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Consistency of Risk Attitude and other Investment Behavior of Japanese Professional Fund Managers: Questionnaire-based Analysis

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Consistency of Risk Attitude and other Investment Behavior of Japanese Professional Fund Managers: Questionnaire-based Analysis

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Abstract

In this paper, we investigate risk consistency and other investment behaviors of fund managers working at Japanese investment institutions using a questionnaire based survey that was conducted in October of 2005. In particular, we focused on the herding behavior and disposition effect of fund managers. We found that 'risk inconsistent' fund managers have a tendency to show disposition behavior. As for herding behavior, we could not find any strong evidence that might indicate a difference between the two groups.

1. Introduction

Recently, a substantial number of papers have investigated the behavioral characteristics of investors based on research results from within the field of behavioral finance. In addition to theoretical analysis, empirical research has been aggressively carried out using both market data as well as information on individual investors. Within this vast research, a variety of behavioral characteristics have been found in investors that match characteristics implicated in behavioral finance studies.

Suto and Toshino (2005) summarized the results of a questionnaire distributed in 2003 to domestic institutional investors in Japan. This questionnaire serves as the basis for the questionnaire we utilize in our research. In the above-mentioned paper, Suto and Toshino found that fund managers tend to sell with a shorter horizon than is optimally

desirable. Furthermore, their research demonstrates that fund managers show herding behavior. Regarding these results, the authors point out that one explanation for such behavioral characteristics is the pressure placed on fund managers by their clients. Based on information from the same questionnaire, Toshino and Suto (2004) found that Japanese institutional investors occasionally predict optimistically (or bullishly) on market returns, and that this behavioral tendency is more apparent when their predictions are based on the domestic market.

Suto, Menkhoff and Beckmann (2005) analyzed the results of a questionnaire conducted in both the US and Germany that are identical to the survey we used. Their analyses indicated that fund managers in the US tend to be more myopic, show stronger herding behavior, and demonstrate higher risk aversion than their counterparts in Germany.

Hiruma and Ikeda (2006) have investigated the factors that affect time-discounting rates as well as the impact of time-discounting rates on individual behavior. They find that a time discounting rate increases when the amount of money that must be paid out is smaller (money amount effect). Furthermore, this rate is significantly higher if the inter-temporal choice is made at a nearer point in time as opposed to a later point in time (dual discount phenomenon).

Misumi, Shumway and Takahashi (2006) have empirically explored disposition effect using Japanese on-line investor data provided by a Japanese securities company. Their results suggest that disposition effect does exist, and that investor irrationality may be its cause.

The questionnaire we utilized for this paper contains questions pertaining to the subjective risk attitudes of individual fund managers as well as their corresponding objective risk attitudes generated by expected utility theory. A question we pose that directly asks fund managers whether they consider themselves to be risk lovers, risk neutral, or risk averters directly exposes each manager's subjective risk attitude. As for the problem based on expected utility theory, we provide questions that pose hypothetical investment opportunities in which there is variance in expected return value. This allows us to measure the theoretical risk attitude of each respondent. We refer to this type of attitude as 'objective risk attitude'.

Consistency of risk attitude can be determined in the following manner. First, we measure the subjective and objective risk attitudes of each respondent based on the method outlined in the previous paragraph. If these two types of risk attitude are the same, for example, when a subjective risk averter answers the questionnaire in a manner consistent with an objective risk averter, then he or she will be called a 'risk consistent' fund manager.

There is also the possibility that a fund manager is 'risk inconsistent'. All the respondents to our questionnaire are professional fund managers. Therefore, we can predict that all the respondents have specialized knowledge concerning risk within the investment field. With this in mind, respondents should theoretically be 'risk consistent' fund managers. However, for example, if a respondent states that they are a subjective risk averter, yet demonstrates through their responses that they are an objective risk lover, they will be considered a 'risk inconsistent' fund manager. We found two types of risk inconsistency in our analysis. The fund manager mentioned above, whose subjective and objective risk attitudes don't match each other represents the first type of 'risk inconsistent' respondent. As for the second type, some fund managers inconsistently answer multiple problems on the questionnaire based on expected utility theory. For example, a respondent will choose an answer that demonstrates risk aversion in first problem, but choose a risk neutral answer in the second problem. Therefore, there are two types of risk inconsistency that appeared in our research.

Later, we will explore the two different types of respondents, 'risk consistent' and 'risk inconsistent' fund managers. As mentioned in the previous paragraph, there are two varieties of 'risk inconsistent' managers. In our analysis, we take up only the second type of risk inconsistency, that is, we will focus our attention only on objective risk attitudes. The rationale for this is that we want to know how 'risk consistent' and 'risk inconsistent' managers choose from alternatives concerning risk. With this objective in mind, we think the second type of 'risk inconsistent' manager described above can be included within the first type of risk inconsistency.

Risk inconsistency in fund managers may cause some objective and subjective differences in their preferences regarding the most important factors affecting investment. Therefore, it might be expected for such fund managers to invest in irrational ways. At the very least, it would not be going too far to assume that 'risk inconsistent' fund managers might invest more irrationally than 'risk consistent'

managers.

In this paper, we look at the characteristics of herding and disposition effect, which we consider to be irrational investment behavior. When facing an unanticipated situation, 'risk inconsistent' fund managers may not be self-conscious, thus they may pay too much attention to the reactions of their colleagues or other fund managers. If this is the case, other fund managers may affect 'risk inconsistent' fund manager's investment actions in these situations. This may be the root of herding behavior. Disposition effect refers to asymmetric assessment for upward and downward price change. This is also an irrational investment act. Therefore, in this paper we will investigate the investment characteristics of Japanese professional fund managers by paying close attention to the two above-mentioned behavioral biases that have recently been the subject of a considerable amount of behavioral finance literature. The data we use is from a questionnaire-type survey conducted in 2005. The respondents were all fund managers working at Japanese institutional investment companies.

The remainder of this paper is structured as follows: In second section, we will explain our questionnaire in more detail. The third section explains our empirical model while the fourth section discusses the results.

2. Brief Summary of Questionnaire-Type Survey

This questionnaire-type survey was conducted in 2005. All respondents were fund managers of investment trusts and pension funds in Japanese trust and investment banks. We sent questionnaires to each respondent by mail and requested for them to send the questionnaires back to us. We collected 283 questionnaires out of 823 .

The questions are divided into four sections. In section 1, we ask about the respondent's background. In section 2, we ask about the relationship between operation performance and incentives. The third section features general questions on fund managing operations. In the final section, we ask respondents about their investment behavior and information gathering process[1].

3. Empirical method and results

In our paper, we divide all respondents into two groups; 'Risk-inconsistent' fund managers and 'risk consistent' fund managers. We investigate the differences between

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[1] A summary of our survey is reported in Toshino (2006).

these two groups in terms of herding and disposition effect. In section 3.1, we define the risk consistent fund manager in detail. This paper's hypothesis is discussed in section 3.2. We conduct statistical evaluations on the differences between these two groups in section 3.3. In section 3.4, we use an ordered probit model to test our hypothesis, using each fund manager's background as a control.

3.1 Definition of a 'risk consistent' fund manager

We utilize the four questions below in order to define a 'risk consistent' fund manager.

Evaluation of investment behavior and information gathering processes

11 Suppose you play a game such as "coin toss" in which the probability of winning is 50%. If you have to pay 10 thousand yen if you lose the game, could you tell us what financial reward you would hope to get when playing this game?

＿＿＿＿＿＿ × 10 thousand yen or more

If you have to pay 1 million yen when you lose in the same game as above, how much money do you want to get when you win?

＿＿＿＿＿＿ × 10 thousands yen or more

12 Suppose you have already won 10 thousand yen in a game. If you continue to play the next game, you can receive 20 thousand yen if you win. However, if you lose, you forfeit the 10 thousand yen you won in the first game. Please tell us the minimum probability of winning necessary for you to play the next game?

＿＿＿＿＿＿ or more

If you get 1 million yen in the first game, what is the minimum probability necessary for you to want to continue playing?

＿＿＿＿＿＿ or more

A 'risk neutral' fund manager should set answers of 1 and 100 in question 4-(11), and 50 for question 4-(12), regardless of the amount of reward. Likewise, risk averse (or lover) fund managers should set more (or less) than 1 in the first part of question 4-(11), and more (or less) than 100 in the second part of the question. Furthermore, risk averse and risk lover managers should set more (or less) than 50 in both parts of question 4-(12), regardless of the amount of reward. If a fund manager is risk consistent, they will show the same risk attitude (answering with consistent numbers)

in all questions. We can thus define such fund managers as 'risk consistent'. 'Risk inconsistent' fund managers are defined as respondents whose answers are inconsistent.

3.2 Hypothesis

As we have already discussed, research within the field of behavioral finance has developed dramatically in recent years. In this paper, we investigate the investment behavior of 'risk consistent' and 'risk inconsistent' fund managers, paying special attention to two important behavioral characteristics, herding and disposition effect.

3.2.1 Disposition effect

Misumi, Shumway and Takahashi (2006) have shown that disposition effect exists in Japanese investors. However, their research utilizes data only from on-line trades made primarily by private investors. In contrast to this, the data analyzed in our research comes entirely from professional fund managers.

We have constructed a hypothesis on disposition effect. Because their subjective and objective risk attitudes are not consistent, 'risk inconsistent' fund managers might not be able to rationally assess upward and downward price movement of investments.

H1: 'Risk consistent' fund managers show weaker disposition effect
phenomenon than 'risk inconsistent' fund manager.

3.2.2 Herding behavior

Toshino and Suto (2004) as well as Suto and Toshino (2005) have shown that herding behavior is evident in fund managers at Japanese investment institutions. The reason for this is partially due to pressure from their customers as well as their institution of employment.

In our paper, we postulate that herding behavior only exists in 'risk inconsistent' fund managers. If a fund manager understands what they need to do when facing a contingent situation in terms of risk management, he or she can take action independently. Suppose a fund manager thinks that they are a risk averter, yet, at the same time answers questions 4-(11) and 4-(12) in the manner of a risk lover. Such a 'risk inconsistent' fund manager does not fully understand his or her own risk attitude. Subjectively, he or she thinks that they are a risk averter, yet cannot choose an answer

that matches this behavior in a theoretical setting. This implies that he or she might take on the behavior of a risk lover when facing a contingent situation. Furthermore, if this kind of fund manager displays anxiety about his or her risk attitude in the manner of the example above, he or she will heavily rely on their colleagues or outside information when taking investment action. This could possibly cause herding behavior in the market.

> *H2:* *'Risk inconsistent' fund managers show a stronger phenomenon of herding behavior than 'risk consistent' fund managers.*

3.3 Descriptive statistics

3.3.1 Risk attitudes of individual fund managers

Before analyzing the differences between the investment behavior of 'risk consistent' fund managers and 'risk inconsistent' fund managers, we will investigate the general characteristics of risk attitude in our respondents. In Table.1, we show frequency distribution of responses to question 4-(11). The highest class of responses in the case of 10 thousand yen is 1 to 2 thousand yen. For the question involving 1 million yen, most responses were between 1-2 million yen. In both cases, there seems to be a high percentage of risk averters among our respondents. However, the relative frequency of the case of over 1 to 2 million yen is bigger than that of over 1 to 2 thousand yen. This means that the fund managers want to gain larger rewards when the amount they need to give up upon a loss increases. Therefore, we can say that the more a fund manager invests, the more they demonstrate risk-averting behavior.

Based on our questionnaire, we were able to define about 10% of our respondents as risk neutral. Less than 1% of the fund managers polled demonstrated risk lover behavior.

Table 1　Frequency distribution for 4-(11)

loss when lose(JPY)		10,000			1 million	
		frequency	relative frequency		frequency	relative frequency
premiun when win(JPY)	10,000	1	0.4%	1 mil	2	0.8%
	10,000	34	13.4%	1 mil	27	10.9%
	10,000 20,000	132	52.0%	1 2 mil	98	39.5%
	20,000 50,000	51	20.1%	2 5 mil	51	20.6%
	50,000 100,000	26	10.2%	5 10 mil	35	14.1%
	100000	10	3.9%	10 mil	35	14.1%
total		254	100%		248	100%

Table 2 shows frequency distribution for 4-(12). As in question 4-(11), the results for 4-(12) demonstrate that the share of the risk-averting fund managers increases as the possible capital losses they would incur simultaneously increases. The share of risk neutral fund managers is larger than for that of question 4-(11). This is especially true in the case of the 1 thousand yen game, in which 40% of respondents displayed risk neutral behavior. This percentage of fund managers showing risk neutral behavior is more than three times higher than that of question 4-(11).

Table 1　Frequency of distribution for 4-(12)

bet(JPY)		10,000		1 million	
		frequency	relative frequency	frequency	relative frequency
minimum probability of win	50	11	4.3%	10	4.0%
	50%	105	41.5%	61	24.3%
	50 60	64	25.3%	39	15.5%
	60 70	41	16.2%	41	16.3%
	70 80	20	7.9%	47	18.7%
	80	12	4.7%	53	21.1%
total		253	100%	251	100%

3.3.2 Difference in disposition effect

In this section, we explore the difference in disposition effect between 'risk consistent' and 'risk inconsistent' fund managers. Responses to questions 4-(1)-　and 4-(1)-　are analyzed.

Assessment of investment behavior and information gathering processes

Please describe your investment behavior. Choose 1 for behavior you agree strongly with, and 6 for behavior you don't agree with. In this manner, please rate each behavior from 1 to 6.

Suppose you face an accidental liquidity shortage and need to sell some assets. You would prefer to sell assets in the black as opposed to assets in the red.

It is preferable for you to wait for price recovery when your asset is in the red as opposed to fixing the loss yourself.

Table 3 shows a summary of the responses to questions related to disposition effect. The number of fund managers who set 3 and 6 is relatively high. That is, the shape of distribution is diphasic. Furthermore, the responses of 'risk consistent' fund managers seem to be higher. The median response of 'risk consistent' fund managers is 4, while that of 'risk inconsistent' fund managers is 3. Using Wilcoxon test, the distribution between 'risk consistent' and 'risk inconsistent' fund managers can be seen to be significantly different for question 4-1- , which has a 5 level, and question 4-1- , which has only a 1% level.

Analyzing the above results, it is evident that the tendency of disposition effect in 'risk consistent' fund managers is weaker than that of 'risk inconsistent' fund managers.

Table 3: Summary of responses to disposition effect related questions

Question		1	2	3	4	5	6	total	median	p-value
4-1-	risk consistent	3	19	34	27	17	43	143	4	
	risk inconsistent	5	22	30	11	14	23	105	3	
	total	8	41	64	38	31	66	248		0.026
4-1-	risk consistent	0	18	33	33	27	30	141	4	
	risk inconsistent	5	23	32	11	17	18	106	3	
	total	5	41	65	44	44	48	247		0.006

p-value is the p-value of the wilcoxon ranksum test.

3.3.3 Difference in herding behavior

Below, we will analyze questions 4-(3)- and 4-(4) to investigate the difference in herding behavior between 'risk consistent' and 'risk inconsistent' fund managers.

Assessment of investment behavior and information gathering processes

When you need to reach an investment decision, how important to you are the following information gathering processes? Choose 1 for information very important to you, and 6 for information that is not important to you. In this manner, rate each behavior from 1 to 6.

Discussion and exchange of opinions with colleague

Opinion of analyst and strategist inside your institution

Investment decision of other market participant

Opinions of leader in the same industry   eg.:Warren Edward Buffett

Opinions of leader in the business world   eg.:Ben S.Bernanke

When your opinion differs from your colleagues or opinion leaders, which do you attach a higher value to? If you attach a higher value to your own decision, please choose 1. If you attach a higher value to others, choose 6. You can thus rate your behavior from 1 to 6.

Table 4 shows the summary of response results to the above questions. In almost all of the questions, we cannot find any difference in the distribution of answers between 'risk consistent' and 'risk inconsistent' fund managers. Only in question 4-(3)-⑤ is a significant difference evident (5%). However, this question is regarding the importance of opinions held by leaders in the business world, which even 'risk consistent' fund managers attach a high value to. This implies that the behavior of 'risk consistent' fund managers may also follow herding. This result goes against our hypothesis.

Table 4   Summary of questions regarding herding behavior

Question		1	2	3	4	5	6	total	median	p-value
4-(3)-	risk consistent	26	47	39	21	8	2	143	2	
	risk inconsistent	23	35	31	10	5	3	107	2	
	total	49	82	70	31	13	5	250		0.45
4-(3)-	risk consistent	36	49	34	14	9	1	143	2	
	risk inconsistent	18	35	31	11	9	3	107	3	
	total	54	84	65	25	18	4	250		0.07
4-(3)-	risk consistent	3	21	52	40	19	8	143	3	
	risk inconsistent	3	19	40	15	21	9	107	3	
	total	6	40	92	55	40	17	250		0.91
4-(3)-	risk consistent	1	8	41	39	33	21	143	4	
	risk inconsistent	0	5	25	33	26	18	107	4	
	total	1	13	66	72	59	39	250		0.33
4-(3)-	risk consistent	17	35	45	20	19	7	143	3	
	risk inconsistent	4	24	28	26	16	9	107	3	
	total	21	59	73	46	35	16	250		0.01
4-(4)	risk consistent	43	67	27	6	0	0	143	2	
	risk inconsistent	40	32	29	3	0	1	105	2	
	total	83	99	56	9	0	1	248		0.92

p-value is the p-value of the wilcoxon ranksumtest.

3.4 Ordered Probit Analysis

In the analysis of the previous section, the tendency of disposition effect in 'risk inconsistent' fund managers appeared to be stronger than that of 'risk consistent' fund managers. However, we need to be careful in reaching a conclusion. We must exclude elements such as individual background, which may affect the above results. In this section, we will estimate an ordered probit model to control these elements as well as to better explore the behavioral characteristics of professional fund managers in Japan.

3.4.1 Model

In questions 4-(1)- and 4-(1)- , which investigate disposition effect, respondents must choose an integer from 1 to 6. If these answers are in ratio scale or interval scale, we can use OLS. However, since we cannot be certain of their scale, and because all of the responses are in integer form, we employ an ordered probit model.

Suppose an unobservable latent variable y_i^* can be determined by the linear expression consisting of AGE_i, $EXPR_i$, $NEXPR_i$, $RSRCH_i$, $WORK_i$, $SWTCH_i$, DC_i.

$$
\begin{aligned}
y_i^* = &\beta_1 AGE_i + \beta_2 EXPR_i + \beta_3 NEXPR_i + \beta_4 RSRCH_i \\
&+ \beta_5 WORK_i + \beta_6 SWTCH_i + \beta_7 DC_i + \varepsilon_i
\end{aligned}
\tag{1}
$$

Here, the variables AGE_i, $EXPR_i$, $NEXPR_i$, $RSRCH_i$, $WORK_i$, $SWTCH_i$, are the age of respondent i, (1-(3)), the length of work experience in the fund investment industry (1-(4)), the length of work experience in the company now he or she belongs to (1-(4-1)), average working hours per week (1-(5)), time for data processing and research (1-(6)), the number of career switches so far (1-(4-2)), and DC_i is a dummy variable. DC_i takes 1 if the i th respondent is a 'risk consistent' fund manager, otherwise 0. ε_i is an error term with normal distribution.

The answer of i th respondent is dependent on y_i^* and this relationship can be expressed as below.

$$y_i = \begin{cases} 1 & \text{if } y_i^* \leq \gamma_1 \\ 2 & \text{if } \gamma_1 < y_i^* \leq \gamma_2 \\ \vdots & \vdots \\ 6 & \text{if } \gamma_6 \leq y_i^* \end{cases} \qquad (2)$$

Here, $\gamma_1, ..., \gamma_6$ and $\beta_0, ..., \beta_7$ are parameters to be estimated.

The larger y_i^* becomes, the larger y_i also becomes. Therefore, y_i^* can represent disposition effect even though y_i^* is a latent variable of i th respondent. The smaller value of y_i^* implies stronger disposition effect. In addition, y_i^* is modeled as depending on the individual background and risk consistency so that the estimated value of $\beta_1, ..., \beta_7$ can be used to test whether these factors statistically affect the level of disposition effect or not.

For estimating our model, we use EViews (Quantitative Micro Software (2004)).

3.4.2 Estimation results

In Table 5, we show estimation results for the ordered probit model related to disposition effect. As for individual background, almost all variables are not significant at the 5 level. Only the result for question 4-(1)- , the parameter of research time, is significantly estimated at the 5% level and positive. This result shows that fund managers whose research time is longer have a weaker tendency to wait for price recovery. However, all other individual background factors do not appear to have any influence on disposition effect.

As for the risk consistency dummy result, the parameters DC_i in both questions are estimated significantly at the 1 level and positive. From these results, we can confirm that 'risk consistent' fund managers show smaller disposition effect than their 'risk inconsistent' counterparts. Thus, here we can reaffirm the results attained in section 3.2.

Table 5 Estimation Results of Ordered Probit Model on Disposition Effect

	Q 4-(1)-		Q 4-(1)-		
	coefficient	standerd error	coefficient	standerd error	
AGE	-0.009	(0.0193)	-0.003	(0.0215)	
EXPR	0.013	(0.0196)	-0.006	(0.0211)	
NEXPR	0.020	(0.0159)	0.022	(0.0153)	
RSRCH	0.010	(0.0067)	0.016	(0.0069)	*
WORK	-0.007	(0.0081)	-0.012	(0.0088)	
SWTCH	0.111	(0.0956)	0.180	(0.0928)	**
DC	0.432	(0.1506) ***	0.412	(0.1502)	***

***, **, * denote statistical significance at th 1%, 5% and 10% level respectively.

Table 6 Estimation Results of Ordered Probit Model on Herding Behavior

	Q 4-(3)-			Q 4-(3)-			Q 4-(3)-		
	coefficient	standerd error		coefficient	standerd error		coefficient	standerd error	
AGE	0.018	(0.0243)		0.019	(0.0248)		0.012	(0.0208)	
EXPR	0.001	(0.0263)		-0.003	(0.0259)		0.013	(0.0227)	
NEXPR	-0.014	(0.0196)		-0.020	(0.0181)		0.024	(0.0178)	
RSRCH	-0.014	(0.0069)	**	0.010	(0.0080)		0.024	(0.0079)	***
WORK	-0.020	(0.0110)	*	0.004	(0.0087)		-0.018	(0.0120)	
SWTCH	0.216	(0.0953)	**	0.143	(0.1187)		0.144	(0.0960)	
DC	0.253	(0.1765)		-0.228	(0.1797)		0.152	(0.1792)	

	Q 4-(3)-			Q 4-(3)-			Q 4-(4)		
	coefficient	standerd error		coefficient	standerd error		coefficient	standerd error	
AGE	0.006	(0.0236)		0.009	(0.0238)		-0.017	(0.0251)	
EXPR	-0.010	(0.0244)		-0.001	(0.0257)		0.004	(0.0267)	
NEXPR	0.006	(0.0197)		0.028	(0.0181)		-0.014	(0.0176)	
RSRCH	0.015	(0.0075)	**	0.005	(0.0074)		-0.020	(0.0076)	***
WORK	0.000	(0.0094)		0.009	(0.0083)		0.000	(0.0107)	
SWTCH	0.135	(0.1114)		-0.057	(0.1339)		-0.011	(0.1329)	
DC	0.039	(0.1779)		-0.237	(0.1753)		-0.375	(0.1934)	*

***, **, * denote statistical significance at th 1%, 5% and 10% level respectively.

In Table 6, we show estimation results for the ordered probit model related to herding

behavior.

The dummy variables that are significantly estimated at a 10% level only exist in question 4-(4). Because the values of these are all minus, it can be seen that 'risk consistent' fund managers tend to place more trust in their own investment decisions and show less herding behavior than 'risk inconsistent' fund managers.

The results in Chap.3.3.3, in which personal background is not controlled, shows that questions 4-(3)-   and 4-(3)-   are significant at the 10% level. However, the dummy variables in the ordered probit model are not significant. From these statistics, the results in Chap.3.3.3 might be considered pseudo results, as there was no control for the backgrounds of each fund manager.

Continuing our analysis of personal backgrounds, results regarding research hours are significant in questions 4-(3)-   4-(3)-   4-(3)-   4-   at the 5% level. The signs of these results are plus in questions 4-(3)-   and 4-(3)- , and minus in 4-(3)-   and 4- . These results show that fund managers whose research hours are long do not pay much attention to the behavior of other market participants. Furthermore, these fund managers tend to care about the opinions of their colleagues and place much trust in their own decisions. Therefore, such fund managers do not seem to demonstrate herding behavior, as they do not follow how other market participants invest.

4. Summary

In this research paper, we investigated risk consistency and other investment behaviors of fund managers working at Japanese investment institutions using a questionnaire based survey that was conducted in October of 2005. In particular, we focused on the herding behavior and disposition effect of fund managers. This research utilized the results of numerous research papers from the field of behavioral finance.

We began by investigating the attitudes towards risk held by fund managers. We then divided them into two groups: 'risk consistent' fund managers and 'risk inconsistent' fund managers. In exploring the difference in investment behavior between these two groups, we found that 'risk inconsistent' fund managers have a tendency to show disposition behavior. As for herding behavior, we could not find any strong evidence that might indicate a difference between the two groups.

To further our research, we took a closer look at the disposition effect that we found

in our preliminary analysis. Because we could not ignore the influence of each fund manger's individual background, we estimated an ordered probit model to control individual characteristics. After controlling individual information, we were able to confirm that 'risk inconsistent' fund managers show disposition effect.

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