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A Model of Investment Decision Making: How Adaptation to Losses Affects Investors' Selling Decisions

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To provide more insight into investors' selling decisions, an integrated model of prospect theory, reference point adaptation and cognitive-experiential self-theory is proposed. We expect that the dynamically changing reference point, together with changing emotions and changing expectation for a stock's future performance, influence the decision to hold or sell losing investments. Experimental findings demonstrate a main effect of positive expectations on the decisions to hold. Also, larger total loss size and longer time in losing position are related to a more downwardly shifted reference point. This adapted reference point indirectly decreases the probability to hold the investment, via its impact on expectations.

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A Model of Investment Decision-Making: How Adaptation to Losses Affects Future Selling Decisions

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EXTENDED ABSTRACT

The well-known disposition effect postulates that investors tend to sell their winners (appreciated investments) too soon and hold their losers (depreciated investments) for too long (Shefrin & Statman, 1985). The prominent explanation for this disposition effect is based on prospect theory (Kahneman & Tversky, 1979), which posits that investors are more risk-averse in the domain of gains and more risk-seeking in the domain of losses. Thus, when facing paper gains, investors tend to be risk-averse implying the tendency to sell their winners. By contrast, when facing paper losses, investors tend to choose the risky option and hold on to their losers. However, it is not clear why and when investors eventually do sell at a loss. The aim of the present study is to address this gap in the current literature by integrating a theory of adaptation, adaptation level theory (Helson, 1964), a theory of reference point dependence, prospect theory (Kahneman & Tversky, 1979), and a theory of dual process decision-making, cognitive-experiential self-theory (Epstein, 1994) to propose a model of investment decision-making.

Our model disentangles the effects of time in losing position and size of loss on reference point adaptation. The adaptation of the reference point (from prospect theory) can be modeled as changes in adaptation level (from adaptation level theory), which are determined by time and size of each stimulus. These are linked to the investor's decision-making process using the framework of cognitive-experiential self-theory, which suggests there are two systems in decision making: experiential and rational (Epstein, 1994). The experiential system can automatically and effortlessly process information. Also, it interacts with the rational system as a source of intuitive wisdom and creativity. On the other hand, the rational system is a deliberative and effortful system, processing at high levels of abstraction and handling long term delay of gratification.

In the integration of prospect theory, adaptation level theory and experiential self-theory, we develop on the results of a recent study by Arkes, Hirshleifer, Jiang and Lim (2008). They find investors adapt to financial gains and losses as their reference point shifts after the value of the investment increased or decreased. However, the link between reference point adaptation and decision-making is still lacking. Therefore, we conduct an experimental study to examine how the adapted reference point influences one's emotions and expectation about an investment's future performance, and eventually leads to the decision to hold or to capitulate a losing investment.

We hypothesize that (H1) the size of total loss and the time in losing position are negatively related to an individual investor's adapted reference point; (H2a) the adapted reference point is positively related to one's optimistic expectations towards the losing investment; (H2b) in turn, more optimistic expectation leads to a smaller probability of an investor's capitulation of the losing investment; (H3a) the size of previous loss is negatively related to one's positive emotion towards the losing investment; (H3b) in turn, more positive emotion leads to a smaller probability of capitulation. We ran an experiment, in which 111 participants

incurred various sizes of stock losses over a course of maximum 10 investment periods. At the end of each period, participants received information of the stock's performance. Before making the decision to hold or to capitulate on the stock, participants answered several questions concerning their emotions, expectations and adaptation to losses.

We applied the partial least squares (PLS) approach to estimate the proposed model. Significant effects were observed from both time in losing position and size of total loss on reference point adaptation. We show that the investors' adapted reference point significantly shifts downwards when total loss and time in losing position increase. These experimental results give support to hypothesis 1. Moreover, a higher adapted reference point predicts more optimistic expectations about the stock's future performance, while a larger previous loss predicts more negative emotions. These results give support to hypotheses 2a and 3a. To test hypothesis 2b and 3b, we examine the relation among emotion, expectation and the decision to hold or capitulate on a losing investment. More optimistic expectations about the stock's future performance are positively and significantly related to the tendency to keep the losing investment, although a more positive emotion does not significantly predict a stronger tendency to hold. Thus, hypothesis 2b is supported, but hypothesis 3b is not.

Our results are consistent with Arkes et al. (2008) that investors do adapt to losses, but we contribute to the existing literature by demonstrating that a lower adapted reference point is predicted by a larger size of total losses and/or a longer time in losing position. Moreover, our results add more insight into the separate effects of time in a losing position and the size of investment losses as we have disentangled the unique effect of past stimuli and time. We also show that adaptation of the reference point indirectly affect an investor's decision to hold or to capitulate on a losing investment, thus, we have demonstrated the link between reference point adaptation and decision-making.

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