

Working Paper No.93

Venture Capitalist's Investment Decision Making in the New Technology Based Firms in Japan
(Revised Version)

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February, 2008

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Abstract

In Japan, there has been a notable growth in the percentage of investment in new technology based firms by venture capitalists (here after abbreviated VCists). I analyze Japanese VCists investment decision making based on a questionnaire survey and attempt to seek answers for the following research questions: “How do Japanese VCists value their potential investments?” and, more specifically, “How do VCists who invest in new technology based firms value their potential investments?”.

The questionnaire survey reveals that a relatively high proportion of Japanese VCists place a special importance on the interview with entrepreneurs, and curriculum vitae of management in valuating the potential investments. At the same time, they use capitalized maintainable earning (P/E multiples) as the valuation method. However, it seems that VCists who allocate a higher proportion of their investment in the new technology based firms do not focus particularly on any source of information or valuation method even though there has been a rapid growth in an investment in the new technology based firms in the recent years.

1. Introduction

Venture capitalists (here after abbreviated VCists) have played an important role in fostering the new technology based firms, many of which have become today’s large businesses such as Google, Apple and Intel (Florida and Kenney, 1988; Pfirrmann, Wupperfeld and Lerner, 1997). VCists basically raise money from both institutions and individuals for the investment in high-risk, high-return unlisted firms. VCists also play a part in investment selection by acting both as “scouts” able to identify future potentials and as “coaches” who can help realize them (Baum and Silverman, 2003).

In Japan, the investment style of VCists has changed rapidly since the late 1990s. There has been a notable growth in the percentage of VCists’ investment in the new technology based firms, as well as, increase in VCists’ management involvement in their portfolio firms. For this paper, I will focus on the VCist’s role as a “scout” as it appears to be one of the important VCist’s roles in cultivating the new technology based firms in Japan.

The structure of this paper is as follows. Firstly, the latest situation of Japanese venture capital investment is presented along with related prior researches. Secondly, the data and sample characteristics of Japanese VCists survey conducted in this paper are described. Thirdly, the empirical results are presented. Then, lastly, my evidence and some implication discussion are summarized.

2. Japan’s Venture Capital Investment

According to the data by the Ministry of International Trade and Industry (MITI) (1995-96) and Japan Venture Enterprise Center (VEC) (1997-2004), Japan’s venture capital investment amount in stocks marked a steady 13 percent increase from 654 billion yen in 1995 to 743 billion yen in 2004. The total amount of annual new and additional stock investments increased approximately 50 percent from 75 billion yen in 1995 to 113 billion yen in 2004. A year-to-year change in the total investment amount and annual new and additional investment in stocks indicates a general upward trend of investment, although, not a

continuous increase (See Table 1).

Table 1: A year-to-year change in the total stock investment and annual new and additional investment amount by Japanese Venture capital firms (in billion yen)

	Ye	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
Total stock investment		654	638	723	665	622	667	867	851	831	743
Listed stocks		103	114	127	99	95	97	97	70	-	-
Unlisted stocks		551	523	557	565	505	528	587	577	-	-
New/additional investment		75	74	108	105	72	148	213	122	133	113
Listed stocks		6	5	6	4	4	2	7	90	-	-
Unlisted stocks		68	69	102	100	66	139	129	95	-	-

Note: The figures from 1995 to 1999 and 2004 were compiled as of March, those of 2000 were as of June, and those from 2001 to 2003 were as of September.

Sources: MITI (1995-96) and VEC (1997-2004).

A survey on the new annual investment by growth stage indicates a rapid increase in investment in the early stage firms. Notably, there has been a rapid shift of investment to early stage firms among Japanese VCists since the late 1990s. To be specific, the percentage of investments in firms during the first 5 years of inauguration was 17.2 percent in 1995, which has increased to 62.2 percent in 2000, and slightly declined to 49.8 percent in 2004 (MITI, 1995-1996; VEC 1997-2004).

The breakdown of new investments by business categories (on a value basis) shows that the percentage of investment in an internet-related business which is a major technical innovation area has increased from 15.0 percent in 2001 to 25.8 percent in 2004, while the percentage of investment in biotechnology more than doubled from 4.0 percent in 2001 to 9.1 percent in 2004 (VEC, 1997-2004). The investment in other new technical innovation areas, such as semiconductor/electronic components and computer-related businesses also hold a considerable share.

A number of venture capital funds for university spin-offs, which are the major funds for new technologies established following the Hokkaido University's "Hokudai Ambitious Fund" founded in 1997, has shown a rapid increase since 2001. Along with such continuous increase in the amount of investment in general, there has also been a notable growth in the percentage of investment in the new technology based firms such as those in internet and biotechnology industries.

3. Research Focus

In this paper, I will discuss two research questions: "How do Japanese VCists value their potential investments?" and, specifically, "How do VCists who invest in new technology based firms value their potential investments?"

With regard to the former research question, it has been pointed out in the research by Manigart, Waele, Wright, Robbie, Sapienza and Beekman (2000) that VCists in the network-based countries are likely to

place greater importance on the personal quality of entrepreneurs and information provided by management and their acquaintance as sources of information for valuation. Manigart et al. (2000) did not mention specifically of Japanese VCists but it seems obvious that, according to their definition, Japan can be included as one of the network-based countries.

Concerning the Japanese VCists' methods used in valuating potential investments, Hasegawa (2004) revealed that Japanese VCists rely on the use of book values and recent transaction prices in the sector. These two methods are, however, evaluated to be less advanced when compared to other valuation methods such as the discounted value of free cash flows and capitalized maintainable earning which are widely used by many VCists in the U.S. (Manigart et al., 2000). As for the sources of information, some prior researches have maintained that Japanese VCists pay greater attention to the quality of management (Ray and Turpin, 1993; Nishizawa, 1998) than other things.

Regarding the latter research question, Baum and Silverman (2003) have pointed out that the VCists who invest in the biotechnology based new firms have a potential to "scout" excellent technologies. Bygrave and Timmons (1992) added that the VCists who invest in the early stage firms should also act as "coaches" or "cheerleaders". Many prior researches also added that the VCists who invest in the new technology based firms value their potential investments, "scout" excellent technologies, and support their portfolio firm's management as coaches or cheerleaders after investment. I will discuss these research questions in details below.

4. Data and Sample Characteristics

4.1. Data

A questionnaire survey was conducted with the Japanese VCists directly or indirectly through 157 venture capital firms, namely the corporate members of the Japanese Venture Capital Association (JVCA)²⁾ and firms listed on the "Japan Venture Capital Directory in FY2005" by the Venture Enterprise Center in 2006. To be more specific, three to fifteen questionnaire forms were sent out to these venture capital firms based on their annual investment size in FY2004. Via these channels, a total 614 questionnaire forms were distributed from late July to mid August of 2006. Following the sending of the first questionnaire form, non-responding VCists were approached directly or through venture capital firms via phone, fax, or e-mail, to be reminded of the questionnaire response from late August to late September. In this survey, VCists were asked to present their personal experiences and views regarding their investments. This paper analyzes the responses returned by 105 VCists before the end of September 2006.

4.2. Sample Characteristics

The 105 responses reveal that the respondents have been involved in the investment activities as VCists for 7.38 years, and engaged in the non-investment activities for 3.59 years. The average number of years of business experiences at non-venture capital firms is 8.55 years. The number of portfolio companies in which the respondents have been in charge of is 28.36 on average. Among these firms, the

2) Japanese Venture Capital Association (JVCA) was established in November 2002 with approximately seventy firms and individual investors. The association is the first association in the Japanese venture capital industry.

technology-based portfolio firms that have filed patents or achieved other technical innovations account for 33.0 percent on average. An average breakdown by business category of the portfolio firms in which the respondents have been in charge of is as follows: IT-related businesses, 39.7 percent; biotechnology, medical and healthcare service industries, 13.2 percent; industrial and energy services, 13.7 percent; products/services, 29.5 percent; and others, 3.6 percent.

Respondents were further asked to indicate the investment stage of portfolio firms in which they have been in charge of at the time of investment. The four stages of development advocated by Maison and Harrison (1999) were adopted for this purpose. The average results are as follows: 1) start-up stage (from inauguration to achievement of sales), 17.6 percent; 2) early stage (from achievement of sales to achievement of single-year profit), 35.9 percent; 3) growth stage (from achievement of single-year profit to elimination of cumulative loss), 22.9 percent; and 4) later stage (from elimination of cumulative loss to IPO), 22.2 percent. With regard to the average breakdown of exit types, 25.6 percent of the portfolio firms were IPOed, 9.6 percent were merged/acquired for further development, 23.9 percent were sold to other shareholders or their original owners, 11.5 percent went bankrupt or were dissolved or liquidated, and 29.0 percent were others.

The VCists were then asked to indicate the expected internal rate of return at each stage of portfolio firms. The following results were obtained: start-up stage, 70.3 percent (standard deviation: 21.55); early stage, 58.7 percent (standard deviation: 19.79); growth stage, 43.6 percent (standard deviation: 17.33); and later stage, 30.2 percent (standard deviation: 17.07). Similarly, the study by Wetzel (1997: 197) with the US VCists also reveals that the annual expected rate of return of their portfolio is 80 percent at the seed stage prior to establishment of a firm, 60 percent at the start-up stage immediately following the establishment of a firm, 50 percent to 30 percent at the first to third stages of growth, and 25 percent at the bridge stage immediately preceding IPO. While direct comparison is difficult due to the difference in definitions adopted, I have found that the level of expected internal rate of return among Japanese VCists is very close to the level shown with the US VCists in the study by Wetzel (1997).

5. Results

5.1. Primary Source of Information

To determine the primary sources of information used when deciding which firms to invest in, VCists were asked to rate the following items on a scale of 1 (never use) to 5 (always use). These items were selected based on the study by Manigart et al.(2000); the curriculum vitae of management, interview with entrepreneurs, production capacity/technical information, own due diligence report, due diligence by accounting/consulting firms, business plan (overall consistency of business plan), business plan (management projections, more than 1 year ahead), interview with other firm personnel, and sales and marketing information. Among VCists, the interview with entrepreneurs was ranked the highest on average, followed by the curriculum vitae of management. The comparison between these results and the results shown by Manigart et al. (2000) indicates that Japanese VCists place more importance on the curriculum vitae of managements and interview with entrepreneurs for their decision making than VCists from other parts of the world (See Table 2a).

Table 2a: Sources of Information for Potential Investment Valuation among VCists

	Manigart et al. (2000)				
	Japan (n = 105)	U.S. (n = 73)	U.K. (n = 66)	N&B (n = 38)	France (n = 32)
Curriculum vitae of management	4.80	4.19	3.91	4.34	4.41
Interview with entrepreneurs	4.91	4.22	3.65	4.47	4.25
Production capacity/technical information	4.63	3.71	3.42	3.71	4.19
Own due diligence report	4.10	4.88	4.47	4.61	4.57
Due diligence by accounting/consulting firms	3.66	3.82	3.75	4.03	4.03
Business plan (overall consistency of plan)	4.77	4.19	4.06	4.47	4.77
Business plan (more than 1 year ahead)	4.67	3.27	3.63	4.03	4.36
Interview with other firm personnel	4.51	3.74	3.17	4.00	4.25
Sales and marketing information	4.73	3.89	3.80	4.24	4.25

Note: figures in mean scores

I further analyzed the correlative relationship among the sources of information VCists use for the valuation of potential investments and their actual investment in (1) technology based and (2) early stage firms. The result shows that among VCists who allocate a higher proportion of their investment to technology based firms, a negative correlation is recognized with the use of own due diligence report, and business plan (overall consistency of plan) (at 5 percent level), and due diligence by accounting/consulting firms (at 10 percent level). On the other hand, among VCists who allocate a higher proportion of their investment to early stage firms, a negative correlation is recognized only with the use of due diligence by accounting/consulting firms (at 5 percent level) (See Table 2b).

Table 2b: Correlation Between the Primary Sources of Investment Information and the Proportion of Investment in Technology Based and Early Stage Firms among the VCists

	PITB ^{a)}	PIES ^{b)}
Curriculum vitae of management	0.048	- 0.062
Interview with entrepreneurs	0.035	0.037
Production capacity /technical information	0.136	- 0.105
Own due diligence report	- 0.252*	- 0.029
Due diligence by accounting/consulting firms	- 0.307**	- 0.199*
Business plan (overall consistency of plan)	- 0.216*	- 0.122
Business plan (more than 1 year ahead)	- 0.061	- 0.111
Interview with other firm personnel	- 0.081	0.071
Sales and marketing information	- 0.102	- 0.087

Notes: samples: $n = 105$

^{a)} PITB = Proportion of investment in technology based firms

^{b)} PIES = Proportion of investment in early stage firms

** Significant at 1 percent level (two-tailed)

* Significant at 5 percent level (two-tailed)

With a closer look at VCists who allocate a higher proportion of their investment to technology based firms, a relatively high probability (0.136) is recognized in the use of production capability/technical information, though not significant, and a negative correlation is observed with the use of almost all other sources listed. Among VCists who allocate a higher proportion of their investment to early stage firms, there is a slight positive correlation only with the use of the interview with entrepreneurs, and interview with other firm personnel. Negative correlations are observed with the use of all other sources listed.

5.2. Methods Used in Valuating Potential Investments

To determine the methods used in valuating potential investments, VCists were asked to rate the followings items on a scale of 1 (never use) to 5 (always use). These items were selected based on the studies by Timmons (1992) and Manigart et al. (2000); discounted value of free cash flows (DCF), capitalized maintainable earning (P/E multiples), capitalized maintainable earning (EBIT multiples), payback period, dividend yield basis, recent transaction prices for acquisitions in the sector. Among Japanese VCists, the capitalized maintainable earning (P/E multiples) was ranked the highest on average, followed by payback period (See Table 3a).

Table 3a: Methods Used in Valuating Potential Investments among VCists

	Manigart et al. (2000)				
	Japan (n = 105)	U.S. (n = 73)	U.K. (n = 66)	N&B (n = 38)	France (n = 32)
DCF	3.27	3.62	-	3.89	3.26
P/E multiples	4.08	3.63	4.31	3.58	3.66
EBIT multiples	2.84	3.83	3.90	3.76	3.66
Payback period	3.90	3.47	-	2.92	4.20
Dividend yield basis	1.62	2.14	2.22	3.03	2.29
Recent transaction prices for acquisitions in the sector	3.09	3.78	3.63	3.61	4.22

Note: figures in mean scores

I further analyzed the methods of valuation used by VCists to find out how they are correlated to the proportions of investment to technology based and early stage firms. A significant negative correlation is observed with the recent transaction prices for acquisitions in the sector (at 5 percent level) among VCists who allocate a higher proportion of their investment to early stage firms. However, no significant correlation is observed in all valuation methods listed among the VCists allocating a higher proportion of their investment to technology based firms (See Table 3b).

Table 3b: Correlation between the Methods used in Valuating Potential Investments and the Proportion of Investment to Technology Based and Early Stage Firms among the VCists

	PITB ^{a)}	PIES ^{b)}
DCF	0.118	0.024
P/E multiples	0.025	-0.032
EBIT multiples	0.180	0.054
Payback period	0.134	-0.036
Dividend yield basis	0.174	-0.084
Recent transaction prices for acquisitions in the sector	0.112	-0.258*

Notes: samples: n = 105

^{a)} PITB = Proportion of investment in technology based firms

^{b)} PIES = Proportion of investment in early stage firms

* Significant at 5 percent level (two-tailed)

6. Summary and Implications

6.1. Summary

This paper discusses the results of the analysis for the following research questions; “How do Japanese VCists value their potential investments?”, and “How do VCists who invest in new technology based firms value their potential investments?” The results can be summarized as follows.

6.1.1. Japanese VCists

In valuating potential investments, Japanese VCists place special importance on the interview with entrepreneurs, and curriculum vitae of management as their sources of valuation information. In addition, a relatively high proportion of Japanese VCists use capitalized maintainable earning (P/E multiples), and payback period as the methods used in evaluating potential investments.

6.1.2. VCists investing in the new technology based firms

In terms of primary sources of information used in valuating potential investments by VCists who allocate a higher proportion of their investment to technology based firms, a negative correlation is recognized with the use of own due diligence report, due diligence by accounting/consulting firms, and business plan (overall consistency of plan). At the same time, no significant correlation is observed regarding valuation methods used.

Among VCists who allocate a higher proportion of their investment to early stage firms, a negative correlation is observed only with the use of due diligence by accounting/consulting firms for valuation source of information, while a negative correlation is observed between the recent transaction prices for acquisitions for valuation method.

6.2. Implications

While the research by Manigart et al. (2000) indicated that the VCists in the U.S. and U.K. place a greater importance on own due diligence report than any other means for their source of information for potential investment, I have found that the Japanese VCists emphasize more on the curriculum vitae of management, and interview with entrepreneurs, similarly to those in France, Belgium, and the Netherlands. This finding corresponds to the conclusions of the researches by Ray and Turpin (1993) and Nishizawa (1998)—for Japanese VCists, the valuating potential investment equates the selection of management.

In terms of methods used in valuating potential investments, it should be noted that a relatively high proportion of Japanese VCists use capitalized maintainable earnings (P/E multiples). While Hasegawa (2004) maintained that many VCists adopt the book value, and recent transaction prices in the sector as their valuation methods, the reality is that capitalized maintainable earnings (P/E multiples) which is considered to be commonly used in countries with well-developed capital markets (Manigart et al., 2000: 401) is also widely adopted by Japanese VCists. Considering the study of Hasegawa's (2004), I may say that Japanese VCists have come to attach a greater importance to capitalized maintainable earnings (P/E multiples) in valuating potential investments in recent years just as those in the U.S. and U.K.

Regarding the correlation between the VCists' proportion of technology based and early stage firms and the sources of information and valuation methods, it can be claimed that the more VCists invest in technology based firms, the less they use own due diligence by accounting/consulting for sources of information. Likewise, the more VCists invest in technology based firms, the less they use due diligence report, and business plan (overall consistency of plan). At the same time, the more VCists invest in early stage firms, the less they use recent transaction prices for acquisitions in the sector as their valuation method. This means that the VCists recognize that the valuation methods or sources of information in which depict present values of business or business performances such as own due diligence reports, due diligences by

accounting/consulting firms, and recent transaction prices for acquisitions in the sector are not useful for valuating new technology based firms.

On the other hand, no significant positive correlation was founded in any correlation analysis. This reveals that the VCists perhaps do not have particular sources of information and valuation methods for allocating potential investments although there has been a notable growth in the percentage of investment in the technology based and early stage firms in these recent years.

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