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MYOPIC LOSS AVERSION: INFORMATION FEEDBACK VS. INVESTMENT FLEXIBILITY

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Myopic Loss Aversion:

Information Feedback vs. Investment Flexibility[*]

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Abstract

We experimentally disentangle the effect of information feedback from the effect of investment flexibility on the investment behavior of a myopically loss averse investor. Our findings show that varying the information condition alone suffices to induce behavior that is in line with the hypothesis of Myopic Loss Aversion.

JEL Codes: D81,C91

Keywords: Myopic loss aversion, information feedback, commitment, investment flexibility.

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Introduction

The behavioral hypothesis of myopic loss aversion (MLA), introduced by Bernartzi and Thaler (1995), predicts that investors with longer evaluation periods find risky investments more attractive. Gneezy and Potters (1997) (hereafter GP) tested this hypothesis in laboratory experiments. They compared the investment choices of two groups of subjects with different evaluation periods: One group of subjects received less information feedback and had less flexibility in adjusting their investments than a control group. The results of their study suggest that the more frequently returns of investments are evaluated, the lower is the average level of investments in risky assets. Such an evaluation period effect is in line with the MLA hypothesis. Haigh and List (2002) replicated the study of GP with professional traders and found an even stronger effect. Gneezy, Kapteyn and Potters (2003) demonstrated the effect in a market experiment.

However, all of these experiments exhibit a common design feature: Both the frequency of information feedback and the level of investment flexibility are manipulated simultaneously. Our question of interest is to investigate which of the two manipulations is responsible for the effect of the evaluation period on investment behavior. In this paper, we report an experimental test that allowed us to disentangle the effect of information feedback from that of investment flexibility. We first replicated the high frequency information / high investment flexibility treatment (labelled H) and the low frequency information / low investment flexibility treatment (labelled L) that were used in previous experiments. In addition, we conducted a high frequency information / low flexibility treatment (labelled M).

In comparing M and L, the information feedback is varied while the investment flexibility is held constant. Whereas in comparing M and H, the investment flexibility is varied while

the information feedback remains unchanged. We show that the evaluation period effect previously reported in the literature can be explained by information feedback alone.

1   Test Design and Procedure

We designed the basic setting of our experiment in close resemblance to GP. Participants were confronted with a sequence of nine independent draws of the same gamble. For each draw an individual received an endowment of 70 Eurocents, which could be totally or partially invested. In the gamble, there was a probability of 1/3 of winning two and a half times the amount bet. With probability 2/3 the amount would be lost entirely. Subjects were fully informed about the objective probabilities of winning and losing, and about the corresponding size of gains and losses. It is important to stress that subjects could not bet any money accumulated in previous rounds. Hence, the maximum bet in each round was 70 Eurocents, independently of the outcome of the bet in any of the previous rounds.

First, we replicated the GP treatments H (high frequency information / high flexibility) and L (low frequency information / low flexibility) in order to provide a basis for comparison.

In treatment H the subjects played the gambles one by one. At the beginning of round one they had to choose how much of their endowment of 70 Eurocents to bet in the lottery. Then they were informed about the realization of the lottery in round one. Only then they could decide how much of their new endowment of 70 Eurocents to bet in round two, and so on. Hence, in this treatment subjects made nine subsequent betting decisions.

In treatment L, on the other hand, subjects played the nine rounds in blocks of three. At the beginning of round one, subjects had to decide how much of their endowment of 70

Eurocents to bet in the lotteries of rounds one, two, and three. In addition, these bets were restricted to be equal. If a subject bet X in round one, she also bet X in rounds two and three. After subjects decided on their bets, they were informed about the realizations for rounds one, two, and three at the same time. Subsequently, subjects decided how much to bet in rounds four, five, and six, and so on.

In addition to these two treatments, we conducted a third treatment M. In this treatment, we combined the information condition of treatment H with the flexibility condition of treatment L. That is, while subjects received information about the outcome of the gamble after each draw, they had to commit to a fixed equal amount of investment for three subsequent periods in advance in each of the periods one, four, and seven. Hence, relative to treatment H, varying the evaluation period meant lowering the flexibility while holding the information frequency constant. Treatments L and M had the same investment flexibility, but in L information was obtained at a low frequency while in M information was obtained at a high frequency.

We ran a computerized experiment with a total of twelve sessions in September 2003. Participants were recruited via email from the subject pool of the CentERlab at Tilburg University comprising 500 people at the time of recruitment. The invitation announced a decision-making experiment that would last no longer than 40 minutes, with a reward that would depend on their decisions. The experiment was held in the CentER lab, where students were seated in separated compartments. In total, 135 students participated: 47 in treatment M and 44 in treatments H and L, respectively. The number of subjects per session varied from 4 to 18.

Upon entering the room, instructions written in English were distributed.[1] Subjects ex-

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[1]Instructions are in appendix.

amined the instructions on average for seven minutes, within which also questions were answered in private.

Treatment H: On the computer screen subjects were asked to enter their bet for the first round. Then, the lottery was conducted by means of a 'wheel:' A random number generator gave out a sequence drawn from the numbers 1, 2, and 3 with each number replacing the previous until the wheel came to a halt. The subject won in case the last number displayed was a '3.' After the round, the computer program displayed gains or losses, the profit and the earnings from that round and subjects recorded their earnings on their registration forms. This procedure was repeated for all nine rounds.

Treatment L: On the computer screen subjects were asked to enter their bet for the subsequent three rounds. Then, three neighboring wheels would run one after the other on the same computer screen. Next, the computer program displayed gains or losses, the profit and earnings jointly for the three rounds and subjects recorded their joint results for the previous three rounds on their registration forms. Note the important difference: In this treatment subjects recorded one entry per three rounds as opposed to separate entries for each rounds in the H and M treatments. This procedure was repeated three times, for a total of nine rounds.

Treatment M: On the computer screen subjects were asked to enter their bet for the subsequent three rounds. Then, the wheel ran one time. Next, the computer program displayed gains or losses, the profit and earnings from that round and subjects recorded their results. Thereafter, the wheel ran another time for the second round without subjects entering another bet since the bet had already been decided upon in the first round. Again, the computer program displayed the results and subjects had to record them separately from the

results of the first round. The wheel ran a third time and results were again displayed and recorded separately for the third round. Note that although subjects had to fix their bets for three rounds in advance, they were forced to experience the gains or losses they had made in each round separately when recording their results on paper. This procedure was repeated three times, for a total of nine rounds.

At the end of each treatment, participants calculated their total earnings. The computer program displayed summary statistics so that we could check the calculations to make sure that the output of the computer screen matched the amounts entered. Finally, forms were collected. Sessions for treatments H and M lasted about 30 minutes in total, whereas sessions for treatment L had a duration of about 20 minutes.

2 Results

In order to analyze the results, we compared average percentages of endowment bet in the gamble per round across the three treatments. The left-hand side of Table 1 displays these average percentages of the invested amount for each treatment, while the right-hand side presents the Mann-Whitney test values for each hypothesis tested. The p-values of each test are enclosed in brackets.

To begin with, we replicated the test of GP by comparing average investments in the high frequency information / high flexibility treatment (H) and in the low frequency information / low flexibility treatment (L). Like GP, we found average investments in treatment L to be significantly higher than average investments in treatment H for all three blocks.

Thereafter, we tested the null hypothesis that flexibility in adjustment does not affect investments against the alternative hypothesis that $H < M$ by comparing average investments

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in the high frequency information / high flexibility treatment (H) with average investments in the high frequency information / low flexibility treatment (M). We could not reject this null hypothesis in any of the three blocks at 5% significance levels.

Finally, we tested the null hypothesis that information feedback does not affect investments against the alternative hypothesis that $M < L$ by comparing average investments in the low frequency information / low flexibility treatment (L) with average investments in the high frequency information / low flexibility treatment (M). We found that subjects with low investment flexibility but more frequent information on their financial situation invested significantly less than subjects who faced the same flexibility but received less information. This effect was particularly strong in the first two blocks, and was less strong but still significant in the third block at the 6% level. Both sets of tests clearly indicate that the evaluation period effect found in the literature can entirely be attributed to information feedback rather than to investment flexibility.

It is interesting to report related evidence in Langer and Weber (2003), who find average investments in their corresponding M treatment to be significantly *higher* than those of their H treatment. While our results suggest that average investments in our M treatment are not significantly different from those of our H treatment when aggregated over the nine rounds of play, we find in the last three rounds an effect in line with that reported by Langer and Weber. In particular, average investments in rounds 7 to 9 are slightly higher in treatment M than in treatment H ($p = 0.062$). Equally interesting in the Langer and Weber study is their finding that average investments in M and L treatments are not statistically different (i.e. no information feedback effect), which is in sharp contrast to our results. These differences might be due to the "multiplicative approach" used by Langer and Weber, where investors

receive an initial endowment that is transferred from period to period and can be reinvested together with its returns. In contrast, our design is chosen in consistency with the existing "additive-based" literature on an evaluation period effect, in which individuals invest a certain amount out of a constant income flow, and gains and losses in a period do not affect the endowments in subsequent periods. Although this gives us the advantage of making our comparisons with the existing literature possible, a more careful comparison of the additive and multiplicative approaches is an interesting area of future research.

Conclusion

In this paper, we reported the results of an alternative experimental test for the presence of an evaluation period effect. This test allowed us to disentangle the effect of information feedback from that of flexibility on the investments in risky assets. We confirm the works by Gneezy and Potters (1997) and others building on it, and furthermore find that experimentally induced myopia in combination with loss aversion remained to affect investment behavior systematically even when flexibility in adjusting investment was no longer varied. MLA is driven by information feedback. Hence the latter should be the variable of interest for researchers and actors in financial markets alike.

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	Treatment H[a]	Treatment L[a]	Treatment M[a]	Mann-Whitney z^b		
				H *vs* L	H *vs* M	M *vs* L
Rounds 1-3	56.6 (32.4)	63.9 (30.7)	50.9 (31.8)	-2.15 [0.016]	-1.26 [0.104]	-3.42 [0.000]
Rounds 4-6	60.6 (36.0)	72.7 (28.3)	62.8 (29.7)	-2.51 [0.006]	-0.04 [0.484]	-2.86 [0.002]
Rounds 7-9	61.4 (38.7)	76.6 (29.1)	70.6 (32.3)	-2.77 [0.003]	-1.54 [0.062]	-1.59 [0.056]
Rounds 1-9	59.5 (35.8)	71.1 (29.8)	61.4 (32.2)	-4.36 [0.000]	-0.50 [0.309]	-4.47 [0.000]

Table 1: Average percentage of endowment bet. *a*: #obs = 44, 44, 47 for treatments H, L and M. Standard errors in parentheses. *b*: One tailed significance levels (*p*-values in brackets).