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Myopic Loss Aversion, Information Dissemination, and the Equity Premium Puzzle

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Abstract:
We experimentally disentangle the effect of information dissemination from the effect of the time horizon on the investment behavior of a myopically loss averse investor. Our findings show that varying the information condition only suffices to induce behavior that is in line with the hypothesis of Myopic Loss Aversion.

Keywords: Myopic loss aversion, information dissemination

JEL Classification: D81, C91

Introduction

The behavioral hypothesis of myopic loss aversion (MLA), introduced by Bernarzti and Thaler (1995), predicts that a longer evaluation period makes a risky investment look more attractive. Gneezy and Potters (1997) (hereafter GP) tested this hypothesis in laboratory experiments. They have done so by manipulating the evaluation period of individuals: giving one group of experimental subjects less information feedback and less freedom of adjustment than a control group. The results of their experimental studies suggest that the more frequently returns are evaluated, the lower are the average level of investments in the equity market. Such an evaluation effect is in line with the MLA hypothesis. Haigh and List (2002) replicate the study of GP with professional traders and find an even stronger evaluation period effect. Gneezy, Kapteyn and Potters (2003) demonstrate the effect in a market experiment.

However, all of these experiments on evaluation period effects exhibit a common design feature: they manipulate both the frequency of information feedback and the commitment period simultaneously. Our question of interest is to investigate which of the two manipulations is responsible for the effect of evaluation period on investment behavior. In this note, we design an experimental test that allows us to disentangle the effect of information dissemination from that of commitment on investment behavior. To do so, we compare a low frequency information / long commitment period treatment (labelled L) with a high frequency information / long commitment period treatment (labelled M). In comparing M and L, the information dissemination is varied while holding the length of the commitment period constant. In addition, we replicate the high frequency information / short commitment period treatment (labelled H) that was commonly used in previous experiments. In comparing M and H, the length of the commitment period is varied while holding the information dissemination constant. We show that the totality of the effect previously observed in the literature can be explained by information dissemination 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 / short commitment period) and L (low frequency information / long commitment period) 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 labelled M. In this treatment, we combined the information condition of treatment H with the commitment 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 periods in advance in each of the periods one, four, and seven. Hence, relative to treatment H, varying the evaluation period meant changing the information frequency while holding the commitment period constant. Treatments L and M had the same commitment period, but in L information was obtained at a low frequency while in M information disseminated 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 subjectpool 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. Subjects examined 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, the 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 the endowment bet in the gamble per round across the three treatments. The left-hand side of Table 1 displays these average percentages of endowment bet for each treatment, while the right-hand side presents the hypothesis tested and the Mann-Whitney test values. The p-values of each test are enclosed in brackets.

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

Thereafter, we tested the null hypothesis that long commitment periods do not affect investments by comparing average investments in the high frequency information / short commitment treatment (H) with average investments in the high frequency information / long commitment treatment (M) against the alternative hypothesis that H<M. We cannot reject this null hypothesis in any of the three blocks at conventional significance levels.

Finally, we tested the null hypothesis that information dissemination does not affect investments by comparing average investments in the low frequency information / long commitment treatment (L) with average investments in the high frequency information / long commitment treatment (M) against the alternative hypothesis that M<L. We find that subjects with a long commitment period but who receive more often information on their financial situation invest significantly less than subjects who face the same commitment horizon but receive less information. This effect is found to be particularly strong in the first two blocks, and is significant in the third block at the 6% level. Both sets of tests clearly indicate that the effect found in the literature can entirely be attributed to information dissemination, and not to longer commitment periods.

It is interesting to report related evidence provided in Langer and Weber (2003), who obtain quite different results from ours: While they do not find an effect of information dissemination on investment behavior they find some evidence in favor of a commitment effect. However, they use what they label the 'multiplicative approach' in reference to the way investment returns are compounded over time. According to the multiplicative approach, investors receive an initial endowment that is transferred from period to period and can be reinvested together with its returns. Our design and results succeed in replicating those of the existing "additive-based" literature in which gains cannot be reinvested in subsequent periods. Although this gives us the advantage of making our comparisons with the existing literature possible, the results of Langer and Weber do indicate that a more careful investigation of the additive and multiplicative approaches is required in future work.

Conclusion

In this note, we performed an alternative test on the evaluation period effect, which allowed us to disentangle the effect of information dissemination from that of commitment on investment behavior. We tested experimentally whether the length of the evaluation period would influence investment behavior holding the commitment period constant. Furthermore, we replicated the test that was used in previous experimental works on MLA. Our results confirmed the results found by GP and others building on it: Experimentally induced myopia in combination with loss aversion remained to affect investment behavior systematically when the length of the commitment period was no longer varied. MLA is driven by information dissemination. Hence the latter should be the variable of interest for researchers and actors in financial markets alike.

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				Mann-Whitney z^b		
	Treatment H^a	Treatment L^a	Treatment M^a	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).