The Behavior of Japanese Venture Capitalists and the Role of Intellectual Capital Information

THE BEHAVIOR OF JAPANESE VENTURE CAPITALISTS AND THE ROLE OF INTELLECTUAL CAPITAL INFORMATION (14pt, align center)

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***ABSTRACT*:** This paper examines Japanese venture capitalists' behavior and the role of intellectual capital information. Besides, this paper also intends to provide empirical evidence on the disclosure of intellectual capital information.

Venture enterprises, in their early stage usually characterized as knowledge-intensive firm, in which knowledge instead of physical asset is the most important assets. The other characteristic is they also often lack of fund to support their development. One way to solve the problem is to get external financing from venture capitalists, which are often the main sources of fund for a venture capital corporation in Japan. Many previous studies have discussed how venture capital corporations analyze venture enterprises and how they get information needed. However there are only few studies using empirical approach to examine venture capitalists' investment behavior and the way the intellectual capital information are used. To investigate how the intellectual capital information serves to the investment decision making of venture capitalists, we sent two copies of questionnaires for every venture capital corporation. There were total of 216 respondents (108 venture capital corporations x 2 persons), and only 50 effective answers are received (23.1% of respond rate). We used descriptive statistics and multiple regression analysis to analyze the data. The findings suggest that Japanese venture capitalists use intellectual capital information in their investment decision making process. However, even the intellectual capital information disclosed in *Chitekishisan Keiei Houkokusyo* (the report of intellectual capital information made according to *Japanese intellectual Capital Statement* by venture enterprises) is starting to be available, most of the venture capitalists seem not so prevalently use it. The respondents also reveal that the information concerning risk valuation is not so easy to be acquired and valued. Based on the multiple regression tests, we find that the ratio of intellectual capital information used by Japanese venture capitalists is significantly affected by some risk factors such as market risk, product risk, organization and strategy risk. Therefore, it can be inferred that in future, the database of intellectual capital information should provide more detail information on risk factors.

KEYWORDS: intellectual capital information, business risk

1. INTRODUCTION

This paper aims to find the role of intellectual capital information and contribute to the disclosure of intellectual capital information. We focus on the behavior of venture capitalists in Japanese venture capital corporations, which supplying venture capital to venture enterprises and analyzing how the intellectual capital information used in the decision of venture capitals' investment. Specifically, we

intend to illuminate the ratio and the content of intellectual capital information that venture capitalists are using when they value the risk of a venture enterprise's business. To accomplish the aim of this study, we review some previous papers to design a questionnaire, and send it to 108 Japanese venture capital corporations.

Many previous studies have discussed how venture capital corporations analyze venture enterprises and how they get needed information. But there are only few studies using empirical approach to examine the valuation of venture enterprises' business risks and the usage of intellectual capital information's coefficient, especially in Japan.

We analyze the result of the research by using descriptive statistics as well as multiple regression analysis, and find that Japanese venture capitalists' risk use intellectual capital information in their decision making process.

The next section of this paper discusses venture capital corporation's characters, including investment and business risk faced by venture capital corporations, and intellectual capital information. Section 3 describes methodology and design of questionnaire that used in this study. Section 4 discusses the result of the research.

2. Risk of investment faced by venture capital

2.1 The character of Venture Capitalists

The early stage of the knowledge-intensive firm is mainly characterized by the common pattern that the most important assets are often knowledge instead of physical assets. Furthermore, they also often are short of fund to support their development. An important way to solve the problem is to get external financing from venture capitalists, which is mostly a venture capital corporation in Japan.

2.1 Venture capitalists' character

Although there are many definitions of venture capitalists, they can be defined as the specialists that invest venture capital into venture enterprises. In this paper we do not distinguish *venture capitalists* as an individual investors and *venture capital corporations*, because in Japan venture capitalists always mean venture capital corporations.

The main character of venture capitalists is they often considered as h*igh-risk* and *high-return*, based on the way they invest for three reasons. First, their investee is new and rapidly growing companies and they assist in the development of new products or services. Second, they purchase equity securities and have a long-term orientation. Third, they take higher risks with the expectation of higher rewards and for that they add value to the company through active participation (URL of National Venture Capital Association, US). Therefore, since they invest through equity, they're supposed to share the business risk of venture enterprises.

2.2 Venture enterprises' business risk

What is the meaning of risk? Risk can be defined as "the possibility of some result (beyond expectations) experienced from a business or environment"- (Koga *et al.*, 2003, pp.17-18). In other words, risk is the consequence of some decision (choices), which may be an unfavorable result (the possibility of loss) or a favorable result (the possibility of potential chance) (*Ibid.*, p.19).

Taplin and Shymyck (2005) also note that there are not only threat and danger lurking in risk, but also big chance. It also indicates that the core of risk-taking and innovation is the ability to adopt

changes and look them as chances but threats (Taplin and Shymyck, 2005, pp.2-5). Since venture enterprises have the ability to invest their money and to take risk, it can be inferred also that the venture capitalists act as providers of venture capital as well as a risk-takers that can find chance from threat. Form these point of view, *high-risk* and *high-return* which are mentioned before can be thought as the two aspects of venture capitalist's investment risk.

Since venture capitalists invest capital in term of equity, they should also have the willingness to share some of the risk of venture enterprises' business. When venture capitalists invests, they should value two aspects of venture enterprises' business risk, the favorable result from the stream of future cash flow, and the unfavorable result that may comes from the failure of business.

Because of the agency relationship, there will be asymmetry of information between venture capitalists and venture enterprises (Amit *et al.*, 1998). We hypothesize that the intellectual capital information concerning the risk of venture enterprises' businesses can fill in the gap. According to the source of risk, risk can be classified into entrepreneur risk, product and service risk, technology risk, marketing risk, financial risk, operational risk, organization risk, strategy risk, and environment risk (Gupta *et al.*, 2003). Some of those risks can be affected by venture capitalists by participating in investee's management and some others can not. In this paper, we yearn to investigate which one of those risk factors are related to the usage ratio of intellectual capital information.

2.3 Intellectual capital information

What is intellectual capital? It can be defined as the value made from an enterprise's source of knowledge, which is intangible knowledge (Koga 2005, pp.6-7).

The IASB (International Accounting Standard Board) defines the intangible asset as: (a) separable, i.e. is capable of being separated or divided from the entity and sold, transferred, licensed, rented or exchanged, either individually or together with a related contract, asset or liability; or (b) arises from contractual or other legal rights, regardless of whether those rights are transferable or separable from the entity or from other rights and obligations" (IAS, Para.38).

However, intellectual capital has a broader definition beyond the accounting's definition of intangible asset. MERITUM (2002) classifies intellectual capital as human Capital, Structure Capital, and Relationship Capital (MERITUM, 2002). These three kinds of intellectual capital can be understood in the context of business value creation process (Holland, 2001a, pp.7-12). It also means human capital and structure capital mainly create value in enterprises' vertical and horizontal value creation processes, and the relationship chiefly create value in network value creation process. In other words, intellectual capital raises enterprises' ability to produce profit and generate cash flow.

For venture capitalists, the traditional financial information, which focus on firms' past performance and tangible assets, are not enough to judge the prospect of venture enterprises in their investment decision. The reason is that there is more intangible intellectual capital than tangible physical capital in venture enterprises.

Therefore, in evaluating a venture enterprise, venture capitalists need to assess the ability of venture enterprise to gain future cash flow, which is equal to the potential of growth, whose sources are

value creation processes and their driver is intellectual capital (Koga, 2005, p.179).

Venture capitalists evaluate a venture enterprise through the information of (1) product, production, and development; (2) target market, marketing, and competitor; (3) management and staff; (4) financial statement, budget and plan (Morck *et al.*, 2003, p.25). Furthermore, Koga (2005, p.184) classified those all type of information into two main category, which are, (1) qualitative information, consists of information on structure capital, costumer, relationship capital, and human capital, and (2) quantitative monetary information which can be found in financial statement. Among those all information, in the case of venture capitalist' investment valuation, the information concerning intangible intellectual capital as a driver of value creation are more important than the information regarding tangible assets as security.

2.4 Review of previous studies

2.4.1 The problem of information asymmetry faced by venture capitalists

Previous studies regarding the problem information asymmetry faced by venture capitalists basically focus on two aspects. The first aspect is that venture capitalists have better skill and method to reduce the information asymmetry than other investors (Amit *et al.*, 1988; Amit *et al.*, 2000). The reasons are venture capitalists can get and evaluate more information, and use some investment policy to reduce problems resulting from information asymmetry through due diligence before investing, staged investment, syndication, participation in management (Sahlman, 1990; Bergemann and Hege, 1998; Lerner, 1994a; Lerner, 1994b).

The other aspect is about the venture capitalists' investment process and especially the standards to valuate a venture enterprise (Tyebjee and Bruno, 1984; Macmillan *et al.*, 1985; Macmillan *et al.*, 1987). They pointed out that when venture capitalists make a decision for investment they usually focus on risk valuation, especially about the venture enterprises' business risks.

2.4.1 The usefulness of intellectual capital information

Some researches examined the usefulness of intellectual capital information (no-financial information), and find the information about the strategy of firm is very useful, especially for investors and also concerning growth industry (Mavrinac and Siesfeld, 1998; Eccles and Mavrinac, 1995). Holland *et al.*(2003) and Holland (2004) notes that the intellectual capital information is useful in the process of fund managers' decision.

Other researches find that (a) the venture capitalists' decision is affected by the quality of top management, patent, the teamwork inside of a firm (Baum and Silverman, 2004) and the organization capital of entrepreneur (Hsu, 2007); (b) the future performance of venture enterprises is affected by patents (Mann and Sager, 2007) or the social capital, human capital of entrepreneur (Batjargal, 2007). Therefore, we can conclude that the intellectual capital information is important to valuate a venture enterprise.

But all of those previous researches haven't examined the relationship between the usage ratio of intellectual capital information in venture capitalists' decision and venture enterprises' business risks. Therefore, in this study we investigate it by classifying the business risk into entrepreneur risk, product and service risk, technology risk, marketing risk, financial risk, operational risk, organization risk, strategy risk, and environment risk.

3. METHODOLOGY

To investigate the usage ratio of intellectual capital information determination, we sent 2 copies of questionnaires to every of 108 Japanese venture capital corporations. Therefore total respondents are 216, with only 50 effective answers are received (respond rate of 23.1%).

This survey tries to find the venture capitalists' opinions of the Japanese *Chitekishisan Keiei Houkokusyo* and includes the risk factors that will affect the usage ratio of the intellectual capital information determination.

4. THE RESULT

4.1 Descriptive statistics

We use frequency distributions to check the result of questionnaires at first. Table1 notes that important business risks as perceived by venture capitalists are entrepreneur risk, product and service risk, technology risk, market risk, operational risk, strategy risk, and environment risk. However, in these important risks, the information of operational risk is relatively difficult to be acquired. Furthermore, in these important risks, only the information of product and service is easy to valuate.

Table1: Importance of risks, the difficulties to obtain and valuation the information concerning risks.

Type of risk	Importance of risk		Availability of Information concerned		Difficulties of valuating information	
ENTREPRENEUR	Important	○	Easy to Acquire	○	Difficult to valuate	×
PRODSERV	Important	○	Relatively easy to Acquire	○	Easy to valuate	○
TECHNOLOGY	Important	○	Easy to Acquire	○	Difficult to valuate	×
MARKET	Important	○	Relatively easy to Acquire	○	Relatively difficult to valuate	×
FINANCE	Not important	×	Very easy to Acquire	○	Easy to valuate	○
OPERATION	Important	○	Relatively difficult to acquire	×	Relatively difficult to valuate	×
ORGANIZATION	Not important	×	Relatively difficult to acquire	×	Difficult to valuate	×
STRATEGY	Important	○	Relatively easy to Acquire	○	Ambiguous	△
ENVIRONMENT	Important	○	Relatively easy to Acquire	○	Ambiguous	△

Table2: The usefulness of information disclosed in Japanese *Chitekishisan Keiei Houkokusyo* now

Effective	Frequency	%	Cumulative frequency
1 Very useful	2	3.8	96.2
2 Partial useful	11	21.2	92.3
3 Ambiguous	25	48.1	48.1
4 Modification needed	2	3.8	100.0
5 Don't know about it	12	23.1	71.2
合計	52	100.0	

Table3: Frequency distribution of the information supposed to be disclosed

Information supposed to be disclosed in *Chitekishisan Keiei Houkokusyo*	Number of response		% of per case
	N	%	
ENTREPRENEUR	12	8.2	25.0
PRODSERV	27	18.4	56.3
TECHNOLOGY	34	23.1	70.8
MARKET	24	16.3	50.0
FINANCE	6	4.1	12.5
OPERATION	11	7.5	22.9
ORGANIZATION	6	4.1	12.5
STRATEGY	12	8.2	25.0
ENVIRONMENT	15	10.2	31.3
合計	147	100.0	306.3

Table 4: Definition of Variables

Variables	Definition
STAGE	**1 for investment at late stage, 0 for others**
INDUSTRY	**1 for investment for traditional industry, 0 for others**
ENTREPRENEUR	**1 for attaching importance to the founder / entrepreneur risk, 0 for others**
PRODSERV	**1 for attaching importance to product and the service risk, 0 for others**
TECHNOLOGY	**1 for attaching importance to technology risk, 0 for others**
MARKET	**1 for attaching importance to market risk, 0 for others**
FINANCE	**1 for attaching importance to finance risk, 0 for others**
OPERATION	**1 for attaching importance to operation risk, 0 for others**
ORGANIZATION	**1 for attaching importance to organization risk, 0 for others**
STRATEGY	**1 for attaching importance to strategy risk, 0 for others**
ENVIRONMENT	**1 for attaching importance to social environment risk, 0 for others**
YEAR	**The experience years of venture capitalist**
INDEPENDENCE	**1 for the independence of venture capitalist, 0 for others**
PARTICIPATION	**1 for attaching importance to the participation to the management, 0 for others**
Explained Variable	
INTCAPINF	**The usage ratio of intellectual capital information**

Table2 remarks that based on the perception of respondent, the usefulness of information as disclosed in Japanese *Chitekishisan Keiei Houkokusyo* are not really useful for them.

Table3 indicates that the information of productive and service risk, technology risk and market risk need to be disclosed in Japanese *Chitekishisan Keiei Houkokus.*

4.2 Regression analysis

4.2.1 Data and Definition of Variables

To investigate the usage ratio of intellectual capital information determination, we sent 2 copies of questionnaires to every of 108 Japanese venture capital corporations. Therefore total respondent is 216, with only 50 effective answers are received (respond rate of 23.1%).

This survey includes the factors that will affect the usage ratio of the intellectual capital information determination. We use this survey to find out how the intellectual capital information serves to the investment decision making of venture capitalists.

In this study, the explained variable is the ratio of the intellectual capital information (INTCAPINF). This variable represents the degree of usage when venture capitalists analyze the risk of investment into a venture company. On the other hand, the survey also includes some important explanatory variables. Table 4 presents the definition for each variable.

We used the following variables for the explanatory variables. When a venture capitalist invests in a company at early part of the stage, we assign the value of 0, on the other hand, for late stage we use 1 (STAGE). When a venture capitalist invests to traditional industry, we assign the value of 1 and 0 otherwise (INDUSTRY).

Table 5: Descriptive Statistics for Variables

Variable	Mean	Standard Deviations	Minimum	Maximum
STAGE	.42	.499	0	1
INDUSTRY	.44	.501	0	1
ENTREPRENEUR	.94	.240	0	1
PRODSERV	.66	.479	0	1
TECHNOLOGY	.74	.443	0	1
MARKET	.54	.503	0	1
FINANCE	.10	.303	0	1
OPERATION	.42	.499	0	1
ORGANIZATION	.24	.431	0	1
STRATEGY	.62	.490	0	1
ENVIRONMEN	.24	.431	0	1
YEAR	5.780	5.2452	0.1	27
INDEPENDENCE	.32	.471	0	1
PARTICIPATION	.50	.505	0	1
Explained Variable				
INTCAPINF	56.10	18.959	10	90

Table 6: Factors Governing the Usage ratio of Intellectual Capital Information (OLS)

Variable	*Coefficient*		*t value*
C	49.115	***	5.332
STAGE	10.861	*	1.853
INDUSTRY	-11.536	**	-2.528
ENTREPRENEUR	-9.458		-.948
PROSERV	11.916	**	2.142
TECHNOLOGY	-.907		-.153
MARKET	-22.800	***	-4.300
FINANCE	-.856		-.115
OPERATION	4.224		.953
ORGANIZATION	14.584	***	2.751
STRATEGY	14.835	***	2.850
ENVIRONMENT	7.265		1.480
YEAR	-.660		-1.408
INDEPENDENCE	12.085	**	2.536
PARTICIPATION	10.655	*	1.942
$\overline{R}^2$	.466		
No. of observations	50		

Note:
* denotes that the variables are significant at the 10% level.
** denotes that the variables are significant at the 5% level.
*** denotes that the variables are significant at the 1% level.

When a venture capitalist invests to a company, it means they attach importance to the founder/entrepreneur risk, we assign this sample for value of 1, and the value of 0 otherwise (ENTREPRENEUR)[1]. The other similar variables

[1] Our questionnaire contains some risk types as shown in Appendix. The founder/entrepreneur risk, for example, consists of 5 risk factors, namely, 1 1 (1)Management ability, (2)Promoter's personality, (3)Willingness to go public (IPO), (4)Experience or skill concerning related field and (5)Knowledge of law, accounting, or industry. Every risk factor contains 4 choices: (1)Not important at all, (2)Not important, (3)Important and (4)Very important. We assign 4 choices for 0, 1, 2 and 3, respectively. If the total amount of founder/entrepreneur risk of a sample is more than mean, 10 obtained from that multiply 5

include a set of dummies representing the degree of importance of product and the service risk (PRODSERV), technology risk (TECHNOLOGY), market risk (MARKET), finance risk (FINANCE), operation risk (OPERATION), organization risk (ORGANIZATION), strategy risk (STRATEGY), and social environment risk (ENVIRONMENT).

The other three variables include the degree of independence of venture capitalist (INDEPENDENCE), the experience years of venture capitalist (YEAR) and the degree of participation to the management (PARTICIPATION). Table 5 presents the descriptive statistics for variables.

4.2.2 Empirical Results

The empirical framework used in this study can best be described as the following equation.

$$INTCAPINF_i = \alpha \mathbf{X}_i' + \varepsilon_i$$

where INTCAPINF denotes the use ratio of the intellectual capital information for individual i; $\mathbf{X}_i$ denotes the vector of factors that may affect the usage ratio of the intellectual capital information for individual i; and ε_i, an error term with $E(\varepsilon_i) = 0$.

Table 6 presents the OLS estimates of the use ratio of the intellectual capital information for 50 samples. The usage ratio of the intellectual capital information of venture investors which invest to a company at late part of the stage, is 10.86% more than the reference group (investing at early part of the stage), and the usage ratio of intellectual capital (INTCAPINF) by venture investors who invest to traditional industry is 11.53% less than the reference group (investing to other industries). On the other hand, the usage ratio of intellectual capital by venture investors attaching importance to the founder/entrepreneur risk is 11.92% more than venture investors not attaching importance to same risk. The usage ratio of venture investors attaching importance to the market risk is 22.80% less than the reference group, and the usage ratio of venture investors attaching importance to organization and strategy risk is 14.58% and 14.84% more than the reference group, respectively.

Furthermore, the usage ratio of intellectual capital by independent venture capitalists is 12.09% more than the dependent venture capitalists. On the other hand, the use ratio of venture investors attaching importance to the participation to the management is 10.66% more than the reference group.

Moreover, some variables, namely, representing the degree of importance of the founder/entrepreneur risk (ENTREPRENEUR), technology risk (TECHNOLOGY), finance risk (FINANCE), operation risk (OPERATION), social environment risk (ENVIRONMENT) and the experience years of venture capitalist (YEAR), are not statistically significant.

5. SOME CONCLUDING REMARKS

The result of the descriptive statistics suggests that Japanese venture capitalists use intellectual capital information in their investment decision making process. However, even the intellectual capital information disclosed in *Chitekishisan Keiei Houkokusyo* is starting to be available, most of the venture capitalists seem not so prevalently use it. Furthermore, the information concerning venture enterprises' business risk is not so easy to be acquired and valued.

The multiple regression tests, notes that the ratio of intellectual capital information used by Japanese venture capitalists is significantly affected by some risk factors such as market risk, product risk, organization and strategy risk. Therefore, it

by 2 in this case, then we assign the variable (ENTREPRENEUR) of this sample for value of 1, and the value of 0 otherwise. The other similar variables are obtained by same method.

can be inferred that in future, the database of intellectual capital information should provide more detail information on risk factors.

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Appendix：Classification of venture capitalist's risk valuation

Risk	Component
1. Promoter/entrepreneur risk	・Management Ability ・Promoter's personality ・Willingness to go public(IPO) ・Experience or skill concerning related field ・Knowledge of law, accounting, or industry
2. Product and service risk	・Development stage of products and services ・Life cycle of products and services ・Risk of reverse engineering ・Quality of products and services ・Technology's difficulty of products and services ・Appropriateness of products and services
3. Technological risk	・Availability of superior technology by competitor ・Development stage of technology ・Maturity of technology ・Appropriateness of investment for new technology ・Application of technology ・Technological capability of consociate and the type of collaboration agreement ・Level of technology
4. Marketing risk	・Acceptance of marketing for products and services ・Market size ・Market growth rate ・Market share ・Substitute products and services ・Entry barrier ・Expense for marketing research and sales promotion
5. Financial Risk 財務リスク	・Capital market situation (e.g. lack of exit opportunities) ・Ratio of capital-to-asset ・Growth rate of sale and profit ・Foreign exchange risk ・Liquidity ratio ・Expected performance ・System to make financial statements
6. Implementation/Operational risk	・Applicability of technology to support production ・Applicability of establishing production system ・Ability to get manufacturing and skilled labor ・Ability to maintain production system ・Ability to obtain fund
7. Organisational risk	・Motivation of employees ・Employee turnover ・Year of continued service ・Dependence on few workers ・Training system of employee ・Ability of management team
8. Strategy risk	・Appropriateness of business strategy ・Competing strategy and competitive edge ・Concentration in core business
9. Environmental risk	・Changes in government policy ・Development of legal systems concerning business ・Lack of understanding about regulations ・Occurrence of antisocial case ・Availability of raw material ・Occurrence of pollution case

Note：Draw out by referencing to Gupta *et al.*(2003).