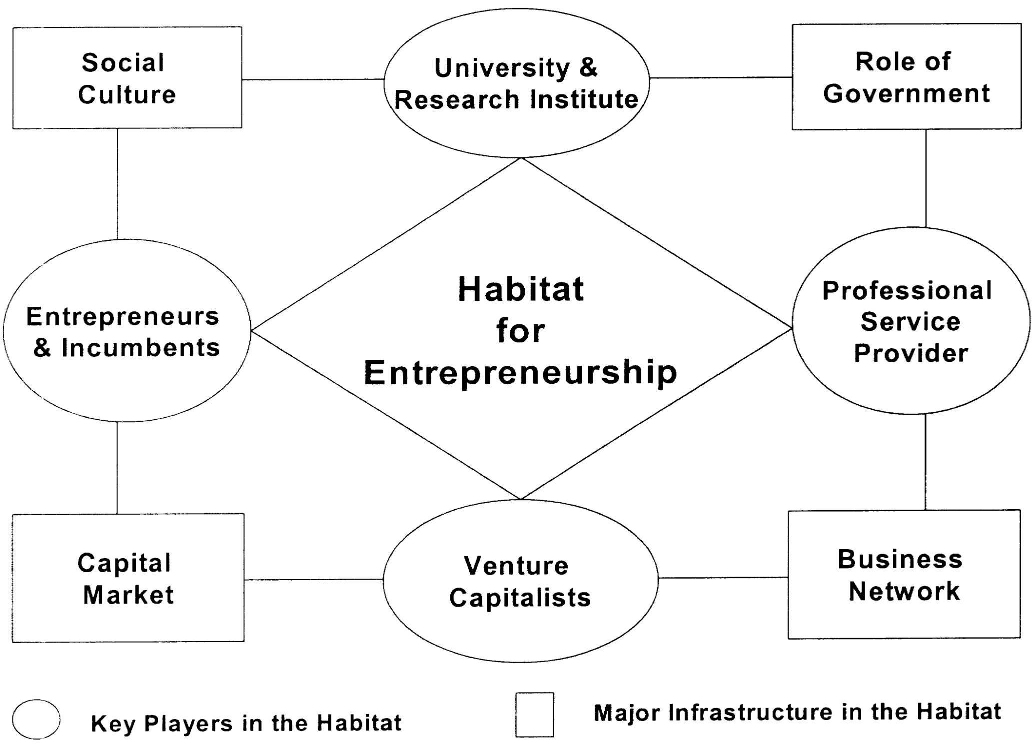
2) SEM: Stock Exchange Market

<Figure 2> Trends of KOSDAQ market



Source: KOSDAQ data

<Figure 3> Configuration of Habitat for Entrepreneurship



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